

TEST REPORT

of

FCC Part 2 Subpart J, Part 24 Subpart E
and Part 27 Subpart C

FCC ID: BEJTFGMEIBBCD1

Equipment Under Test : Telematics
Model Name : TFGMEIBBCD1
Variant Model Name(s) : Refer to page 3
Applicant : LG Electronics USA, Inc.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2025.04.30
Date of Test(s) : 2025.06.17 ~ 2025.07.30
Date of Issue : 2025.08.04

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

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- 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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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 Electronics USA, Inc.

Address : 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632

Contact Person : Cho, Hee-jae

Phone No. : +1 201 470 2696

1.3. Details of Manufacturer

Company : LG Electronics Inc.

Address : 128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Republic of Korea, 07336

1.4. Description of EUT

Kind of Product	Telematics
Model Name	TFGMEIBBCD1
Variant Model Name	TFGMEIBBCD2, TFGMEIBBCD3, TFGMEIBBCD1_MY27, TFGMEIBBCD2_MY27, TFGMEIBBCD3_MY27
Serial Number	Conducted: 356715660000004 Radiated: 356715660000012
Power Supply	DC 13.5 V
Rated Power	LTE Band 25, 71 : 24 dBm
Frequency Range	LTE Band 25: 1 850 MHz ~ 1 915 MHz LTE Band 71: 663 MHz ~ 698 MHz
Modulation Technique	QPSK, 16QAM, 64QAM
Antenna Type	Internal: Planar Inverted F Antenna External: Metal Antenna
Antenna Gain [*]	Refer to the clause 1.16
H/W Version	Rev.G
S/W Version	SW180

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Due	Cal. Interval
Spectrum Analyzer	R&S	FSV30	103454	10/29/2025	Annual
Spectrum Analyzer	Agilent	N9020A	MY53421758	09/10/2025	Annual
Signal Generator	R&S	SMA100B	106887	10/11/2025	Annual
DC Power Supply	R&S	HMP2020	022802107	10/31/2025	Annual
Communication Analyzer	Anritsu	MT8821C	6262192291	02/19/2026	Annual
Temperature Chamber	ESPEC CORP.	PL-2J	15004184	06/04/2026	Annual
Directional Coupler	KRYTAR	152613	140972	10/11/2025	Annual
BRIDGE Coupler	MARK MICROWAVE INC	CBR16-0012	1542	05/15/2026	Annual
High Pass Filter	Wainwright Instrument GmbH	WHNX10-900-1000-18000-40-SS	7	02/24/2026	Annual
High Pass Filter	Wainwright Instrument GmbH	WHKX3.0/18G-10SS	21	06/17/2026	Annual
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	11	10/16/2025	Annual
Preamplifier	H.P.	8447F	2944A03909	08/09/2025	Annual
Preamplifier	R&S	SCU 18F	101058	02/27/2026	Annual
Test Receiver	R&S	ESU26	100109	01/13/2026	Annual
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	03/25/2027	Biennial
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	03/05/2027	Annual
Horn Antenna	R&S	HF906	100326	02/24/2026	Annual
Antenna Master	Innco systems GmbH	MA4640-XP-ET	MA4640/536/38330516/L	N.C.R.	N/A
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/38330516/L	N.C.R.	N/A
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
Coaxial Cable	RADIALL	TESTPRO 3	182287	Oct. 11, 2025	Semi-Annual
Coaxial Cable	RADIALL	TESTPRO 3	182284	Oct. 11, 2025	Semi-Annual
Coaxial Cable	RADIALL	TESTPRO 3	182288	Oct. 11, 2025	Semi-Annual
Coaxial Cable	SENSORVIEW	NMST-13A26-NMST-5m	TPC2402190004	Oct. 08, 2025	Semi-Annual
Coaxial Cable	SENSORVIEW	NMST-13A26-NMST-10m	TPC2402190001	Oct. 08, 2025	Semi-Annual

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, Part 24 and 27		
Section	Section	Section
§24.232(c) §27.50(c)(10)	E.R.P. / E.I.R.P.	Pass ¹⁾
§24.238(a) §27.53(g)	Radiated Spurious Emission	Pass ¹⁾
§2.1046	Conducted Output Power	Pass ²⁾
§2.1049	Occupied Bandwidth	Pass ²⁾
§24.232(d)	Peak-Average Ratio	Pass
§24.238(a) §27.53(g)	Spurious Emission at Antenna Terminal	Pass ²⁾
§24.238(a) §27.53(g)	Band Edge and Emission Mask	Pass ²⁾
§2.1055 §24.235 §27.54	Frequency Stability	Pass ²⁾

Note;

- 1) The EUT has two antenna types (external, internal) and all antennas operated by one module.
- 2) The EUT uses same module with TM05FNNAGM0, so only spot check was performed for radiated spurious emissions and the rule was satisfied.
- 3) The EUT has various external antennas and radiated spurious emission test was performed with external antenna which has highest gain of each band

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 (dBμV) + 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. Introduction of Test Data Reuse

This report referenced from the FCC ID: BEJTM05FNNAGM0.

The applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID

1.9. Difference

Model name	Description
TM05FNNAGM0	- Reference model - Single modular
TFGMEIBBCD1	- Host equipment - Same to reference model except below - With external case - Internal antenna

1.10. Spot Check Data

After confirming through preliminary radiated spurious emissions in the band that the performance of the FCC ID: BEJTM05FNNAGM0 remains representative of FCC ID: BEJTFGMEIBBCD1
The test data of FCC ID: BEJTM05FNNAGM0 is being submitted for this application to cover LTE features.

Band	Test item	Frequency (MHz)	Limit	Original model	Spot check model	Deviation (dB)	Remark
				TM05FNNAGM0	TFGMEIBBCD1		
				FCC ID: BEJTM05FNNAGM0	FCC ID: BEJTFGMEIBBCD1		
25	Radiated Spurious Emissions	1 850 ~ 1 915	-13 dB m	-36.55	-35.93	0.62	-
71	Radiated Spurious Emissions	663 ~ 698	-13 dB m	-42.46	-43.56	-0.90	-

Note;

Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC technical limits.

1.11. Reference Detail

Reference applicant that contains the reused reference data in the individual test reports:

Equipment class	Reference FCC ID	Application type	Reference test report number	Exhibit type	Variant test report number	Data reuse
PCB	FCC ID: BEJTM05FNNAGM0	Original grant	F690501-RF-RTL006148 (LTE)	Test report	F690501-RF-RTL006227 (LTE)	All
			F690501-RF-RTL006149 (NR)		F690501-RF-RTL006228 (NR)	

1.12. Information of Variant Model

Model Name		Description
Basic Model	TFGMEIBBCD1	- Dual GNSS is supported. - Ultra-super cruise service is supported.
Variant Models	TFGMEIBBCD2	- Same to RF module with basic model except following function. - Single GNSS is supported. - Ultra-super cruise service is not supported.
	TFGMEIBBCD3	- Same to RF module with basic model except following function. - Single GNSS is supported. - Ultra-super cruise service is not supported. - eUICC part is different with TFGMEIBBCD2.
	TFGMEIBBCD1_MY27	- Same as Basic model. - Only the model name differs for marketing purposes.
	TFGMEIBBCD2_MY27	- Same to RF module with basic model except following function. - Single GNSS is supported. - Ultra-super cruise service is not supported.
	TFGMEIBBCD3_MY27	- Same to RF module with basic model except following function. - Single GNSS is supported. - Ultra-super cruise service is not supported. - eUICC part is different with TFGMEIBBCD2.

Note;

The all test items performed with basic model.

1.13. Worst Case Configuration and Mode

The worst-case is based on the conducted output power measurement investigation results. All testing was performed using QPSK, 16QAM and 64QAM 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 in QPSK.

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

1.14. Manufacturer Declaration

The EUT supports two ports and LTE and 5G NR FDD bands support only port 1. The 5G NR TDD (n41, n77, n78) band supports both port 1 and port 2

1.15. Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation			RB #		
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full
Conducted Output Power	25	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	71	V	V	V			V	V	V	V	V	V	V	V	V	V
Frequency Stability	25	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V
	71	-	V	-			V	-	-	-	V	-	-	-	-	V
Occupied Bandwidth	25	V	V	V	V	V	V	V	V	V	V	V	-	-	-	V
	71	V	V	V			V	V	V	V	V	V	-	-	-	V
Peak-to-Average Ratio	25	V	V	V	V	V	V	V	V	V	V	V	V	-	-	V
	71	V	V	V			V	V	V	V	V	V	V	-	-	V
Band edge	25	V	-	V	V	V	V	V	V	V	V	V	-	V	-	V
	71	V	-	V			V	V	V	V	V	V	-	V	-	V
Spurious at antenna terminal & Spurious Radiated Emission	25	V	V	V	worst case											
	71	V	V	V	worst case											

1.16. Antenna Information

Band	Operating Frequency (MHz)	Antenna Peak Gain (dB i)						
		Internal	External					
			84933920	87832572	85015365	85015378	86784729 85647584	85846853 85846852
25	1 850 ~ 1 915	2.23	5.12	<u>5.18</u>	0.08	1.27	4.39	0.80
71	663 ~ 698	0.58	0.37	0.67	-0.47	0.09	<u>4.37</u>	-1.50

Note;

The radiated emission test was performed external antenna with highest gain.

1.17. 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	0.03 MHz	
Conducted Spurious Emissions	0.86 dB	
Peak to Average Ratio	0.65 dB	
Frequency Stability	110 Hz	
Radiated Emission, 9 kHz to 30 MHz	H	3.40 dB
	V	3.40 dB
Radiated Emission, below 1 GHz	H	4.60 dB
	V	5.00 dB
Radiated Emission, above 1 GHz	H	3.60 dB
	V	3.60 dB

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

1.18. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL006227	2025.08.04	Initial

1.19. Emission Designator and Max Power

-Internal Antenna

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
25	1.4	QPSK	1 850.7	1 914.3	24.18	2.23	26.41	0.438	1M09G7D
		16QAM			23.45		25.68	0.370	1M10D7D
	3	QPSK	1 851.5	1 913.5	24.26		26.49	0.446	2M69G7D
		16QAM			23.66		25.89	0.388	2M69D7D
	5	QPSK	1 852.5	1 912.5	24.15		26.38	0.435	4M51G7D
		16QAM			23.49		25.72	0.373	4M50D7D
	10	QPSK	1 855.0	1 910.0	24.32		26.55	0.452	8M95G7D
		16QAM			23.69		25.92	0.391	8M91D7D
	15	QPSK	1 857.5	1 907.5	24.29		26.52	0.449	13M5G7D
		16QAM			23.63		25.86	0.385	13M5D7D
	20	QPSK	1 860.0	1 905.0	24.33		26.56	0.453	17M9G7D
		16QAM			23.63		25.86	0.385	17M9D7D

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. Average (dB m)	E.R.P. Average (W)	Emission Designator
71	5	QPSK	665.5	695.5	23.83	0.58	22.26	0.168	4M49G7D
		16QAM			23.18		21.61	0.145	4M50D7D
	10	QPSK	668.0	693.0	23.83		22.26	0.168	8M95G7D
		16QAM			23.26		21.69	0.148	8M93D7D
	15	QPSK	670.5	690.5	23.93		22.36	0.172	13M5G7D
		16QAM			23.29		21.72	0.149	13M5D7D
	20	QPSK	673.0	688.0	23.85		22.28	0.169	17M9G7D
		16QAM			23.34		21.77	0.150	17M9D7D

-External Antenna

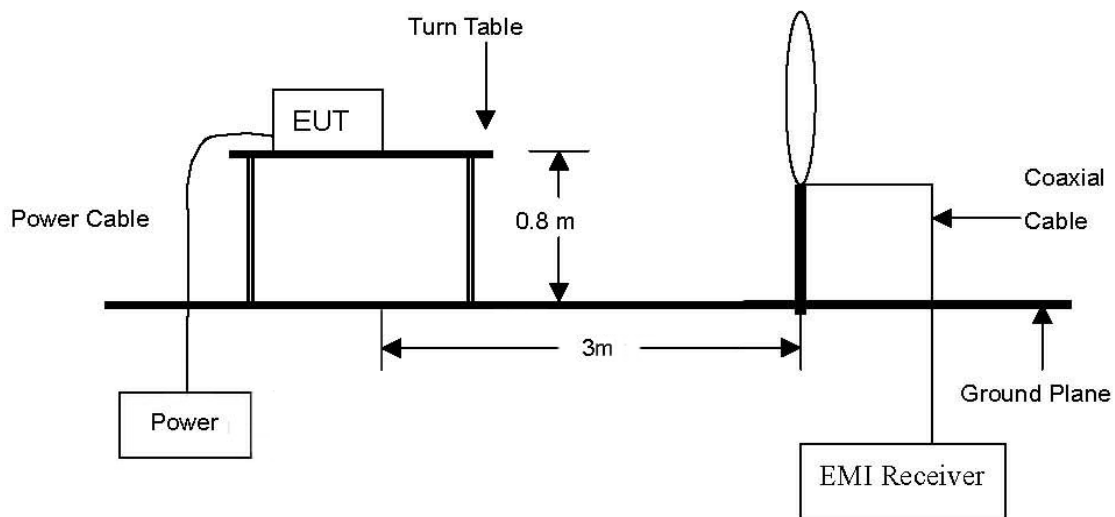
Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.I.R.P. Average (dB m)	E.I.R.P. Average (W)	Emission Designator
25	1.4	QPSK	1 850.7	1 914.3	24.18	5.18	29.36	0.863	1M09G7D
		16QAM			23.45		28.63	0.729	1M10D7D
	3	QPSK	1 851.5	1 913.5	24.26		29.44	0.879	2M69G7D
		16QAM			23.66		28.84	0.766	2M69D7D
	5	QPSK	1 852.5	1 912.5	24.15		29.33	0.857	4M51G7D
		16QAM			23.49		28.67	0.736	4M51D7D
	10	QPSK	1 855.0	1 910.0	24.32		29.50	0.891	8M95G7D
		16QAM			23.69		28.87	0.771	8M93D7D
	15	QPSK	1 857.5	1 907.5	24.29		29.47	0.885	13M5G7D
		16QAM			23.63		28.81	0.760	13M5D7D
	20	QPSK	1 860.0	1 905.0	24.33		29.51	0.893	17M9G7D
		16QAM			23.63		28.81	0.760	17M9D7D

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.R.P. Average (dB m)	E.R.P. Average (W)	Emission Designator
71	5	QPSK	665.5	695.5	23.83	4.37	26.05	0.403	4M51G7D
		16QAM			23.18		25.40	0.347	4M51D7D
	10	QPSK	668.0	693.0	23.83		26.05	0.403	8M95G7D
		16QAM			23.26		25.48	0.353	8M95D7D
	15	QPSK	670.5	690.5	23.93		26.15	0.412	13M5G7D
		16QAM			23.29		25.51	0.356	13M5D7D
	20	QPSK	673.0	688.0	23.85		26.07	0.405	17M9G7D
		16QAM			23.34		25.56	0.360	17M9D7D

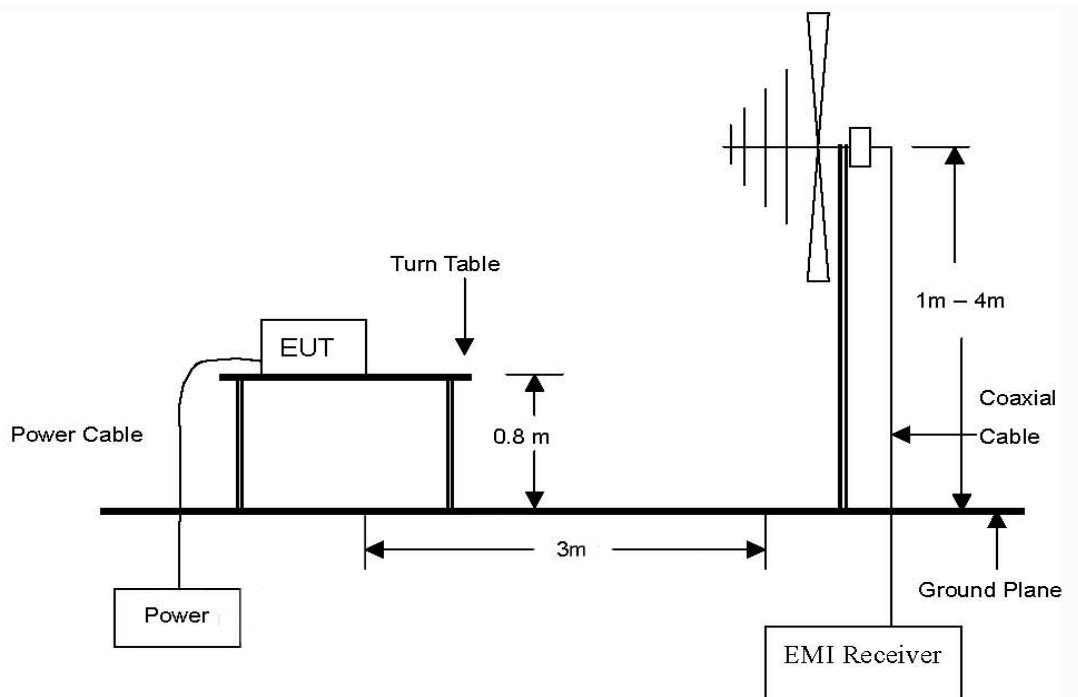
2. E.R.P. / E.I.R.P. & Radiated Spurious Emission

2.1. Test setup

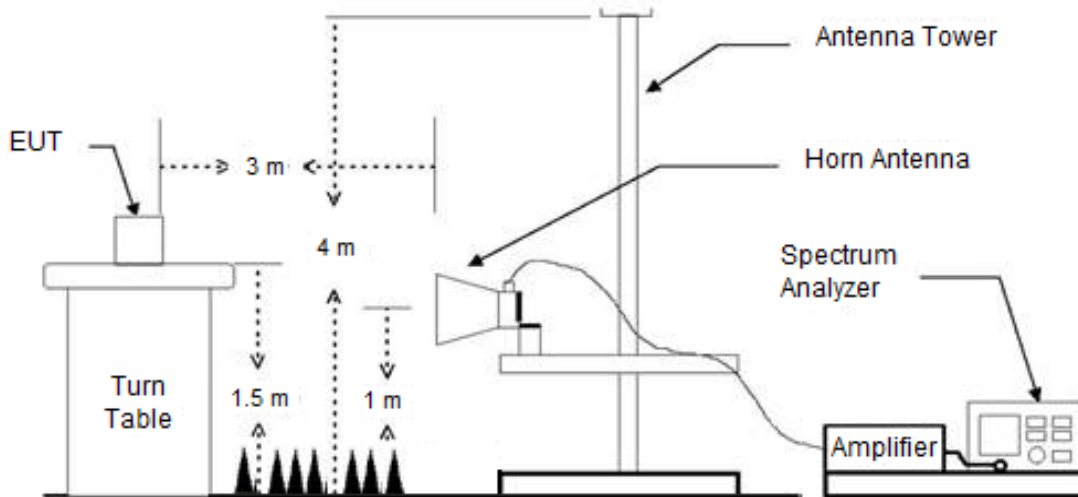
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



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. The spurious emissions were investigated from 1 GHz to the 10th harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



2.2. Limit

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

- §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.
- §27.50(c)(10), portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

2.2.2. Limit of Radiated Spurious Emission

- §24.238(a), The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
- §27.53(g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log(P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

2.3. Test Procedure

2.3.1. E.R.P. / 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/TIA 603E: 2016 and 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 ≥ 3 x 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 % R.H.

2.4.1. E.R.P. / E.I.R.P.

-Internal Antenna

Band	Frequency (MHz)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
25	1 850 ~ 1 915	24.33	0.271	2.23	26.56	0.453			2 W E.I.R.P.
71	663 ~ 698	23.93	0.247	0.58	24.51	0.282	22.36	0.172	3 W E.R.P.

-External Antenna

Band	Frequency (MHz)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Worst Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
25	1 850 ~ 1 915	24.33	0.271	5.18	29.51	0.893			2 W E.I.R.P.
71	663 ~ 698	23.93	0.247	4.37	28.30	0.676	26.15	0.412	3 W E.R.P.

Remark;

1. E.I.R.P. (dB m) = Maximum Conducted Power (dB m) + Antenna Gain (dB i)
2. E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.

2.4.2. Radiated Spurious emission

-Internal Antenna

LTE band 25 (20 MHz - 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 (1 860.0 MHz)									
3 720.25	45.57	H	32.08	-30.83	46.82	-95.26	-48.44	-13	35.44
3 720.17	52.36	V	32.08	-30.83	53.61	-95.26	-41.65	-13	28.65
5 580.33	43.30	H	34.10	-27.35	50.05	-95.26	-45.21	-13	32.21
5 580.37	47.41	V	34.10	-27.35	54.16	-95.26	-41.10	-13	28.10
Above 5 600.00	Not detected	—	—	—	—	—	—	—	—
Middle Channel (1 882.5 MHz)									
3 765.19	49.74	H	32.23	-30.76	51.21	-95.26	-44.05	-13	31.05
3 765.21	54.47	V	32.23	-30.75	55.95	-95.26	-39.31	-13	26.31
5 647.81	41.99	H	34.10	-27.57	48.52	-95.26	-46.74	-13	33.74
5 647.75	46.83	V	34.10	-27.57	53.36	-95.26	-41.90	-13	28.90
Above 5 700.00	Not detected	—	—	—	—	—	—	—	—
High Channel (1 905.0 MHz)									
3 810.17	49.63	H	32.30	-30.42	51.51	-95.26	-43.75	-13	30.75
3 810.21	55.19	V	32.30	-30.42	57.07	-95.26	<u>-38.19</u>	-13	25.19
5 715.25	39.07	H	34.20	-27.21	46.06	-95.26	-49.20	-13	36.20
5 715.21	44.39	V	34.20	-27.21	51.38	-95.26	-43.88	-13	30.88
Above 5 800.00	Not detected	—	—	—	—	—	—	—	—

LTE band 71 (15 MHz - QPSK)

Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (670.5 MHz)									
2 031.71	41.48	H	27.73	-33.42	35.79	-97.41	-61.62	-13	48.62
2 031.60	44.63	V	27.73	-33.42	38.94	-97.41	-58.47	-13	45.47
4 063.03	45.18	H	32.07	-30.14	47.11	-97.41	-50.30	-13	37.30
4 062.91	49.99	V	32.07	-30.14	51.92	-97.41	-45.49	-13	32.49
Above 4 100.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (680.5 MHz)									
4 122.84	43.36	H	32.05	-30.06	45.35	-97.41	-52.06	-13	39.06
4 123.04	43.65	V	32.05	-30.05	45.65	-97.41	-51.76	-13	38.76
Above 4 200.00	Not detected	-	-	-	-	-	-	-	-
High Channel (690.5 MHz)									
4 182.65	41.39	H	32.10	-29.34	44.15	-97.41	-53.26	-13	40.26
4 182.55	40.78	V	32.10	-29.34	43.54	-97.41	-53.87	-13	40.87
Above 4 200.00	Not detected	-	-	-	-	-	-	-	-

-External Antenna (87832572)

LTE band 25 (20 MHz - 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 (1 860.0 MHz)									
3 720.27	43.76	H	32.08	-30.83	45.01	-95.26	-50.25	-13	37.25
3 720.14	45.30	V	32.08	-30.83	46.55	-95.26	-48.71	-13	35.71
5 580.34	43.52	H	34.10	-27.35	50.27	-95.26	-44.99	-13	31.99
5 580.39	46.11	V	34.10	-27.35	52.86	-95.26	-42.40	-13	29.40
Above 5 600.00	Not detected	—	—	—	—	—	—	—	—
Middle Channel (1 882.5 MHz)									
3 765.15	45.81	H	32.23	-30.76	47.28	-95.26	-47.98	-13	34.98
3 765.20	50.67	V	32.23	-30.76	52.14	-95.26	-43.12	-13	30.12
5 647.81	42.77	H	34.10	-27.57	49.30	-95.26	-45.96	-13	32.96
5 647.80	46.21	V	34.10	-27.57	52.74	-95.26	-42.52	-13	29.52
Above 5 700.00	Not detected	—	—	—	—	—	—	—	—
High Channel (1 905.0 MHz)									
3 810.13	42.81	H	32.30	-30.42	44.69	-95.26	-50.57	-13	37.57
3 810.16	49.35	V	32.30	-30.42	51.23	-95.26	-44.03	-13	31.03
5 715.20	40.71	H	34.20	-27.21	47.70	-95.26	-47.56	-13	34.56
5 715.35	45.46	V	34.20	-27.21	52.45	-95.26	-42.81	-13	29.81
Above 5 800.00	Not detected	—	—	—	—	—	—	—	—

-External Antenna (86784729)

LTE band 71 (15 MHz - QPSK)

Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (670.5 MHz)									
4 063.12	48.00	H	32.07	-30.14	49.93	-97.41	-47.48	-13	34.48
4 062.94	49.02	V	32.07	-30.14	50.95	-97.41	-46.46	-13	33.46
Above 4 100.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (680.5 MHz)									
4 122.90	43.10	H	32.05	-30.06	45.09	-97.41	-52.32	-13	39.32
4 122.98	45.65	V	32.05	-30.05	47.65	-97.41	-49.76	-13	36.76
Above 4 200.00	Not detected	-	-	-	-	-	-	-	-
High Channel (690.5 MHz)									
4 182.92	41.76	H	32.10	-29.35	44.51	-97.41	-52.90	-13	39.90
4 183.02	43.89	V	32.10	-29.35	46.64	-97.41	-50.77	-13	37.77
Above 4 200.00	Not detected	-	-	-	-	-	-	-	-

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dBμV/m) = Measured Level (dBμV) + Antenna Factor (dB/m) + AMP (dB) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dBμV/m) + CF (dB).
4. E.R.P. (dB m) = E (dBμV/m) + CF (dB) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
5. CF (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

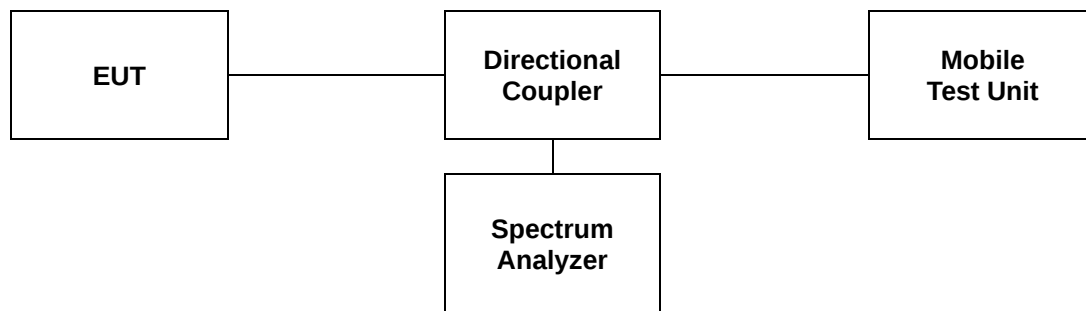
3.1. Limit

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 % R.H.

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26047 (1 850.7 MHz)		26365 (1 882.5 MHz)		26683 (1914.3 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.07	0.255	23.86	0.243	22.83	0.192	29.36	0.863
		1	2	24.18	0.262	23.78	0.239	22.86	0.193		
		1	5	24.14	0.259	23.87	0.244	22.94	0.197		
		3	0	24.09	0.256	23.77	0.238	22.91	0.195		
		3	2	24.15	0.260	23.91	0.246	22.90	0.195		
		3	3	24.13	0.259	23.97	0.249	22.80	0.191		
		6	0	23.14	0.206	23.78	0.239	22.78	0.190		
	16QAM	1	0	23.30	0.214	23.44	0.221	22.20	0.166	28.63	0.729
		1	3	23.29	0.213	23.19	0.208	22.32	0.171		
		1	5	23.24	0.211	23.12	0.205	22.32	0.171		
		3	0	23.11	0.205	22.94	0.197	22.26	0.168		
		3	2	23.14	0.206	23.45	0.221	22.19	0.166		
		3	3	23.09	0.204	23.24	0.211	22.16	0.164		
		6	0	22.18	0.165	23.25	0.211	21.25	0.133		
	64QAM	1	0	22.21	0.166	21.53	0.142	20.43	0.110	27.52	0.565
		1	2	22.11	0.163	21.52	0.142	20.57	0.114		
		1	5	22.11	0.163	21.53	0.142	20.67	0.117		
		3	0	22.26	0.168	21.57	0.144	20.58	0.114		
		3	2	22.34	0.171	21.69	0.148	20.54	0.113		
		3	3	22.28	0.169	21.66	0.147	20.53	0.113		
		6	0	21.19	0.132	20.60	0.115	20.55	0.114		

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26055 (1 851.5 MHz)		26365 (1 882.5 MHz)		26675 (1913.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.06	0.255	23.91	0.246	23.38	0.218	29.44	0.879
		1	7	24.21	0.264	23.97	0.249	22.86	0.193		
		1	14	24.26	0.267	24.06	0.255	22.83	0.192		
		8	0	23.05	0.202	22.94	0.197	22.24	0.167		
		8	4	23.14	0.206	23.04	0.201	22.24	0.167		
		8	7	23.16	0.207	23.05	0.202	22.24	0.167		
		15	0	23.20	0.209	23.03	0.201	22.22	0.167		
	16QAM	1	0	23.47	0.222	23.24	0.211	22.63	0.183	28.84	0.766
		1	7	23.66	0.232	23.38	0.218	22.26	0.168		
		1	14	23.60	0.229	23.26	0.212	22.21	0.166		
		8	0	22.42	0.175	22.03	0.160	21.45	0.140		
		8	4	22.36	0.172	22.16	0.164	21.48	0.141		
		8	7	22.47	0.177	22.23	0.167	21.45	0.140		
		15	0	22.31	0.170	22.05	0.160	21.46	0.140		
	64QAM	1	0	22.40	0.174	22.18	0.165	20.86	0.122	27.67	0.585
		1	7	22.49	0.177	22.18	0.165	20.32	0.108		
		1	14	22.45	0.176	22.20	0.166	20.59	0.115		
		8	0	21.31	0.135	20.97	0.125	19.73	0.094		
		8	4	21.39	0.138	21.02	0.126	19.75	0.094		
		8	7	21.35	0.136	21.13	0.130	19.77	0.095		
		15	0	21.30	0.135	21.14	0.130	19.74	0.094		

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26065 (1 852.5 MHz)		26365 (1 882.5 MHz)		26665 (1912.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.12	0.258	23.95	0.248	23.80	0.240	29.33	0.857
		1	12	24.15	0.260	24.00	0.251	23.24	0.211		
		1	24	24.15	0.260	24.10	0.257	22.86	0.193		
		12	0	23.08	0.203	22.85	0.193	22.70	0.186		
		12	6	23.02	0.200	22.88	0.194	22.48	0.177		
		12	13	23.05	0.202	22.98	0.199	22.11	0.163		
		25	0	23.08	0.203	22.95	0.197	22.36	0.172		
	16QAM	1	0	23.45	0.221	23.32	0.215	23.02	0.200	28.67	0.736
		1	12	23.41	0.219	23.26	0.212	22.59	0.182		
		1	24	23.49	0.223	23.40	0.219	22.09	0.162		
		12	0	22.40	0.174	22.06	0.161	21.90	0.155		
		12	6	22.28	0.169	22.11	0.163	21.71	0.148		
		12	13	22.29	0.169	22.11	0.163	21.34	0.136		
		25	0	22.25	0.168	22.01	0.159	21.55	0.143		
	64QAM	1	0	22.41	0.174	22.17	0.165	21.05	0.127	27.59	0.574
		1	12	22.40	0.174	22.31	0.170	20.85	0.122		
		1	24	22.35	0.172	22.28	0.169	20.41	0.110		
		12	0	21.33	0.136	21.03	0.127	20.05	0.101		
		12	6	21.26	0.134	21.02	0.126	19.97	0.099		
		12	13	21.31	0.135	21.07	0.128	19.67	0.093		
		25	0	21.19	0.132	21.01	0.126	19.75	0.094		

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26090 (1 855.0 MHz)		26365 (1 882.5 MHz)		26640 (1910.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.23	0.265	24.05	0.254	23.95	0.248	29.50	0.891
		1	25	24.31	0.270	24.17	0.261	23.84	0.242		
		1	49	24.32	0.270	24.00	0.251	23.90	0.245		
		25	0	23.24	0.211	23.05	0.202	22.90	0.195		
		25	12	23.32	0.215	23.15	0.207	22.95	0.197		
		25	25	23.32	0.215	23.11	0.205	22.96	0.198		
		50	0	23.24	0.211	23.14	0.206	22.93	0.196		
	16QAM	1	0	23.51	0.224	23.43	0.220	23.21	0.209	28.87	0.771
		1	25	23.56	0.227	23.34	0.216	22.99	0.199		
		1	49	23.69	0.234	23.46	0.222	22.96	0.198		
		25	0	22.33	0.171	22.18	0.165	22.05	0.160		
		25	12	22.48	0.177	22.25	0.168	22.11	0.163		
		25	25	22.51	0.178	22.23	0.167	22.16	0.164		
		50	0	22.45	0.176	22.03	0.160	22.03	0.160		
	64QAM	1	0	22.44	0.175	22.06	0.161	21.27	0.134	27.66	0.583
		1	25	22.37	0.173	21.99	0.158	21.30	0.135		
		1	49	22.48	0.177	22.10	0.162	21.02	0.126		
		25	0	21.37	0.137	21.08	0.128	20.17	0.104		
		25	12	21.40	0.138	21.08	0.128	20.27	0.106		
		25	25	21.45	0.140	21.09	0.129	20.34	0.108		
		50	0	21.46	0.140	21.15	0.130	20.22	0.105		

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26115 (1 857.5 MHz)		26365 (1 882.5 MHz)		26615 (1907.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	24.21	0.264	24.09	0.256	23.96	0.249	29.47	0.885
		1	36	24.29	0.269	24.24	0.265	23.62	0.230		
		1	74	24.28	0.268	24.12	0.258	23.66	0.232		
		36	0	23.32	0.215	23.15	0.207	22.72	0.187		
		36	18	23.17	0.207	23.17	0.207	22.75	0.188		
		36	37	23.20	0.209	23.20	0.209	22.77	0.189		
		75	0	23.27	0.212	23.16	0.207	22.82	0.191		
	16QAM	1	0	23.54	0.226	23.31	0.214	22.86	0.193	28.81	0.760
		1	36	23.54	0.226	23.51	0.224	22.91	0.195		
		1	74	23.63	0.231	23.47	0.222	22.89	0.195		
		36	0	22.45	0.176	22.34	0.171	21.92	0.156		
		36	18	22.34	0.171	22.38	0.173	21.90	0.155		
		36	37	22.39	0.173	22.28	0.169	21.98	0.158		
		75	0	22.34	0.171	22.24	0.167	21.93	0.156		
	64QAM	1	0	22.52	0.179	22.35	0.172	21.33	0.136	27.81	0.604
		1	36	22.48	0.177	22.27	0.169	20.79	0.120		
		1	74	22.63	0.183	22.37	0.173	20.82	0.121		
		36	0	21.46	0.140	21.18	0.131	20.09	0.102		
		36	18	21.46	0.140	21.16	0.131	20.08	0.102		
		36	37	21.40	0.138	21.17	0.131	20.14	0.103		
		75	0	21.40	0.138	21.14	0.130	20.03	0.101		

LTE Band 25											
Ant. Gain						5.18 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	26140 (1 860.0 MHz)		26365 (1 882.5 MHz)		26590 (1905.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	24.26	0.267	24.13	0.259	23.98	0.250	29.51	0.893
		1	50	24.33	0.271	24.12	0.258	23.93	0.247		
		1	99	24.17	0.261	24.16	0.261	23.45	0.221		
		50	0	23.31	0.214	23.12	0.205	23.04	0.201		
		50	25	23.28	0.213	23.16	0.207	22.97	0.198		
		50	13	23.23	0.210	23.12	0.205	22.87	0.194		
		100	0	23.22	0.210	23.16	0.207	22.04	0.160		
	16QAM	1	0	23.49	0.223	23.45	0.221	22.46	0.176	28.81	0.760
		1	50	23.63	0.231	23.49	0.223	22.14	0.164		
		1	99	23.49	0.223	23.34	0.216	21.99	0.158		
		50	0	22.53	0.179	22.28	0.169	22.20	0.166		
		50	25	22.40	0.174	22.32	0.171	21.13	0.130		
		50	50	22.38	0.173	22.37	0.173	21.03	0.127		
		100	0	22.42	0.175	22.30	0.170	21.05	0.127		
	64QAM	1	0	22.54	0.179	22.26	0.168	21.57	0.144	27.79	0.601
		1	50	22.61	0.182	22.35	0.172	21.18	0.131		
		1	99	22.54	0.179	22.25	0.168	20.93	0.124		
		50	0	21.49	0.141	21.25	0.133	20.48	0.112		
		50	25	21.55	0.143	21.27	0.134	20.33	0.108		
		50	50	21.54	0.143	21.24	0.133	20.22	0.105		
		100	0	21.39	0.138	21.21	0.132	20.27	0.106		

LTE Band 71											
Ant. Gain						4.37 dB i					
Limit: 3W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	133147 (665.5 MHz)		133297 (680.5 MHz)		133447 (695.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	23.81	0.240	23.76	0.238	23.72	0.236	26.05	0.403
		1	2	23.70	0.234	23.74	0.237	23.64	0.231		
		1	5	23.61	0.230	23.83	0.242	23.63	0.231		
		3	0	22.88	0.194	22.70	0.186	22.61	0.182		
		3	2	22.82	0.191	22.74	0.188	22.51	0.178		
		3	3	22.67	0.185	22.77	0.189	22.53	0.179		
		6	0	22.83	0.192	22.70	0.186	22.69	0.186		
	16QAM	1	0	23.03	0.201	23.16	0.207	22.97	0.198	25.40	0.347
		1	2	23.13	0.206	22.93	0.196	23.10	0.204		
		1	5	22.94	0.197	23.18	0.208	23.03	0.201		
		3	0	21.90	0.155	21.73	0.149	22.10	0.162		
		3	2	21.86	0.153	21.71	0.148	21.84	0.153		
		3	3	21.73	0.149	21.74	0.149	21.78	0.151		
		6	0	21.79	0.151	21.73	0.149	21.98	0.158		
	64QAM	1	0	22.04	0.160	21.95	0.157	22.00	0.158	24.26	0.267
		1	2	21.79	0.151	21.98	0.158	21.89	0.155		
		1	5	21.85	0.153	22.00	0.158	21.95	0.157		
		3	0	20.95	0.124	20.71	0.118	20.90	0.123		
		3	2	20.86	0.122	20.70	0.117	20.81	0.121		
		3	3	20.83	0.121	20.75	0.119	20.75	0.119		
		6	0	20.83	0.121	20.78	0.120	20.87	0.122		

LTE Band 71											
Ant. Gain						4.37 dB i					
Limit: 3W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	133172 (668.0 MHz)		133297 (680.5 MHz)		133422 (693.0 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	23.82	0.241	23.67	0.233	23.83	0.242	26.05	0.403
		1	7	23.83	0.242	23.61	0.230	23.59	0.229		
		1	14	23.65	0.232	23.69	0.234	23.63	0.231		
		8	0	22.83	0.192	22.77	0.189	22.82	0.191		
		8	4	22.73	0.187	22.72	0.187	22.73	0.187		
		8	7	22.72	0.187	22.73	0.187	22.76	0.189		
		15	0	22.82	0.191	22.74	0.188	22.81	0.191		
	16QAM	1	0	23.19	0.208	23.21	0.209	23.26	0.212	25.48	0.353
		1	7	23.12	0.205	23.01	0.200	23.10	0.204		
		1	14	23.02	0.200	23.04	0.201	23.04	0.201		
		8	0	21.91	0.155	21.76	0.150	21.62	0.145		
		8	4	21.81	0.152	21.71	0.148	21.73	0.149		
		8	7	21.83	0.152	21.75	0.150	21.73	0.149		
		15	0	21.71	0.148	21.71	0.148	21.75	0.150		
	64QAM	1	0	21.90	0.155	21.72	0.149	21.86	0.153	24.20	0.263
		1	7	21.98	0.158	21.80	0.151	21.80	0.151		
		1	14	21.81	0.152	21.73	0.149	21.86	0.153		
		8	0	20.96	0.125	20.76	0.119	20.83	0.121		
		8	4	20.86	0.122	20.76	0.119	20.83	0.121		
		8	7	20.77	0.119	20.73	0.118	20.81	0.121		
		15	0	20.88	0.122	20.76	0.119	20.84	0.121		

LTE Band 71											
Ant. Gain						4.37 dB i					
Limit: 3W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	133197 (670.5 MHz)		133297 (680.5 MHz)		133397 (690.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	23.85	0.243	23.76	0.238	23.74	0.237	26.15	0.412
		1	12	23.86	0.243	23.84	0.242	23.70	0.234		
		1	24	23.93	0.247	23.75	0.237	23.53	0.225		
		12	0	22.91	0.195	22.80	0.191	22.84	0.192		
		12	6	22.83	0.192	22.83	0.192	22.75	0.188		
		12	13	22.82	0.191	22.74	0.188	22.71	0.187		
		25	0	22.80	0.191	22.82	0.191	22.81	0.191		
	16QAM	1	0	22.32	0.171	23.29	0.213	23.10	0.204	25.51	0.356
		1	12	22.11	0.163	23.23	0.210	23.04	0.201		
		1	24	22.29	0.169	23.27	0.212	22.83	0.192		
		12	0	22.04	0.160	21.77	0.150	21.85	0.153		
		12	6	21.91	0.155	21.77	0.150	21.80	0.151		
		12	13	21.99	0.158	21.74	0.149	21.73	0.149		
		25	0	21.87	0.154	21.81	0.152	21.80	0.151		
	64QAM	1	0	22.15	0.164	22.08	0.161	21.95	0.157	24.37	0.274
		1	12	22.03	0.160	22.00	0.158	21.97	0.157		
		1	24	22.15	0.164	22.03	0.160	21.87	0.154		
		12	0	20.96	0.125	20.80	0.120	20.81	0.121		
		12	6	21.04	0.127	20.87	0.122	20.78	0.120		
		12	13	20.97	0.125	20.78	0.120	20.75	0.119		
		25	0	20.87	0.122	20.86	0.122	20.77	0.119		

LTE Band 71											
Ant. Gain						4.37 dB i					
Limit: 3W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	133222 (673.0 MHz)		133297 (680.5 MHz)		133372 (688.0 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	23.84	0.242	23.80	0.240	23.76	0.238	26.07	0.405
		1	25	23.84	0.242	23.78	0.239	23.85	0.243		
		1	49	23.78	0.239	23.71	0.235	23.64	0.231		
		25	0	22.89	0.195	22.85	0.193	22.83	0.192		
		25	12	22.85	0.193	22.86	0.193	22.86	0.193		
		25	25	22.81	0.191	22.88	0.194	22.78	0.190		
		50	0	22.81	0.191	22.83	0.192	22.79	0.190		
	16QAM	1	0	23.34	0.216	23.20	0.209	23.19	0.208	25.56	0.360
		1	25	23.22	0.210	23.11	0.205	23.10	0.204		
		1	49	23.16	0.207	23.08	0.203	22.92	0.196		
		25	0	21.96	0.157	21.93	0.156	21.84	0.153		
		25	12	22.03	0.160	21.86	0.153	21.85	0.153		
		25	25	21.95	0.157	21.81	0.152	21.84	0.153		
		50	0	21.95	0.157	21.86	0.153	21.78	0.151		
	64QAM	1	0	22.15	0.164	22.02	0.159	22.10	0.162	24.37	0.274
		1	25	21.97	0.157	21.95	0.157	22.01	0.159		
		1	49	22.01	0.159	22.01	0.159	21.89	0.155		
		25	0	20.99	0.126	20.89	0.123	20.88	0.122		
		25	12	20.91	0.123	20.85	0.122	20.89	0.123		
		25	25	20.87	0.122	20.85	0.122	20.83	0.121		
		50	0	20.85	0.122	20.86	0.122	20.82	0.121		

4. Occupied Bandwidth

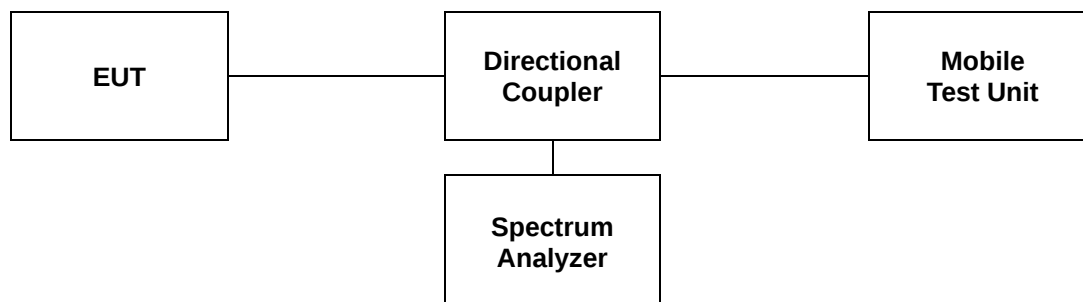
4.1. Limit

CFR 47, Section FCC §2.1049

4.2. Test Procedure

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

- 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).
- 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 $\geq 3 \times \text{RBW}$.
- 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.
- Set the detection mode to peak, and the trace mode to max-hold.
- 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.
- 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).



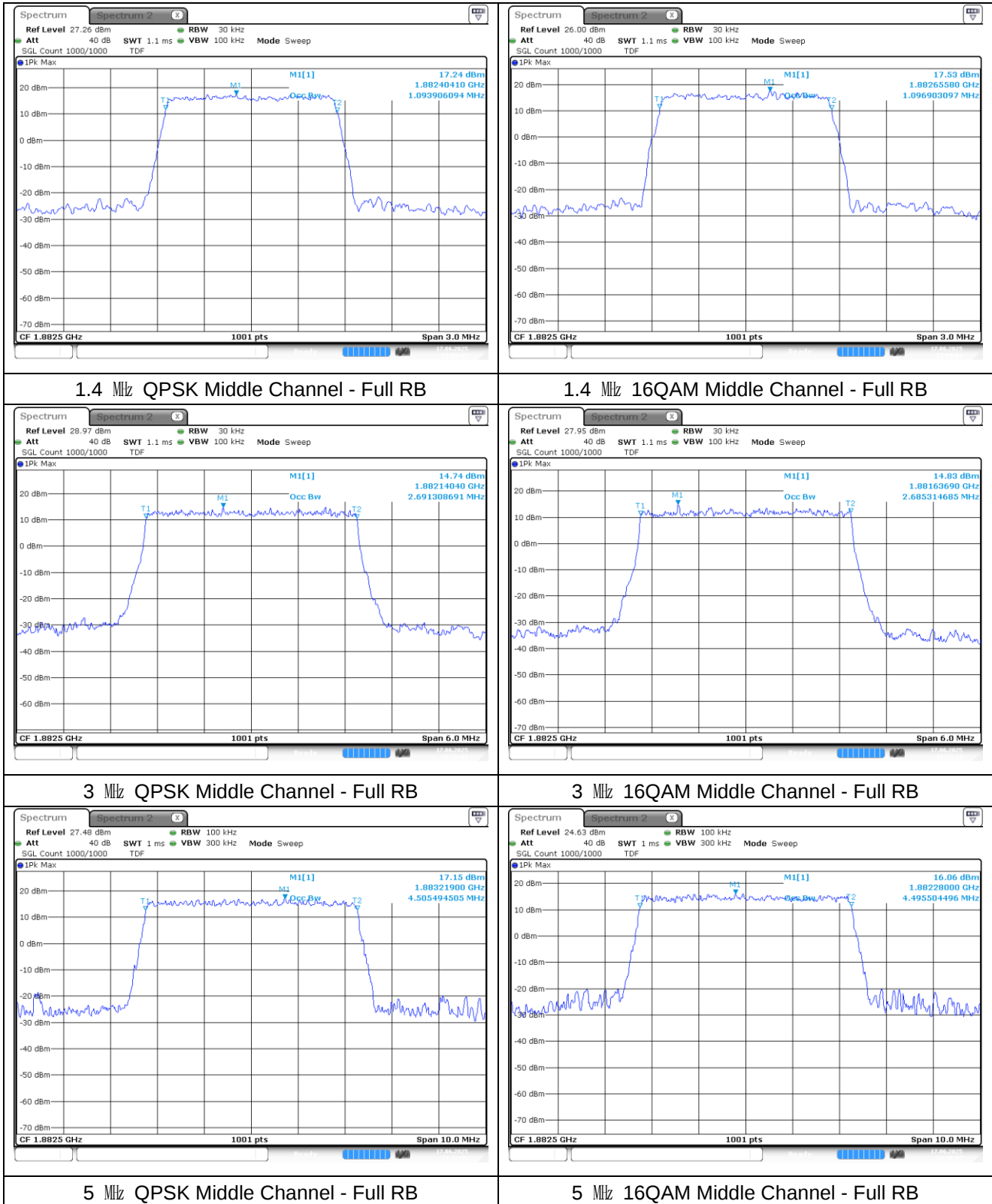
4.3 Test Results

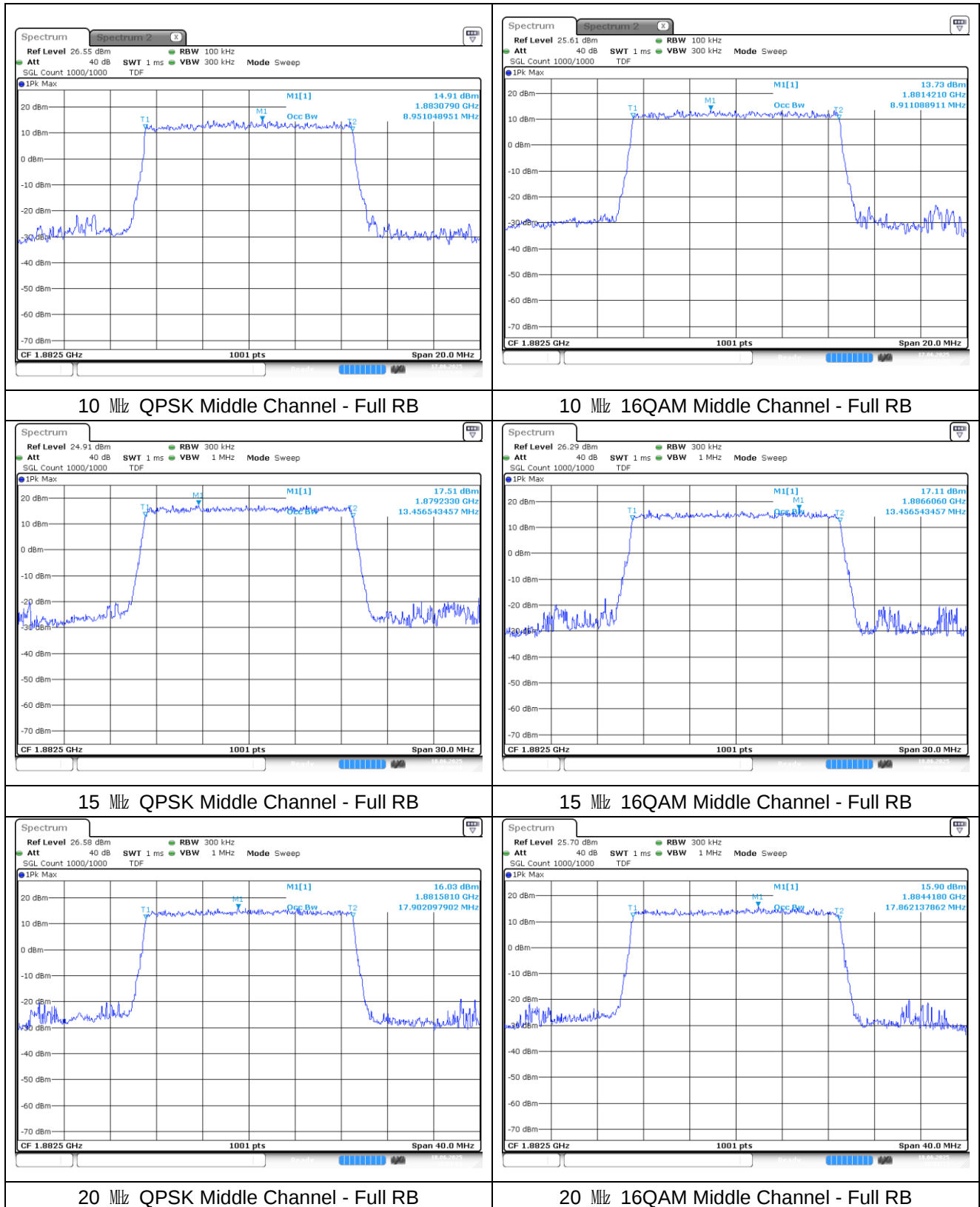
Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
25	1.4	1 850.7	1.094	1.100
		1 882.5	1.094	1.097
		1 914.3	1.094	1.097
	3	1 851.5	2.691	2.691
		1 882.5	2.691	2.685
		1 913.5	2.685	2.691
	5	1 852.5	4.496	4.505
		1 882.5	4.505	4.496
		1 912.5	4.496	4.505
	10	1 855.0	8.951	8.931
		1 882.5	8.951	8.911
		1 910.0	8.931	8.931
	15	1 857.5	13.457	13.457
		1 882.5	13.457	13.457
		1 907.5	13.487	13.487
	20	1 860.0	17.902	17.902
71	5	665.5	4.496	4.496
		680.5	4.486	4.496
		695.5	4.505	4.505
	10	668.0	8.951	8.951
		680.5	8.951	8.931
		693.0	8.951	8.931
	15	670.5	13.427	13.457
		680.5	13.487	13.487
		690.5	13.457	13.457
	20	673.0	17.902	17.862
		680.5	17.902	17.902
		688.0	17.862	17.902

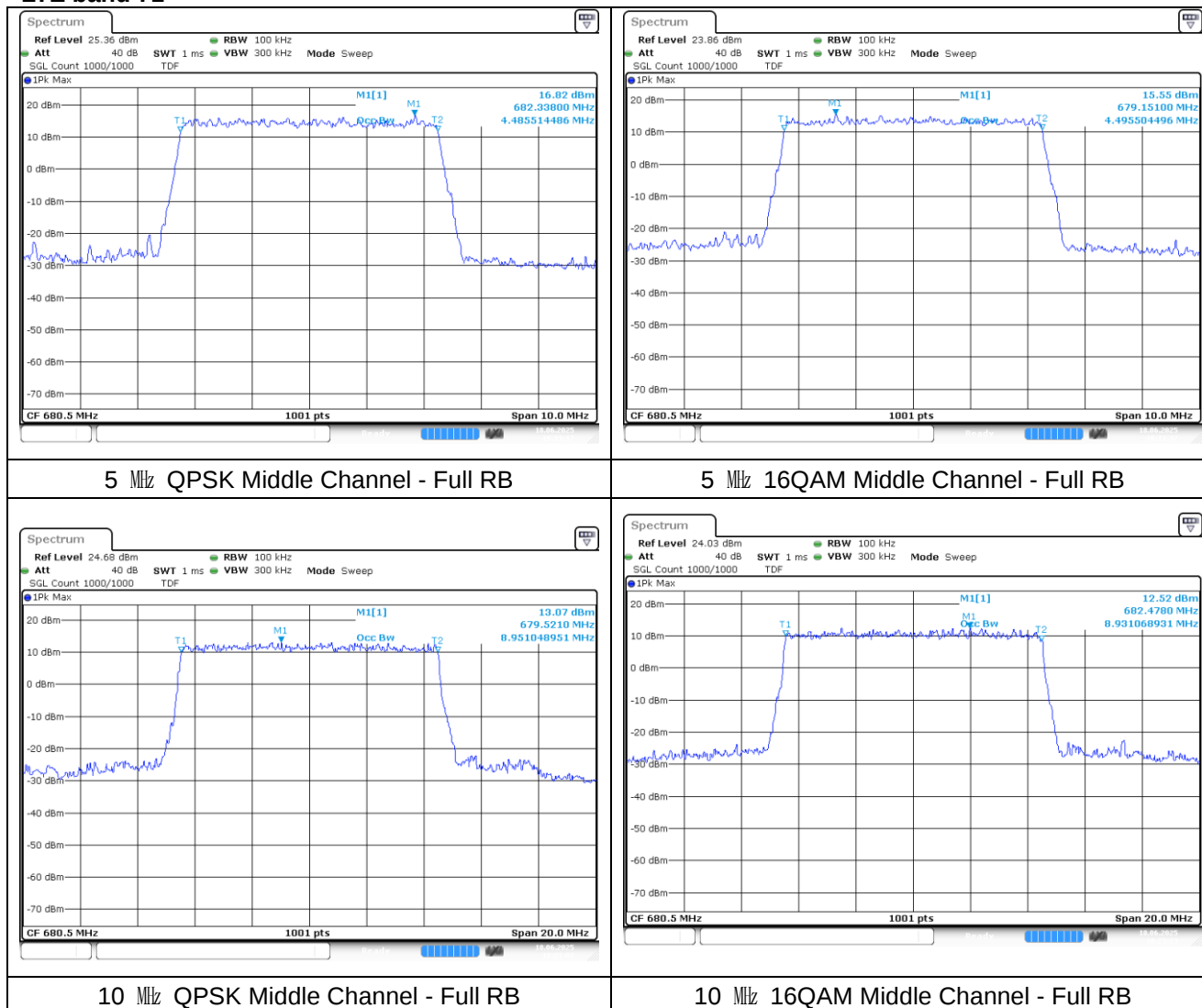
- Test plots

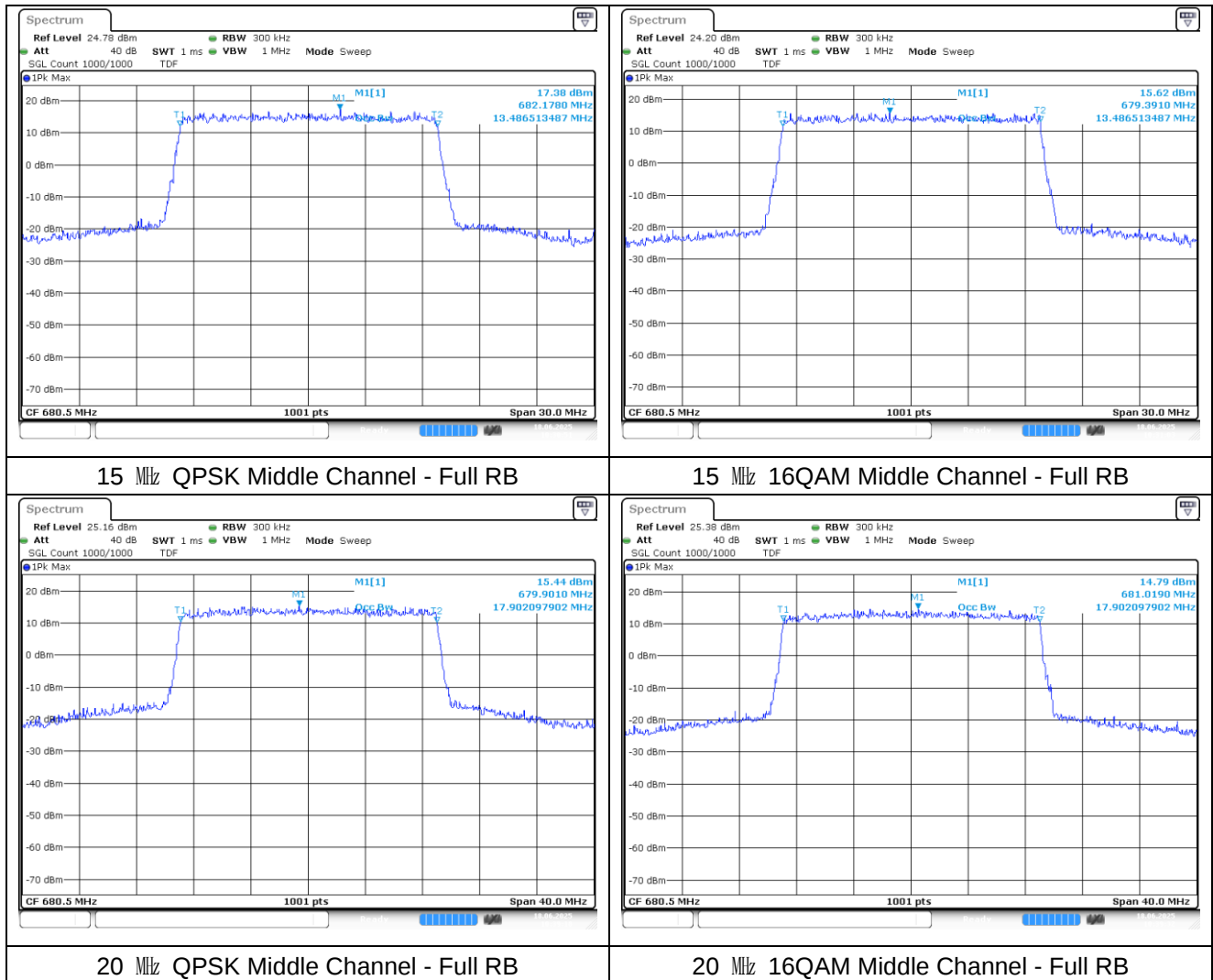
LTE band 25





LTE band 71





5. Peak-Average Ratio

5.1. Limit

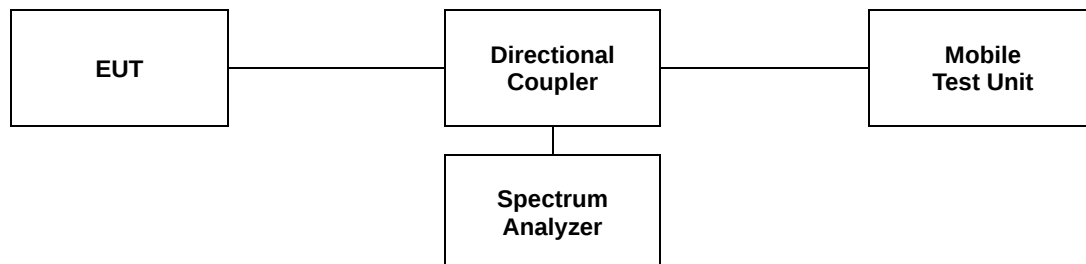
- §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

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.



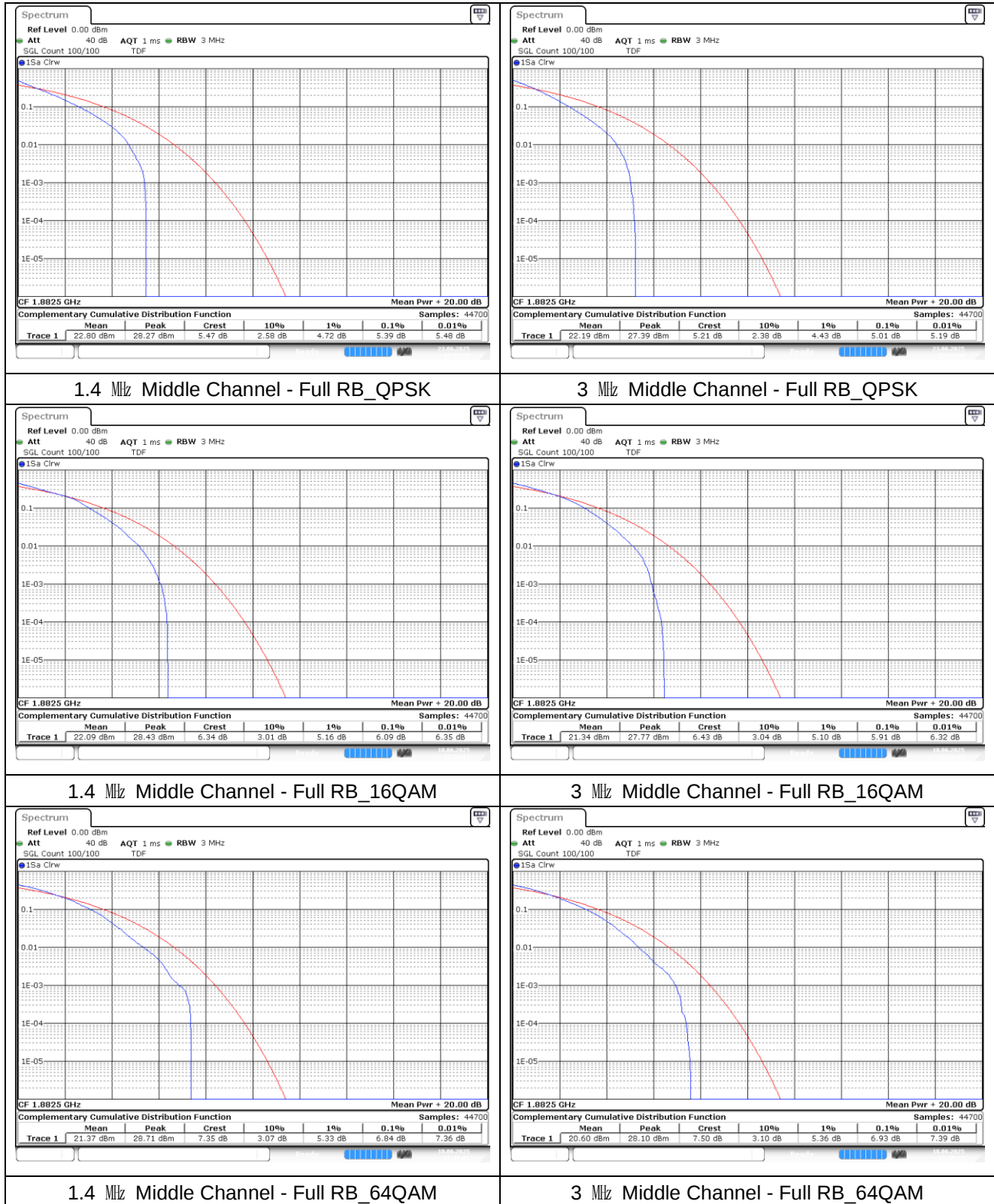
5.3 Test Results

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

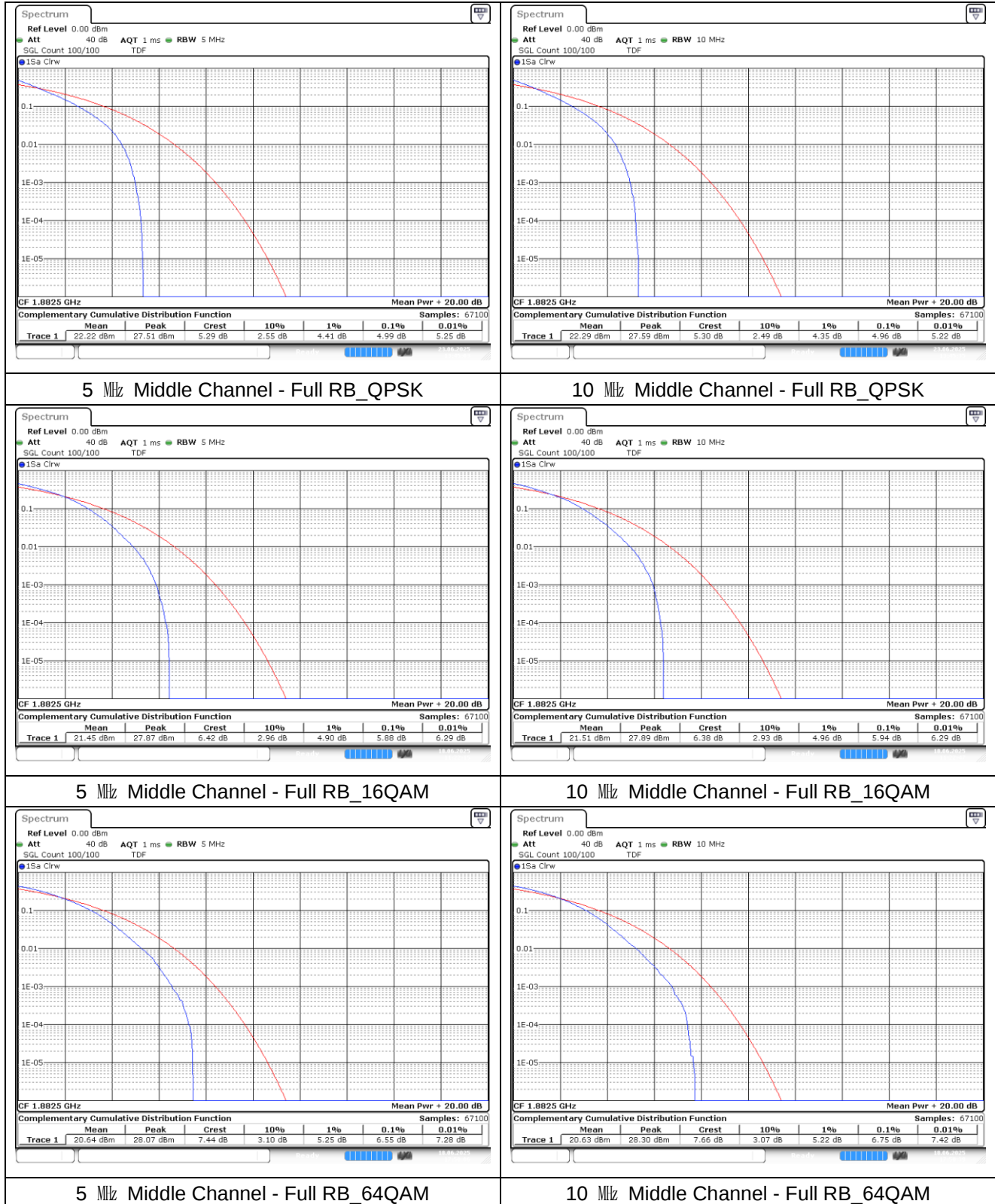
Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)		
			QPSK	16QAM	64QAM
25	1.4	1 850.7	4.72	5.59	6.41
		1 882.5	5.39	6.09	6.84
		1 914.3	3.65	4.35	6.06
	3	1 851.5	4.72	5.80	6.49
		1 882.5	5.01	5.91	6.93
		1 913.5	3.83	4.90	6.29
	5	1 852.5	4.90	5.88	6.43
		1 882.5	4.99	5.88	6.55
		1 912.5	4.26	5.36	6.55
	10	1 855.0	4.96	5.97	6.43
		1 882.5	4.96	5.94	6.75
		1 910.0	4.49	5.54	6.64
	15	1 857.5	5.13	6.00	6.61
		1 882.5	5.07	6.00	6.55
		1 907.5	4.81	5.74	6.81
	20	1 860.0	4.99	6.00	6.52
		1 882.5	4.84	5.86	6.49
		1 905.0	4.81	5.68	6.43
71	5	665.5	4.87	5.74	6.38
		680.5	4.99	5.86	6.49
		695.5	4.84	5.83	6.32
	10	668.0	4.96	5.88	6.41
		680.5	5.04	5.94	6.52
		693.0	4.87	5.83	6.43
	15	670.5	5.01	6.00	6.61
		680.5	5.10	5.91	6.49
		690.5	4.87	5.77	6.46
	20	673.0	4.70	5.83	6.26
		680.5	4.93	5.80	6.35
		688.0	4.67	5.74	6.29

- Test plots

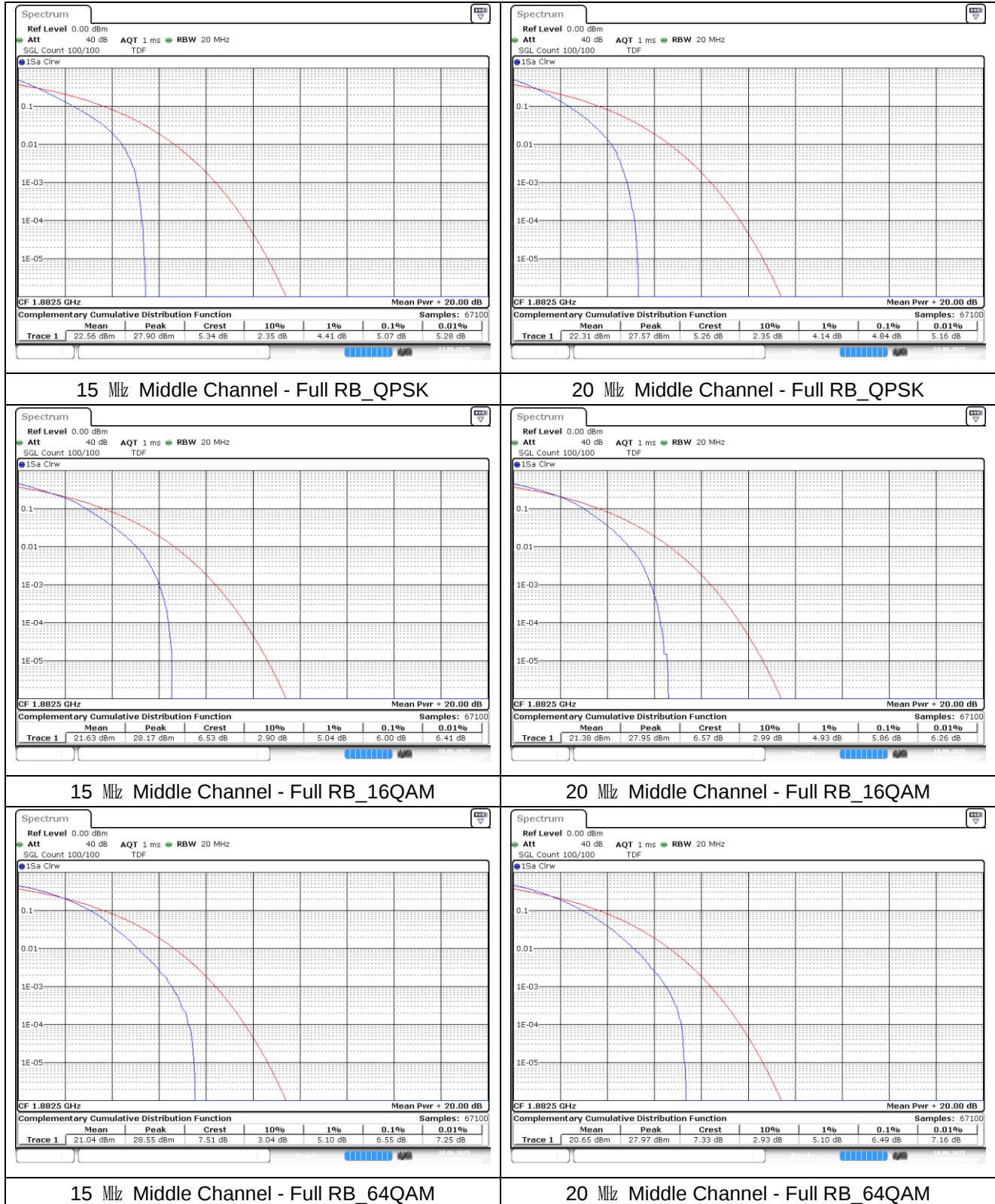
LTE band 25



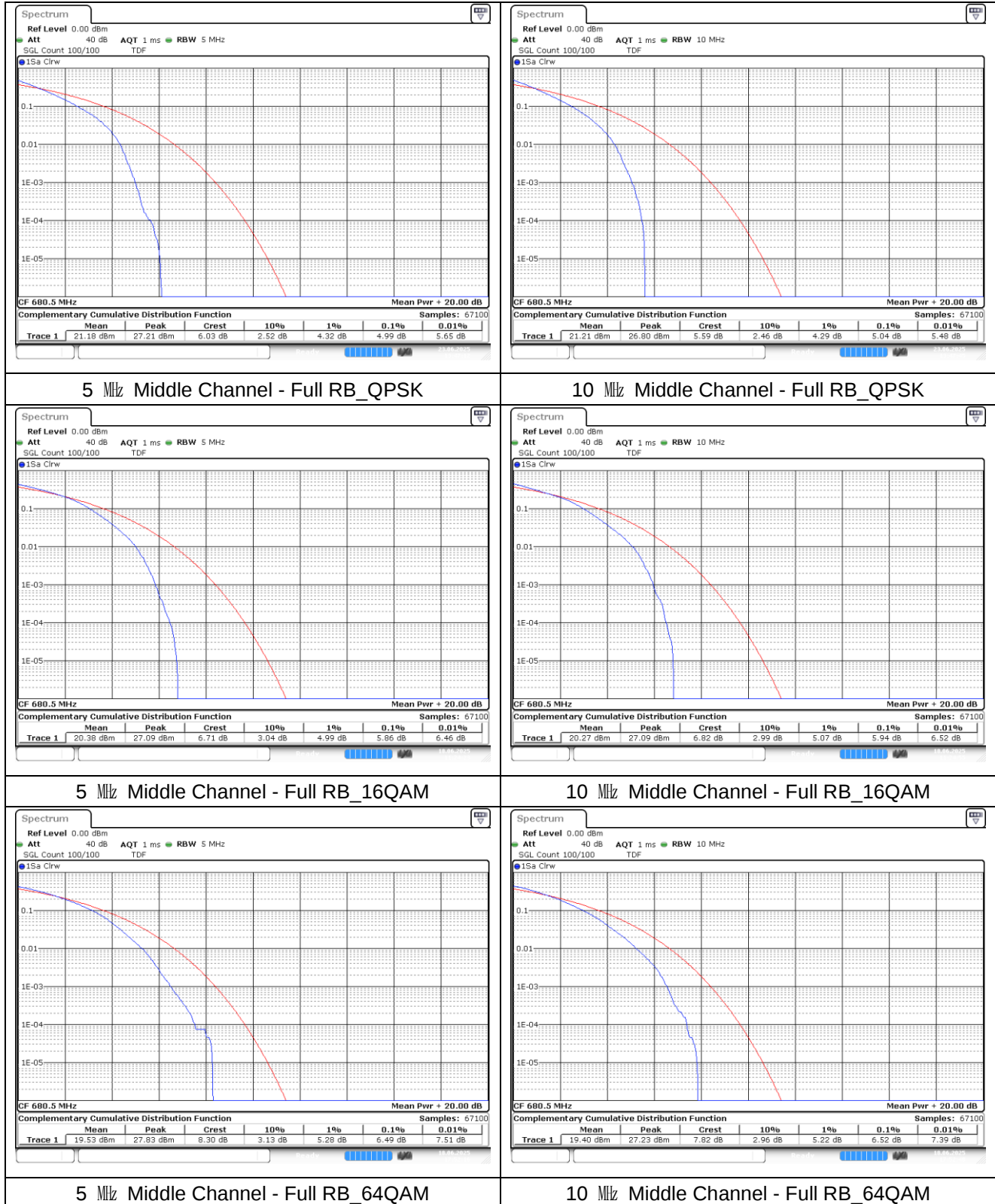
LTE band 25



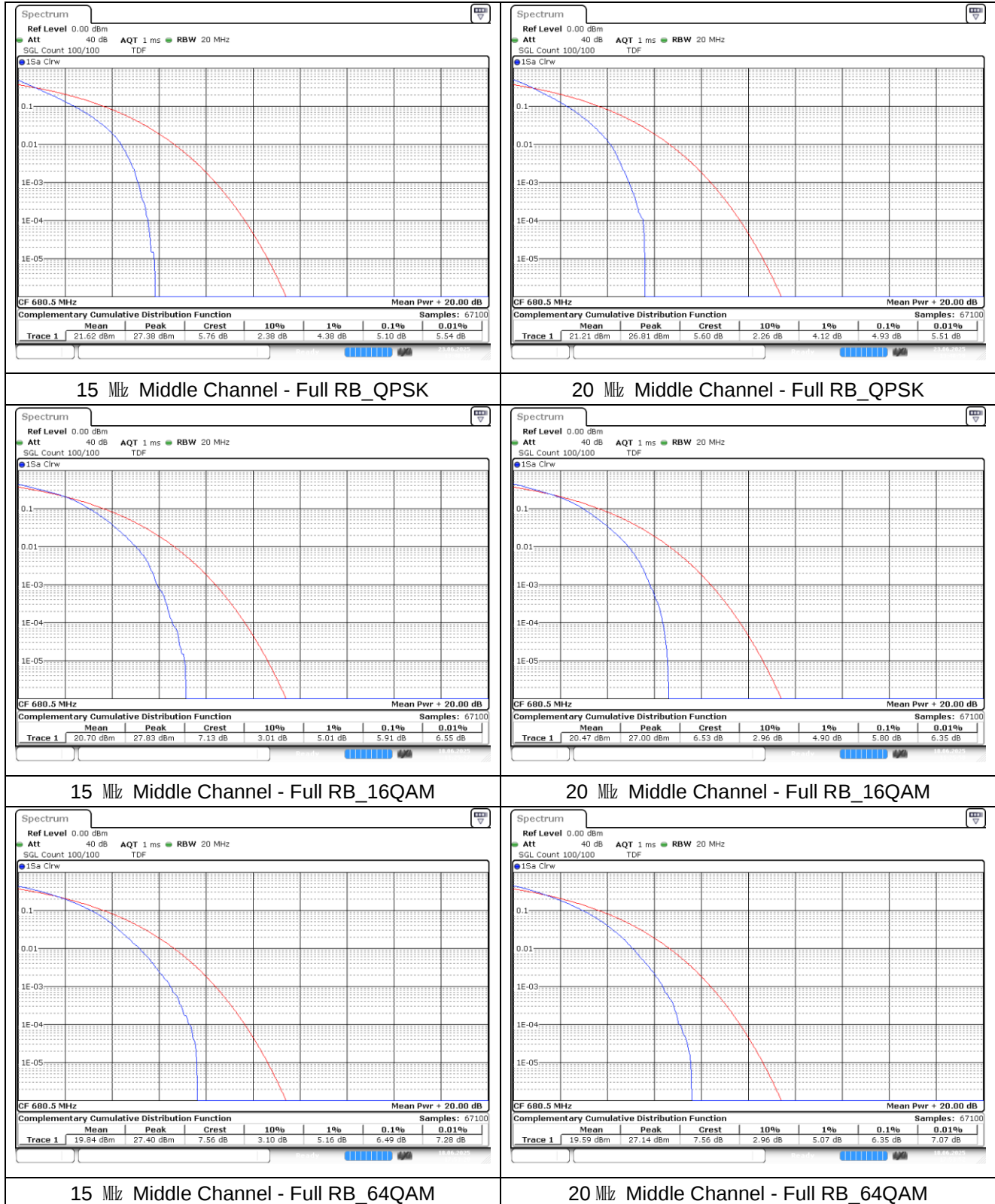
LTE band 25



LTE band 71



LTE band 71



6. Spurious Emissions at Antenna Terminal

6.1. Limit

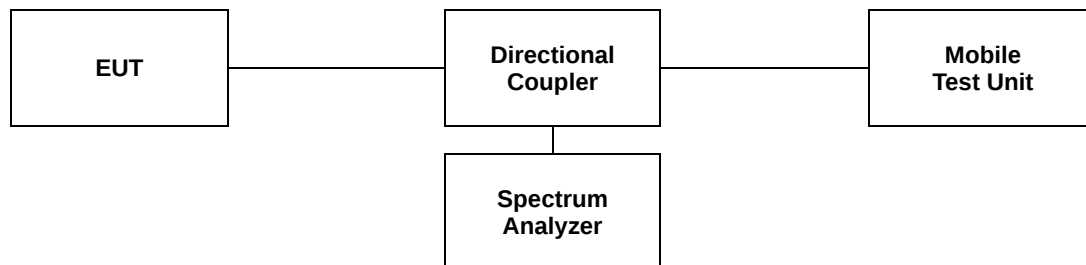
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

- §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

6.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

1. Start frequency was set to 9 kHz and stop frequency was set to at least 10* the fundamental frequency.
2. Detector = Peak.
3. Trace mode = Max hold.
4. Sweep time = Auto couple.
5. The trace was allowed to stabilize.
6. Please see notes below for RBW and VBW settings.
7. For plots showing conducted spurious emissions from 9 kHz to 9 GHz, all path loss of wide frequency range was investigated and compensated to spectrum analyzer as TDF function.



Note;

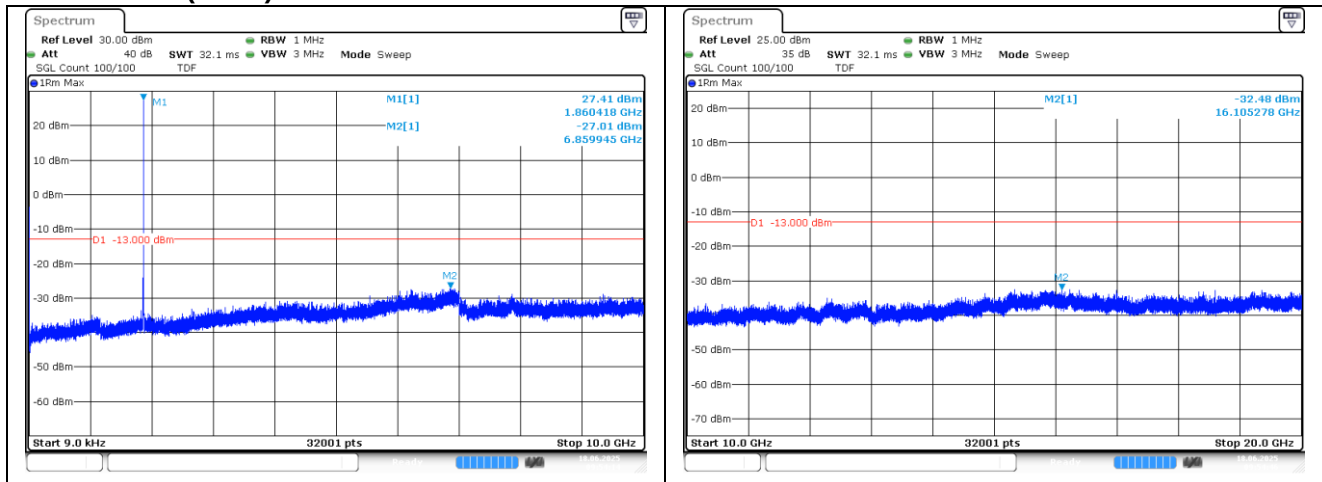
Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two point, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

6.3. Test Results

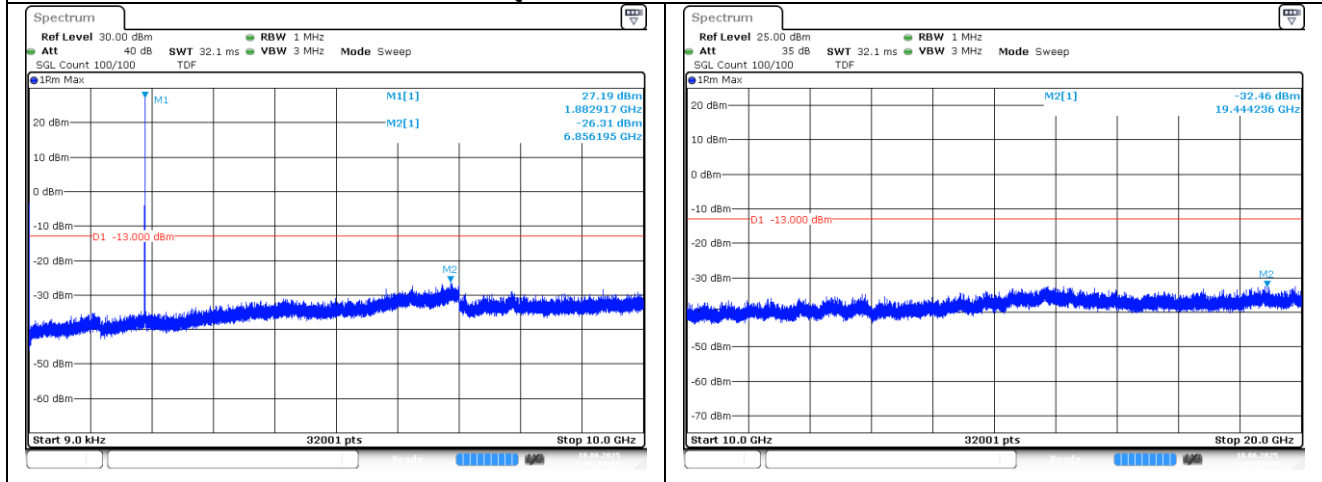
Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.

- Test plots

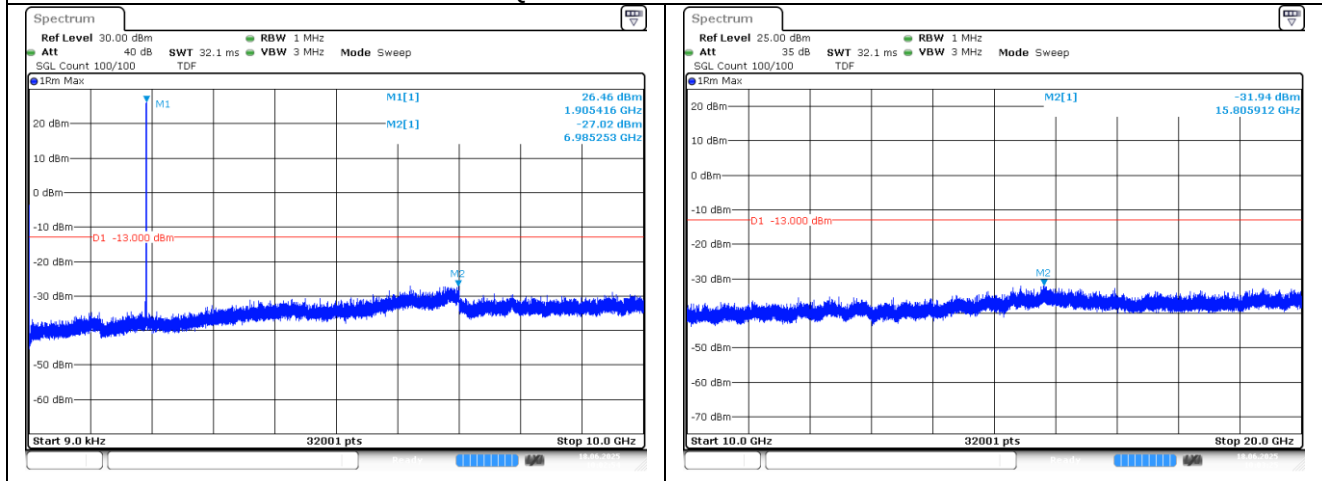
LTE band 25 (20 MHz)



QPSK Low Channel - 1 RB

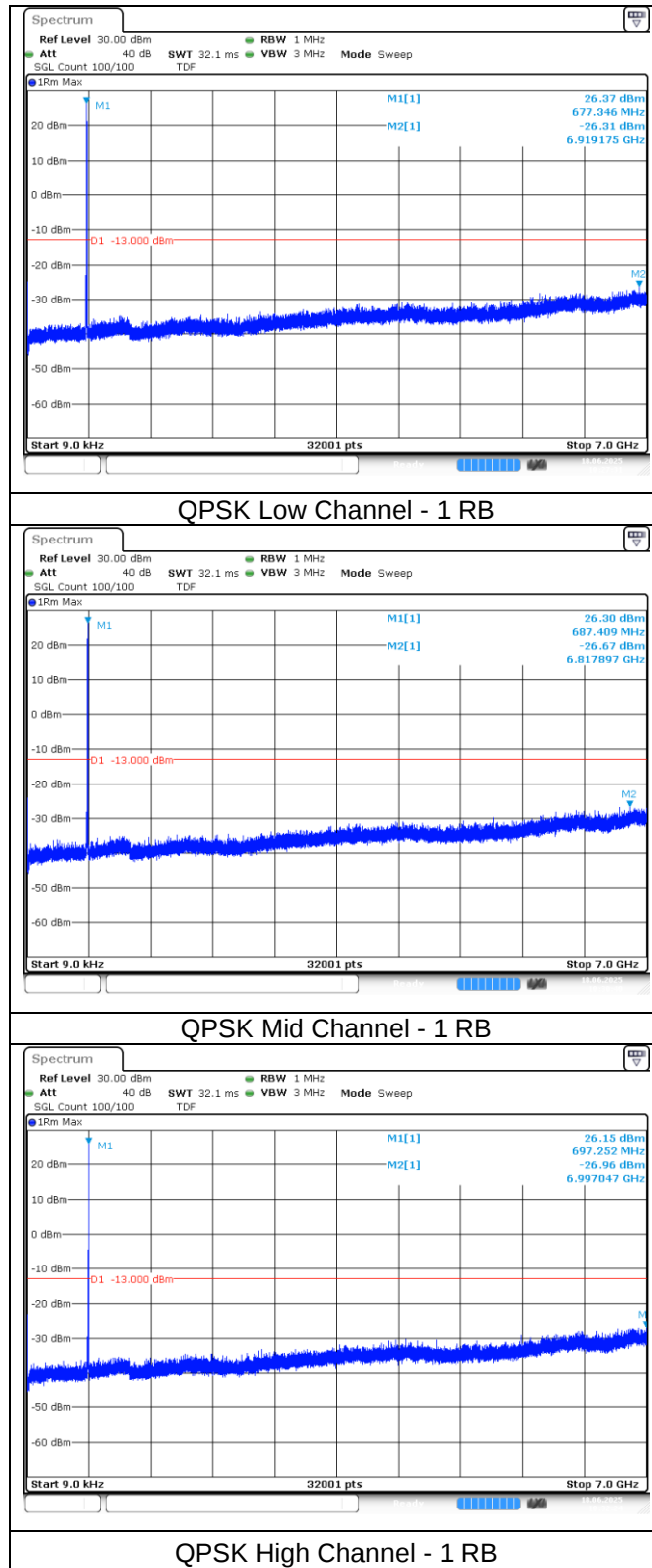


QPSK Mid Channel - 1 RB



QPSK High Channel - 1 RB

LTE band 71 (15 MHz)



7. Band Edge and Emission Mask

7.1. Limit

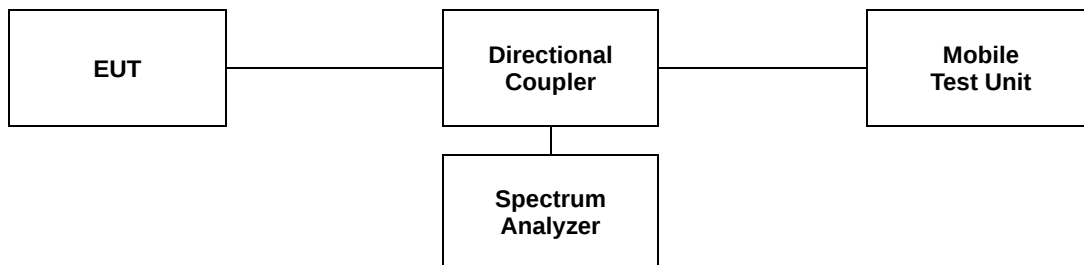
- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

- §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

7.2. Test Procedure

The test follows section 5.7 of ANSI C63.26-2015.

- a. Span was set large enough so as to capture all out of band emissions near the band edge.
- b. RBW $\geq 1\%$ of OBW
- c. VBW $\geq 3 \times$ RBW.
- d. Detector = RMS.
- e. Trace mode = Average.
- f. Sweep time = Auto.
- g. The trace was allowed to stabilize.
- h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.

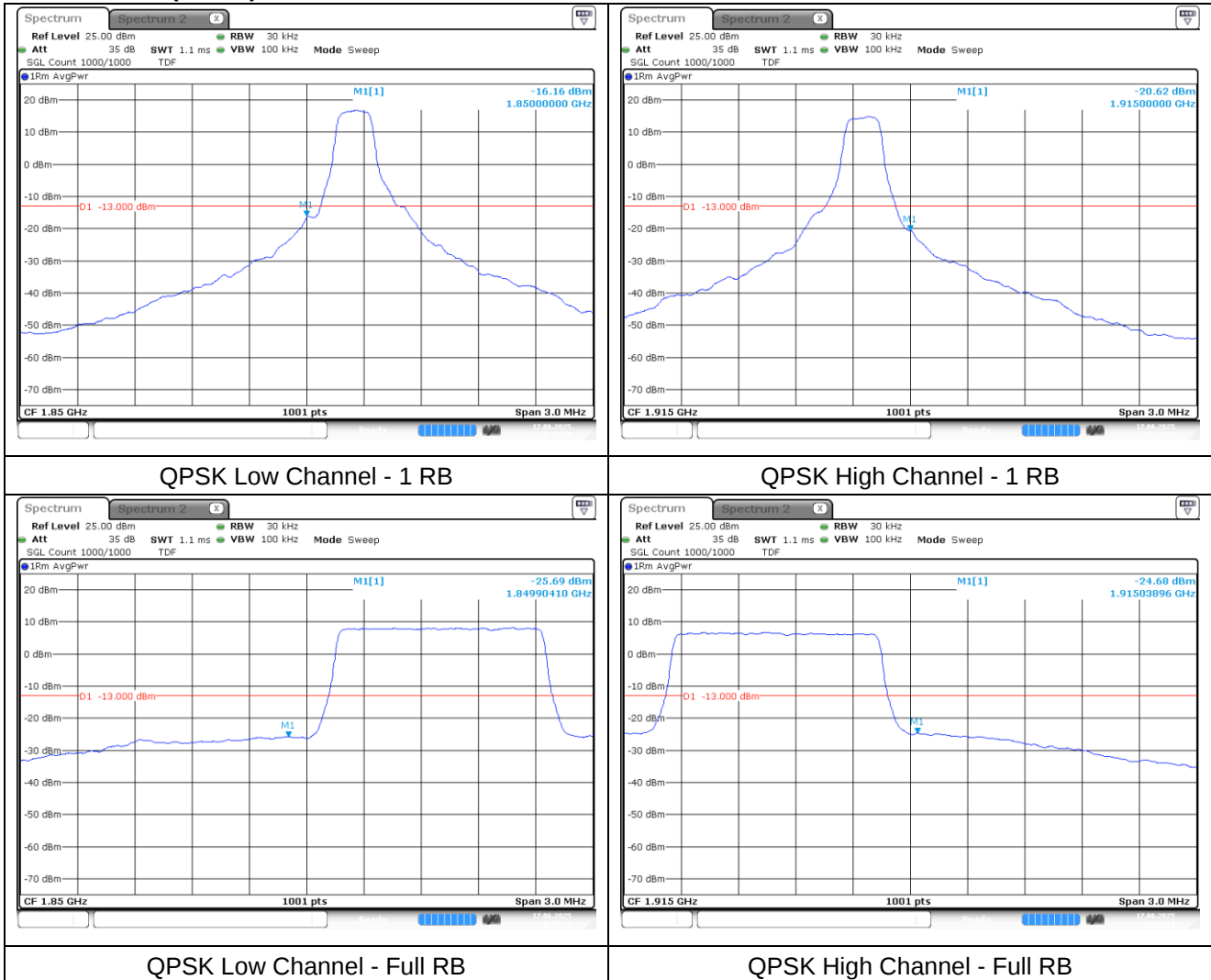


7.3. Test Results

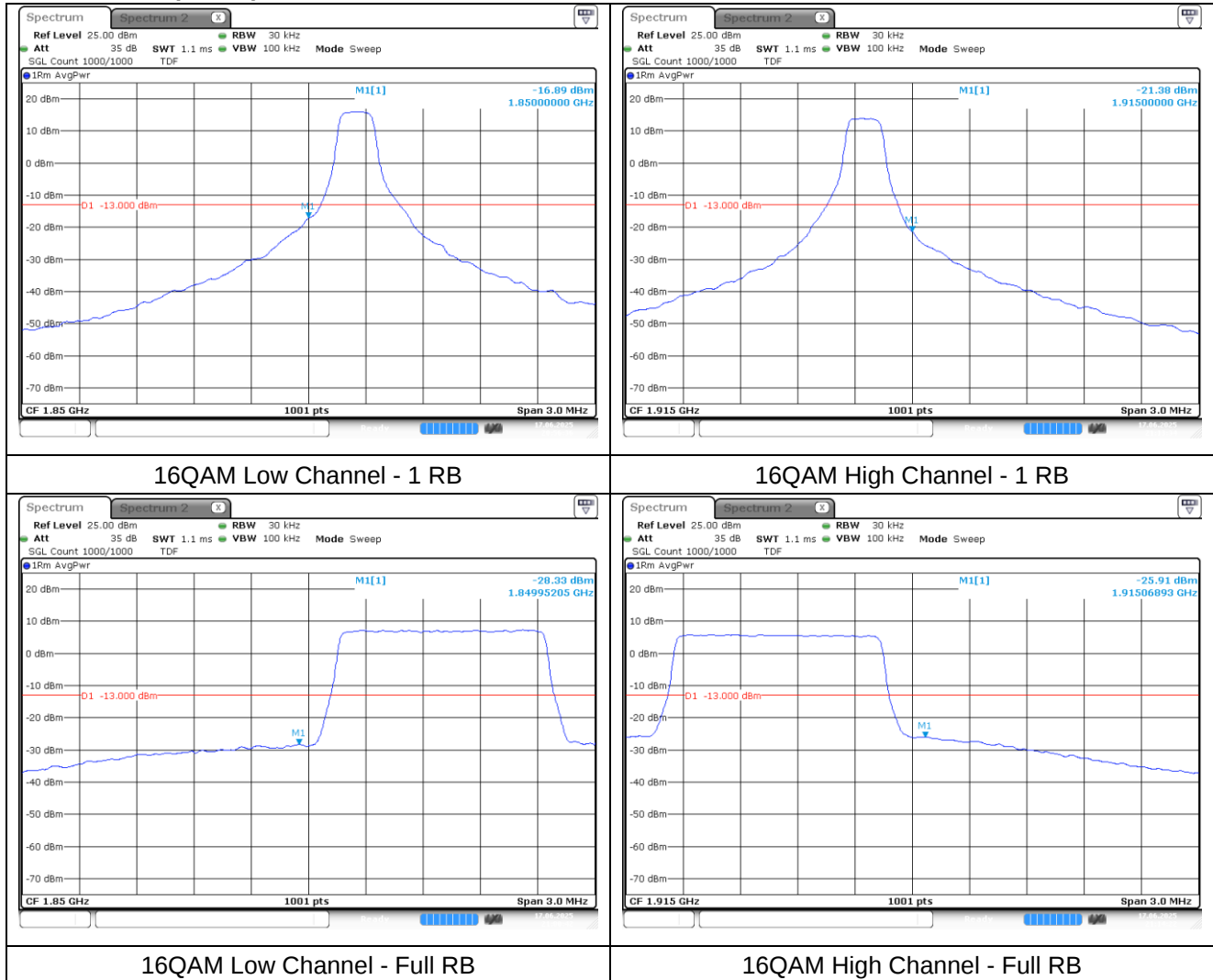
Ambient temperature : $(23 \pm 1) ^\circ\text{C}$
 Relative humidity : 47 % R.H.

- Test plots

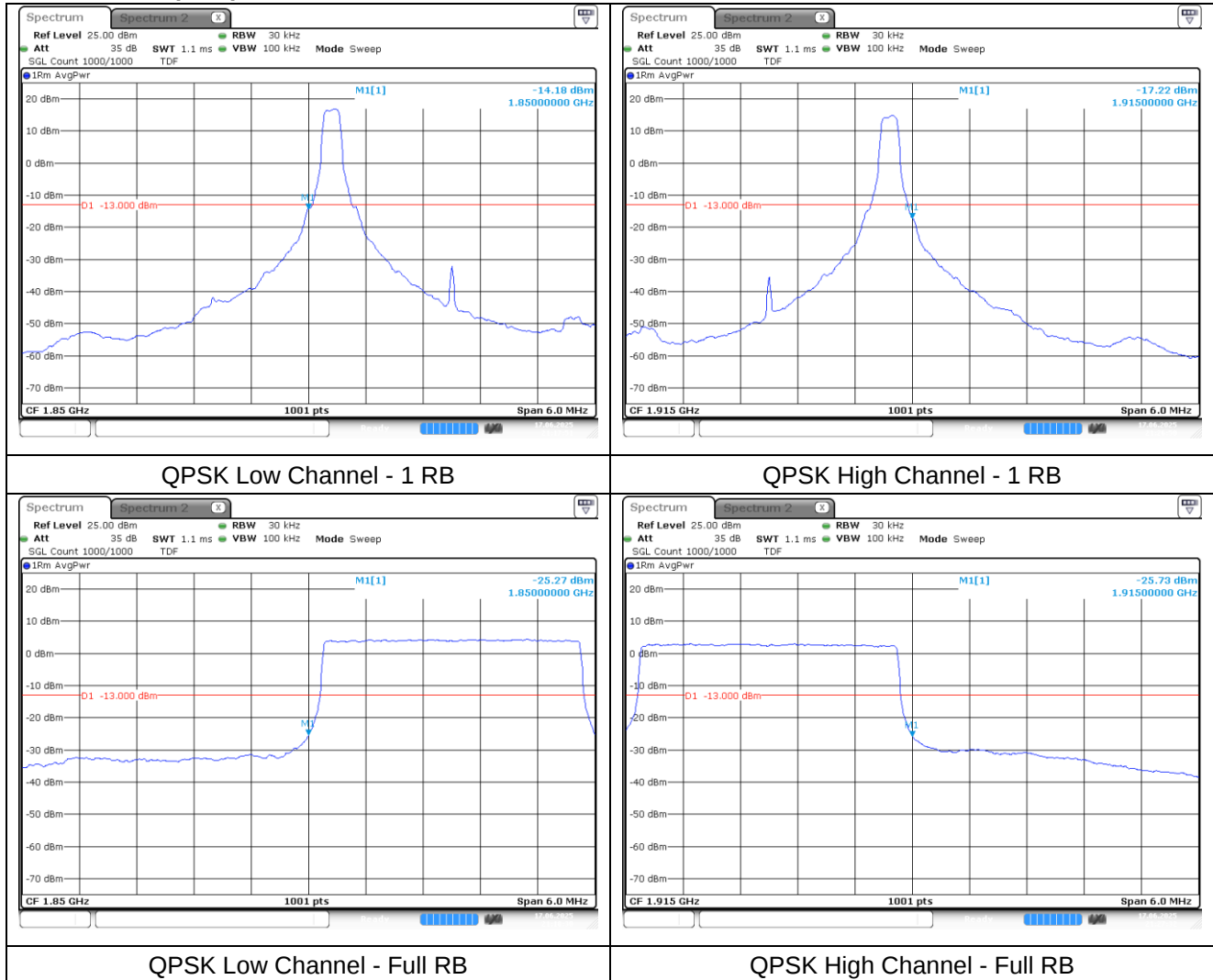
LTE band 25 (1.4 MHz)



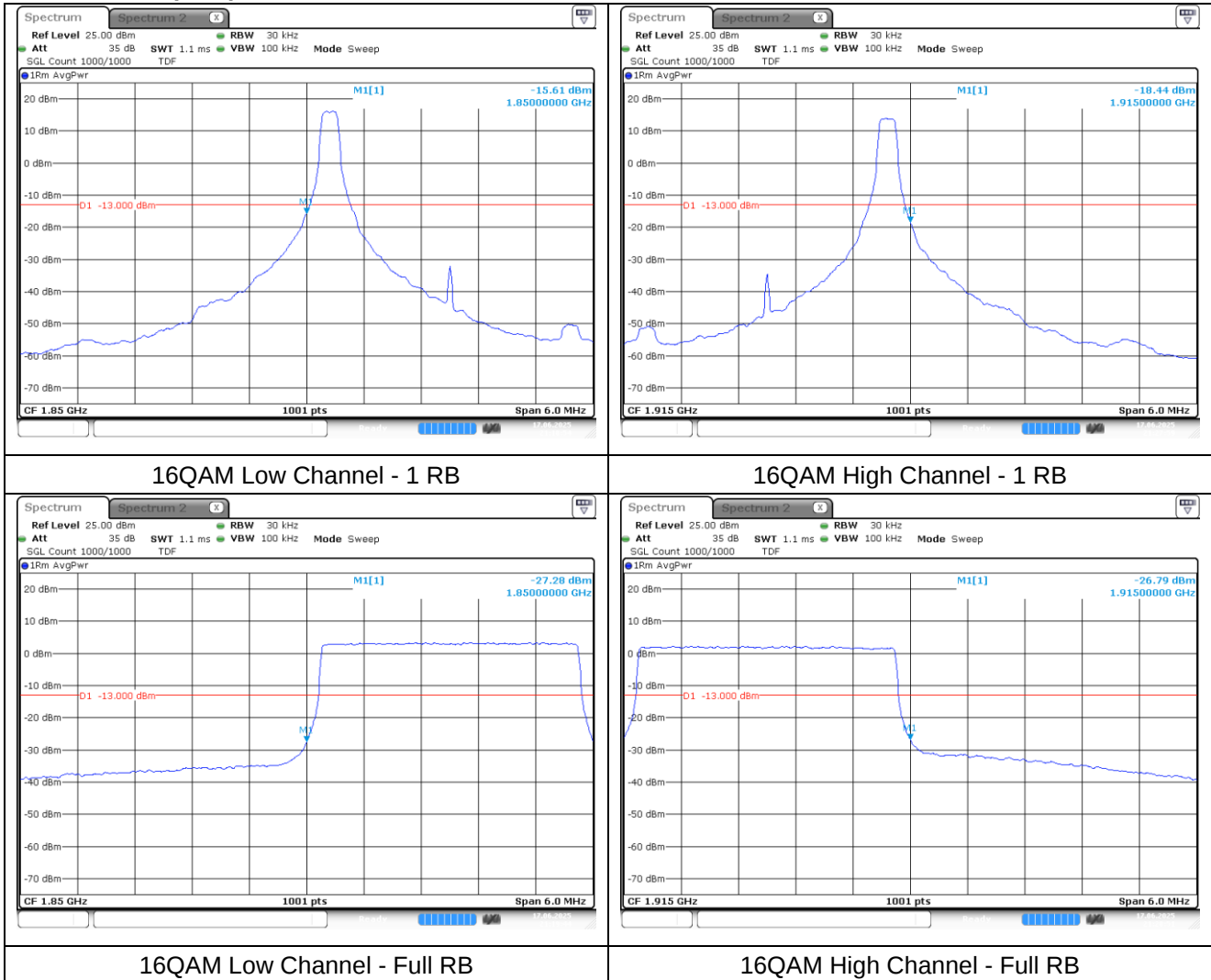
LTE band 25 (1.4 MHz)



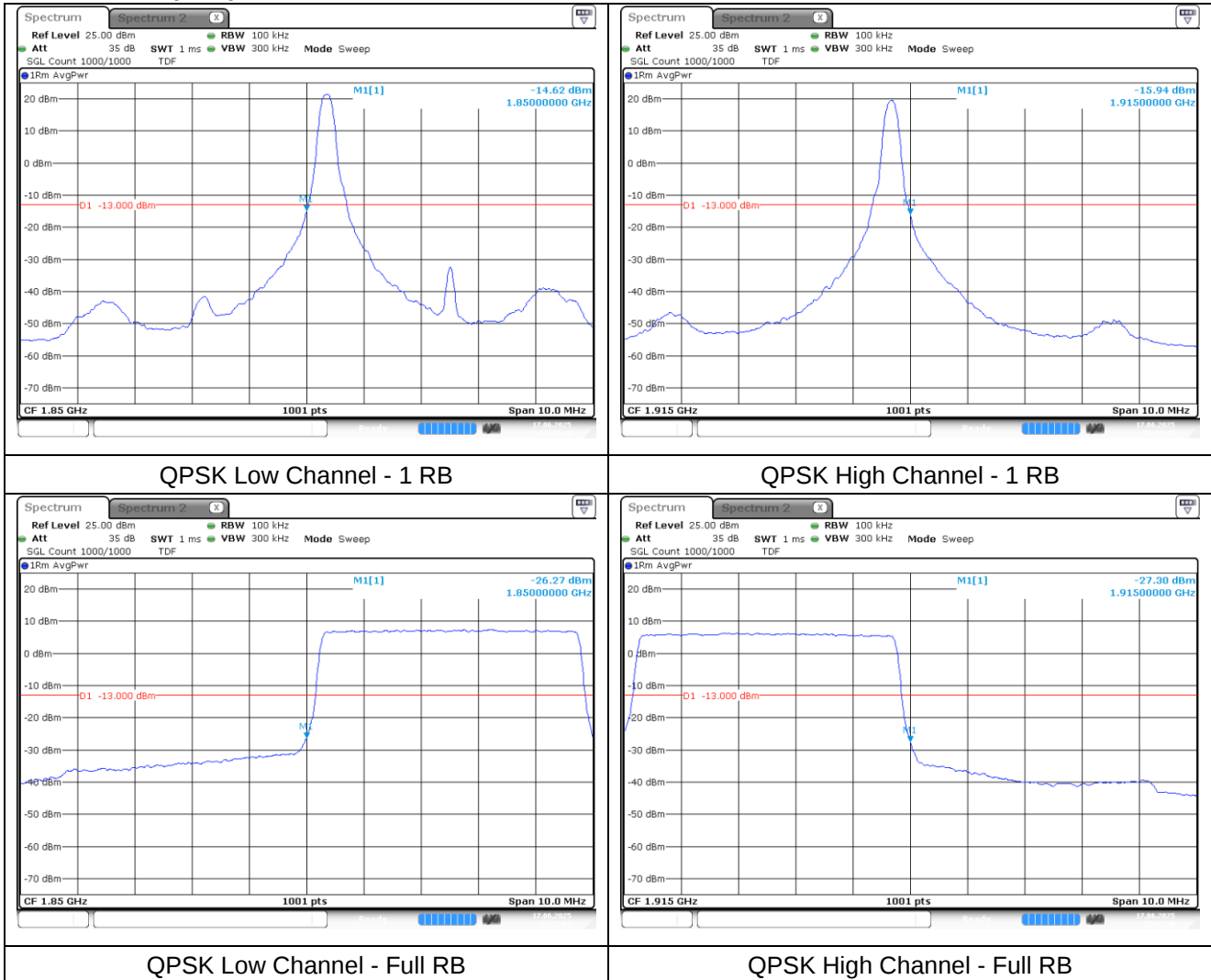
LTE band 25 (3 MHz)



LTE band 25 (3 MHz)



LTE band 25 (5 MHz)



LTE band 25 (5 MHz)

