

TEST REPORT

of

FCC Part 2 Subpart J, Part 22 Subpart C/H,
Part 24 Subpart E and Part 27 Subpart C
IC RSS-130 Issue 2, RSS-132 Issue 4, RSS-133 Issue 7,
RSS-139 Issue 4, RSS-199 Issue 4 and RSS-Gen Issue 5

FCC ID: : BEJTM13LNNAJL0
IC Certification: 2703H-TM13LNNAJL0

Equipment Under Test : Telematics Module
Model Name : TM13LNNAJL0
Applicant : FCC: LG Electronics USA, Inc.
: IC: LG ELECTRONICS INC.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2024.09.13
Date of Test(s) : 2024.11.08 ~ 2025.02.07
Date of Issue : 2025.03.14

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.
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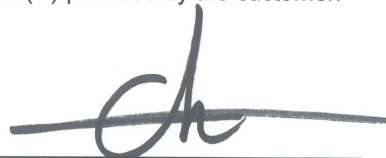
We are responsible for all the information of this test report except for the data(※) provided by the customer.

Tested by:



Youngbin Kim

Technical
Manager:



Jinhyoung Cho

SGS Korea Co., Ltd. Gunpo Laboratory

INDEX

<u>Table of Contents</u>	Page
1. General Information -----	3
2. E.R.P. / E.I.R.P. & Radiated Spurious Emission -----	11
3. Conducted Output Power -----	26
4. Occupied Bandwidth -----	40
5. Peak-Average Ratio -----	55
6. Spurious Emissions at Antenna Terminal -----	70
7. Band Edge and Emission Mask -----	81
8. Frequency Stability -----	188

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

FCC Applicant : LG Electronics USA, Inc.

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

IC Applicant : LG ELECTRONICS INC.

IC Address : 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea (Republic of), 451-713

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 Module
Model Name	TM13LNNAJL0
Serial Number	Conducted: TM13LNNAJL0_1 Radiated: TM13LNNAJL0_2
Power Supply	DC 3.90 V
Rated Power	LTE Band 2, 4, 5, 7, 12, 13, 17 : 23 dB m
Frequency Range	LTE Band 2: 1 850 MHz ~ 1 910 MHz LTE Band 4: 1 710 MHz ~ 1 755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2 500 MHz ~ 2 570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 17: 704 MHz ~ 716 MHz
Modulation Technique	QPSK, 16QAM
Antenna Type	PIFA
Antenna Gain*	699 MHz ~ 716 MHz: -1.89 dB i 777 MHz ~ 787 MHz: 0.20 dB i 824 MHz ~ 849 MHz: -1.12 dB i 1 710 MHz ~ 1 755 MHz: 1.25 dB i 1 850 MHz ~ 1 910 MHz: 2.51 dB i 2 500 MHz ~ 2 570 MHz: 1.31 dB i
H/W Version	Rev1.0
S/W Version	JT25XE02
FVIN	N/A

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Spectrum Analyzer	R&S	FSV30	101004	Dec. 18, 2024	Annual	Dec. 18, 2025
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 10, 2024	Annual	Sep. 10, 2025
Signal Generator	R&S	SMA100B	106887	Oct. 11, 2024	Annual	Oct. 11, 2025
DC Power Supply	R&S	HMP2020	102133	Apr. 23, 2024	Annual	Apr. 23, 2025
Communication Analyzer	Anritsu	MT8821C	6262192291	Feb. 08, 2024	Annual	Feb. 08, 2025
Temperature Chamber	ESPEC CORP.	PL-2J	15004184	Jun. 03, 2024	Annual	Jun. 03, 2025
Directional Coupler	KRYTAR	152613	122661	Feb. 24, 2025	Annual	Feb. 24, 2026
BRIDGE Coupler	MARK MICROWAVE INC	CBR16-0012	1542	May 13, 2024	Annual	May 13, 2025
Power Sensor	Anritsu	MA2411B	1207272	May 29, 2024	Annual	May 29, 2025
Power Meter	Anritsu	ML2495A	1223004	May 29, 2024	Annual	May 29, 2025
High Pass Filter	Wainwright Instrument GmbH	WHNX10-900-1000-18000-40-SS	7	Feb. 27, 2024	Annual	Feb. 27, 2025
High Pass Filter	Wainwright Instrument GmbH	WHKX3.0/18G-10SS	21	Jun. 07, 2024	Annual	Jun. 07, 2025
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	11	Oct. 16, 2024	Annual	Oct. 16, 2025
Preamplifier	H.P.	8447F	2944A03909	Aug. 09, 2024	Annual	Aug. 09, 2025
Preamplifier	R&S	SCU 18F	102218	Mar. 08, 2024	Annual	Mar. 08, 2025
Test Receiver	R&S	ESU26	100109	Jan. 13, 2025	Annual	Jan. 13, 2026
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 21, 2023	Biennial	Aug. 21, 2025
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	9163-396	Apr. 02, 2024	Biennial	Apr. 02, 2026
Horn Antenna	R&S	HF906	100326	Feb. 24, 2025	Annual	Feb. 24, 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 × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RADIALL	TESTPRO 3	182287	Oct. 11, 2024	Semi-Annual	Apr. 11, 2025
Coaxial Cable	RADIALL	TESTPRO 3	182288	Oct. 11, 2024	Semi-Annual	Apr. 11, 2025
Coaxial Cable	RADIALL	TESTPRO 3	182291	Oct. 11, 2024	Semi-Annual	Apr. 11, 2025
Coaxial Cable	RF ONE	NMST-13A26-NMST-5m	TPC2402190004	Oct. 04, 2024	Semi-Annual	Apr. 04, 2025
Coaxial Cable	RF ONE	NMST-13A26-NMST-10m	TPC2402190001	Oct. 04, 2024	Semi-Annual	Apr. 04, 2025

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:

Section in FCC	Section in IC	Test Item(s)	Result
APPLIED STANDARD: FCC Part 2,22,24 and 27/ IC RSS-Gen Issue 5, RSS-130 Issue 2, RSS-132 Issue 4, RSS-133 Issue 7, RSS-139 Issue 4 and RSS-199 Issue 4			
§22.913(a)(5) §24.232(c) §27.50(b)(9) §27.50(c)(9) §27.50(d)(4) §27.50(h)(2)	RSS-130 Issue 2 4.6 RSS-132 Issue 4 5.4 RSS-133 Issue 7 5.5 RSS-139 Issue 4 5.5 RSS-199 Issue 4 5.5	E.R.P. / E.I.R.P.	Pass
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(f) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7 RSS-132 Issue 4 5.5 RSS-133 Issue 7 5.6 RSS-139 Issue 4 5.6 RSS-199 Issue 4 5.6	Radiated Spurious Emission	Pass
§2.1046	RSS-Gen Issue 5 6.12	Conducted Output Power	Pass
§2.1049	RSS-Gen Issue 5 6.7	Occupied Bandwidth	Pass
§22.913(d) §24.232(d) §27.50(d)(5)	RSS-130 Issue 2 4.6 RSS-132 Issue 4 5.4 RSS-133 Issue 7 5.5 RSS-139 Issue 4 5.5 RSS-199 Issue 4 5.5	Peak-Average Ratio	Pass
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7 RSS-132 Issue 4 5.5 RSS-133 Issue 7 5.5 RSS-139 Issue 4 5.5 RSS-199 Issue 4 5.5	Spurious Emission at Antenna Terminal	Pass
§22.917(a) §24.238(a) §27.53(c)(2)(4) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7 RSS-132 Issue 4 5.5 RSS-133 Issue 7 5.6 RSS-139 Issue 4 5.6 RSS-199 Issue 4 5.6	Band Edge and Emission Mask	Pass
§2.1055 §22.355 §24.235 §27.54	RSS-Gen Issue 5 6.11 RSS-130 Issue 2 4.5 RSS-132 Issue 4 5.3 RSS-133 Issue 7 5.4 RSS-139 Issue 4 5.4 RSS-199 Issue 4 5.4	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. Device Capabilities

This device contains the following capabilities;

LTE Band 17 (704 MHz ~ 716 MHz) is covered by LTE Band 12 (699 MHz ~ 716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth. Therefore test data provided in this report covers LTE Band 17 as well as Band 12.

1.9. Worst Case Configuration and Mode

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

1.10. Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
Conducted Power	2	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	4	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	5	V	V	V	V	V	V	V			V	V	V	V	V
	7	V	V	V			V	V	V	V	V	V	V	V	V
	*12/17	V	V	V	V	V	V	V			V	V	V	V	V
	13	V	V	V			V	V			V	V	V	V	V
Frequency Stability	2	-	V	-	-	-	V	-	-	-	V	-	-	-	V
	4	-	V	-	-	-	V	-	-	-	V	-	-	-	V
	5	-	V	-	-	-	V	-			V	-	-	-	V
	7	-	V	-			V	-	-	-	V	-	-	-	V
	*12/17	-	V	-	-	-	V	-			V	-	-	-	V
	13	-	V	-			V	-			V	-	-	-	V
Occupied Bandwidth	2	V	V	V	V	V	V	V	V	V	V	V	-	-	V
	4	V	V	V	V	V	V	V	V	V	V	V	-	-	V
	5	V	V	V	V	V	V	V			V	V	-	-	V
	7	V	V	V			V	V	V	V	V	V	-	-	V
	*12/17	V	V	V	V	V	V	V			V	V	-	-	V
	13	V	V	V			V	V			V	V	-	-	V
Peak-to-Average Ratio	2	V	V	V	V	V	V	V	V	V	V	V	-	-	V
	4	V	V	V	V	V	V	V	V	V	V	V	-	-	V
	5	V	V	V	V	V	V	V			V	V	-	-	V
	7	V	V	V			V	V	V	V	V	V	-	-	V
	*12/17	V	V	V	V	V	V	V			V	V	-	-	V
	13	V	V	V			V	V			V	V	-	-	V
Band edge	2	V	-	V	V	V	V	V	V	V	V	V	V	-	V
	4	V	-	V	V	V	V	V	V	V	V	V	V	-	V
	5	V	-	V	V	V	V	V			V	V	V	-	V
	7	V	-	V			V	V	V	V	V	V	V	-	V
	*12/17	V	-	V	V	V	V	V			V	V	V	-	V
	13	V	-	V			V	V			V	V	V	-	V
Spurious at antenna terminal & Spurious Radiated Emission	2	V	V	V	worst case										
	4	V	V	V	worst case										
	5	V	V	V	worst case										
	7	V	V	V	worst case										
	*12/17	V	V	V	worst case										
	13	V	V	V	worst case										

*B17 is not supported 1.4M/3M bandwidth

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	0.33 dB	
Occupied Bandwidth	0.05 MHz	
Conducted Spurious Emissions	0.99 dB	
Peak to Average Ratio	0.66 dB	
Frequency Stability	116 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.

1.12. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL005833	2025.03.14	Initial

1.13. Emission Designator and Max Power

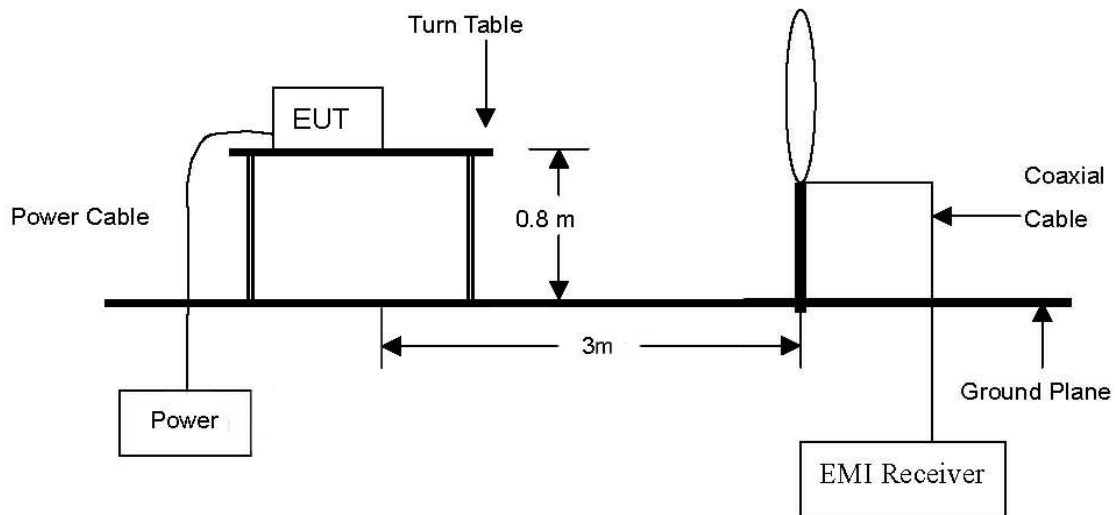
Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
2	1.4	QPSK	1 850.7	1 909.3	24.85	2.51	27.36	0.545	1M10G7D
		16QAM			23.83		26.34	0.431	1M10D7D
	3	QPSK	1 851.5	1 908.5	24.89		27.40	0.550	2M69G7D
		16QAM			23.77		26.28	0.425	2M69D7D
	5	QPSK	1 852.5	1 907.5	24.92		27.43	0.553	4M50G7D
		16QAM			23.86		26.37	0.434	4M50D7D
	10	QPSK	1 855.0	1 905.0	24.91		27.42	0.552	8M95G7D
		16QAM			23.85		26.36	0.433	8M95D7D
	15	QPSK	1 857.5	1 902.5	24.85		27.36	0.545	13M5G7D
		16QAM			23.85		26.36	0.433	13M5D7D
	20	QPSK	1 860.0	1 900.0	24.90		27.41	0.551	17M8G7D
		16QAM			23.89		26.40	0.437	17M9D7D
4	1.4	QPSK	1 710.7	1 754.3	24.84	1.25	26.09	0.406	1M09G7D
		16QAM			23.68		24.93	0.311	1M09D7D
	3	QPSK	1 711.5	1 753.5	24.87		26.12	0.409	2M70G7D
		16QAM			23.83		25.08	0.322	2M69D7D
	5	QPSK	1 712.5	1 752.5	24.96		26.21	0.418	4M51G7D
		16QAM			23.90		25.15	0.327	4M51D7D
	10	QPSK	1 715.0	1 750.0	24.91		26.16	0.413	8M93G7D
		16QAM			23.65		24.90	0.309	8M97D7D
	15	QPSK	1 717.5	1 747.5	24.91		26.16	0.413	13M5G7D
		16QAM			23.78		25.03	0.318	13M5D7D
	20	QPSK	1 720.0	1 745.0	24.94		26.19	0.416	17M9G7D
		16QAM			23.70		24.95	0.313	17M9D7D
5	1.4	QPSK	824.7	848.3	24.93	-1.12	21.66	0.147	1M09G7D
		16QAM			23.96		20.69	0.117	1M09D7D
	3	QPSK	825.5	847.5	24.91		21.64	0.146	2M69G7D
		16QAM			24.04		20.77	0.119	2M69D7D
	5	QPSK	826.5	846.5	24.95		21.68	0.147	4M51G7D
		16QAM			23.93		20.66	0.116	4M50D7D
	10	QPSK	829.0	844.0	24.93		21.66	0.147	8M95G7D
		16QAM			23.94		20.67	0.117	8M93D7D
7	5	QPSK	2 502.5	2 567.5	24.82	1.31	26.13	0.410	4M49G7D
		16QAM			23.95		25.26	0.336	4M52D7D
	10	QPSK	2 505.0	2 565.0	24.92		26.23	0.420	8M95G7D
		16QAM			23.98		25.29	0.338	8M95D7D
	15	QPSK	2 507.5	2 562.5	24.91		26.22	0.419	13M5G7D
		16QAM			23.95		25.26	0.336	13M5D7D
	20	QPSK	2 510.0	2 560.0	24.88		26.19	0.416	17M9G7D
		16QAM			23.91		25.22	0.333	17M9D7D

Band	Band width (MHz)	Modulation	Low Freq. (MHz)	Upper Freq. (MHz)	Conducted Average (dB m)	Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
12	1.4	QPSK	699.7	715.3	24.85	-1.89	20.81	0.121	1M10G7D
		16QAM			23.97		19.93	0.098	1M10D7D
	3	QPSK	700.5	714.5	24.87		20.83	0.121	2M69G7D
		16QAM			23.92		19.88	0.097	2M69D7D
12/17	5	QPSK	701.5	713.5	24.88		20.84	0.121	4M50G7D
		16QAM			23.95		19.91	0.098	4M50D7D
	10	QPSK	704.0	711.0	24.91		20.87	0.112	8M95G7D
		16QAM			23.98		19.94	0.099	8M91D7D
13	5	QPSK	779.5	784.5	24.84	0.20	22.89	0.195	4M53G7D
		16QAM			23.93		21.98	0.158	4M49D7D
	10	QPSK	782.0	24.86	22.91		0.195	8M91G7D	
		16QAM		23.76	21.81		0.152	8M89D7D	

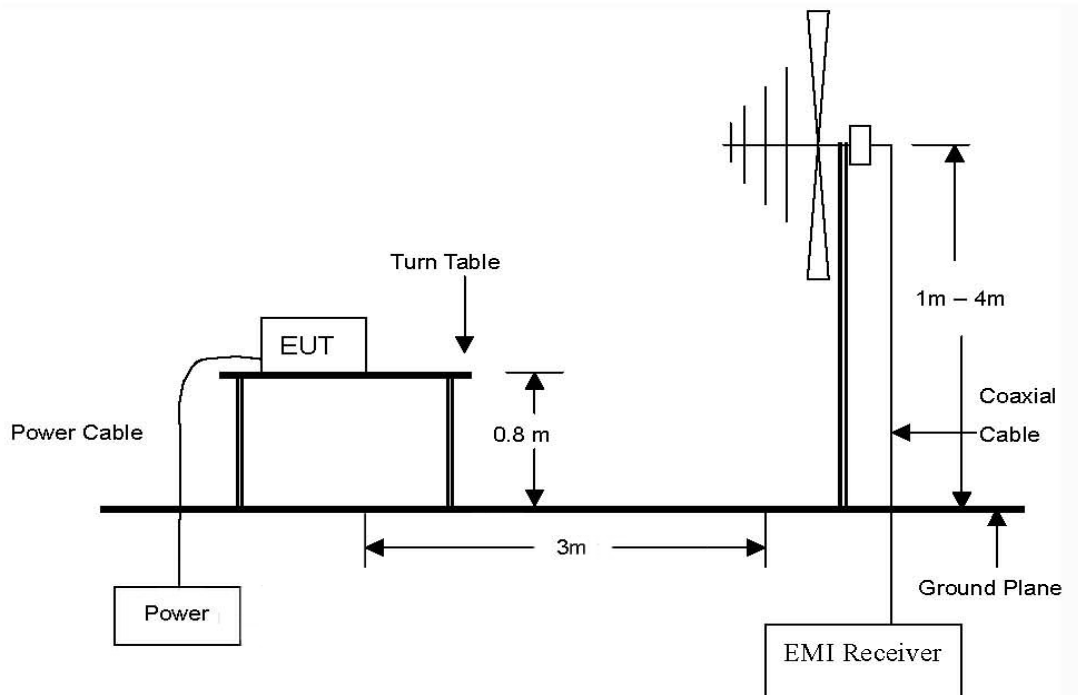
2. E.R.P. / E.I.R.P. & Radiated Spurious Emission

2.1. Test setup

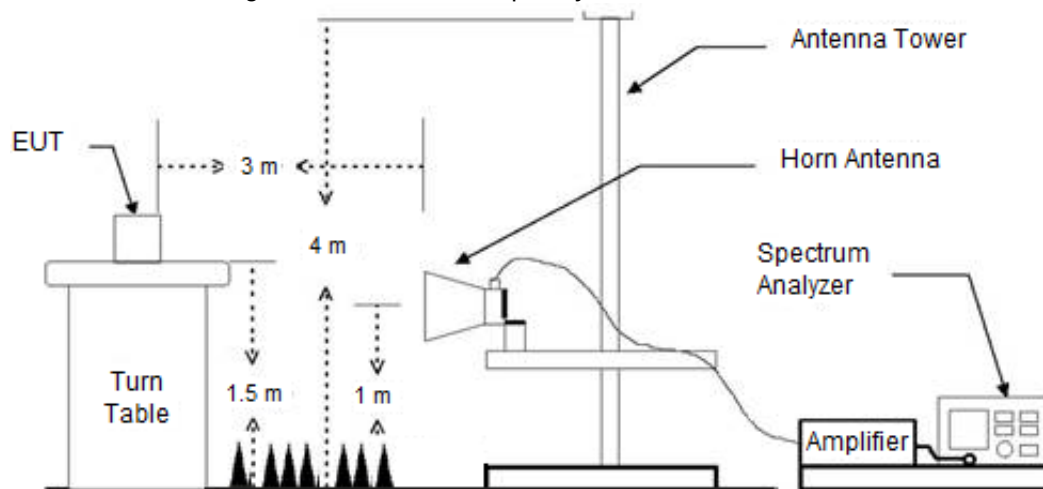
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



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

FCC

- §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
- §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(b)(9), Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.
- §27.50(c)(9), Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.
- §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1 710-1 755 MHz band and mobile and portable stations operating in the 1 695-1 710 MHz and 1 755-1 780 MHz bands are limited to 1 watt EIRP.
- §27.50(h)(2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

IC

- RSS-130 Issue 2

4.6.3, the e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

- RSS-132 Issue 4

5.4, The transmitter output power shall be measured in terms of average power. The equivalent radiated power (e.r.p.) shall not exceed 7 watts for mobile equipment and 3 watts for portable equipment.

- RSS-133 Issue 7

5.5, The maximum power spectral density of the equipment, measured in terms of average values, shall comply with the limits specified in table 2. These limits are either specified in terms of equivalent isotropically radiated power (e.i.r.p.) or TRP for the purpose of certification and may not apply to all deployment scenarios. Consult SRSP-510 for more deployment details in the bands 1850-1915 MHz and 1930-1995 MHz.

AAS equipment with eight antenna elements or less can demonstrate compliance with the e.i.r.p limit specified for non-AAS equipment in table 2, instead of the TRP limit.

Table 2: Maximum power spectral density of equipment

Equipment type	Maximum power
Non-AAS fixed station and base station	3 280 W/MHz e.i.r.p
AAS Fixed station and base station	46 dBm/MHz TRP
Subscriber equipment	2W/channel bandwidth e.i.r.p

- RSS-139 Issue 4

5.5, The maximum output power of the equipment shall comply with the limits specified below. In the tables, maximum power refers to the equivalent isotropically radiated power (e.i.r.p.) or total radiated power (TRP), measured in terms of average values.

Table 3: Maximum power of equipment in the band 1 710-1 780 MHz

Equipment type	Maximum power
Fixed station and base station	30 dBm e.i.r.p./channel bandwidth
Subscriber equipment	30 dBm e.i.r.p./channel bandwidth

- RSS-199 Issue 4

5.5, The maximum output power of the equipment shall comply with the limits specified in table 3. In this table, maximum power refers to the equivalent isotropically radiated power (e.i.r.p.) or total radiated power (TRP), measured in terms of average values.

Subscriber equipment other than fixed subscriber equipment shall not exceed an e.i.r.p of 2W per channel bandwidth.

Fixed subscriber equipment shall not exceed the following:

- I. conducted power of 2W per channel bandwidth for all ports
- II. e.i.r.p of 40 W per channel bandwidth

The maximum power limits for fixed station and base station are provided in Table 3. The limits in this RSS are specified for the purpose of certification and may not apply to all deployment scenarios. Consult SRSP-517 for more deployment details in the band 2 500-2 690 MHz.

Table 3: Maximum power of fixed station and base station in the band 2 500-2 690 MHz

Equipment type	Maximum power
Non-AAS fixed station and base station	e.i.r.p.of 1 640 W / MHz
AAS fixed station and base station	TRP of 43 dBm / MHz

2.2.2. Limit of Radiated Spurious Emission

FCC

- §22.917(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.

- §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(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

- §27.53(f), For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1 559-1 610 MHz shall be limited to -70 dB W/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dB W EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

- §27.53(g), 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.

- §27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

- §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log_{10} (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log_{10} (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log_{10} (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that $43 + 10 \log_{10} (P)$ dB on all frequencies between 2 490.5 MHz and 2 496 MHz and $55 + 10 \log_{10} (P)$ dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies

below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

IC

- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dB W), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2, In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dB W), by at least:

- (i) $76 + 10 \log_{10} p$ (watts), dB, for base and fixed equipment, and
- (ii) $65 + 10 \log_{10} p$ (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1 559-1 610 MHz shall not exceed -70 dB W/MHz for wideband signal and -80 dB W for discrete emission with bandwidth less than 700 Hz.

- RSS-132 Issue 4

5.5, Equipment shall meet the unwanted emission limits specified below:

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (dB).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (dB). If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 7

5.6, Unwanted emissions shall be measured in terms of average values while the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified in table 3, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range.

For the unwanted emission limits, in the 1 MHz bands immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth (OBW). Beyond these 1 MHz bands, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth may be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1% of the OBW, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the table 3.

Table 3: Unwanted emission limits for all equipment

Offset from the edge of the frequency block or frequency block group	Unwanted emission limit
≤ 1 MHz	-13 dB m/(1% of OBW)
> 1 MHz	-13 dB m

- RSS-139 Issue 4

5.6, Unwanted emissions shall be measured in terms of average values.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Table 6: Unwanted emission limits

Offset from the edge of the frequency block or frequency block group	Unwanted emission limit
≤ 1 MHz	-13 dB m/(1% of OB)*
> 1 MHz	-13 dB m

* OB is the occupied bandwidth

- RSS-199 Issue 4

5.6, unwanted emissions shall be measured in terms of average values when the transmitter is operating at the manufacturer's rated power and modulated as specified in RSS-Gen.

Equipment shall meet the unwanted emission limits, specified below, outside each frequency block group. For each channel bandwidth supported by the equipment under test, the unwanted emissions shall be measured and reported for two channel frequencies: one located as close as possible to the low end and one located as close as possible to the high end of the equipment's operating frequency range.

For the unwanted emission limits, in the 1 MHz band immediately outside and adjacent to the frequency block group, the power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for fixed stations, base stations, and fixed subscriber equipment, and 2 % for subscriber equipment other than fixed subscriber equipment. Beyond this 1 MHz band, a resolution bandwidth of 1 MHz shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz, or 1 % or 2 % of the occupied bandwidth, as applicable.

For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors), where applicable, of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in the tables below.

Table 4: Unwanted emission limits for fixed station, base station and fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
≤1	-13 dB m/(1% of OB*)
>1	-13 dB m/MHz

* OB is the occupied bandwidth

Table 5: Unwanted emission limits for subscriber equipment other than fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
0-1	-10 dB m/(2% of OB*)
1-5	-10 dB m/MHz
5-X**	-13 dB m/MHz
≥X	-25 dB m/MHz

* OB is the occupied bandwidth

** X is 6 MHz or the equipment occupied bandwidth, whichever is greater

In addition to complying with the limits in table 5, subscriber equipment other than fixed subscriber equipment shall not exceed -13 dB m/MHz on all frequencies between 2 490.5 MHz and 2 496 MHz, and -25 dB m/MHz at or below 2 490.5 MHz.

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 Output Power & 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 $\geq 3 \times$ 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 : $(23 \pm 1) ^\circ\text{C}$

Relative humidity : 47 %

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

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
2	1 850 ~ 1 915	24.92	0.310	2.51	27.43	0.553			2 W E.I.R.P.
4	1 710 ~ 1 755	24.96	0.313	1.25	26.21	0.418			1 W E.I.R.P.
5	824 ~ 849	24.95	0.311	-1.12	23.83	0.242	21.68	0.147	7 W E.R.P.
7	2 500 ~ 2 570	24.92	0.310	1.31	26.23	0.420			2 W E.I.R.P.
12/17	699 ~ 716	24.91	0.310	-1.89	23.02	0.200	20.87	0.122	30 W E.R.P.
13	777 ~ 787	24.86	0.306	0.20	25.06	0.321	22.91	0.195	30 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

LTE Band 2 (5 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 (1 852.5 MHz)									
3 701.14	45.21	H	32.10	-34.44	42.87	-95.26	-52.39	-13	39.39
3 701.16	46.93	V	32.10	-34.44	44.59	-95.26	-50.67	-13	37.67
Above 3 800.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 880.0 MHz)									
3 756.02	48.25	H	32.30	-34.43	46.12	-95.26	-49.14	-13	36.14
3 756.10	47.02	V	32.30	-34.43	44.89	-95.26	-50.37	-13	37.37
Above 3 800.00	Not detected	-	-	-	-	-	-	-	-
High Channel (1 907.5 MHz)									
3 811.22	46.71	H	32.30	-33.66	45.35	-95.26	-49.91	-13	36.91
3 810.96	48.56	V	32.30	-33.66	47.20	-95.26	<u>-48.06</u>	-13	35.06
Above 3 900.00	Not detected	-	-	-	-	-	-	-	-

LTE Band 4 (5 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 (1 712.5 MHz)									
3 420.97	48.40	H	31.00	-35.30	44.10	-95.26	-51.16	-13	38.16
3 421.11	50.06	V	31.00	-35.30	45.76	-95.26	-49.50	-13	36.50
Above 3 500.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
3 461.07	55.68	H	31.02	-34.15	52.55	-95.26	-42.71	-13	29.71
3 461.19	55.78	V	31.02	-34.14	52.66	-95.26	-42.60	-13	29.60
Above 3 500.00	Not detected	-	-	-	-	-	-	-	-
High Channel (1 752.5 MHz)									
3 501.04	48.27	H	31.10	-34.85	44.52	-95.26	-50.74	-13	37.74
3 501.28	49.46	V	31.10	-34.85	45.71	-95.26	-49.55	-13	36.55
Above 3 600.00	Not detected	-	-	-	-	-	-	-	-

LTE Band 5 (5 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 (826.5 MHz)									
1 648.66	48.94	H	25.79	-39.94	34.79	-97.41	-62.62	-13	49.62
1 648.65	51.05	V	25.79	-39.94	36.90	-97.41	-60.51	-13	47.51
2 473.26	47.42	H	28.29	-37.69	38.02	-97.41	-59.39	-13	46.39
2 473.11	49.97	V	28.29	-37.69	40.57	-97.41	-56.84	-13	43.84
Above 2 500.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
1 668.83	49.71	H	26.14	-39.87	35.98	-97.41	-61.43	-13	48.43
1 668.58	52.52	V	26.13	-39.87	38.78	-97.41	-58.63	-13	45.63
2 503.02	50.76	H	28.41	-37.86	41.31	-97.41	-56.10	-13	43.10
2 502.88	50.86	V	28.41	-37.86	41.41	-97.41	-56.00	-13	43.00
Above 2 600.00	Not detected	-	-	-	-	-	-	-	-
High Channel (846.5 MHz)									
1 688.73	46.43	H	26.50	-39.67	33.26	-97.41	-64.15	-13	51.15
1 688.77	51.05	V	26.50	-39.66	37.89	-97.41	-59.52	-13	46.52
2 533.06	49.17	H	28.53	-37.77	39.93	-97.41	-57.48	-13	44.48
2 532.98	46.95	V	28.53	-37.77	37.71	-97.41	-59.70	-13	46.70
Above 2 600.00	Not detected	-	-	-	-	-	-	-	-

LTE Band 7 (10 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 (2 505.0 MHz)									
5 001.62	38.11	H	33.40	-31.93	39.58	-95.26	-55.68	-25	30.68
5 001.65	38.07	V	33.40	-31.93	39.54	-95.26	-55.72	-25	30.72
7 502.23	39.17	H	36.10	-28.45	46.82	-95.26	-48.44	-25	23.44
7 502.22	41.67	V	36.10	-28.45	49.32	-95.26	-45.94	-25	20.94
10 003.02	37.01	H	37.71	-24.84	49.88	-95.26	-45.38	-25	20.38
10 003.26	40.62	V	37.71	-24.84	53.49	-95.26	-41.77	-25	16.77
Above 10 100.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (2 535.0 MHz)									
5 061.36	37.15	H	33.42	-31.39	39.18	-95.26	-56.08	-25	31.08
5 061.53	40.40	V	33.42	-31.39	42.43	-95.26	-52.83	-25	27.83
7 592.32	43.79	H	36.00	-27.88	51.91	-95.26	-43.35	-25	18.35
7 592.39	44.86	V	36.00	-27.88	52.98	-95.26	-42.28	-25	17.28
10 123.00	35.87	H	37.75	-25.53	48.09	-95.26	-47.17	-25	22.17
10 123.15	38.46	V	37.75	-25.53	50.68	-95.26	-44.58	-25	19.58
Above 10 200.00	Not detected	-	-	-	-	-	-	-	-
High Channel (2 565.0 MHz)									
5 121.58	39.07	H	33.54	-31.73	40.88	-95.26	-54.38	-25	29.38
5 121.58	42.54	V	33.54	-31.73	44.35	-95.26	-50.91	-25	25.91
7 682.22	47.38	H	35.94	-27.90	55.42	-95.26	-39.84	-25	14.84
7 682.39	48.21	V	35.94	-27.90	56.25	-95.26	-39.01	-25	14.01
10 243.06	36.41	H	37.79	-24.62	49.58	-95.26	-45.68	-25	20.68
10 243.04	40.65	V	37.79	-24.62	53.82	-95.26	-41.44	-25	16.44
Above 10 300.00	Not detected	-	-	-	-	-	-	-	-

LTE Band 12/17 (10 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 (704.0 MHz)									
1 399.56	60.38	H	25.10	-40.36	45.12	-97.41	-52.29	-13	39.29
1 399.57	71.60	V	25.10	-40.36	56.34	-97.41	-41.07	-13	28.07
Above 1 400.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (707.5 MHz)									
1 406.59	64.92	H	25.11	-40.35	49.68	-97.41	-47.73	-13	34.73
1 406.61	69.37	V	25.11	-40.35	54.13	-97.41	-43.28	-13	30.28
Above 1 500.00	Not detected	-	-	-	-	-	-	-	-
High Channel (711.0 MHz)									
1 413.75	56.89	H	25.13	-40.33	41.69	-97.41	-55.72	-13	42.72
1 413.75	67.03	V	25.13	-40.33	51.83	-97.41	-45.58	-13	32.58
Above 1 500.00	Not detected	-	-	-	-	-	-	-	-

LTE Band 13 (10 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)
Middle Channel (782.0 MHz)									
1 555.66	57.57	H	25.22	-36.57	46.22	-97.41	-51.19	-13	38.19
1 555.63	55.85	V	25.22	-36.57	44.50	-97.41	-52.91	-13	39.91
Above 1 600.00	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

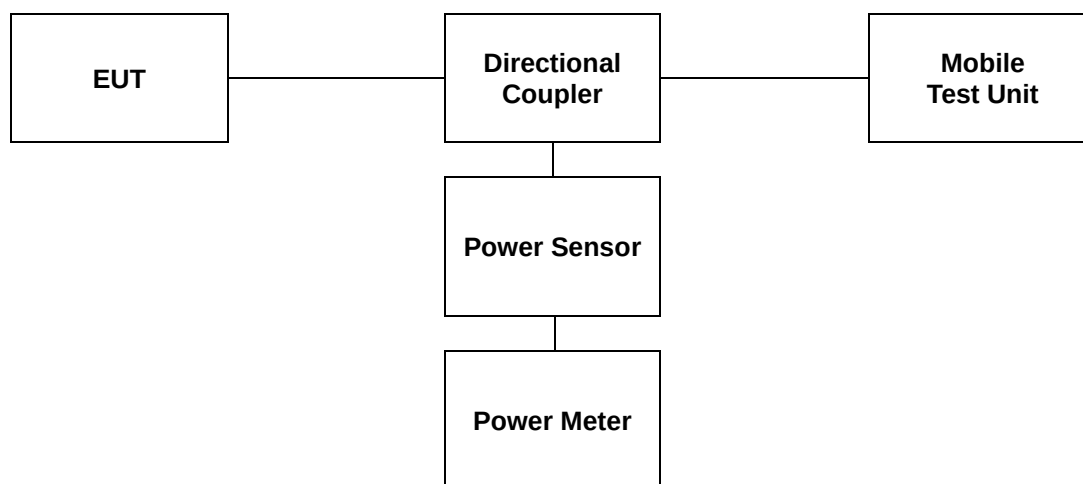
3.1. Limit

CFR 47, Section FCC §2.1046 and IC RSS-Gen Issue 5 6.12.

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. The measurement performed using a wideband RF power meter.
4. 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 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18607 (1 850.7 MHz)		18900 (1 880.0 MHz)		19193 (1 909.3 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.58	0.287	24.73	0.297	24.63	0.290	27.36	0.545
		1	2	24.75	0.299	24.79	0.301	24.63	0.290		
		1	5	24.69	0.294	24.83	0.304	24.61	0.289		
		3	0	24.68	0.294	24.79	0.301	24.85	0.305		
		3	2	24.73	0.297	24.80	0.302	24.64	0.291		
		3	3	24.62	0.290	24.80	0.302	24.60	0.288		
		6	0	23.72	0.236	23.79	0.239	23.85	0.243		
	16QAM	1	0	23.66	0.232	23.60	0.229	23.53	0.225	26.34	0.431
		1	3	23.58	0.228	23.68	0.233	23.51	0.224		
		1	5	23.50	0.224	23.76	0.238	23.52	0.225		
		3	0	23.78	0.239	23.74	0.237	23.63	0.231		
		3	2	23.81	0.240	23.62	0.230	23.83	0.242		
		3	3	23.86	0.243	23.52	0.225	23.50	0.224		
		6	0	22.69	0.186	22.68	0.185	22.75	0.188		

LTE Band 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18615 (1 851.5 MHz)		18900 (1 880.0 MHz)		19185 (1 908.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.73	0.297	24.89	0.308	24.76	0.299	27.40	0.550
		1	7	24.81	0.303	24.78	0.301	24.83	0.304		
		1	14	24.88	0.308	24.80	0.302	24.82	0.303		
		8	0	23.70	0.234	23.82	0.241	23.80	0.240		
		8	4	23.78	0.239	23.86	0.243	23.73	0.236		
		8	7	23.74	0.237	23.78	0.239	23.79	0.239		
		15	0	23.74	0.237	23.81	0.240	23.80	0.240		
	16QAM	1	0	23.64	0.231	23.51	0.224	23.57	0.228	26.28	0.425
		1	7	23.67	0.233	23.77	0.238	23.57	0.228		
		1	14	23.60	0.229	23.62	0.230	23.43	0.220		
		8	0	22.78	0.190	22.84	0.192	22.56	0.180		
		8	4	22.86	0.193	22.76	0.189	22.61	0.182		
		8	7	22.87	0.194	22.79	0.190	22.51	0.178		
		15	0	22.64	0.184	22.81	0.191	22.72	0.187		

LTE Band 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18625 (1 852.5 MHz)		18900 (1 880.0 MHz)		19175 (1 907.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)7
5	QPSK	1	0	24.76	0.299	24.79	0.301	24.78	0.301	27.43	0.553
		1	12	24.75	0.299	24.87	0.307	24.75	0.299		
		1	24	24.92	0.310	24.87	0.307	24.77	0.300		
		12	0	23.65	0.232	23.81	0.240	23.66	0.232		
		12	6	23.72	0.236	23.85	0.243	23.76	0.238		
		12	13	23.74	0.237	23.80	0.240	23.76	0.238		
		25	0	23.67	0.233	23.84	0.242	23.72	0.236		
	16QAM	1	0	23.55	0.226	23.63	0.231	23.49	0.223	26.37	0.434
		1	12	23.59	0.229	23.69	0.234	23.86	0.243		
		1	24	23.58	0.228	23.73	0.236	23.40	0.219		
		12	0	22.76	0.189	22.77	0.189	22.63	0.183		
		12	6	22.69	0.186	22.84	0.192	22.70	0.186		
		12	13	22.84	0.192	22.88	0.194	22.72	0.187		
		25	0	22.69	0.186	22.75	0.188	22.67	0.185		

LTE Band 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18650 (1 855.0 MHz)		18900 (1 880.0 MHz)		19150 (1 905.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.80	0.302	24.91	0.310	24.84	0.305	27.42	0.552
		1	25	24.81	0.303	24.81	0.303	24.87	0.307		
		1	49	24.83	0.304	24.84	0.305	24.86	0.306		
		25	0	23.79	0.239	23.80	0.240	23.64	0.231		
		25	12	23.86	0.243	23.85	0.243	23.67	0.233		
		25	25	23.80	0.240	23.78	0.239	23.74	0.237		
		50	0	23.81	0.240	23.85	0.243	23.70	0.234		
	16QAM	1	0	23.79	0.239	23.83	0.242	23.73	0.236	26.36	0.433
		1	25	23.78	0.239	23.59	0.229	23.66	0.232		
		1	49	23.85	0.243	23.71	0.235	23.80	0.240		
		25	0	22.93	0.196	22.78	0.190	22.76	0.189		
		25	12	22.93	0.196	22.86	0.193	22.64	0.184		
		25	25	22.84	0.192	22.88	0.194	22.81	0.191		
		50	0	22.76	0.189	22.84	0.192	22.78	0.190		

LTE Band 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18675 (1 857.5 MHz)		18900 (1 880.0 MHz)		19125 (1 902.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	24.82	0.303	24.81	0.303	24.79	0.301	27.36	0.545
		1	36	24.84	0.305	24.81	0.303	24.83	0.304		
		1	74	24.83	0.304	24.85	0.305	24.84	0.305		
		36	0	23.81	0.240	23.89	0.245	23.62	0.230		
		36	18	23.83	0.242	23.83	0.242	23.59	0.229		
		36	37	23.83	0.242	23.82	0.241	23.71	0.235		
		75	0	23.74	0.237	23.87	0.244	23.56	0.227		
	16QAM	1	0	23.63	0.231	23.68	0.233	23.59	0.229	26.36	0.433
		1	36	23.78	0.239	23.69	0.234	23.57	0.228		
		1	74	23.65	0.232	23.85	0.243	23.47	0.222		
		36	0	22.68	0.185	22.84	0.192	22.38	0.173		
		36	18	22.82	0.191	22.93	0.196	22.68	0.185		
		36	37	22.80	0.191	22.88	0.194	22.55	0.180		
		75	0	22.76	0.189	22.85	0.193	22.65	0.184		

LTE Band 2											
Ant. Gain						2.51 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	18700 (1 860.0 MHz)		18900 (1 880.0 MHz)		19100 (1 900.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	24.81	0.303	24.86	0.306	24.86	0.306	27.41	0.551
		1	50	24.82	0.303	24.86	0.306	24.90	0.309		
		1	99	24.89	0.308	24.81	0.303	24.77	0.300		
		50	0	23.75	0.237	23.86	0.243	23.68	0.233		
		50	25	23.88	0.244	23.88	0.244	23.69	0.234		
		50	13	23.83	0.242	23.97	0.249	23.72	0.236		
		100	0	23.84	0.242	23.86	0.243	23.68	0.233		
	16QAM	1	0	23.59	0.229	23.86	0.243	23.53	0.225	26.40	0.437
		1	50	23.86	0.243	23.70	0.234	23.78	0.239		
		1	99	23.77	0.238	23.89	0.245	23.86	0.243		
		50	0	22.84	0.192	22.82	0.191	22.79	0.190		
		50	25	22.92	0.196	22.88	0.194	22.77	0.189		
		50	50	22.89	0.195	22.86	0.193	22.80	0.191		
		100	0	22.83	0.192	22.94	0.197	22.63	0.183		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	19957 (1 710.7 MHz)		20175 (1 732.5 MHz)		20393 (1 754.3 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.58	0.287	24.63	0.290	24.76	0.299	26.09	0.406
		1	2	24.67	0.293	24.78	0.301	24.67	0.293		
		1	5	24.45	0.279	24.76	0.299	24.58	0.287		
		3	0	24.56	0.286	24.73	0.297	24.65	0.292		
		3	2	24.54	0.284	24.71	0.296	24.66	0.292		
		3	3	24.52	0.283	24.71	0.296	24.84	0.305		
		6	0	23.58	0.228	23.71	0.235	23.65	0.232		
	16QAM	1	0	23.57	0.228	23.61	0.230	23.50	0.224	24.93	0.311
		1	2	23.48	0.223	23.51	0.224	23.64	0.231		
		1	5	23.42	0.220	23.68	0.233	23.45	0.221		
		3	0	23.67	0.233	23.52	0.225	23.50	0.224		
		3	2	23.58	0.228	23.65	0.232	23.59	0.229		
		3	3	23.64	0.231	23.56	0.227	23.54	0.226		
		6	0	22.57	0.181	22.68	0.185	22.33	0.171		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	19965 (1 711.5 MHz)		20175 (1 732.5 MHz)		20385 (1 753.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.60	0.288	24.81	0.303	24.62	0.290	26.12	0.409
		1	7	24.74	0.298	24.84	0.305	24.78	0.301		
		1	14	24.59	0.288	24.87	0.307	24.77	0.300		
		8	0	23.66	0.232	23.82	0.241	23.68	0.233		
		8	4	23.55	0.226	23.80	0.240	23.68	0.233		
		8	7	23.58	0.228	23.80	0.240	23.69	0.234		
		15	0	23.65	0.232	23.76	0.238	23.69	0.234		
	16QAM	1	0	23.50	0.224	23.59	0.229	23.34	0.216	25.08	0.322
		1	7	23.77	0.238	23.83	0.242	23.48	0.223		
		1	14	23.33	0.215	23.55	0.226	23.52	0.225		
		8	0	22.79	0.190	22.72	0.187	22.59	0.182		
		8	4	22.62	0.183	22.71	0.187	22.63	0.183		
		8	7	22.51	0.178	22.68	0.185	22.74	0.188		
		15	0	22.55	0.180	22.75	0.188	22.75	0.188		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	19975 (1 712.5 MHz)		20175 (1 732.5 MHz)		20375 (1 752.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.76	0.299	24.71	0.296	24.54	0.284	26.12	0.418
		1	12	24.76	0.299	24.89	0.308	24.96	0.313		
		1	24	24.68	0.294	24.88	0.308	24.85	0.305		
		12	0	23.61	0.230	23.73	0.236	23.64	0.231		
		12	6	23.50	0.224	23.74	0.237	23.60	0.229		
		12	13	23.64	0.231	23.80	0.240	23.88	0.244		
		25	0	23.57	0.228	23.77	0.238	23.56	0.227		
	16QAM	1	0	23.35	0.216	23.58	0.228	23.38	0.218	25.15	0.327
		1	12	23.56	0.227	23.57	0.228	23.81	0.240		
		1	24	23.27	0.212	23.57	0.228	23.90	0.245		
		12	0	22.54	0.179	22.67	0.185	22.57	0.181		
		12	6	22.63	0.183	22.68	0.185	22.60	0.182		
		12	13	22.65	0.184	22.73	0.187	22.75	0.188		
		25	0	22.41	0.174	22.78	0.190	22.64	0.184		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20000 (1 715.0 MHz)		20175 (1 732.5 MHz)		20350 (1 750.0 MHz)		20000 (1 715.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.72	0.296	24.68	0.294	24.85	0.305	26.16	0.413
		1	25	24.69	0.294	24.89	0.308	24.75	0.299		
		1	49	24.77	0.300	24.91	0.310	24.68	0.294		
		25	0	23.63	0.231	23.75	0.237	23.65	0.232		
		25	12	23.61	0.230	23.72	0.236	23.53	0.225		
		25	25	23.62	0.230	23.76	0.238	23.61	0.230		
		50	0	23.68	0.233	23.75	0.237	23.42	0.220		
	16QAM	1	0	23.42	0.220	23.45	0.221	23.48	0.223	24.90	0.309
		1	25	23.54	0.226	23.45	0.221	23.26	0.212		
		1	49	23.49	0.223	23.61	0.230	23.65	0.232		
		25	0	22.58	0.181	22.72	0.187	22.61	0.182		
		25	12	22.64	0.184	22.69	0.186	22.52	0.179		
		25	25	22.58	0.181	22.72	0.187	22.50	0.178		
		50	0	22.48	0.177	22.65	0.184	22.57	0.181		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20025 (1 717.5 MHz)		20175 (1 732.5 MHz)		20325 (1 747.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	24.67	0.293	24.76	0.299	24.91	0.310	26.16	0.413
		1	36	24.84	0.305	24.88	0.308	24.78	0.301		
		1	74	24.84	0.305	24.83	0.304	24.80	0.302		
		36	0	23.59	0.229	23.72	0.236	23.71	0.235		
		36	18	23.57	0.228	23.67	0.233	23.54	0.226		
		36	37	23.68	0.233	23.68	0.233	23.59	0.229		
		75	0	23.64	0.231	23.64	0.231	23.48	0.223		
	16QAM	1	0	23.51	0.224	23.64	0.231	23.78	0.239	25.03	0.318
		1	36	23.42	0.220	23.55	0.226	23.44	0.221		
		1	74	23.45	0.221	23.37	0.217	23.46	0.222		
		36	0	22.56	0.180	22.75	0.188	22.69	0.186		
		36	18	22.62	0.183	22.61	0.182	22.46	0.176		
		36	37	22.52	0.179	22.66	0.185	22.57	0.181		
		75	0	22.52	0.179	22.72	0.187	22.55	0.180		

LTE Band 4											
Ant. Gain						1.25 dB i					
Limit: 1W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20050 (1 720.0 MHz)		20175 (1 732.5 MHz)		20300 (1 745.0 MHz)		20000 (1 715.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	24.53	0.284	24.73	0.297	24.92	0.310	26.19	0.416
		1	50	24.55	0.285	24.82	0.303	24.94	0.312		
		1	99	24.59	0.288	24.86	0.306	24.90	0.309		
		50	0	23.54	0.226	23.63	0.231	23.82	0.241		
		50	25	23.43	0.220	23.73	0.236	23.84	0.242		
		50	13	23.47	0.222	23.71	0.235	23.86	0.243		
		100	0	23.44	0.221	23.71	0.235	23.82	0.241		
	16QAM	1	0	23.19	0.208	23.54	0.226	23.65	0.232	24.95	0.313
		1	50	23.12	0.205	23.58	0.228	23.70	0.234		
		1	99	23.36	0.217	23.49	0.223	23.60	0.229		
		50	0	22.38	0.173	22.54	0.179	22.82	0.191		
		50	25	22.46	0.176	22.64	0.184	22.94	0.197		
		50	50	22.38	0.173	22.71	0.187	22.75	0.188		
		100	0	22.16	0.164	22.75	0.188	22.78	0.190		

LTE Band 5											
Ant. Gain						-1.12 dB i					
Limit: 7W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	20407 (824.7 MHz)		20525 (836.5 MHz)		20643 (848.3 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.84	0.305	24.93	0.311	24.91	0.310	21.66	0.147
		1	2	24.83	0.304	24.83	0.304	24.92	0.310		
		1	5	24.88	0.308	24.82	0.303	24.89	0.308		
		3	0	24.83	0.304	24.75	0.299	24.89	0.308		
		3	2	24.90	0.309	24.88	0.308	24.87	0.307		
		3	3	24.77	0.300	24.71	0.296	24.86	0.306		
		6	0	23.75	0.237	23.84	0.242	23.94	0.248		
	16QAM	1	0	23.84	0.242	23.66	0.232	23.83	0.242	20.69	0.117
		1	2	23.89	0.245	23.85	0.243	23.96	0.249		
		1	5	23.71	0.235	23.86	0.243	23.65	0.232		
		3	0	23.71	0.235	23.82	0.241	23.81	0.240		
		3	2	23.79	0.239	23.68	0.233	23.78	0.239		
		3	3	23.82	0.241	23.83	0.242	23.85	0.243		
		6	0	22.72	0.187	22.87	0.194	22.69	0.186		

LTE Band 5											
Ant. Gain						-1.12 dB i					
Limit: 7W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	20415 (825.5 MHz)		20525 (836.5 MHz)		20635 (847.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.85	0.305	24.81	0.303	24.90	0.309	21.64	0.146
		1	7	24.84	0.305	24.89	0.308	24.72	0.296		
		1	14	24.85	0.305	24.91	0.310	24.73	0.297		
		8	0	23.86	0.243	23.96	0.249	23.84	0.242		
		8	4	23.78	0.239	23.97	0.249	23.83	0.242		
		8	7	23.82	0.241	23.91	0.246	23.83	0.242		
		15	0	23.80	0.240	23.93	0.247	23.82	0.241		
	16QAM	1	0	23.69	0.234	23.65	0.232	23.60	0.229	20.77	0.119
		1	7	23.72	0.236	24.04	0.254	23.94	0.248		
		1	14	23.75	0.237	23.77	0.238	23.95	0.248		
		8	0	22.77	0.189	22.89	0.195	22.87	0.194		
		8	4	22.78	0.190	22.76	0.189	22.73	0.187		
		8	7	22.76	0.189	22.73	0.187	22.76	0.189		
		15	0	22.62	0.183	22.80	0.191	22.72	0.187		

LTE Band 5											
Ant. Gain						-1.12 dB i					
Limit: 7W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	20425 (826.5 MHz)		20525 (836.5 MHz)		20625 (846.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.84	0.305	24.84	0.305	24.79	0.301	21.68	0.147
		1	12	24.73	0.297	24.90	0.309	24.95	0.313		
		1	24	24.79	0.301	24.90	0.309	24.74	0.298		
		12	0	23.71	0.235	23.90	0.245	23.84	0.242		
		12	6	23.75	0.237	23.88	0.244	23.77	0.238		
		12	13	23.73	0.236	23.90	0.245	23.80	0.240		
		25	0	23.71	0.235	23.85	0.243	23.77	0.238		
	16QAM	1	0	23.50	0.224	23.59	0.229	23.58	0.228	20.66	0.116
		1	12	23.62	0.230	23.63	0.231	23.93	0.247		
		1	24	23.76	0.238	23.58	0.228	23.46	0.222		
		12	0	22.71	0.187	22.89	0.195	22.68	0.185		
		12	6	22.76	0.189	22.88	0.194	22.74	0.188		
		12	13	22.76	0.189	22.94	0.197	22.74	0.188		
		25	0	22.65	0.184	22.92	0.196	22.71	0.187		

LTE Band 5											
Ant. Gain						-1.12 dB i					
Limit: 7W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	20450 (829.0 MHz)		20525 (836.5 MHz)		20600 (844.0 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.89	0.308	24.82	0.303	24.85	0.305	21.66	0.147
		1	25	24.93	0.311	24.92	0.310	24.87	0.307		
		1	49	24.82	0.303	24.81	0.303	24.87	0.307		
		25	0	23.86	0.243	23.86	0.243	23.87	0.244		
		25	12	23.85	0.243	23.77	0.238	23.85	0.243		
		25	25	23.81	0.240	23.84	0.242	23.85	0.243		
		50	0	23.80	0.240	23.81	0.240	23.87	0.244		
	16QAM	1	0	23.71	0.235	23.94	0.248	23.88	0.244	20.67	0.117
		1	25	23.73	0.236	23.63	0.231	23.61	0.230		
		1	49	23.61	0.230	23.67	0.233	23.88	0.244		
		25	0	22.77	0.189	22.91	0.195	22.87	0.194		
		25	12	22.92	0.196	22.71	0.187	22.94	0.197		
		25	25	22.89	0.195	22.76	0.189	22.91	0.195		
		50	0	22.83	0.192	22.80	0.191	22.81	0.191		

LTE Band 7											
Ant. Gain						1.31 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20775 (2 502.5 MHz)		21100 (2 535.0 MHz)		21425 (2 567.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.66	0.292	24.81	0.303	24.60	0.288	26.13	0.410
		1	12	24.55	0.285	24.82	0.303	24.57	0.286		
		1	24	24.68	0.294	24.79	0.301	24.53	0.284		
		12	0	23.76	0.238	23.76	0.238	23.66	0.232		
		12	6	23.75	0.237	23.82	0.241	23.86	0.243		
		12	13	23.34	0.216	23.91	0.246	23.63	0.231		
		25	0	23.76	0.238	23.87	0.244	23.59	0.229		
	16QAM	1	0	23.63	0.231	23.95	0.248	23.78	0.239	25.26	0.336
		1	12	23.74	0.237	23.88	0.244	23.83	0.242		
		1	24	23.69	0.234	23.91	0.246	23.81	0.240		
		12	0	22.78	0.190	22.79	0.190	22.54	0.179		
		12	6	22.99	0.199	22.96	0.198	22.76	0.189		
		12	13	22.61	0.182	22.79	0.190	22.69	0.186		
		25	0	22.70	0.186	22.88	0.194	22.86	0.193		

LTE Band 7											
Ant. Gain						1.31 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20800 (2 505.0 MHz)		21100 (2 535.0 MHz)		21400 (2 565.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.60	0.288	24.88	0.308	24.72	0.296	26.23	0.420
		1	25	24.50	0.282	24.92	0.310	24.54	0.284		
		1	49	24.55	0.285	24.85	0.305	24.81	0.303		
		25	0	23.62	0.230	23.81	0.240	23.72	0.236		
		25	12	23.66	0.232	23.76	0.238	23.78	0.239		
		25	25	23.58	0.228	23.85	0.243	23.80	0.240		
		50	0	23.79	0.239	23.79	0.239	23.74	0.237		
	16QAM	1	0	23.78	0.239	23.95	0.248	23.73	0.236	25.29	0.338
		1	25	23.71	0.235	23.98	0.250	23.75	0.237		
		1	49	23.70	0.234	23.75	0.237	23.79	0.239		
		25	0	22.86	0.193	22.80	0.191	22.79	0.190		
		25	12	22.75	0.188	22.88	0.194	22.78	0.190		
		25	25	22.78	0.190	22.91	0.195	22.76	0.189		
		50	0	22.77	0.189	22.91	0.195	22.80	0.191		

LTE Band 7											
Ant. Gain						1.31 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20825 (2 507.5 MHz)		21100 (2 535.0 MHz)		21375 (2 562.5 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	24.61	0.289	24.91	0.310	24.82	0.303	26.22	0.419
		1	36	24.60	0.288	24.82	0.303	24.87	0.307		
		1	74	24.53	0.284	24.87	0.307	24.59	0.288		
		36	0	23.78	0.239	23.76	0.238	23.77	0.238		
		36	18	23.76	0.238	23.80	0.240	23.81	0.240		
		36	37	23.84	0.242	23.87	0.244	23.57	0.228		
		75	0	23.79	0.239	23.83	0.242	23.75	0.237		
	16QAM	1	0	23.85	0.243	23.95	0.248	23.79	0.239	25.26	0.336
		1	36	23.84	0.242	23.86	0.243	23.77	0.238		
		1	74	23.94	0.248	23.89	0.245	23.78	0.239		
		36	0	22.94	0.197	22.91	0.195	22.75	0.188		
		36	18	22.99	0.199	22.89	0.195	22.73	0.187		
		36	37	22.88	0.194	22.81	0.191	22.65	0.184		
		75	0	22.70	0.186	22.87	0.194	22.74	0.188		

LTE Band 7											
Ant. Gain						1.31 dB i					
Limit: 2W EIRP											
BW (MHz)	Modulation	RB Size	RB Offset	20850 (2 510.0 MHz)		21100 (2 535.0 MHz)		21350 (2 560.0 MHz)		E.I.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	24.77	0.300	24.81	0.303	24.69	0.294	26.19	0.416
		1	50	24.48	0.281	24.84	0.305	24.68	0.294		
		1	99	24.69	0.294	24.88	0.308	24.54	0.284		
		50	0	23.70	0.234	23.70	0.234	23.74	0.237		
		50	25	23.98	0.250	23.94	0.248	23.72	0.236		
		50	13	23.75	0.237	23.84	0.242	23.71	0.235		
		100	0	23.70	0.234	23.89	0.245	23.68	0.233		
	16QAM	1	0	23.65	0.232	23.91	0.246	23.82	0.241	25.22	0.333
		1	50	23.75	0.237	23.81	0.240	23.87	0.244		
		1	99	23.85	0.243	23.75	0.237	23.82	0.241		
		50	0	22.87	0.194	22.94	0.197	22.65	0.184		
		50	25	22.75	0.188	22.92	0.196	22.79	0.190		
		50	50	22.84	0.192	22.92	0.196	22.69	0.186		
		100	0	22.75	0.188	22.78	0.190	22.74	0.188		

LTE Band 12											
Ant. Gain						-1.89 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	23017 (699.7 MHz)		23095 (707.5 MHz)		23173 (715.3 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.66	0.292	24.81	0.303	24.60	0.288	20.81	0.121
		1	2	24.55	0.285	24.85	0.305	24.57	0.286		
		1	5	24.68	0.294	24.79	0.301	24.53	0.284		
		3	0	24.76	0.299	24.76	0.299	24.69	0.294		
		3	2	24.75	0.299	24.82	0.303	24.75	0.299		
		3	3	24.34	0.272	24.81	0.303	24.79	0.301		
		6	0	23.76	0.238	23.87	0.244	23.85	0.243		
	16QAM	1	0	23.74	0.237	23.95	0.248	23.78	0.239	19.93	0.098
		1	2	23.74	0.237	23.97	0.249	23.83	0.242		
		1	5	23.65	0.232	23.91	0.246	23.81	0.240		
		3	0	23.78	0.239	23.79	0.239	23.65	0.232		
		3	2	23.79	0.239	23.76	0.238	23.79	0.239		
		3	3	23.61	0.230	23.79	0.239	23.82	0.241		
		6	0	22.70	0.186	22.88	0.194	22.94	0.197		

LTE Band 12											
Ant. Gain						-1.89 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	23025 (700.5 MHz)		23095 (707.5 MHz)		23165 (714.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.60	0.288	24.88	0.308	24.72	0.296	20.83	0.121
		1	7	24.50	0.282	24.87	0.307	24.54	0.284		
		1	14	24.55	0.285	24.85	0.305	24.84	0.305		
		8	0	23.63	0.231	23.81	0.240	23.72	0.236		
		8	4	23.68	0.233	23.76	0.238	23.78	0.239		
		8	7	23.74	0.237	23.85	0.243	23.80	0.240		
		15	0	23.79	0.239	23.79	0.239	23.74	0.237		
	16QAM	1	0	23.71	0.235	23.92	0.247	23.73	0.236	19.88	0.097
		1	7	23.74	0.237	23.91	0.246	23.79	0.239		
		1	14	23.70	0.234	23.92	0.247	23.79	0.239		
		8	0	22.79	0.190	22.80	0.191	22.79	0.190		
		8	4	22.86	0.193	22.98	0.199	22.78	0.190		
		8	7	22.83	0.192	22.91	0.195	22.76	0.189		
		15	0	22.77	0.189	22.91	0.195	22.80	0.191		

LTE Band 12/17											
Ant. Gain						-1.89 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	23035 (701.5 MHz)		23095 (707.5 MHz)		23155 (713.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.61	0.289	24.85	0.305	24.82	0.303	20.84	0.121
		1	12	24.60	0.288	24.82	0.303	24.87	0.307		
		1	24	24.53	0.284	24.88	0.308	24.59	0.288		
		12	0	23.70	0.234	23.76	0.238	23.77	0.238		
		12	6	23.66	0.232	23.80	0.240	23.81	0.240		
		12	13	23.81	0.240	23.87	0.244	23.57	0.228		
		25	0	23.57	0.228	23.83	0.242	23.75	0.237		
	16QAM	1	0	23.85	0.243	23.95	0.248	23.79	0.239	19.91	0.098
		1	12	23.81	0.240	23.90	0.245	23.77	0.238		
		1	24	23.75	0.237	23.94	0.248	23.78	0.239		
		12	0	22.83	0.192	22.91	0.195	22.75	0.188		
		12	6	22.88	0.194	22.89	0.195	22.73	0.187		
		12	13	22.91	0.195	22.81	0.191	22.65	0.184		
		25	0	22.70	0.186	22.87	0.194	22.74	0.188		

LTE Band 12/17											
Ant. Gain						-1.89 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	23060 (704.0 MHz)		23095 (707.5 MHz)		23130 (711.0 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.77	0.300	24.81	0.303	24.69	0.294	20.87	0.122
		1	25	24.48	0.281	24.84	0.305	24.68	0.294		
		1	49	24.62	0.290	24.91	0.310	24.54	0.284		
		25	0	23.71	0.235	23.70	0.234	23.74	0.237		
		25	12	23.97	0.249	23.94	0.248	23.72	0.236		
		25	25	23.73	0.236	23.84	0.242	23.71	0.235		
		50	0	23.70	0.234	23.89	0.245	23.68	0.233		
	16QAM	1	0	23.81	0.240	23.98	0.250	23.82	0.241	19.94	0.09
		1	25	23.86	0.243	23.82	0.241	23.87	0.244		
		1	49	23.85	0.243	23.85	0.243	23.82	0.241		
		25	0	22.79	0.190	22.94	0.197	22.65	0.184		
		25	12	22.86	0.193	22.92	0.196	22.79	0.190		
		25	25	22.93	0.196	22.92	0.196	22.69	0.186		
		50	0	22.75	0.188	22.78	0.190	22.74	0.188		

LTE Band 13											
Ant. Gain						0.20 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	23205 (779.5 MHz)		23230 (782.0 MHz)		23255 (784.5 MHz)		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.74	0.298	24.81	0.303	24.74	0.298	22.89	0.195
		1	12	24.79	0.301	24.84	0.305	24.81	0.303		
		1	24	24.73	0.297	24.81	0.303	24.73	0.297		
		12	0	23.75	0.237	23.93	0.247	24.17	0.261		
		12	6	23.90	0.245	23.94	0.248	24.08	0.256		
		12	13	23.87	0.244	23.93	0.247	24.12	0.258		
		25	0	23.90	0.245	23.91	0.246	23.83	0.242		
	16QAM	1	0	23.87	0.244	23.85	0.243	23.88	0.244	21.98	0.158
		1	12	23.85	0.243	23.81	0.240	23.82	0.241		
		1	24	23.83	0.242	23.75	0.237	23.93	0.247		
		12	0	22.81	0.191	22.97	0.198	22.91	0.194		
		12	6	22.94	0.197	22.90	0.195	22.93	0.196		
		12	13	22.78	0.190	22.97	0.198	22.91	0.195		
		25	0	22.95	0.197	22.98	0.199	22.88	0.194		

LTE Band 13											
Ant. Gain						0.20 dB i					
Limit: 30W ERP											
BW (MHz)	Modulation	RB Size	RB Offset	-		23230 (782.0 MHz)		-		E.R.P	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	-	-	24.85	0.305	-	-	22.91	0.195
		1	25	-	-	24.86	0.306	-	-		
		1	49	-	-	24.82	0.303	-	-		
		25	0	-	-	24.05	0.254	-	-		
		25	12	-	-	23.97	0.249	-	-		
		25	25	-	-	23.81	0.240	-	-		
		50	0	-	-	23.83	0.242	-	-		
	16QAM	1	0	-	-	23.75	0.237	-	-	21.81	0.152
		1	25	-	-	23.76	0.238	-	-		
		1	49	-	-	23.61	0.230	-	-		
		25	0	-	-	22.79	0.190	-	-		
		25	12	-	-	22.81	0.191	-	-		
		25	25	-	-	22.75	0.188	-	-		
		50	0	-	-	22.89	0.195	-	-		

4. Occupied Bandwidth

4.1. Limit

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

4.2. Test Procedure

FCC

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

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

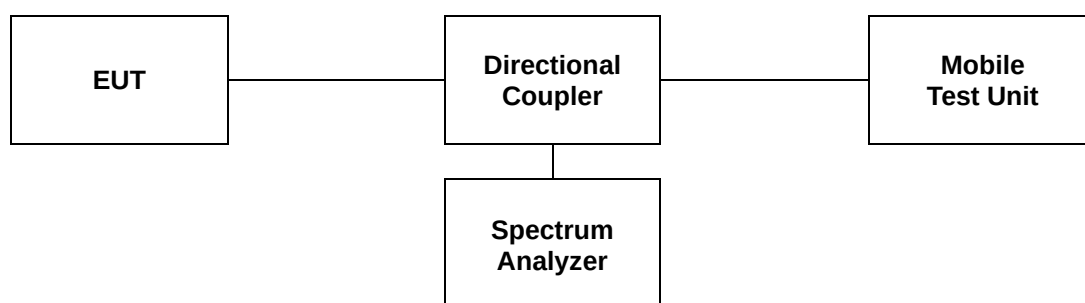
IC

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

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

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

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



4.3 Test Results

Ambient temperature : (23 ± 1) °C

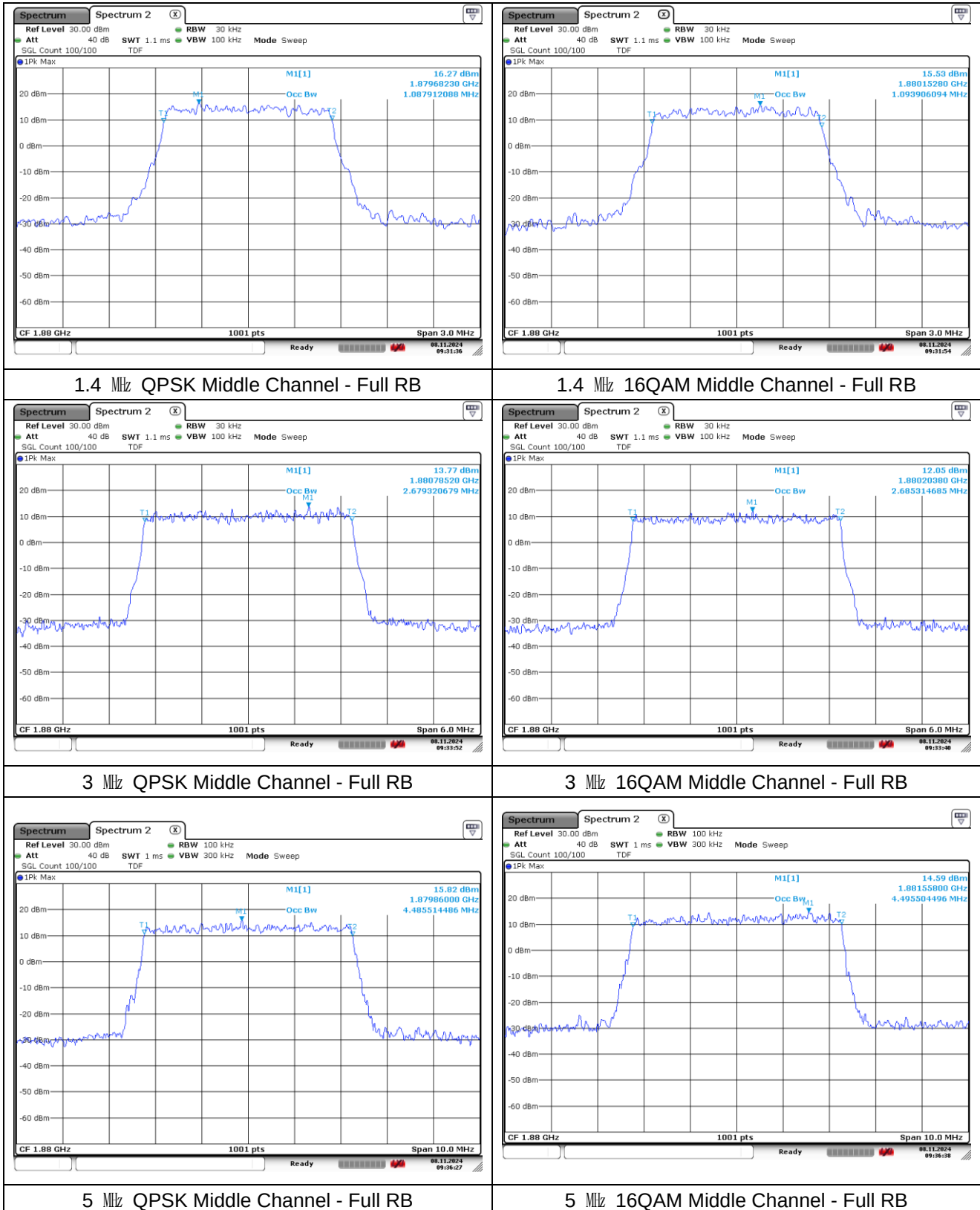
Relative humidity : 47 %

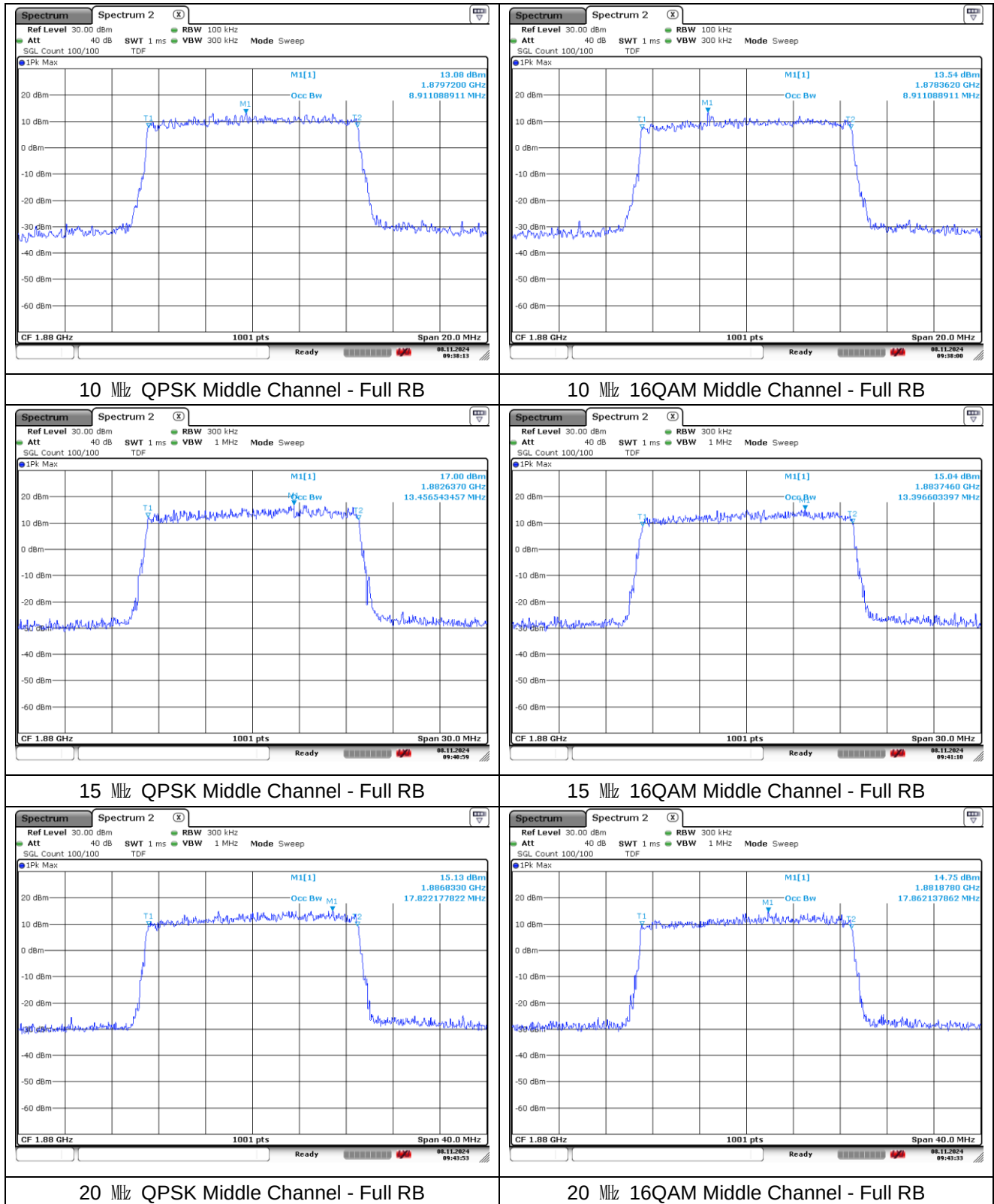
Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
2	1.4	1 850.7	1.100	1.094
		1 880.0	1.088	1.094
		1 909.3	1.094	1.100
	3	1 851.5	2.679	2.685
		1 880.0	2.679	2.685
		1 908.5	2.685	2.679
	5	1 852.5	4.496	4.496
		1 880.0	4.486	4.496
		1 907.5	4.496	4.486
	10	1 855.0	8.951	8.911
		1 880.0	8.911	8.911
		1 905.0	8.931	8.951
	15	1 857.5	13.397	13.397
		1 880.0	13.457	13.397
		1 902.5	13.457	13.457
	20	1 860.0	17.822	17.822
4	1.4	1 710.7	1.091	1.091
		1 732.5	1.094	1.088
		1 754.3	1.091	1.094
	3	1 711.5	2.697	2.685
		1 732.5	2.685	2.685
		1 753.5	2.679	2.685
	5	1 712.5	4.506	4.486
		1 732.5	4.496	4.496
		1 752.5	4.506	4.506
	10	1 715.0	8.911	8.911
		1 732.5	8.931	8.931
		1 750.0	8.931	8.971
	15	1 717.5	13.397	13.397
		1 732.5	13.457	13.367
		1 747.5	13.427	13.457
	20	1 720.0	17.862	17.822
		1 732.5	17.782	17.822
		1 745.0	17.902	17.862

5	1.4	824.7	1.085	1.091
		836.5	1.091	1.091
		848.3	1.091	1.085
	3	825.5	2.691	2.673
		836.5	2.685	2.673
		847.5	2.679	2.685
	5	826.5	4.476	4.476
		836.5	4.505	4.496
		846.5	4.466	4.476
	10	829.0	8.951	8.931
		836.5	8.911	8.931
		844.0	8.911	8.931
7	5	2 502.5	4.466	4.516
		2 535.0	4.486	4.515
		2 567.5	4.486	4.506
	10	2 505.0	8.891	8.951
		2 535.0	8.931	8.951
		2 565.0	8.951	8.911
	15	2 507.5	13.427	13.457
		2 535.0	13.457	13.457
		2 562.5	13.487	13.427
	20	2 510.0	17.822	17.822
		2 535.0	17.862	17.862
		2 560.0	17.822	17.862
12	1.4	699.7	1.091	1.100
		707.5	1.100	1.097
		715.3	1.091	1.097
	3	700.5	2.685	2.685
		707.5	2.685	2.685
		714.5	2.685	2.685
12/17	5	701.5	4.496	4.496
		707.5	4.496	4.486
		713.5	4.486	4.476
	10	704.0	8.911	8.911
		707.5	8.931	8.891
		711.0	8.951	8.911
13	5	779.5	4.476	4.476
		782.0	4.525	4.486
		784.5	4.496	4.476
	10	782.0	8.911	8.891

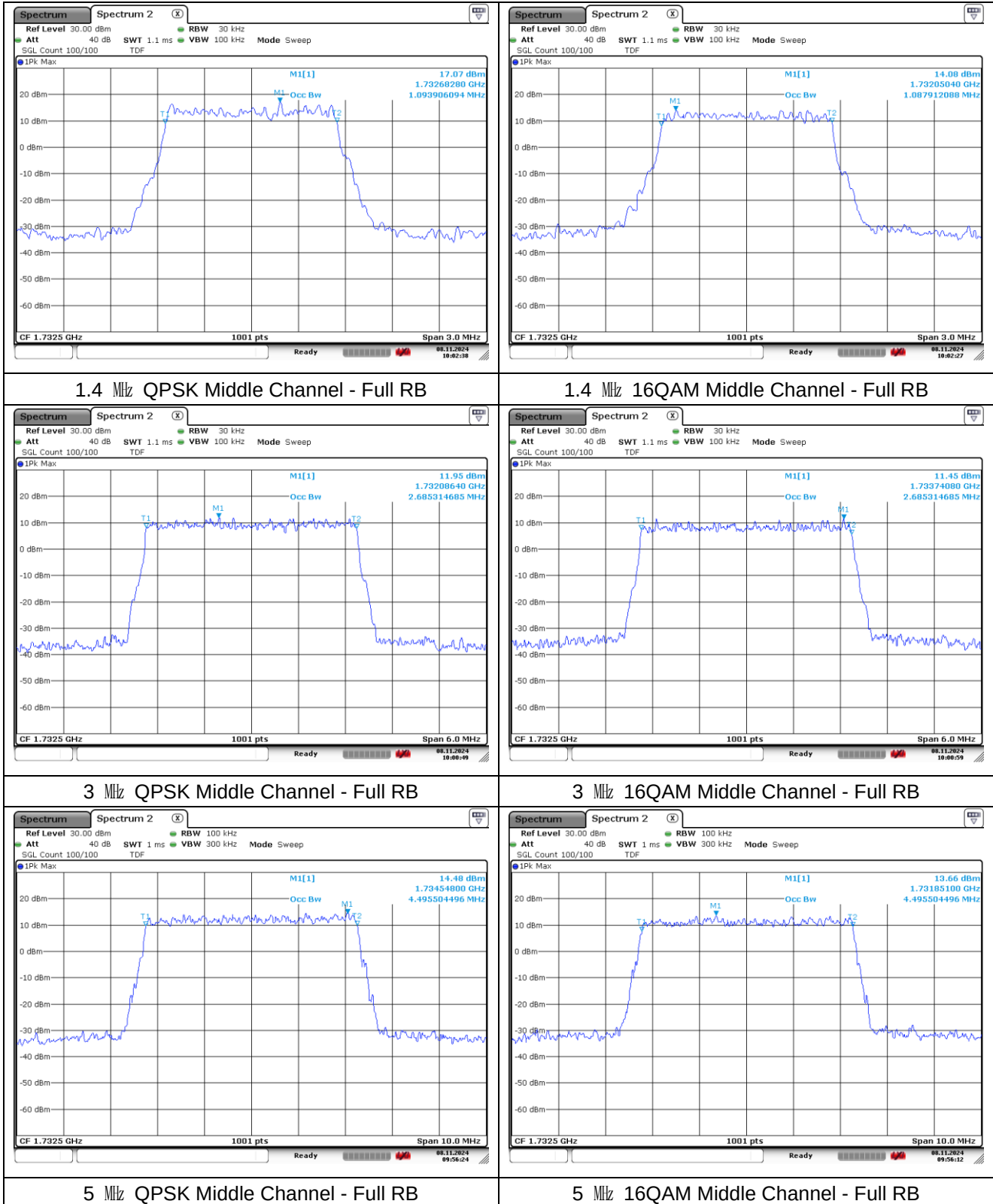
- Test plots

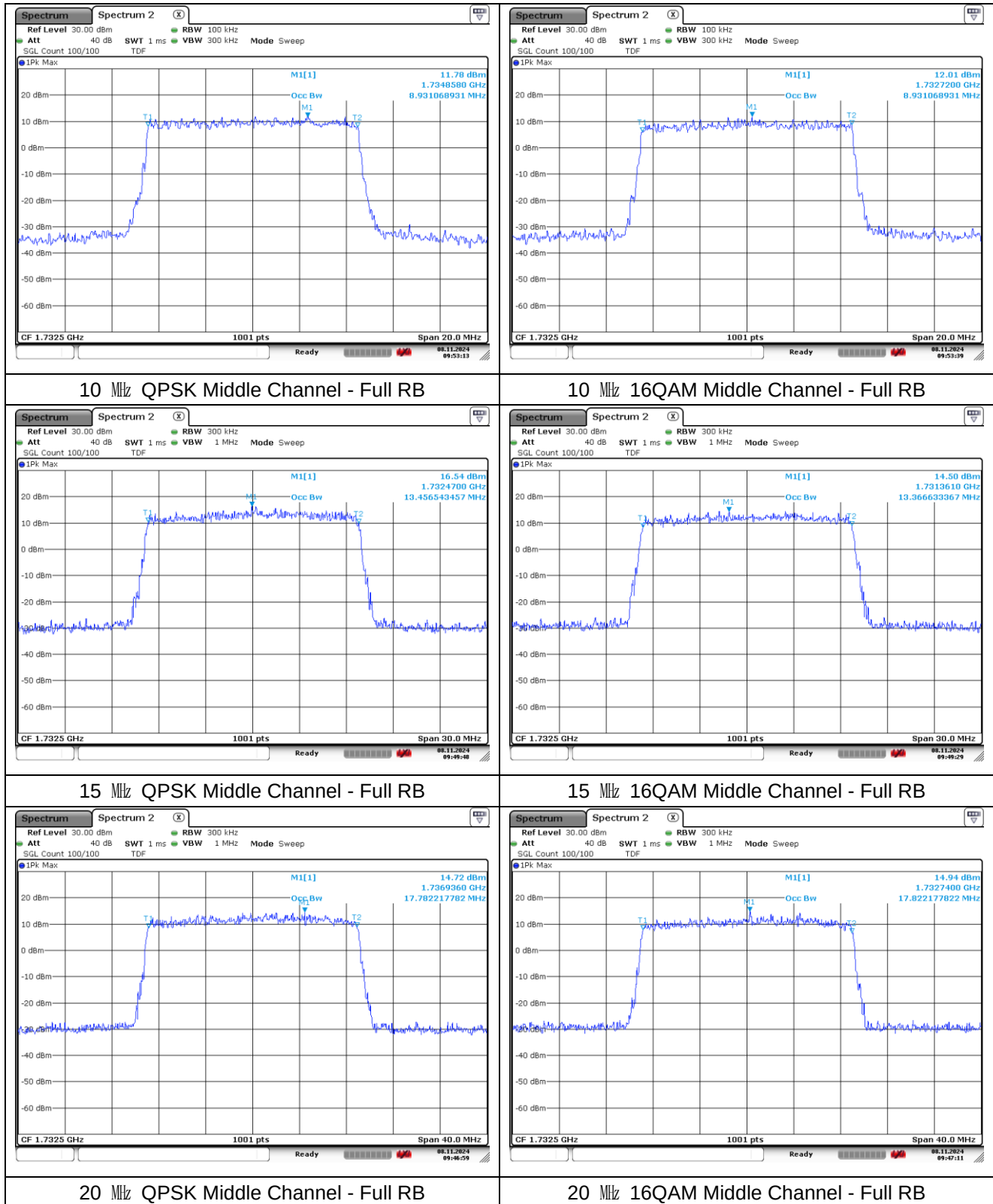
LTE band 2



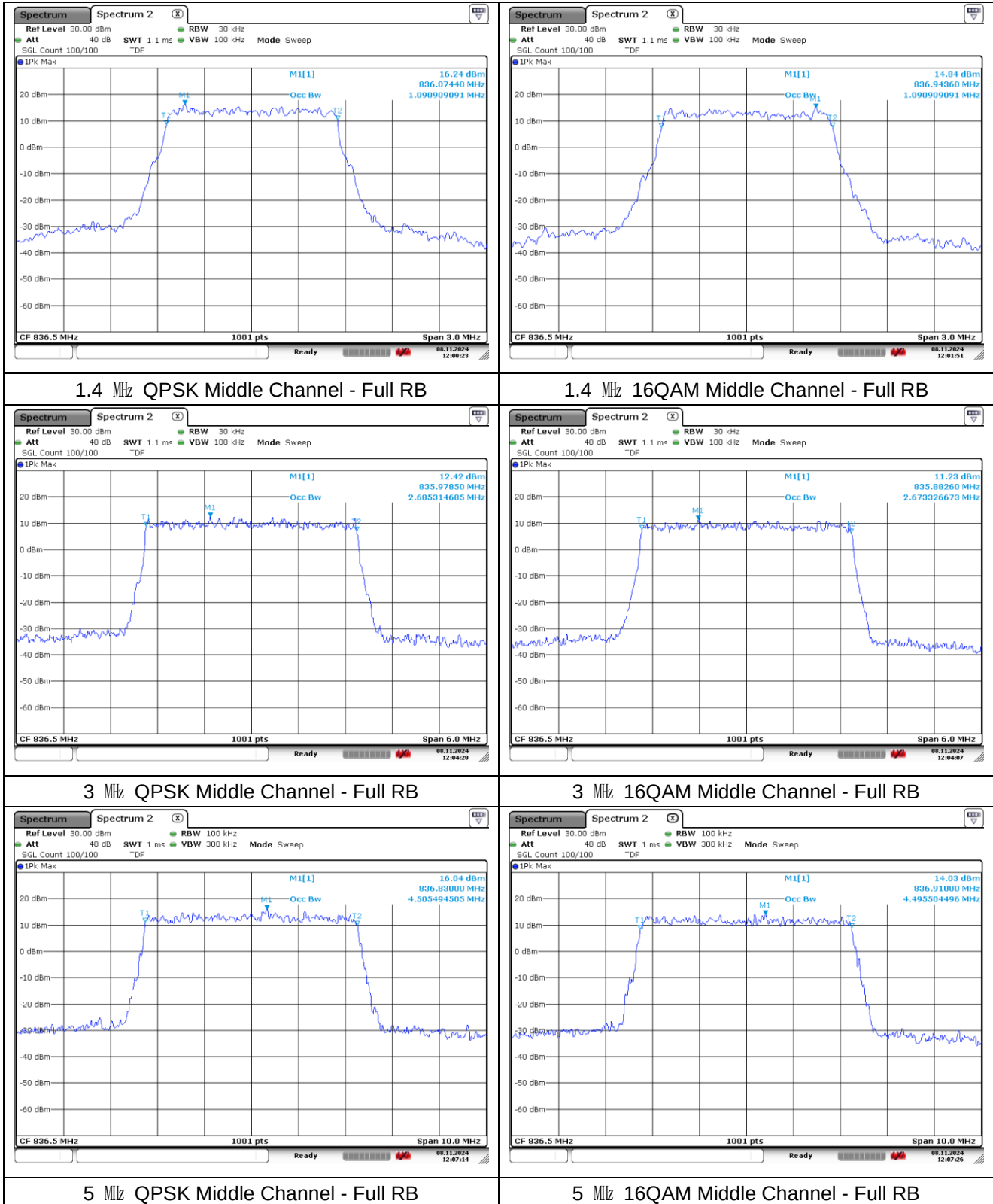


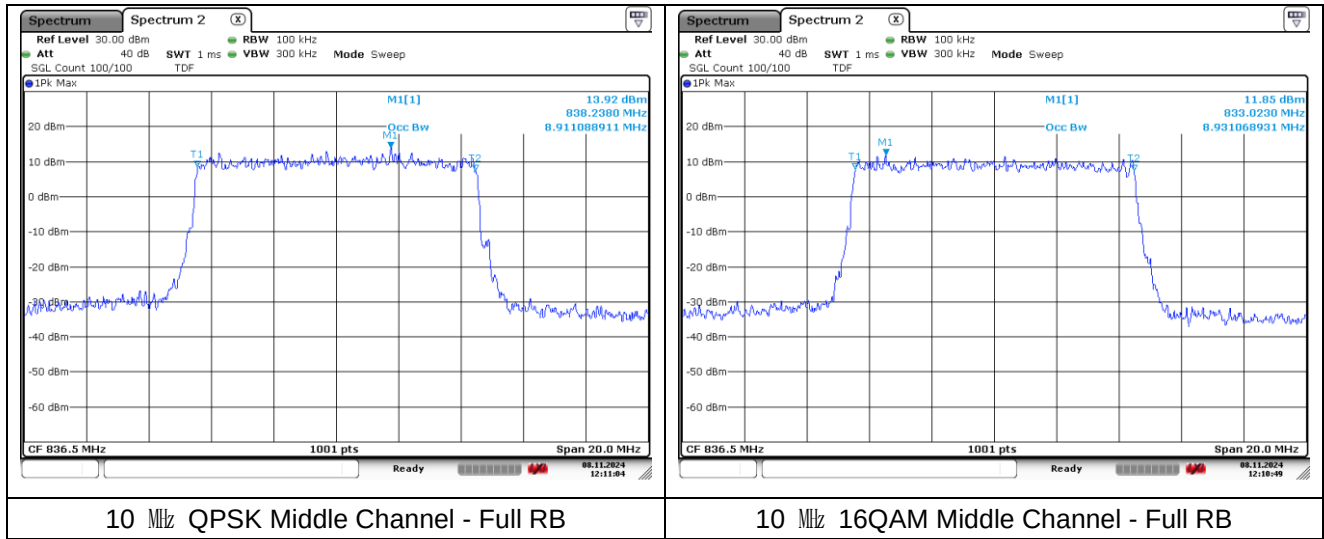
LTE band 4



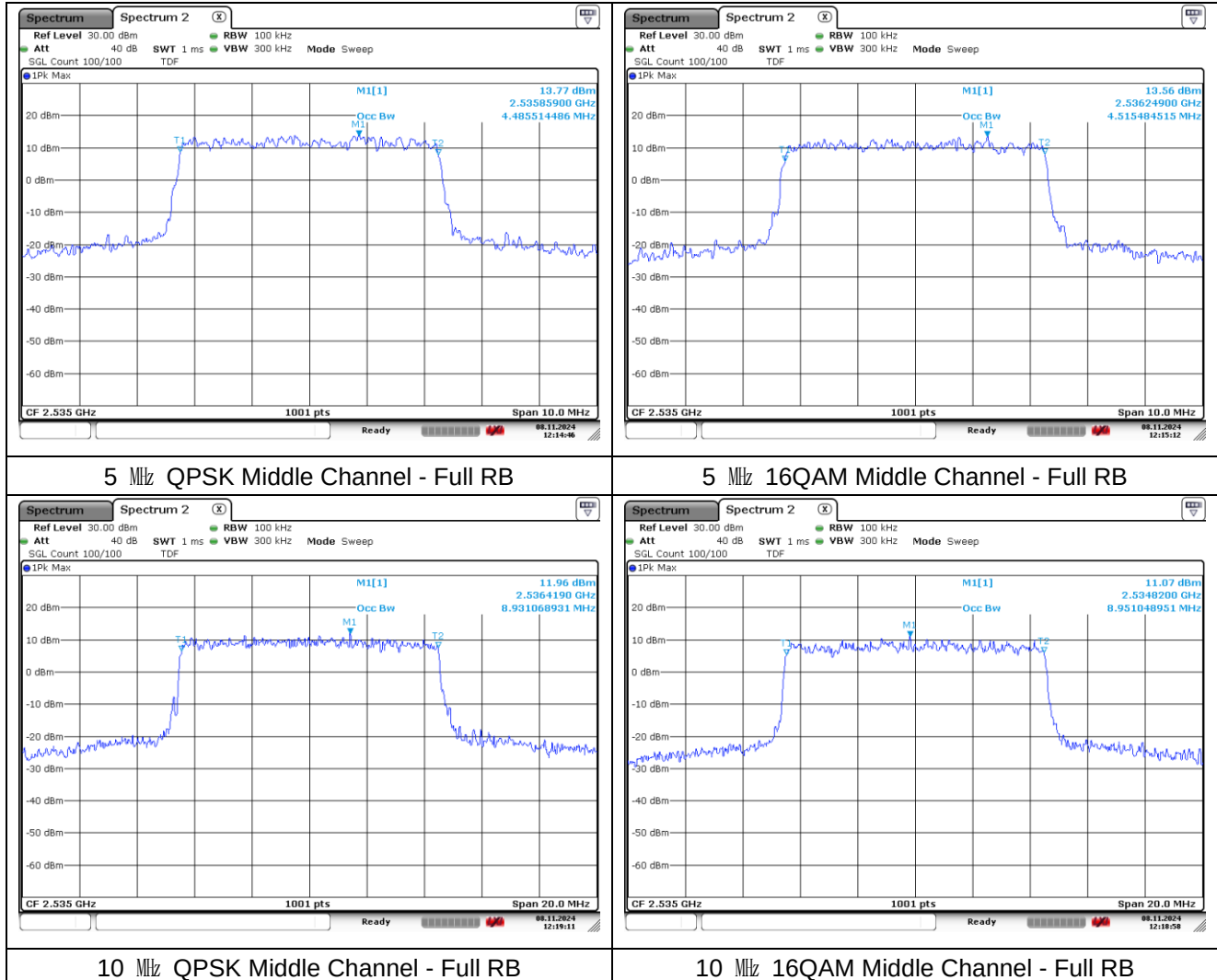


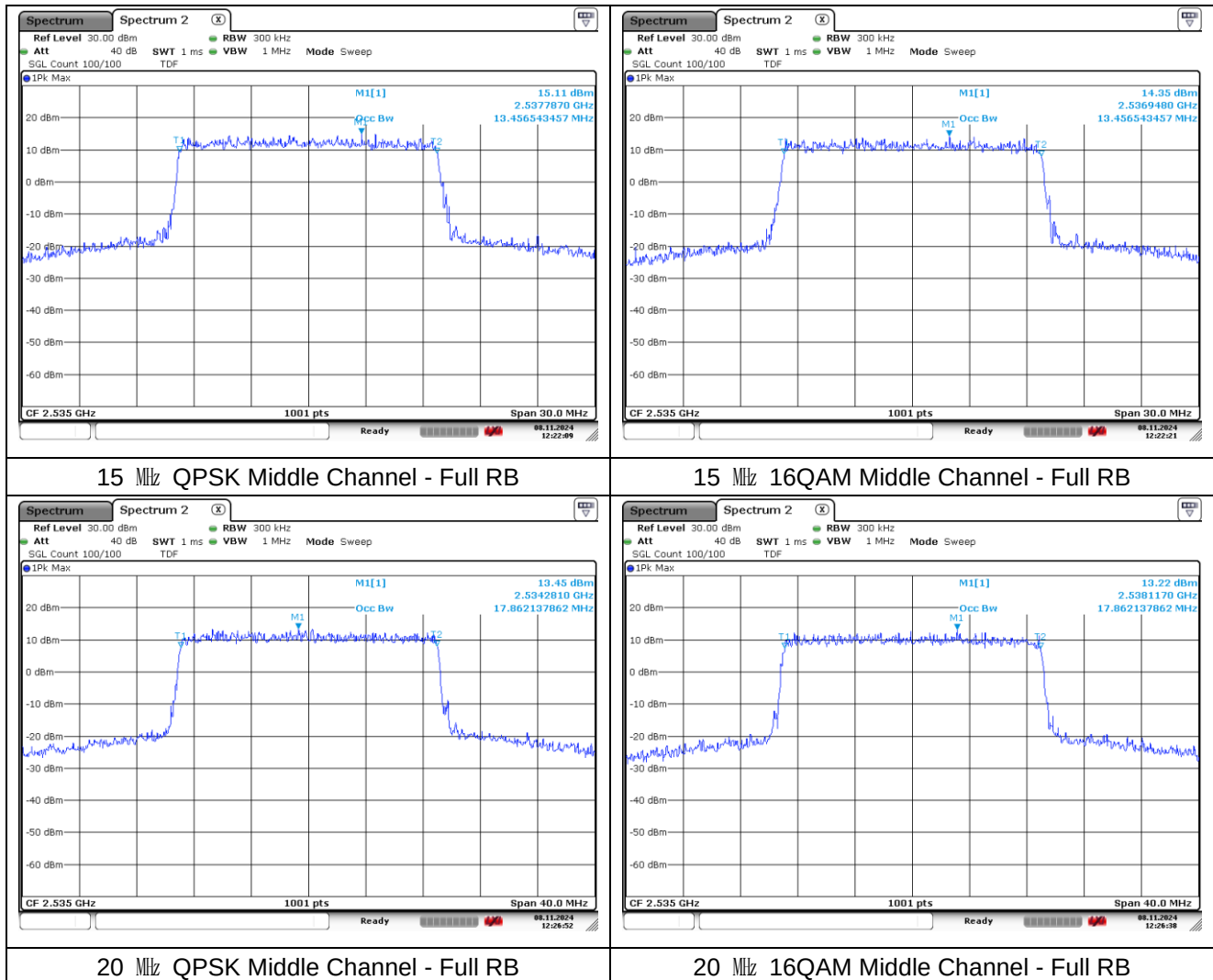
LTE band 5



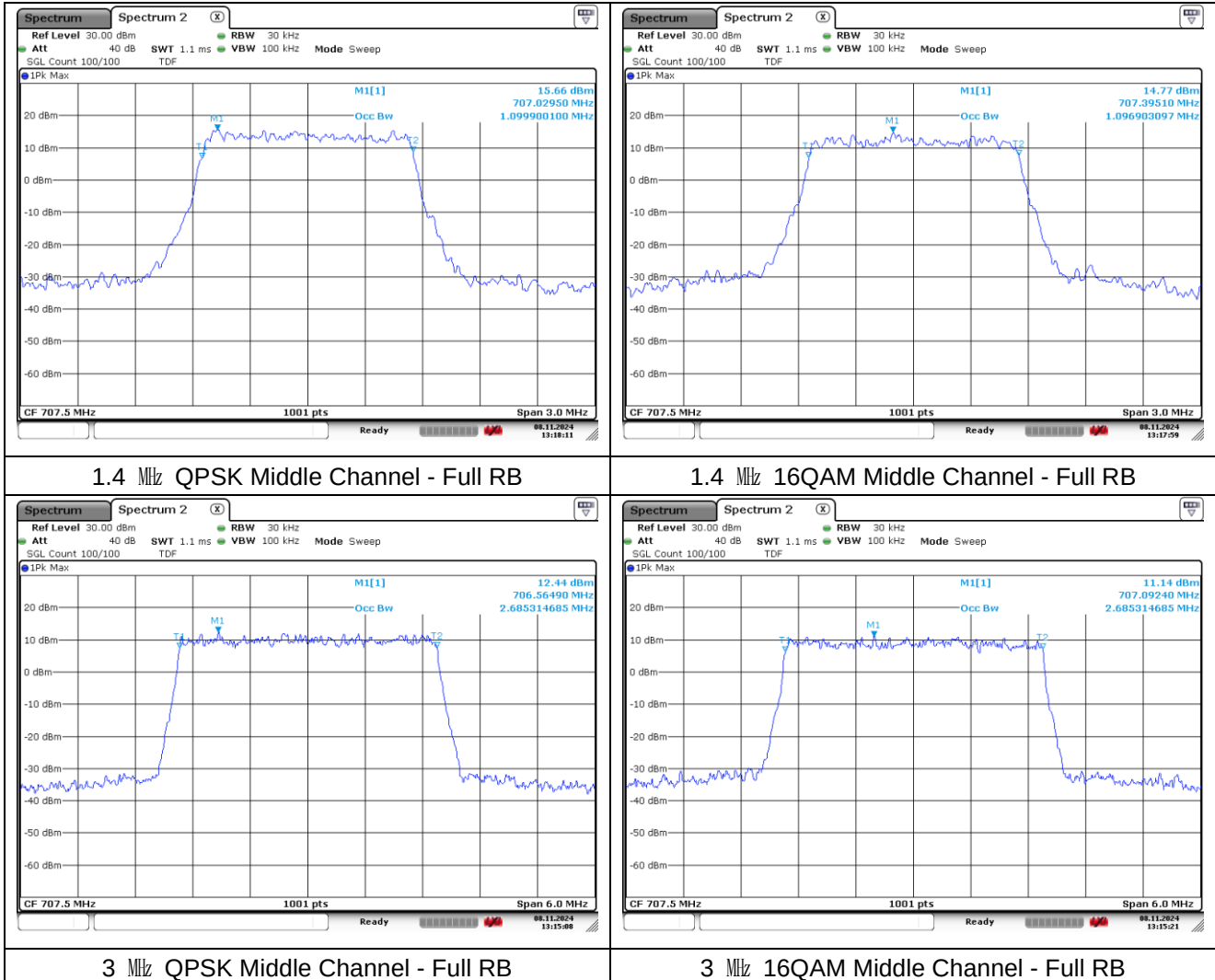


LTE band 7

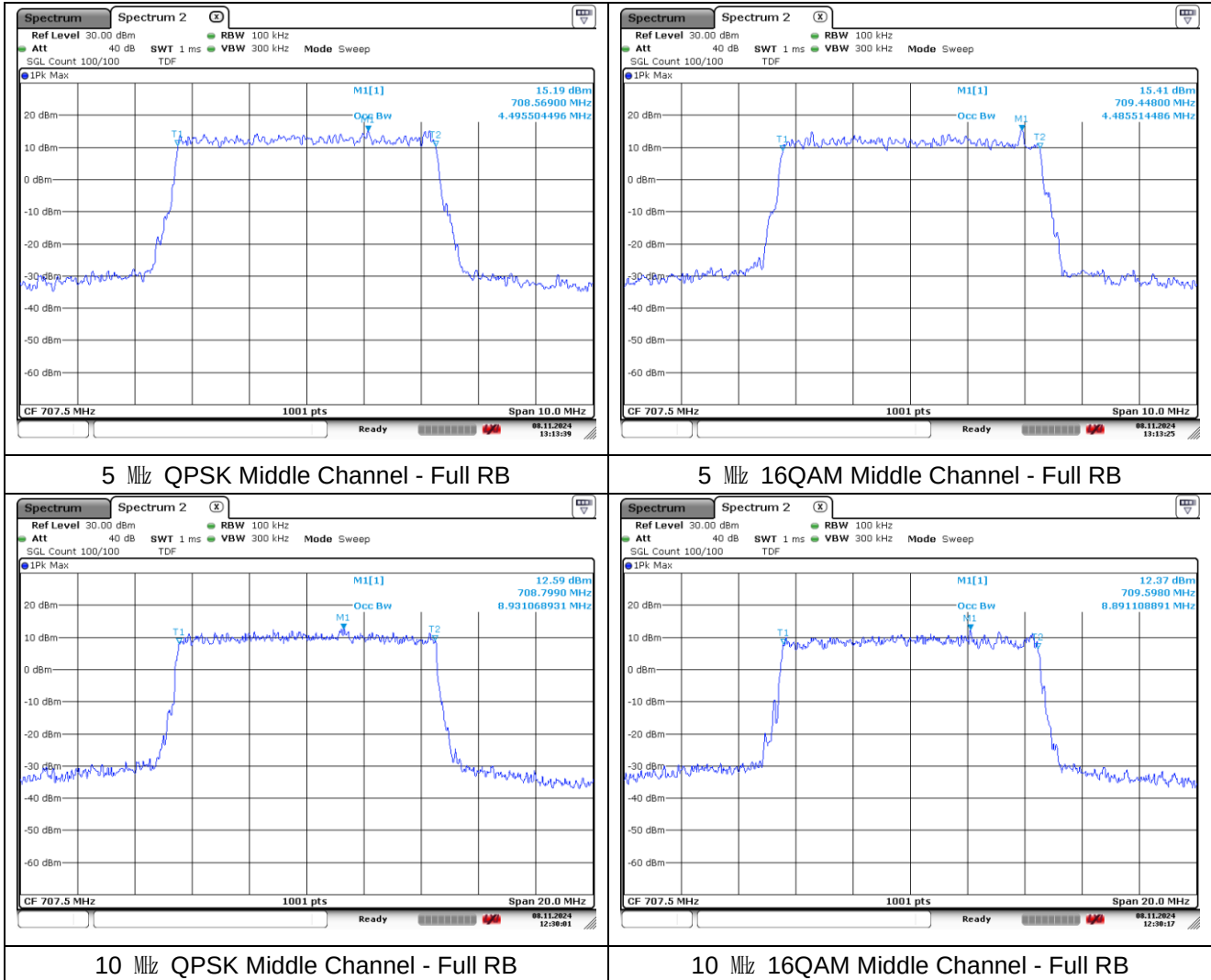




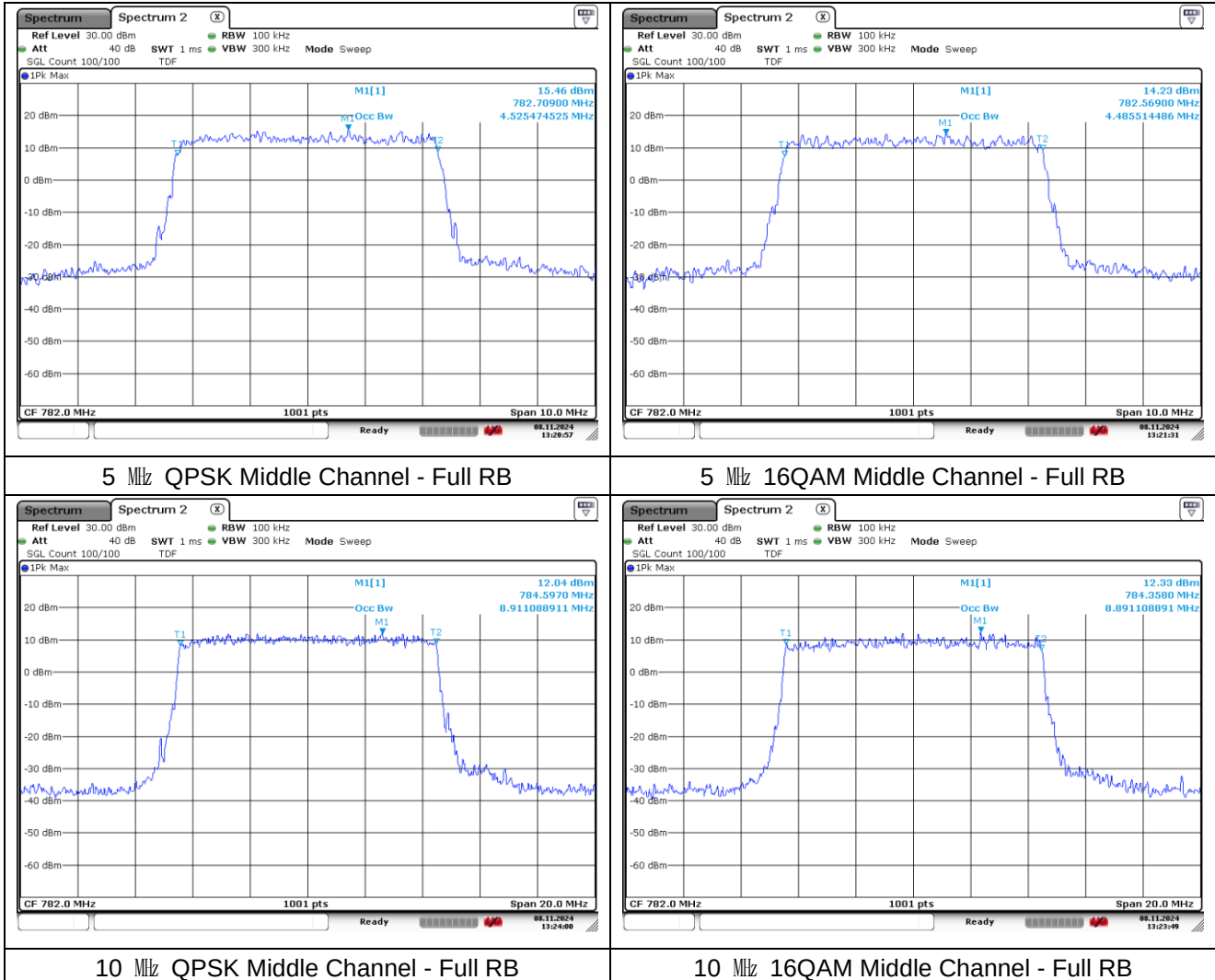
LTE band 12



LTE band 12/17



LTE band 13



5. Peak-Average Ratio

5.1. Limit

FCC

- §22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

- §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.

- §27.50(d)(5), 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 (d)(6) of this section. 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.

IC

- RSS-130 Issue 2

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

- RSS-132 Issue 4

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

- RSS-133 Issue 7

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

- RSS-139 Issue 4

5.5, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1 % of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

- RSS-199 Issue 4

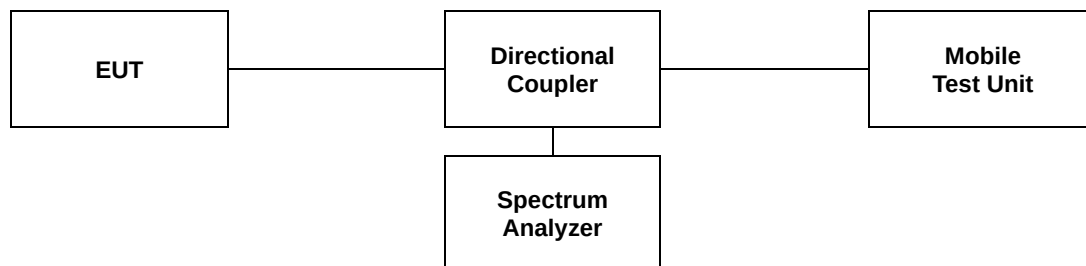
5.5, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

5.2. Test Procedure

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

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

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



5.3 Test Results

Ambient temperature : (23 ± 1) °C

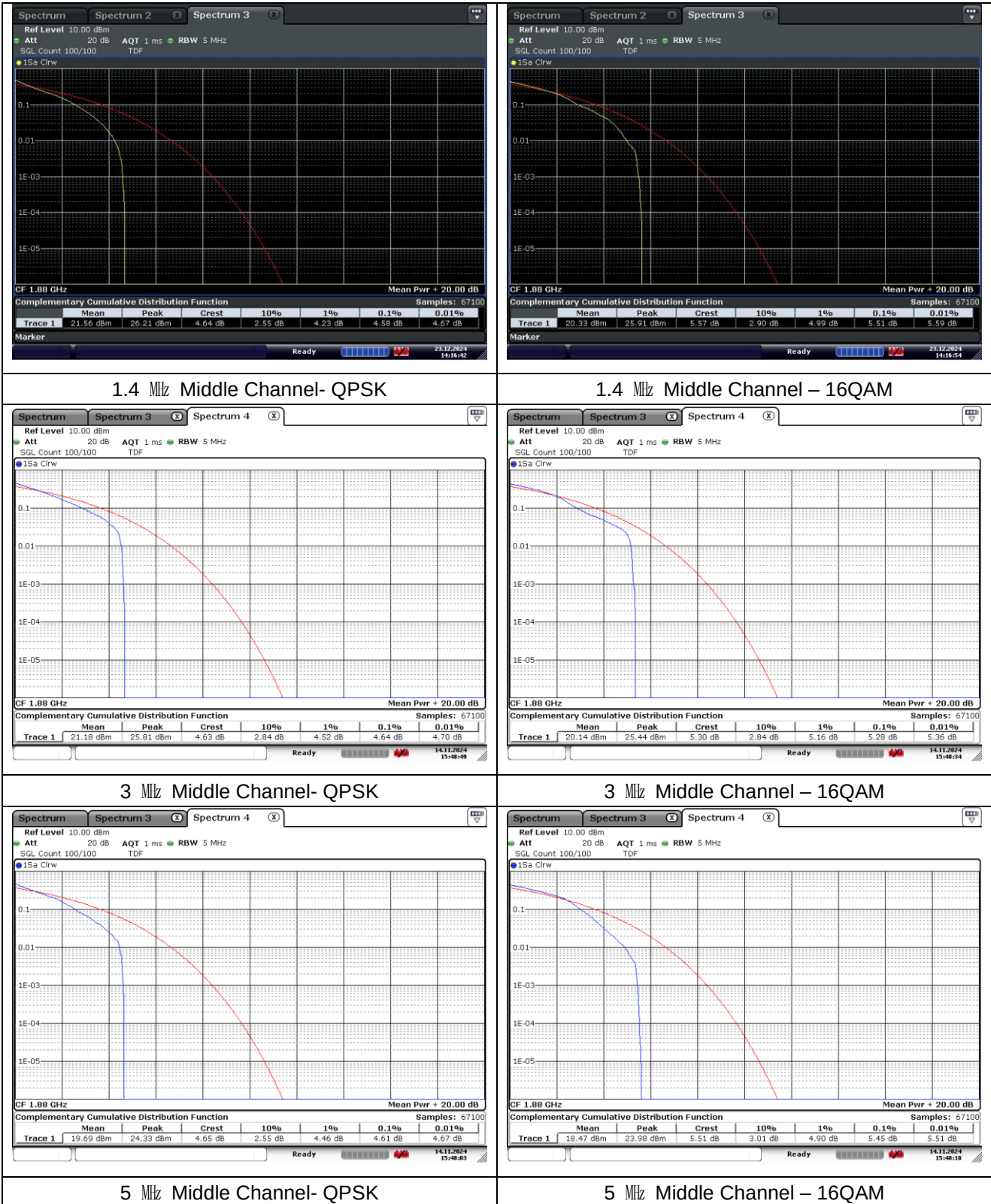
Relative humidity : 47 %

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
2	1.4	1 850.7	4.06	4.81
		1 880.0	4.58	5.51
		1 909.3	4.09	4.70
	3	1 851.5	4.06	4.87
		1 880.0	4.64	5.28
		1 908.5	4.17	5.39
	5	1 852.5	3.97	4.90
		1 880.0	4.61	5.45
		1 907.5	4.12	5.28
	10	1 855.0	4.03	4.84
		1 880.0	4.61	5.45
		1 905.0	4.41	5.04
	15	1 857.5	3.80	4.61
		1 880.0	4.72	5.48
		1 902.5	3.88	4.61
	20	1 860.0	3.80	4.52
		1 880.0	4.72	5.36
		1 900.0	3.71	4.61
4	1.4	1 710.7	4.61	5.30
		1 732.5	4.81	5.57
		1 754.3	4.49	5.01
	3	1 711.5	4.64	5.51
		1 732.5	4.93	5.54
		1 753.5	4.58	5.22
	5	1 712.5	4.52	5.36
		1 732.5	4.75	5.62
		1 752.5	4.58	5.42
	10	1 715.0	4.55	5.57
		1 732.5	4.78	5.57
		1 750.0	4.70	5.65
	15	1 717.5	4.52	5.19
		1 732.5	4.72	5.33
		1 747.5	4.72	5.33
	20	1 720.0	4.61	5.33
		1 732.5	4.67	5.25
		1 745.0	4.75	5.39

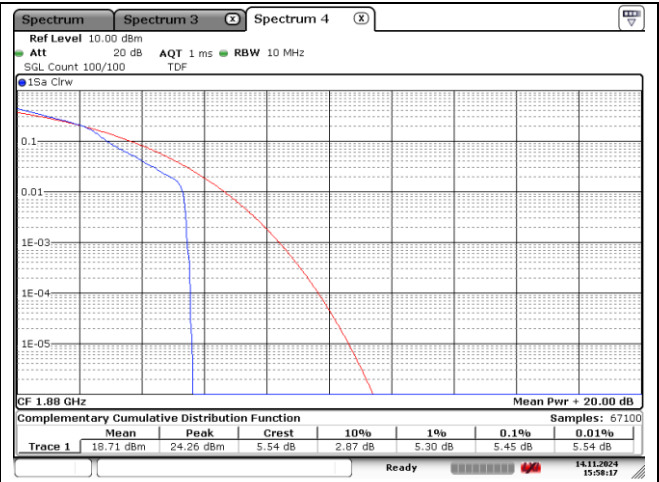
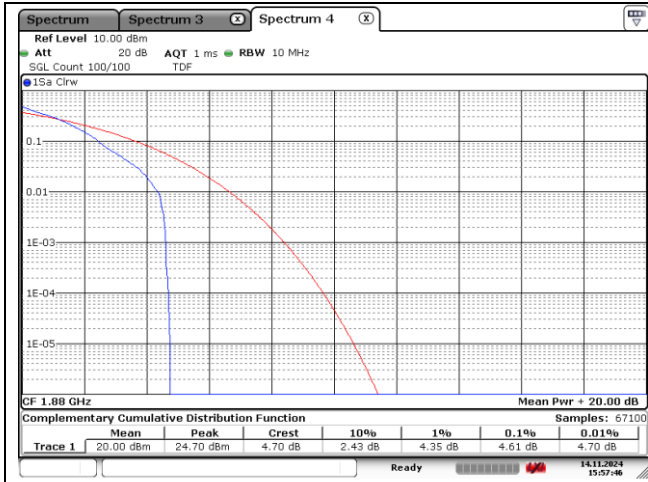
Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
5	1.4	824.7	4.90	5.62
		836.5	4.84	5.86
		848.3	4.81	5.68
	3	825.5	4.09	5.04
		836.5	4.09	5.22
		847.5	4.14	5.16
	5	826.5	4.09	4.87
		836.5	4.58	5.62
		846.5	4.23	5.04
	10	829.0	4.03	4.78
		836.5	3.83	4.84
		844.0	4.09	5.01
7	5	2 502.5	3.86	4.64
		2 535.0	3.65	4.23
		2 567.5	3.74	4.55
	10	2 505.0	3.80	4.64
		2 535.0	4.20	5.10
		2 565.0	3.88	5.10
	15	2 507.5	3.62	4.67
		2 535.0	3.59	4.43
		2 562.5	3.91	4.70
	20	2 510.0	3.62	4.46
		2 535.0	3.65	4.64
		2 560.0	3.71	4.43
12	1.4	699.7	4.75	5.57
		707.5	4.38	5.10
		715.3	4.14	4.84
	3	700.5	4.64	5.54
		707.5	4.61	5.30
		714.5	3.97	4.93
12/17	5	701.5	4.67	5.68
		707.5	4.61	5.48
		713.5	3.97	5.01
	10	704.0	4.72	5.28
		707.5	4.72	5.54
		711.0	4.49	4.99
13	5	779.5	4.70	5.65
		782.0	4.72	5.71
		784.5	4.99	5.86
	10	782.0	3.36	4.14

- Test plots

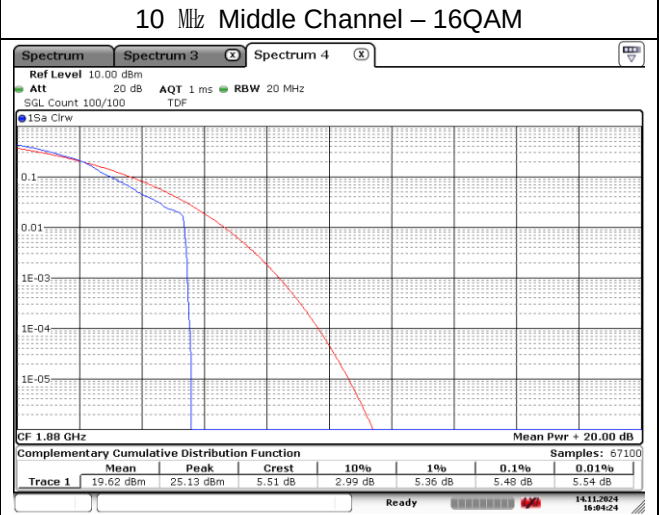
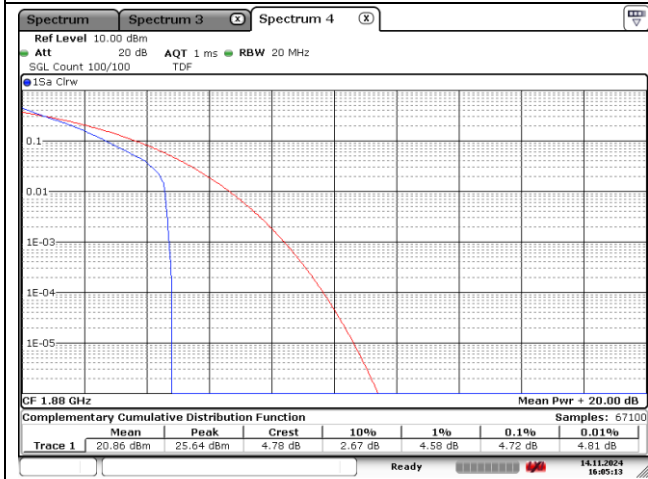
LTE band 2



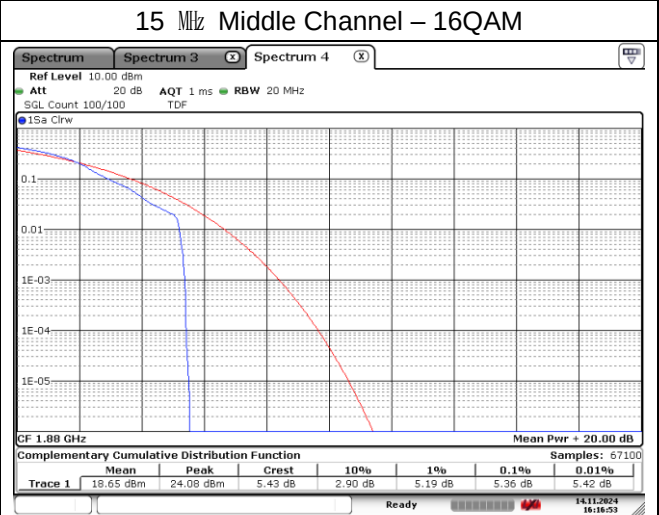
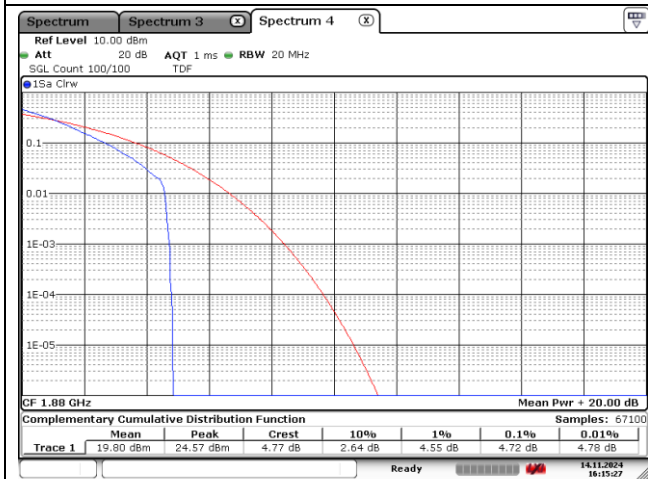
LTE band 2



10 MHz Middle Channel- QPSK



15 MHz Middle Channel- QPSK



20 MHz Middle Channel- QPSK

20 MHz Middle Channel - 16QAM

LTE band 4

