

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 3, RSS-133 Issue 6,
RSS-139 Issue 3, RSS-199 Issue 3 and RSS-Gen Issue 5

FCC ID: BEJTM05GTJN2
IC Certification: 2703H-TM05GTJN2

Equipment Under Test : Car Telematics Device
Model Name : TM05GTJN2
Variant Model Name(s) : -
FCC Applicant : LG Electronics USA
IC Applicant : LG ELECTRONICS INC.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2020.11.16
Date of Test(s) : 2021.01.13 ~ 2021.02.05
Date of Issue : 2021.02.08

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:



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SGS Korea Co., Ltd. Gunpo Laboratory



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1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

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- Designation number: KR0150

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1.2. Details of Applicant

FCC Applicant : LG Electronics USA

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

IC Applicant : LG ELECTRONICS INC.

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

Contact Person : Kim, Dae-woong

Phone No. : +1 201 266 2215

1.3. Details of Manufacturer

Company : LG Electronics Inc.

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

1.4. Description of EUT

Kind of Product	Car Telematics Device
Model Name	TM05GTJN2
Model Serial Number	001VITA000080
Power Supply	DC 12 V
Rated Power	LTE Band 2, 4, 5, 7, 12, 26: 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 26: 824 MHz ~ 849 MHz
Emission Designator	LTE Band 2 (1.4 MHz): 1M10G7D (QPSK) / 1M09D7D (16QAM) LTE Band 2 (3 MHz): 2M68G7D (QPSK) / 2M68D7D (16QAM) LTE Band 2 (5 MHz): 4M49G7D (QPSK) / 4M50D7D (16QAM) LTE Band 2 (10 MHz): 8M97G7D (QPSK) / 8M94D7D (16QAM) LTE Band 2 (15 MHz): 13M5G7D (QPSK) / 13M5D7D (16QAM) LTE Band 2 (20 MHz): 17M9G7D (QPSK) / 17M9D7D (16QAM) LTE Band 4 (1.4 MHz): 1M09G7D (QPSK) / 1M09D7D (16QAM) LTE Band 4 (3 MHz): 2M67G7D (QPSK) / 2M67D7D (16QAM) LTE Band 4 (5 MHz): 4M50G7D (QPSK) / 4M50D7D (16QAM) LTE Band 4 (10 MHz): 8M94G7D (QPSK) / 8M94D7D (16QAM) LTE Band 4 (15 MHz): 13M5G7D (QPSK) / 13M5D7D (16QAM) LTE Band 4 (20 MHz): 17M9G7D (QPSK) / 17M9D7D (16QAM) LTE Band 7 (5 MHz): 4M49G7D (QPSK) / 4M52D7D (16QAM) LTE Band 7 (10 MHz): 8M92G7D (QPSK) / 8M92D7D (16QAM) LTE Band 7 (15 MHz): 13M5G7D (QPSK) / 13M5D7D (16QAM) LTE Band 7 (20 MHz): 17M9G7D (QPSK) / 17M9D7D (16QAM) LTE Band 12 (1.4 MHz): 1M10G7D (QPSK) / 1M09D7D (16QAM) LTE Band 12 (3 MHz): 2M67G7D (QPSK) / 2M68D7D (16QAM) LTE Band 12 (5 MHz): 4M49G7D (QPSK) / 4M50D7D (16QAM) LTE Band 12 (10 MHz): 8M97G7D (QPSK) / 8M94D7D (16QAM) LTE Band 26/5 (1.4 MHz): 1M09G7D (QPSK) / 1M09D7D (16QAM) LTE Band 26/5 (3 MHz): 2M68G7D (QPSK) / 2M67D7D (16QAM) LTE Band 26/5 (5 MHz): 4M50G7D (QPSK) / 4M49D7D (16QAM) LTE Band 26/5 (10 MHz): 8M97G7D (QPSK) / 8M92D7D (16QAM) LTE Band 26 (15 MHz): 13M5G7D (QPSK) / 13M5D7D (16QAM)
Modulation Technique	QPSK, 16QAM, 64QAM
Antenna Type	External antenna
Antenna gain	699 MHz ~ 716 MHz: -1.85 dB i 824 MHz ~ 849 MHz: -2.45 dB i 1 710 MHz ~ 1 755 MHz: 1.45 dB i 1 850 MHz ~ 1 910 MHz: 1.13 dB i 2 500 MHz ~ 2 570 MHz: -1.67 dB i
H/W Version	Rev.D
S/W Version	V9.1.02

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMR40	100272	Jun. 18, 2020	Annual	Jun. 18, 2021
Signal Generator	R&S	SMBV100A	255834	Jun. 03, 2020	Annual	Jun. 03, 2021
Spectrum Analyzer	R&S	FSV30	103101	Jun. 01, 2020	Annual	Jun. 01, 2021
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 04, 2020	Annual	Sep. 04, 2021
Spectrum Analyzer	Agilent	N9030A	US51350132	Nov. 12, 2020	Annual	Nov. 12, 2021
Mobile Test Unit	R&S	CMW500	144034	Feb. 28, 2020	Annual	Feb. 28, 2021
Mobile Test Unit	Anritsu	MT8821C	6262192291	Oct. 08, 2020	Annual	Oct. 08, 2021
Power Meter	Anritsu	ML2495A	1223004	Jun. 01, 2020	Annual	Jun. 01, 2021
Power Sensor	Anritsu	MA2411B	1207272	Jun. 01, 2020	Annual	Jun. 01, 2021
Temperature Chamber	ESPEC CORP.	PL-1J	15000796	Nov. 06, 2020	Annual	Nov. 06, 2021
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000-40SS	7	Mar. 04, 2020	Annual	Mar. 04, 2021
High Pass Filter	Wainwright Instrument GmbH	WHKX1.5/15G-6SS	4	Jun. 11, 2020	Annual	Jun. 11, 2021
High Pass Filter	Wainwright Instrument GmbH	WHK3.0/18G-10SS	344	May 18, 2020	Annual	May 18, 2021
High Pass Filter	Wainwright Instrument GmbH	WHK7.5/26.5G-6SS	15	Jun. 05, 2020	Annual	Jun. 05, 2021
Directional Coupler	KRYTAR	152613	122660	Jun. 11, 2020	Annual	Jun. 11, 2021
DC Power Supply	Agilent	U8002A	MY53150029	Jun. 04, 2020	Annual	Jun. 04, 2021
Preamplifier	H.P.	8447F	2944A03909	Aug. 06, 2020	Annual	Aug. 06, 2021
Preamplifier	R&S	SCU 18	10117	Jun. 10, 2020	Annual	Jun. 10, 2021
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	May 08, 2020	Annual	May 08, 2021
Test Receiver	R&S	ESU26	100109	Feb. 18, 2020	Annual	Feb. 18, 2021
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 22, 2019	Biennial	Aug. 22, 2021
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	396	Mar. 21, 2019	Biennial	Mar. 21, 2021
Horn Antenna	R&S	HF906	100326	Feb. 14, 2020	Annual	Feb. 14, 2021
Horn Antenna	R&S	HF907	102270	Feb. 14, 2020	Annual	Feb. 14, 2021
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	9170-540	Jul. 24, 2019	Biennial	Jul. 24, 2021
Antenna Master	Innco systems GmbH	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/383 30516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.4 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	MWX221-NMSNMS (4 m)	J1023142	Dec. 01, 2020	Semi-annual	Jun. 01, 2021
Coaxial Cable	RFONE	SFX086-NMNM-10M (10 m)	20200324001	Dec. 01, 2020	Semi-annual	Jun. 01, 2021
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 07/20	Aug. 21, 2020	Semi-annual	Feb. 21, 2021
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 10/20	Aug. 21, 2020	Semi-annual	Feb. 21, 2021
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 11/20	Aug. 21, 2020	Semi-annual	Feb. 21, 2021

► **Support Equipment**

Description	Manufacturer	Model	Serial Number
N/A	-	-	-

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2, 22, 24 and 27 / IC part RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3, RSS-199 Issue 3 and RSS-Gen Issue 5			
Section in FCC	Section in IC	Test Item(s)	Result
§22.913(a)(5) §24.232(c) §27.50(c)(10) §27.50(d)(4) §27.50(h)(2)	RSS-130 Issue 2 4.6.3 RSS-132 Issue 3 5.4 RSS-133 Issue 6 6.4 RSS-139 Issue 3 6.5 RSS-199 Issue 3 4.4	E.R.P./E.I.R.P.	Complied
§22.917(a) §24.238(a) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7.1 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Spurious Radiated Emission	Complied
§2.1046	RSS-Gen Issue 5 6.12	Conducted Output Power	Complied
§2.1049	RSS-Gen Issue 5 6.7	Occupied Bandwidth	Complied
§22.913(d) §24.232(d) §27.50(d)(5)	RSS-130 Issue 2 4.6.1 RSS-132 Issue 3 5.4 RSS-133 Issue 6 6.4 RSS-139 Issue 3 6.5 RSS-199 Issue 3 4.4	Peak-Average Ratio	Complied
§22.917(a) §24.238(a) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7.1 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Spurious Emission at Antenna Terminal	Complied
§22.917(a) §24.238(a) §27.53(g) §27.53(h)(1) §27.53(m)(4)	RSS-130 Issue 2 4.7.1 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Band Edge	Complied
§2.1055 §22.355 §24.235 §27.54	RSS-Gen Issue 5 6.11 RSS-130 Issue 2 4.5 RSS-132 Issue 3 5.3 RSS-133 Issue 6 6.3 RSS-139 Issue 3 6.4 RSS-199 Issue 3 4.3	Frequency Stability	Complied

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) + Cable loss (dB) + 20 Log D - 104.5; 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 26 (814 MHz ~ 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 MHz ~ 849 MHz). Therefore, test data provided in this report covers LTE Band 5 as well as Band 26.

1.9. Measurement Uncertainty

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

Parameter	Uncertainty	
Radiated Emission, 9 kHz to 30 MHz	H	± 3.66 dB
	V	± 3.66 dB
Radiated Emission, below 1 GHz	H	± 4.90 dB
	V	± 4.82 dB
Radiated Emission, above 1 GHz	H	± 3.62 dB
	V	± 3.64 dB

Uncertainty figures are valid to a confidence level of 95 %.

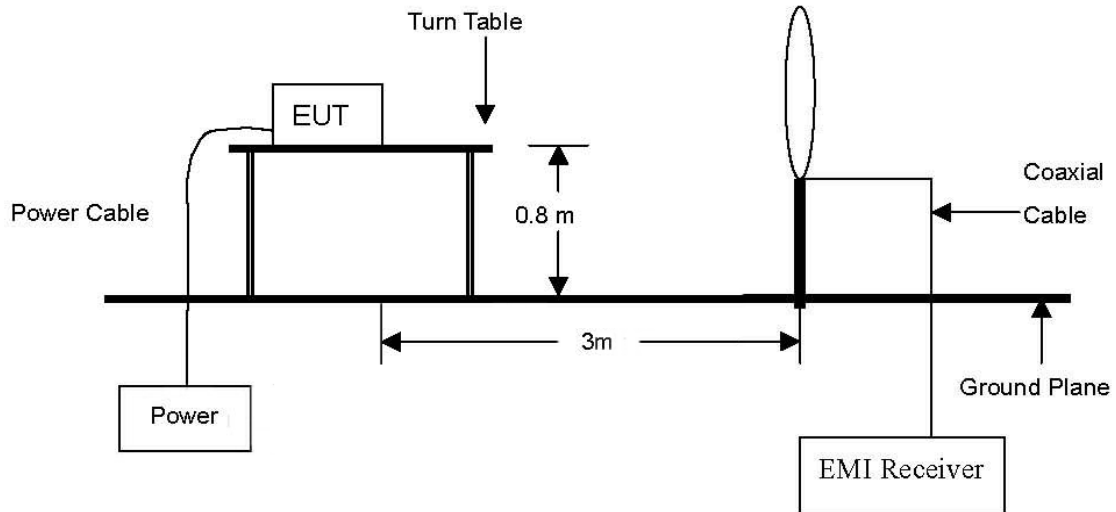
1.10. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL001647	2021.02.08	Initial

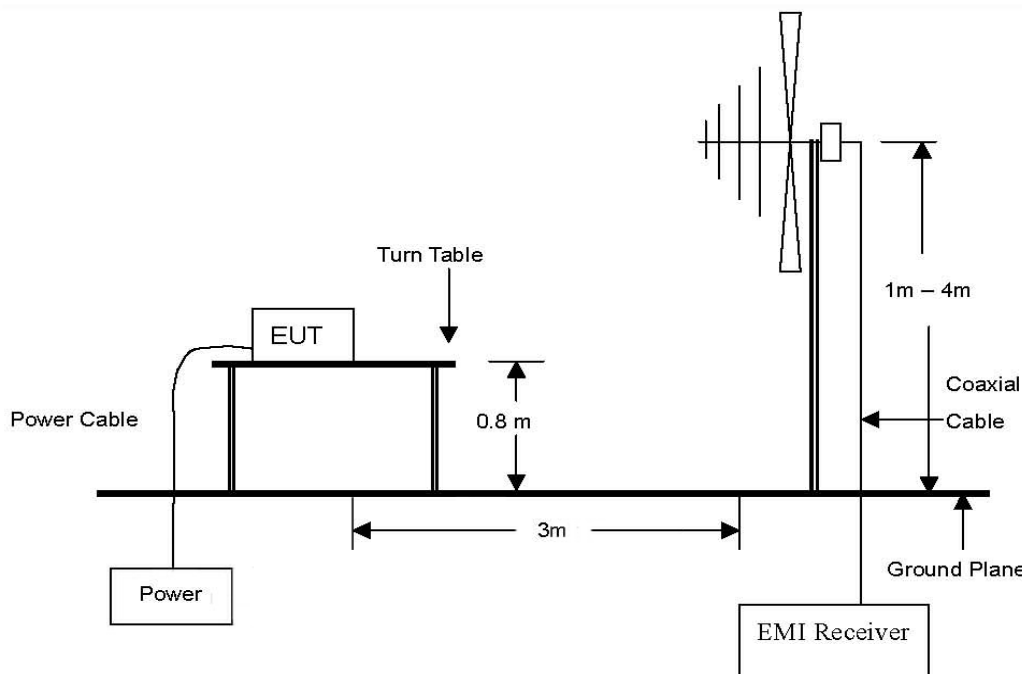
2. Spurious Radiated Emission

2.1. Test Setup

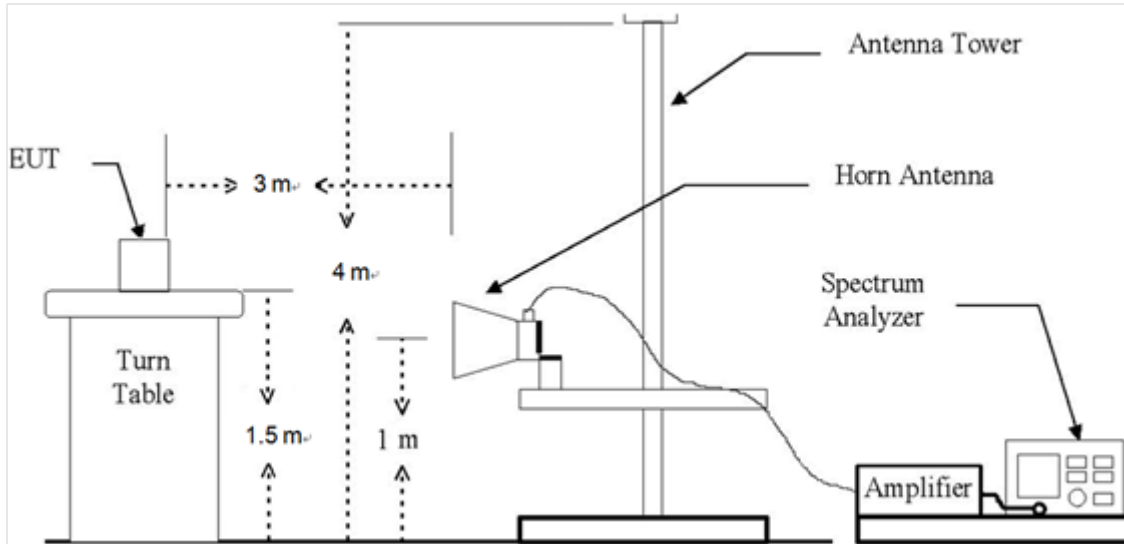
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 26 GHz.



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(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.

- §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 3

5.4, the transmitter output power shall be measured in terms of average power.

The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.

Refer to SRSP-503 for base station e.i.r.p. limits.

- RSS-133 Issue 6

6.4, the equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1 930-1 995 MHz shall not have output power exceeding 100 watts.

- RSS-139 Issue 3

6.5, the equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1 710-1 780 MHz shall not exceed one watt.

- RSS-199 Issue 3

4.4, the transmitter output power shall be measured in terms of average value.

For base station equipment, refer to SRSP-517 for the maximum permissible e.i.r.p.

For mobile subscriber equipment, the e.i.r.p. shall not exceed 2 W. For fixed subscriber equipment, the transmitter output power shall not exceed 2 W and the e.i.r.p. shall be limited to 40 W.

2.2.2. Limit of Spurious Radiated 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(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 than $43 + 10\log_{10}(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10\log_{10}(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 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.

- RSS-132 Issue 3

5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) 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 (in dB) below the transmitter output power P (dB W) by at least $43 + 10\log_{10} p$ (watts).

(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 (in dB) below the transmitter output power P (dB W) by at least $43 + 10\log_{10} p$ (watts). If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 6

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 MHz is required.

- RSS-139 Issue 3

6.6, (i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in dB W) by at least $43 + 10 \log_{10} p$ (watts) dB.

(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dB W) by at least $43 + 10 \log_{10} p$ (watts) dB.

- RSS-199 Issue 3

4.5, In the 1 MHz band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 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.

Equipment shall comply with the following unwanted emission limits:

- a. for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$
- b. for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:
 - i. $40 + 10 \log_{10} p$ from the channel edges to 5 MHz away
 - ii. $43 + 10 \log_{10} p$ between 5 MHz and X MHz from the channel edges, and
 - iii. $55 + 10 \log_{10} p$ at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than $43 + 10 \log_{10} p$ on all frequencies between 2490.5 MHz and 2496 MHz, and $55 + 10 \log_{10} p$ at or below 2490.5 MHz.

In (a) and (b), **p** is the transmitter power measured in watts and **X** is 6 MHz or the equipment occupied bandwidth, whichever is greater.

2.3. Test Procedure: Based on ANSI/TIA 603E: 2016 and ANSI C63.26-2015

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. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions occupied bandwidth, RBW = 1-5 % of the OBW (not to exceed 1 MHz), VBW $\geq 3 \times$ RBW, Detector = power averaging (rms), sweep time = auto, trace average at least 100 traces in power averaging (rms) mode, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. 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 ANSI C63.26-2015 and KDB 971168 D01 Power Meas License Digital Systems v03r01.
6. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
7. 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.
8. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
9. 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.
10. The maximum signal level detected by the measuring receiver shall be noted.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

2.4. Test Result for E.R.P./E.I.R.P.

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

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)	Output Power Limit
2	1 850 ~ 1 910	25.50	0.355	1.13	26.63	0.460			2 W E.I.R.P.
4	1 710 ~ 1 755	25.50	0.355	1.45	26.95	0.495			1 W E.I.R.P.
7	2 500 ~ 2 570	25.50	0.355	-1.67	23.83	0.242			2 W E.I.R.P.
12	699 ~ 716	25.50	0.355	-1.85	23.65	0.232	21.50	0.141	3 W E.R.P.
26/5	824 ~ 849	25.50	0.355	-2.45	23.05	0.202	20.90	0.123	7 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.

2.5. Spurious Radiated Emission

LTE band 2 (1.4 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 (1 850.7 MHz)									
5 550.71	77.63	H	34.00	-34.60	77.03	-95.26	-18.23	-13	5.23
5 550.74	79.29	V	34.00	-34.60	78.69	-95.26	-16.57	-13	3.57
Middle Channel (1 880.0 MHz)									
5 638.59	57.97	H	34.00	-34.73	57.24	-95.26	-38.02	-13	25.02
5 638.63	58.68	V	34.00	-34.73	57.95	-95.26	-37.31	-13	24.31
High Channel (1 909.3 MHz)									
5 726.41	44.89	H	34.05	-34.56	44.38	-95.26	-50.88	-13	37.88
5 726.62	42.61	V	34.05	-34.56	42.10	-95.26	-53.16	-13	40.16

* 1.4 BW 1 RB size / 0 Offset for B2

LTE band 2 (3 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 (1 851.5 MHz)									
5 550.73	77.47	H	34.00	-34.60	76.87	-95.26	-18.39	-13	5.39
5 550.71	79.10	V	34.00	-34.60	78.50	-95.26	-16.76	-13	3.76
Middle Channel (1 880.0 MHz)									
5 636.36	58.35	H	34.00	-34.72	57.63	-95.26	-37.63	-13	24.63
5 636.21	58.97	V	34.00	-34.72	58.25	-95.26	-37.01	-13	24.01
High Channel (1 908.5 MHz)									
5 721.77	43.25	H	34.06	-34.56	42.75	-95.26	-52.51	-13	39.51
5 721.90	43.97	V	34.06	-34.56	43.47	-95.26	-51.79	-13	38.79

* 3 BW 1 RB size / 0 Offset for B2

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)									
5 551.03	77.85	H	34.00	-34.61	77.24	-95.26	-18.02	-13	5.02
5 551.00	79.56	V	34.00	-34.61	78.95	-95.26	-16.31	-13	3.31
Middle Channel (1 880.0 MHz)									
5 633.41	60.25	H	34.00	-34.71	59.54	-95.26	-35.72	-13	22.72
5 633.55	59.67	V	34.00	-34.71	58.96	-95.26	-36.30	-13	23.30
High Channel (1 907.5 MHz)									
5 716.60	45.15	H	34.07	-34.60	44.62	-95.26	-50.64	-13	37.64
5 716.11	46.34	V	34.07	-34.61	45.80	-95.26	-49.46	-13	36.46

* 5 BW 1 RB size / 0 Offset for B2

LTE band 2 (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 (1 855.0 MHz)									
5 551.73	77.42	H	34.00	-34.62	76.80	-95.26	-18.46	-13	5.46
5 551.81	79.02	V	34.00	-34.62	78.40	-95.26	-16.86	-13	3.86
Middle Channel (1 880.0 MHz)									
5 626.83	60.83	H	34.00	-34.68	60.15	-95.26	-35.11	-13	22.11
5 626.69	60.30	V	34.00	-34.68	59.62	-95.26	-35.64	-13	22.64
High Channel (1 905.0 MHz)									
5 701.74	45.77	H	34.10	-34.71	45.16	-95.26	-50.10	-13	37.10
5 701.97	43.31	V	34.10	-34.71	42.70	-95.26	-52.56	-13	39.56

* 10 BW 1 RB size / 0 Offset for B2

LTE band 2 (15 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 (1 857.5 MHz)									
5 552.46	78.20	H	34.00	-34.63	77.57	-95.26	-17.69	-13	4.69
5 552.54	79.64	V	34.00	-34.63	79.01	-95.26	-16.25	-13	3.25
Middle Channel (1 880.0 MHz)									
5 620.04	66.03	H	34.00	-34.71	65.32	-95.26	-29.94	-13	16.94
5 620.07	65.74	V	34.00	-34.71	65.03	-95.26	-30.23	-13	17.23
High Channel (1 902.5 MHz)									
5 687.41	47.99	H	34.07	-34.63	47.43	-95.26	-47.83	-13	34.83
5 687.43	48.42	V	34.07	-34.63	47.86	-95.26	-47.40	-13	34.40

* 15 BW 1 RB size / 0 Offset for B2

LTE band 2 (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)									
5 553.22	78.40	H	34.00	-34.64	77.76	-95.26	-17.50	-13	4.50
5 553.27	80.09	V	34.00	-34.64	79.45	-95.26	-15.81	-13	2.81
Middle Channel (1 880.0 MHz)									
5 613.20	69.57	H	34.00	-34.77	68.80	-95.26	-26.46	-13	13.46
5 613.26	69.34	V	34.00	-34.77	68.57	-95.26	-26.69	-13	13.69
High Channel (1 900.0 MHz)									
5 673.46	52.42	H	34.05	-34.55	51.92	-95.26	-43.34	-13	30.34
5 673.37	53.95	V	34.05	-34.56	53.44	-95.26	-41.82	-13	28.82

* 20 BW 1 RB size / 0 Offset for B2

LTE band 4 (1.4 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 710.7 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 754.3 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 1.4 BW 1 RB size / 0 Offset for B4

LTE band 4 (3 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 711.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 753.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 3 BW 1 RB size / 0 Offset for B4

LTE band 4 (5 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 712.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 752.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 5 BW 1 RB size / 0 Offset for B4

LTE band 4 (10 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 715.0 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 750.0 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 10 BW 1 RB size / 0 Offset for B4

LTE band 4 (15 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 717.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 747.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 15 BW 1 RB size / 0 Offset for B4

LTE band 4 (20 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 720.0 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 732.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (1 745.0 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-

* 20 BW 1 RB size / 0 Offset for B4

LTE band 7 (5 MHz - QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 502.5 MHz)									
5 000.40	44.22	H	33.20	-35.46	41.96	-95.26	-53.30	-25	28.30
5 000.78	48.27	V	33.20	-35.46	46.01	-95.26	-49.25	-25	24.25
7 500.97	44.75	V	36.00	-34.30	46.45	-95.26	-48.81	-25	23.81
Middle Channel (2 535.0 MHz)									
5 065.72	62.15	H	33.26	-35.80	59.61	-95.26	-35.65	-25	10.65
5 065.74	69.75	V	33.26	-35.80	67.21	-95.26	-28.05	-25	3.05
7 598.42	44.18	V	36.00	-33.53	46.65	-95.26	-48.61	-25	23.61
High Channel (2 567.5 MHz)									
5 130.72	49.53	H	33.46	-35.59	47.40	-95.26	-47.86	-25	22.86
5 130.84	54.27	V	33.46	-35.59	52.14	-95.26	-43.12	-25	18.12
7 696.08	40.37	V	35.91	-33.93	42.35	-95.26	-52.91	-25	27.91

* 5 BW 1 RB size / 0 Offset for B7

LTE band 7 (10 MHz - QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 505.0 MHz)									
5 001.20	44.27	H	33.20	-35.47	42.00	-95.26	-53.26	-25	28.26
5 001.32	48.28	V	33.20	-35.47	46.01	-95.26	-49.25	-25	24.25
7 501.69	45.63	V	36.00	-34.30	47.33	-95.26	-47.93	-25	22.93
Middle Channel (2 535.0 MHz)									
5 061.16	61.41	H	33.24	-35.78	58.87	-95.26	-36.39	-25	11.39
5 061.20	66.80	V	33.24	-35.78	64.26	-95.26	-31.00	-25	6.00
7 591.71	43.43	V	36.00	-33.60	45.83	-95.26	-49.43	-25	24.43
High Channel (2 565.0 MHz)									
5 121.34	55.30	H	33.44	-35.63	53.11	-95.26	-42.15	-25	17.15
5 121.16	54.58	V	33.44	-35.63	52.39	-95.26	-42.87	-25	17.87
7 681.86	41.74	V	35.94	-33.94	43.74	-95.26	-51.52	-25	26.52

* 10 BW 1 RB size / 0 Offset for B7

LTE band 7 (15 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 (2 507.5 MHz)									
5 001.42	45.18	H	33.20	-35.47	42.91	-95.26	-52.35	-25	27.35
5 001.76	48.38	V	33.20	-35.48	46.10	-95.26	-49.16	-25	24.16
7 502.41	45.75	V	36.00	-34.30	47.45	-95.26	-47.81	-25	22.81
Middle Channel (2 535.0 MHz)									
5 056.68	62.25	H	33.23	-35.77	59.71	-95.26	-35.55	-25	10.55
5 056.64	66.52	V	33.23	-35.77	63.98	-95.26	-31.28	-25	6.28
7 585.10	43.18	V	36.00	-33.66	45.52	-95.26	-49.74	-25	24.74
High Channel (2 562.5 MHz)									
5 111.77	58.58	H	33.42	-35.68	56.32	-95.26	-38.94	-25	13.94
5 111.68	66.87	V	33.42	-35.68	64.61	-95.26	-30.65	-25	5.65
7 667.61	44.88	V	35.96	-33.96	46.88	-95.26	-48.38	-25	23.38

* 15 BW 1 RB size / 0 Offset for B7

LTE band 7 (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 (2 510.0 MHz)									
5 002.10	46.34	H	33.20	-35.48	44.06	-95.26	-51.20	-25	26.20
5 002.34	48.49	V	33.20	-35.49	46.20	-95.26	-49.06	-25	24.06
7 503.32	45.87	V	36.00	-34.29	47.58	-95.26	-47.68	-25	22.68
Middle Channel (2 535.0 MHz)									
5 052.23	62.16	H	33.21	-35.76	59.61	-95.26	-35.65	-25	10.65
5 052.18	66.28	V	33.21	-35.76	63.73	-95.26	-31.53	-25	6.53
7 578.31	42.56	V	36.00	-33.72	44.84	-95.26	-50.42	-25	25.42
High Channel (2 560.0 MHz)									
5 102.20	60.92	H	33.40	-35.74	58.58	-95.26	-36.68	-25	11.68
5 102.30	66.78	V	33.40	-35.74	64.44	-95.26	-30.82	-25	5.82
7 653.38	43.73	V	35.99	-33.97	45.75	-95.26	-49.51	-25	24.51

* 20 BW 1 RB size / 0 Offset for B7

LTE band 12 (1.4 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (699.7 MHz)									
1 398.50	58.51	H	24.90	-40.55	42.86	-97.41	-54.55	-13	41.55
1 398.43	57.65	V	24.90	-40.54	42.01	-97.41	-55.40	-13	42.40
Middle Channel (707.5 MHz)									
1 413.98	52.33	H	24.98	-40.53	36.78	-97.41	-60.63	-13	47.63
1 414.22	50.34	V	24.99	-40.53	34.80	-97.41	-62.61	-13	49.61
High Channel (715.3 MHz)									
1 429.91	48.72	H	25.08	-40.46	33.34	-97.41	-64.07	-13	51.07
1 429.51	48.87	V	25.08	-40.46	33.49	-97.41	-63.92	-13	50.92

* 1.4 BW 1 RB size / 0 Offset for B12

LTE band 12 (3 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (700.5 MHz)									
1 398.52	58.70	H	24.90	-40.55	43.05	-97.41	-54.36	-13	41.36
1 398.48	57.50	V	24.90	-40.54	41.86	-97.41	-55.55	-13	42.55
Middle Channel (707.5 MHz)									
1 412.39	52.82	H	24.97	-40.53	37.26	-97.41	-60.15	-13	47.15
1 412.43	50.98	V	24.97	-40.53	35.42	-97.41	-61.99	-13	48.99
High Channel (714.5 MHz)									
1 426.63	48.71	H	25.06	-40.50	33.27	-97.41	-64.14	-13	51.14
1 426.33	49.42	V	25.06	-40.50	33.98	-97.41	-63.43	-13	50.43

* 3 BW 1 RB size / 0 Offset for B12

LTE band 12 (5 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (701.5 MHz)									
1 398.70	58.23	H	24.90	-40.55	42.58	-97.41	-54.83	-13	41.83
1 398.68	57.78	V	24.90	-40.55	42.13	-97.41	-55.28	-13	42.28
Middle Channel (707.5 MHz)									
1 410.68	52.90	H	24.96	-40.53	37.33	-97.41	-60.08	-13	47.08
1 410.72	50.96	V	24.96	-40.53	35.39	-97.41	-62.02	-13	49.02
High Channel (713.5 MHz)									
1 422.76	49.83	H	25.04	-40.52	34.35	-97.41	-63.06	-13	50.06
1 422.88	49.09	V	25.04	-40.52	33.61	-97.41	-63.80	-13	50.80

* 5 BW 1 RB size / 0 Offset for B12

LTE band 12 (10 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (704.0 MHz)									
1 399.25	57.75	H	24.90	-40.55	42.10	-97.41	-55.31	-13	42.31
1 399.19	56.72	V	24.90	-40.55	41.07	-97.41	-56.34	-13	43.34
Middle Channel (707.5 MHz)									
1 406.23	53.01	H	24.94	-40.55	37.40	-97.41	-60.01	-13	47.01
1 406.24	51.42	V	24.94	-40.55	35.81	-97.41	-61.60	-13	48.60
High Channel (711.0 MHz)									
1 413.05	52.57	H	24.98	-40.53	37.02	-97.41	-60.39	-13	47.39
1 413.43	50.68	V	24.98	-40.53	35.13	-97.41	-62.28	-13	49.28

* 10 BW 1 RB size / 0 Offset for B12

LTE band 26/5 (1.4 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (824.7 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
2 508.06	67.06	H	28.30	-39.00	56.36	-97.41	-41.05	-13	28.05
2 508.22	62.25	V	28.30	-39.00	51.55	-97.41	-45.86	-13	32.86
High Channel (848.3 MHz)									
2 543.64	69.63	H	28.30	-38.93	59.00	-97.41	-38.41	-13	25.41
2 543.49	67.69	V	28.30	-38.93	57.06	-97.41	-40.35	-13	27.35

* 1.4 BW 1RB size / 0 Offset for B26/5

LTE band 26/5 (3 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (825.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
2 505.70	66.25	H	28.30	-39.02	55.53	-97.41	-41.88	-13	28.88
2 505.78	61.19	V	28.30	-39.02	50.47	-97.41	-46.94	-13	33.94
High Channel (847.5 MHz)									
2 538.72	68.16	H	28.30	-38.92	57.54	-97.41	-39.87	-13	26.87
2 538.79	66.31	V	28.30	-38.92	55.69	-97.41	-41.72	-13	28.72

* 3 BW 1RB size / 0 Offset for B26/5

LTE band 26/5 (5 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
2 502.96	66.42	H	28.30	-39.04	55.68	-97.41	-41.73	-13	28.73
2 502.96	60.21	V	28.30	-39.04	49.47	-97.41	-47.94	-13	34.94
High Channel (846.5 MHz)									
2 533.01	66.12	H	28.30	-38.92	55.50	-97.41	-41.91	-13	28.91
2 533.07	65.19	V	28.30	-38.92	54.57	-97.41	-42.84	-13	29.84

* 5 BW 1RB size / 0 Offset for B26/5

LTE band 26/5 (10 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (829.0 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
2 496.26	66.72	H	28.31	-39.07	55.96	-97.41	-41.45	-13	28.45
2 496.58	59.56	V	28.31	-39.07	48.80	-97.41	-48.61	-13	35.61
High Channel (844.0 MHz)									
2 518.82	67.93	H	28.30	-38.94	57.29	-97.41	-40.12	-13	27.12
2 518.89	65.82	V	28.30	-38.94	55.18	-97.41	-42.23	-13	29.23

* 10 BW 1RB size / 0 Offset for B26/5

LTE band 26 (15 MHz – QPSK)

Frequency (MHz)	Measured Level (dB μ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB μ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (831.5 MHz)									
Above 0.009	Not detected	-	-	-	-	-	-	-	-
High Channel (841.5 MHz)									
2 504.44	66.69	H	28.30	-39.03	55.96	-97.41	-41.45	-13	28.45
2 504.62	62.56	V	28.30	-39.03	51.83	-97.41	-45.58	-13	32.58

* 15 BW 1RB size / 0 Offset for B26

Remark;

1. E (dB μ V/m) = Measured Level (dB μ V) + Antenna Factor (dB/m) + Cable Loss (dB).
2. E.I.R.P. (dB m) = E (dB μ V/m) + 20 log D - 104.8; where D is the measurement distance in meters.
3. 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.
4. CF (dB) (E.I.R.P.) = 20 log D - 104.8 - Distance Correction Factor
5. CF (dB) (E.R.P.) = 20 log D - 104.8 - 2.15.
6. Distance Correction Factor = 20 log (specific distance / test distance)
7. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.

3. Conducted Output Power

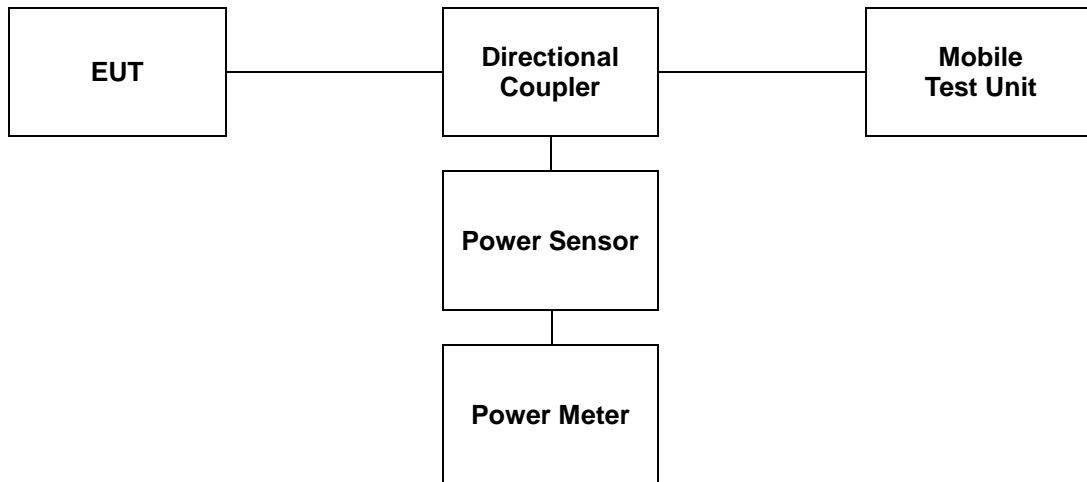
3.1. Limit

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.



Band	Bandwidth (MHz)	RB Size	RB Offset	Conducted Output Power (dB m)								
				QPSK			16QAM			64QAM		
				19957	20175	20393	19957	20175	20393	19957	20175	20393
				1710.7 (MHz)	1732.5 (MHz)	1754.3 (MHz)	1710.7 (MHz)	1732.5 (MHz)	1754.3 (MHz)	1710.7 (MHz)	1732.5 (MHz)	1754.3 (MHz)
4	1.4	1	0	22.10	22.21	22.14	21.27	21.47	21.37	21.29	21.37	21.31
		1	3	22.15	22.24	22.12	21.33	21.49	21.40	21.35	21.50	21.39
		1	5	22.04	22.13	22.11	21.23	21.45	21.41	21.21	21.32	21.33
		3	0	22.07	22.28	22.13	21.19	21.31	21.20	21.28	21.32	21.21
		3	2	22.02	22.27	22.12	21.15	21.26	21.22	21.19	21.35	21.24
		3	3	22.06	22.29	22.19	21.15	21.35	21.18	21.18	21.37	21.28
	Bandwidth (MHz)	RB Size	RB Offset	19965	20175	20385	19965	20175	20385	19965	20175	20385
				1711.5 (MHz)	1732.5 (MHz)	1753.5 (MHz)	1711.5 (MHz)	1732.5 (MHz)	1753.5 (MHz)	1711.5 (MHz)	1732.5 (MHz)	1753.5 (MHz)
	3	1	0	22.14	22.24	22.11	21.45	21.57	21.34	21.28	21.39	21.23
		1	8	22.24	22.34	22.28	21.47	21.58	21.61	21.40	21.54	21.45
		1	14	22.11	22.24	22.16	21.32	21.38	21.39	21.24	21.36	21.35
		8	0	21.19	21.42	21.24	20.25	20.42	20.28	20.22	20.40	20.28
		8	4	21.29	21.40	21.29	20.34	20.40	20.38	20.29	20.40	20.34
		8	7	21.24	21.40	21.21	20.32	20.44	20.25	20.27	20.40	20.23
	Bandwidth (MHz)	RB Size	RB Offset	19975	20175	20375	19975	20175	20375	19975	20175	20375
				1712.5 (MHz)	1732.5 (MHz)	1752.5 (MHz)	1712.5 (MHz)	1732.5 (MHz)	1752.5 (MHz)	1712.5 (MHz)	1732.5 (MHz)	1752.5 (MHz)
	5	1	0	22.24	22.32	22.88	21.38	21.62	22.07	21.39	21.47	21.99
		1	12	22.18	22.24	22.82	21.39	21.59	22.00	21.30	21.42	22.05
		1	24	22.15	22.26	22.76	21.36	21.45	22.05	21.37	21.41	21.88
		12	0	21.24	21.37	21.83	20.18	20.40	20.82	20.17	20.32	20.79
		12	7	21.23	21.39	21.90	20.20	20.34	20.89	20.15	20.34	20.85
		12	13	21.22	21.26	21.83	20.18	20.31	20.84	20.12	20.23	20.78
	Bandwidth (MHz)	RB Size	RB Offset	20000	20175	20350	20000	20175	20350	20000	20175	20350
				1715.0 (MHz)	1732.5 (MHz)	1750.0 (MHz)	1715.0 (MHz)	1732.5 (MHz)	1750.0 (MHz)	1715.0 (MHz)	1732.5 (MHz)	1750.0 (MHz)
	10	1	0	22.35	22.43	22.39	21.55	21.68	21.61	21.52	21.56	21.49
		1	25	22.17	22.29	22.24	21.35	21.58	21.37	21.32	21.43	21.37
		1	49	22.01	22.25	22.03	21.25	21.50	21.34	21.21	21.40	21.22
		25	0	21.28	21.48	21.33	20.28	20.39	20.35	20.25	20.39	20.32
		25	12	21.32	21.36	21.33	20.30	20.30	20.32	20.27	20.32	20.34
		25	25	21.19	21.33	21.15	20.14	20.27	20.17	20.18	20.27	20.12
	Bandwidth (MHz)	RB Size	RB Offset	20025	20175	20325	20025	20175	20325	20025	20175	20325
				1717.5 (MHz)	1732.5 (MHz)	1747.5 (MHz)	1717.5 (MHz)	1732.5 (MHz)	1747.5 (MHz)	1717.5 (MHz)	1732.5 (MHz)	1747.5 (MHz)
	15	1	0	22.88	23.19	22.98	22.15	22.37	22.29	22.07	22.20	22.08
		1	37	22.07	22.28	22.11	21.44	21.58	21.40	21.24	21.39	21.27
		1	74	22.59	22.62	22.49	21.87	21.93	21.96	21.73	21.77	21.67
		36	0	21.62	21.64	21.54	20.54	20.56	20.51	20.52	20.67	20.52
		36	20	21.26	21.49	21.33	20.24	20.43	20.32	20.25	20.45	20.34
		36	39	21.34	21.48	21.44	20.31	20.43	20.40	20.28	20.44	20.36
	Bandwidth (MHz)	RB Size	RB Offset	20050	20175	20300	20050	20175	20300	20050	20175	20300
				1720.0 (MHz)	1732.5 (MHz)	1745.0 (MHz)	1720.0 (MHz)	1732.5 (MHz)	1745.0 (MHz)	1720.0 (MHz)	1732.5 (MHz)	1745.0 (MHz)
20	1	0	23.30	23.53	23.40	22.63	22.69	22.70	22.45	22.65	22.43	
	1	50	22.09	22.29	22.05	21.40	21.50	21.24	21.35	21.38	21.22	
	1	99	23.00	23.05	22.97	22.18	22.35	22.17	22.00	22.29	22.08	
	50	0	21.76	21.84	21.80	20.70	20.82	20.67	20.75	20.83	20.74	
	50	25	21.35	21.41	21.40	20.27	20.39	20.40	20.22	20.41	20.41	
	50	50	21.50	21.60	21.57	20.51	20.57	20.52	20.43	20.57	20.48	
	100	0	21.61	21.77	21.54	20.58	20.68	20.58	20.60	20.69	20.49	

Band	Bandwidth (MHz)	RB Size	RB Offset	Conducted Output Power (dB m)									
				QPSK			16QAM			64QAM			
				20775	21100	21425	20775	21100	21425	20775	21100	21425	
				2502.5 (MHz)	2535.0 (MHz)	2567.5 (MHz)	2502.5 (MHz)	2535.0 (MHz)	2567.5 (MHz)	2502.5 (MHz)	2535.0 (MHz)	2567.5 (MHz)	
7	5	1	0	22.74	22.75	22.70	21.67	21.92	21.94	21.79	21.79	21.82	
		1	12	22.45	22.67	22.63	21.75	21.98	21.87	21.85	21.80	21.90	
		1	24	22.41	22.65	22.60	21.58	21.74	21.73	21.72	21.71	21.63	
		12	0	21.43	21.62	21.60	20.46	20.64	20.61	20.60	20.57	20.63	
		12	7	21.41	21.61	21.58	20.64	20.61	20.56	20.62	20.62	20.56	
		12	13	21.40	21.61	21.53	20.62	20.58	20.52	20.53	20.52	20.47	
		25	0	21.38	21.60	21.54	20.60	20.57	20.58	20.60	20.57	20.56	
		Bandwidth (MHz)	RB Size	RB Offset	20800	21100	21400	20800	21100	21400	20800	21100	21400
					2505.0 (MHz)	2535.0 (MHz)	2565.0 (MHz)	2505.0 (MHz)	2535.0 (MHz)	2565.0 (MHz)	2505.0 (MHz)	2535.0 (MHz)	2565.0 (MHz)
		10	1	0	22.74	22.73	22.71	21.93	21.90	21.84	21.79	21.73	21.84
			1	25	22.65	22.61	22.52	21.90	21.86	21.81	21.78	21.77	21.69
			1	49	22.52	22.57	22.44	21.69	21.82	21.67	21.59	21.69	21.52
			25	0	21.69	21.72	21.64	20.66	20.65	20.63	20.64	20.61	20.62
			25	12	21.67	21.64	21.68	20.65	20.64	20.70	20.64	20.60	20.68
			25	25	21.56	21.57	21.51	20.56	20.57	20.50	20.53	20.56	20.48
		50	0	21.67	21.64	21.57	20.64	20.60	20.55	20.61	20.59	20.55	
		Bandwidth (MHz)	RB Size	RB Offset	20825	21100	21375	20825	21100	21375	20825	21100	21375
					2507.5 (MHz)	2535.0 (MHz)	2562.5 (MHz)	2507.5 (MHz)	2535.0 (MHz)	2562.5 (MHz)	2507.5 (MHz)	2535.0 (MHz)	2562.5 (MHz)
		15	1	0	23.25	23.27	23.24	22.51	22.49	22.50	22.41	22.42	22.40
			1	37	22.60	22.59	22.55	21.84	21.85	21.86	21.73	21.80	21.62
			1	74	22.94	22.86	22.83	22.12	22.20	22.05	21.97	22.04	21.98
			36	0	21.87	21.86	21.84	20.84	20.77	20.80	20.85	20.80	20.81
			36	20	21.63	21.66	21.60	20.61	20.64	20.60	20.64	20.62	20.60
			36	39	21.65	21.66	21.64	20.62	20.67	20.64	20.66	20.64	20.58
		75	0	21.77	21.74	21.72	20.74	20.72	20.70	20.72	20.73	20.72	
		Bandwidth (MHz)	RB Size	RB Offset	20850	21100	21350	20850	21100	21350	20850	21100	21350
					2510.0 (MHz)	2535.0 (MHz)	2560.0 (MHz)	2510.0 (MHz)	2535.0 (MHz)	2560.0 (MHz)	2510.0 (MHz)	2535.0 (MHz)	2560.0 (MHz)
		20	1	0	23.63	23.66	23.63	22.86	22.93	22.95	22.76	22.81	22.73
			1	50	22.53	22.66	22.62	21.88	21.80	21.85	21.71	21.75	21.79
			1	99	23.05	23.20	23.21	22.35	22.41	22.25	22.27	22.37	22.26
	50		0	22.01	21.95	22.01	21.02	20.94	21.00	20.95	20.95	20.99	
	50		25	21.69	21.68	21.69	20.70	20.70	20.69	20.70	20.67	20.68	
	50		50	21.75	21.80	21.72	20.72	20.77	20.67	20.70	20.76	20.68	
	100	0	21.86	21.91	21.90	20.84	20.87	20.88	20.81	20.84	20.94		



Band	Bandwidth (MHz)	RB Size	RB Offset	Conducted Output Power (dB m)										
				QPSK			16QAM			64QAM				
				23017	23095	23173	23017	23095	23173	23017	23095	23173		
				699.7 (MHz)	707.5 (MHz)	715.3 (MHz)	699.7 (MHz)	707.5 (MHz)	715.3 (MHz)	699.7 (MHz)	707.5 (MHz)	715.3 (MHz)		
12	1.4	1	0	22.12	22.06	21.93	21.30	21.24	21.13	21.32	21.22	21.06		
		1	3	22.06	22.10	21.93	21.30	21.35	21.23	21.28	21.30	21.12		
		1	5	22.07	22.02	21.94	21.28	21.24	21.11	21.25	21.16	21.09		
		3	0	22.18	22.10	22.07	21.24	21.06	21.09	21.20	21.13	21.06		
		3	2	22.15	22.06	22.07	21.19	21.14	21.08	21.20	21.12	21.17		
		3	3	22.08	22.04	22.01	21.14	21.06	21.03	21.20	21.13	21.08		
	Bandwidth (MHz)	RB Size	RB Offset	23025	23095	23165	23025	23095	23165	23025	23095	23165		
				700.5 (MHz)	707.5 (MHz)	714.5 (MHz)	700.5 (MHz)	707.5 (MHz)	714.5 (MHz)	700.5 (MHz)	707.5 (MHz)	714.5 (MHz)		
				1	0	22.23	22.10	21.95	21.43	21.30	21.21	21.36	21.22	21.18
				1	8	22.15	22.15	22.06	21.48	21.40	21.36	21.31	21.23	21.26
				1	14	22.14	22.14	22.05	21.31	21.28	21.18	21.23	21.18	21.18
				8	0	21.20	21.13	21.09	20.26	20.22	20.13	20.25	20.13	20.08
	3	RB Size	RB Offset	8	4	21.24	21.15	21.22	20.30	20.24	20.28	20.30	20.22	20.31
				8	7	21.19	21.14	21.10	20.23	20.19	20.21	20.21	20.17	20.15
				15	0	21.20	21.10	21.17	20.25	20.15	20.20	20.24	20.13	20.21
				23035	23095	23155	23035	23095	23155	23035	23095	23155		
				701.5 (MHz)	707.5 (MHz)	713.5 (MHz)	701.5 (MHz)	707.5 (MHz)	713.5 (MHz)	701.5 (MHz)	707.5 (MHz)	713.5 (MHz)		
				1	0	22.36	22.13	22.00	21.56	21.35	21.26	21.50	21.25	21.23
	5	RB Size	RB Offset	1	12	22.27	22.02	22.00	21.48	21.43	21.31	21.33	21.22	21.20
				1	24	22.27	22.14	22.04	21.43	21.34	21.26	21.38	21.27	21.20
				12	0	21.30	21.21	21.15	20.31	20.23	20.18	20.25	20.17	20.11
				12	7	21.32	21.17	21.09	20.33	20.22	20.12	20.29	20.20	20.08
				12	13	21.39	21.23	21.12	20.38	20.27	20.10	20.31	20.19	20.06
				25	0	21.26	21.23	21.09	20.26	20.19	20.13	20.26	20.19	20.11
	Bandwidth (MHz)	RB Size	RB Offset	23060	23095	23130	23060	23095	23130	23060	23095	23130		
				704.0 (MHz)	707.5 (MHz)	711.0 (MHz)	704.0 (MHz)	707.5 (MHz)	711.0 (MHz)	704.0 (MHz)	707.5 (MHz)	711.0 (MHz)		
	10	RB Size	RB Offset	1	0	22.15	22.11	21.98	21.27	21.37	21.24	21.28	21.22	21.07
				1	25	22.29	22.18	22.05	21.58	21.37	21.26	21.42	21.27	21.14
				1	49	22.09	21.93	21.80	21.32	21.14	21.08	21.24	21.09	21.00
				25	0	21.30	21.27	21.13	20.29	20.29	20.07	20.31	20.26	20.04
				25	12	21.41	21.26	21.19	20.41	20.28	20.22	20.41	20.23	20.18
				25	25	21.27	21.13	21.00	20.29	20.16	20.10	20.28	20.14	20.09
				50	0	21.31	21.18	21.12	20.31	20.16	20.14	20.30	20.17	20.12

Band	Bandwidth (MHz)	RB Size	RB Offset	Conducted Output Power (dB m)								
				QPSK			16QAM			64QAM		
				26797	26915	27033	26797	26915	27033	26797	26915	27033
				824.7 (MHz)	836.5 (MHz)	848.3 (MHz)	824.7 (MHz)	836.5 (MHz)	848.3 (MHz)	824.7 (MHz)	836.5 (MHz)	848.3 (MHz)
26/5	1.4	1	0	22.40	22.24	22.44	21.52	21.45	21.60	21.40	21.45	21.47
		1	3	22.55	22.23	22.36	21.68	21.52	21.62	21.55	21.48	21.50
		1	5	22.25	22.20	22.29	21.43	21.43	21.70	21.25	21.30	21.44
		3	0	22.45	22.23	22.34	21.32	21.15	21.33	21.45	21.44	21.51
		3	2	22.46	22.22	22.28	21.42	21.32	21.42	21.46	21.34	21.40
		3	3	22.47	22.22	22.40	21.27	21.20	21.41	21.47	21.28	21.38
	Bandwidth (MHz)	RB Size	RB Offset	26805	26915	27025	26805	26915	27025	26805	26915	27025
				825.5 (MHz)	836.5 (MHz)	847.5 (MHz)	825.5 (MHz)	836.5 (MHz)	847.5 (MHz)	825.5 (MHz)	836.5 (MHz)	847.5 (MHz)
	3	1	0	22.36	22.34	22.35	21.50	21.60	21.58	21.46	21.46	21.54
		1	8	22.40	22.41	22.45	21.53	21.62	21.72	21.56	21.55	21.60
		1	14	22.23	22.20	22.44	21.41	21.45	21.47	21.41	21.35	21.53
		8	0	21.45	21.31	21.45	20.50	20.40	20.58	20.50	20.41	20.41
		8	4	21.44	21.42	21.48	20.49	20.49	20.47	20.47	20.41	20.50
		8	7	21.25	21.31	21.41	20.33	20.37	20.51	20.30	20.34	20.47
		15	0	21.34	21.35	21.42	20.41	20.41	20.50	20.32	20.34	20.46
	Bandwidth (MHz)	RB Size	RB Offset	26815	26915	27015	26815	26915	27015	26815	26915	27015
				826.5 (MHz)	836.5 (MHz)	846.5 (MHz)	826.5 (MHz)	836.5 (MHz)	846.5 (MHz)	826.5 (MHz)	836.5 (MHz)	846.5 (MHz)
	5	1	0	22.34	22.31	22.31	21.48	21.44	21.62	21.50	21.42	21.42
		1	12	22.31	22.36	22.42	21.46	21.60	21.74	21.44	21.64	21.53
		1	24	22.26	22.20	22.40	21.42	21.42	21.50	21.41	21.38	21.57
		12	0	21.44	21.30	21.42	20.47	20.39	20.41	20.41	20.36	20.40
		12	7	21.35	21.42	21.46	20.35	20.42	20.45	20.31	20.37	20.51
		12	13	21.34	21.31	21.41	20.35	20.29	20.41	20.30	20.30	20.38
		25	0	21.39	21.35	21.43	20.42	20.38	20.42	20.38	20.36	20.46
	Bandwidth (MHz)	RB Size	RB Offset	26840	26915	26990	26840	26915	26990	26840	26915	26990
				829.0 (MHz)	836.5 (MHz)	844.0 (MHz)	829.0 (MHz)	836.5 (MHz)	844.0 (MHz)	829.0 (MHz)	836.5 (MHz)	844.0 (MHz)
	10	1	0	22.33	22.20	22.31	21.54	21.40	21.52	21.45	21.31	21.40
		1	25	22.38	22.34	22.37	21.57	21.52	21.60	21.40	21.38	21.47
		1	49	22.02	22.08	22.21	21.15	21.38	21.36	21.13	21.19	21.34
		25	0	21.32	21.34	21.51	20.30	20.33	20.45	20.30	20.30	20.48
		25	12	21.38	21.46	21.43	20.45	20.43	20.43	20.37	20.42	20.44
		25	25	21.24	21.26	21.41	20.31	20.29	20.39	20.29	20.26	20.39
		50	0	21.40	21.35	21.48	20.36	20.28	20.42	20.31	20.30	20.43
	Bandwidth (MHz)	RB Size	RB Offset	26865	-	26965	26865	-	26965	26865	-	26965
				831.5 (MHz)	-	841.5 (MHz)	831.5 (MHz)	-	841.5 (MHz)	831.5 (MHz)	-	841.5 (MHz)
	26	15	1	0	22.65	-	22.75	21.90	-	22.00	21.80	-
1			37	22.24	-	22.37	21.52	-	21.70	21.40	-	21.50
1			74	22.41	-	22.49	21.53	-	21.71	21.60	-	21.70
36			0	21.49	-	21.58	20.46	-	20.58	20.45	-	20.60
36			20	21.46	-	21.47	20.41	-	20.45	20.44	-	20.44
36			39	21.40	-	21.40	20.42	-	20.40	20.42	-	20.43
75			0	21.39	-	21.54	20.40	-	20.50	20.38	-	20.54

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 between 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).

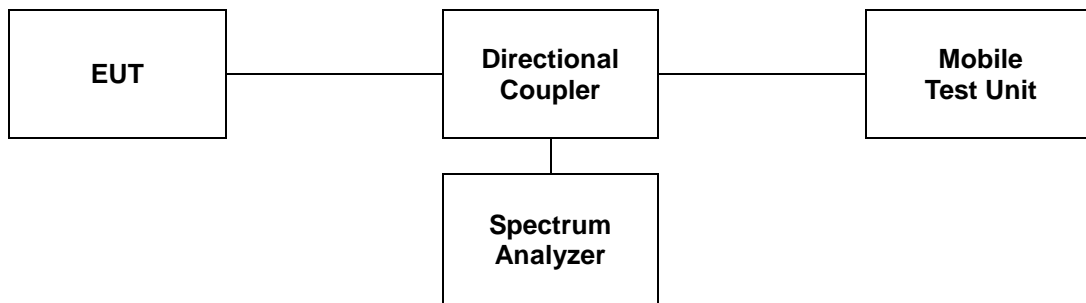
IC

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 % R.H.

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
2	1.4	1 880.0	1.098	1.094
	3		2.683	2.683
	5		4.486	4.501
	10		8.973	8.944
	15		13.459	13.459
	20		17.887	17.945

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
4	1.4	1 732.5	1.094	1.094
	3		2.674	2.674
	5		4.501	4.501
	10		8.944	8.944
	15		13.459	13.502
	20		17.887	17.887

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
7	5	2 535.0	4.486	4.515
	10		8.915	8.915
	15		13.459	13.459
	20		17.887	17.945

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
12	1.4	707.5	1.098	1.094
	3		2.674	2.683
	5		4.486	4.501
	10		8.973	8.944

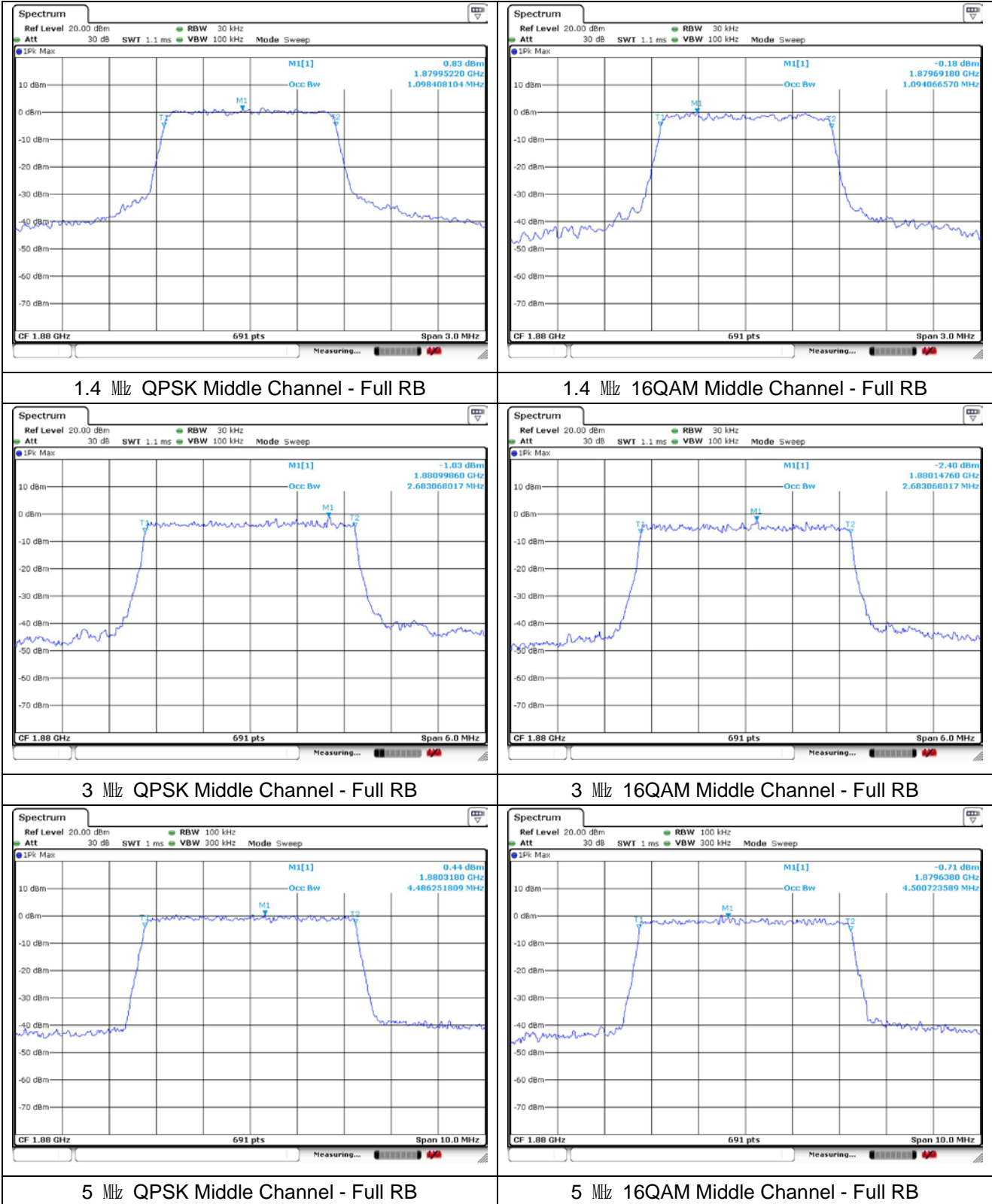
Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
26/5	1.4	836.5	1.090	1.094
	3		2.683	2.674
	5		4.501	4.486
	10		8.973	8.915
26	15	831.5	13.502	13.459

Note;

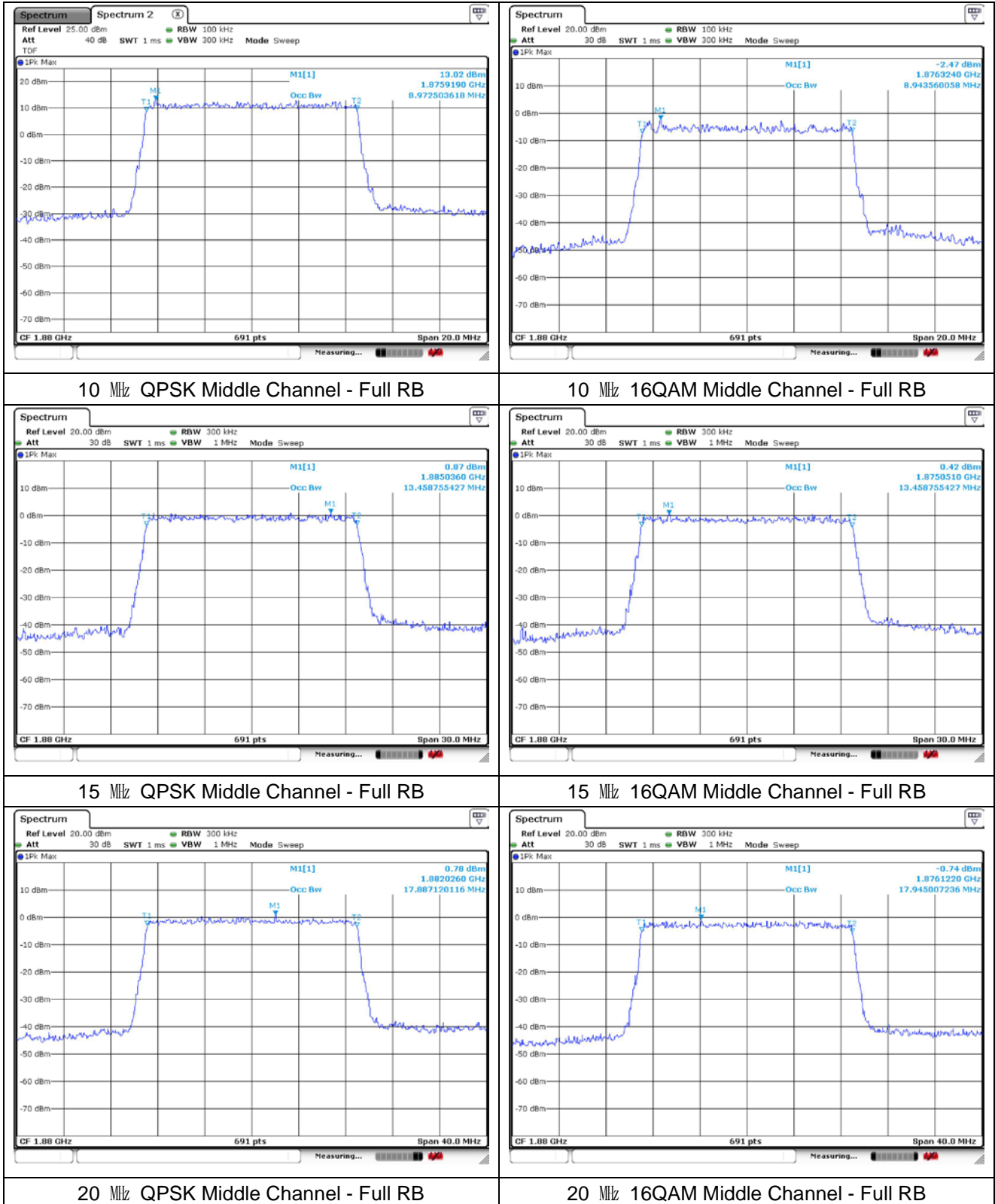
There is no limit required and power is the same for low, middle and high channel; therefore, All channels were tested but only middle channel was reported.

- Test plots

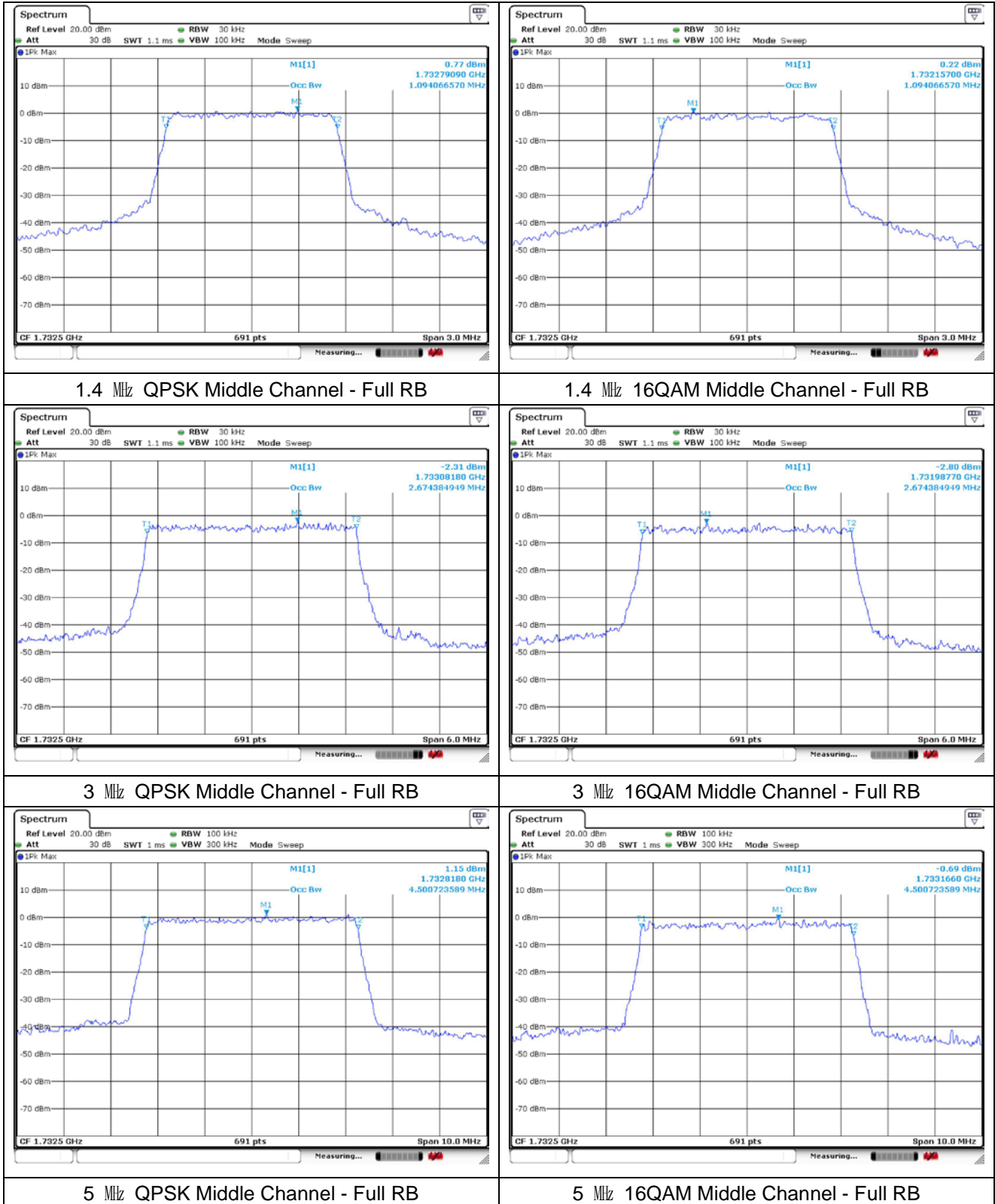
LTE band 2



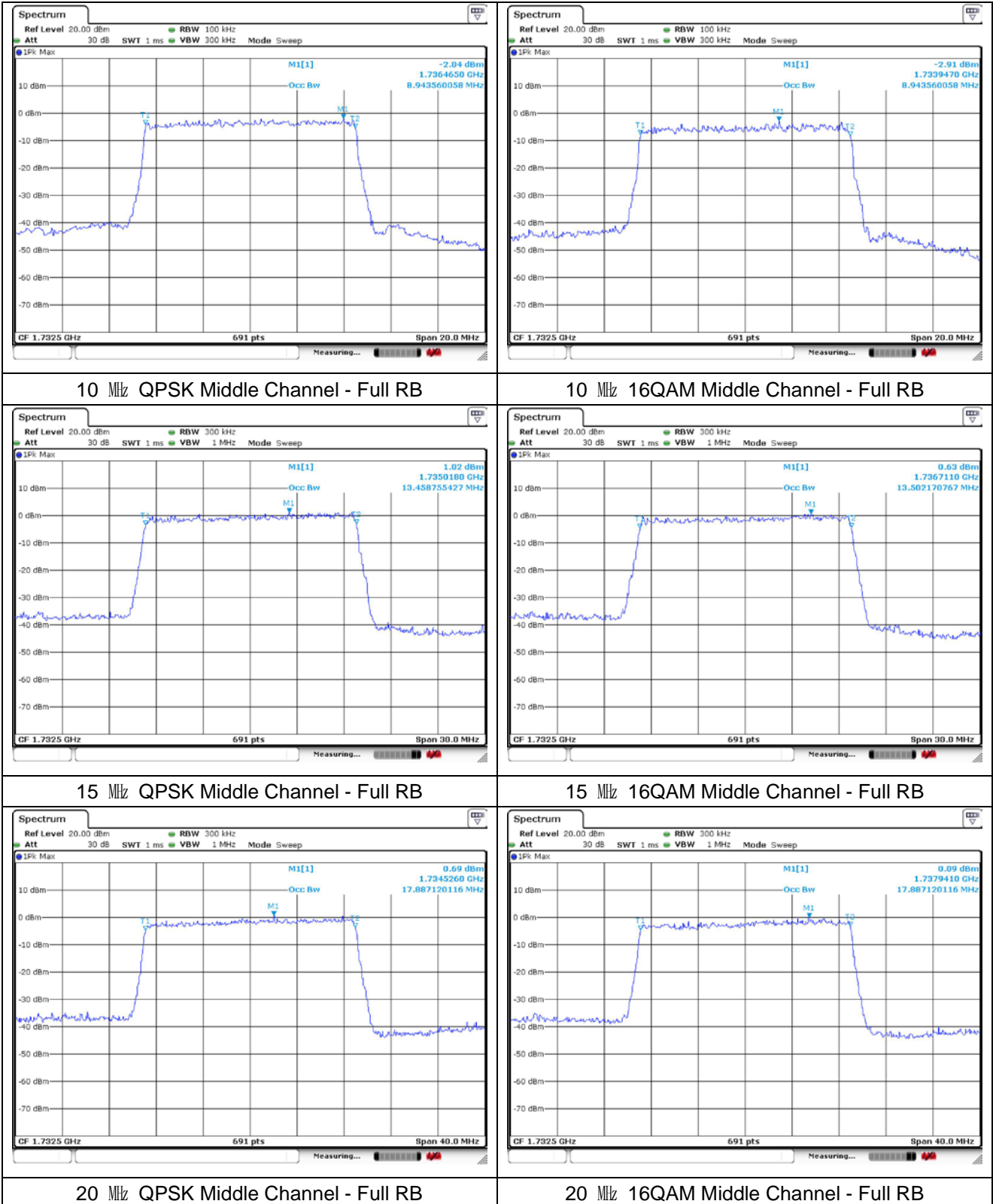
LTE band 2



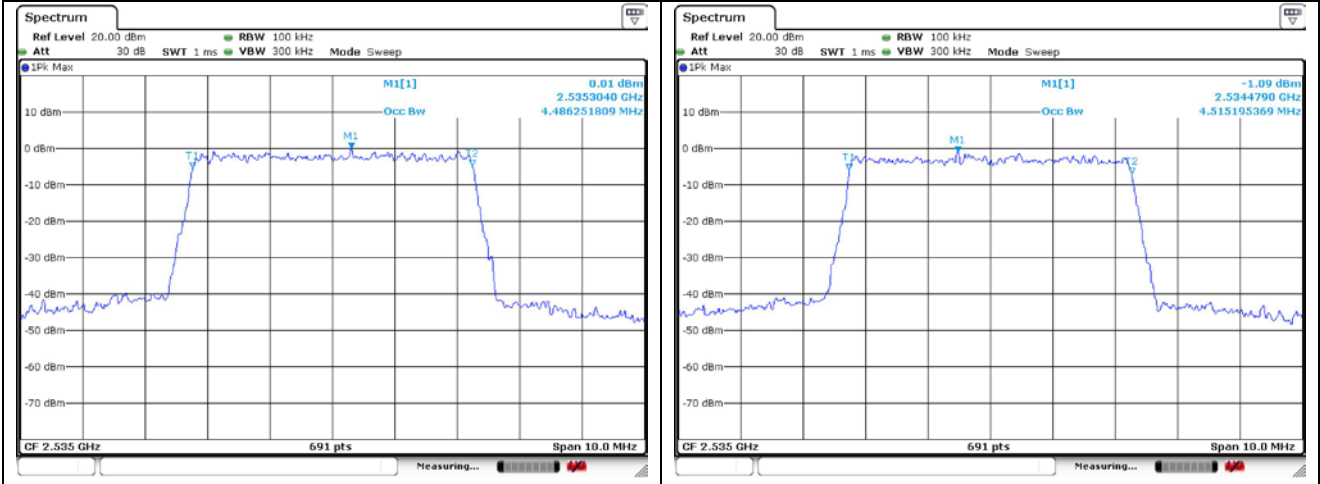
LTE band 4



LTE band 4

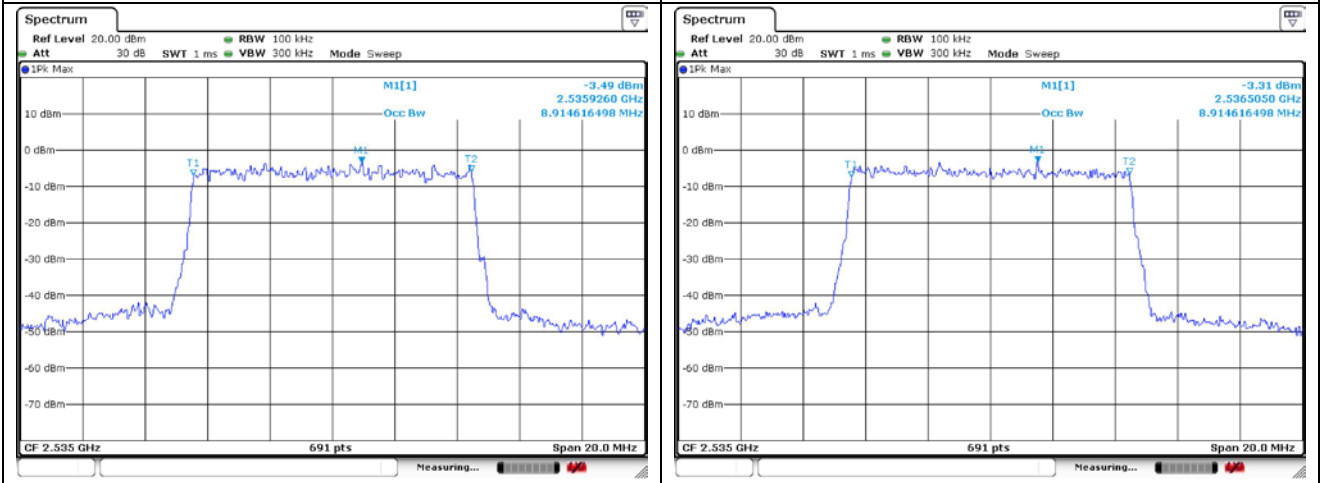


LTE band 7



5 MHz QPSK Middle Channel - Full RB

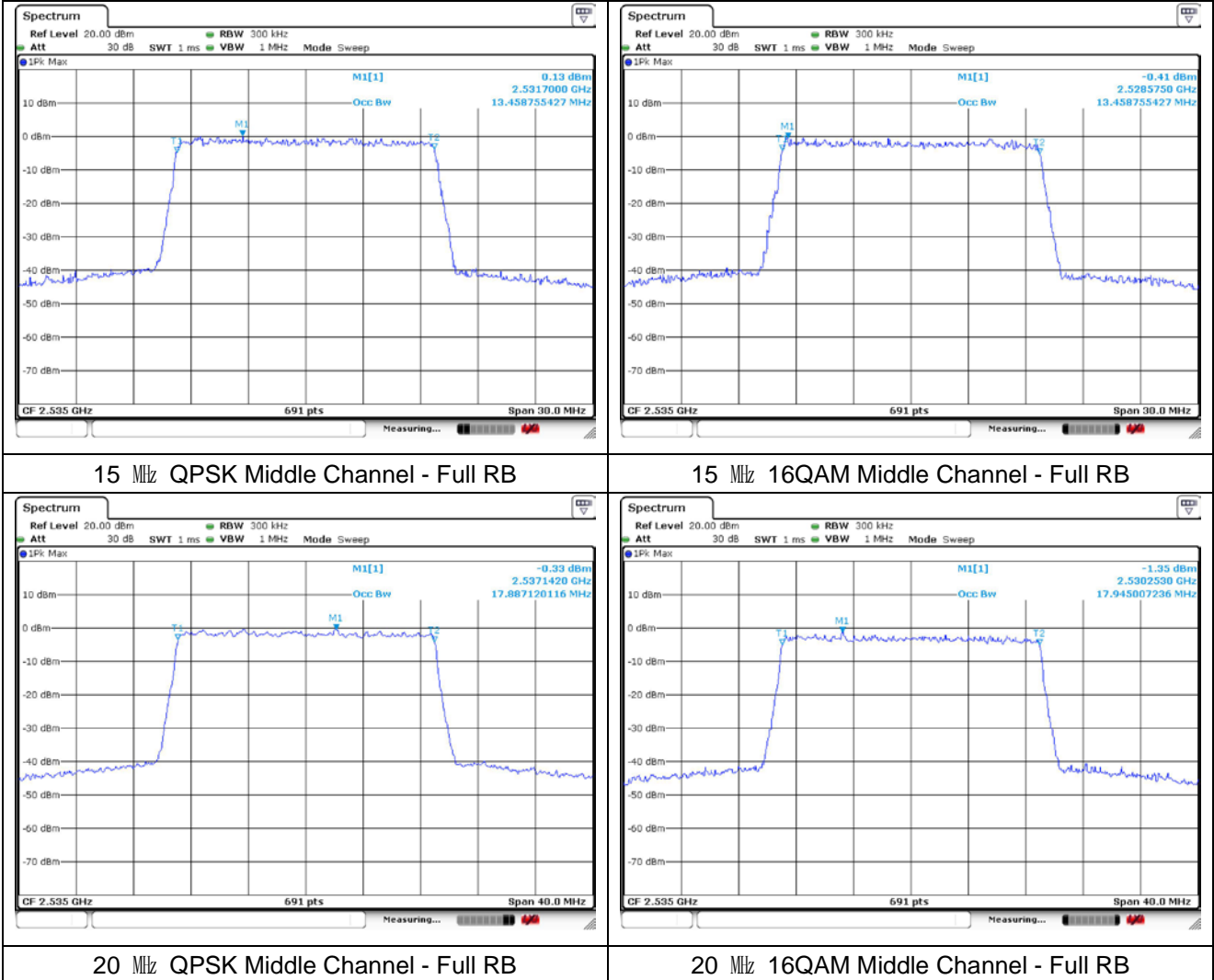
5 MHz 16QAM Middle Channel - Full RB



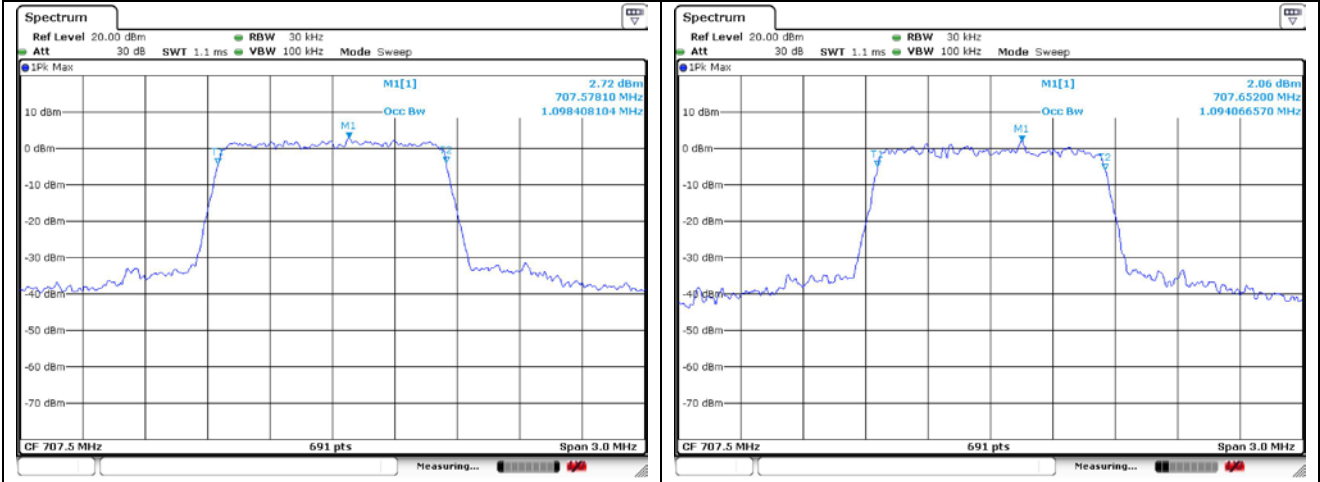
10 MHz QPSK Middle Channel - Full RB

10 MHz 16QAM Middle Channel - Full RB

LTE band 7

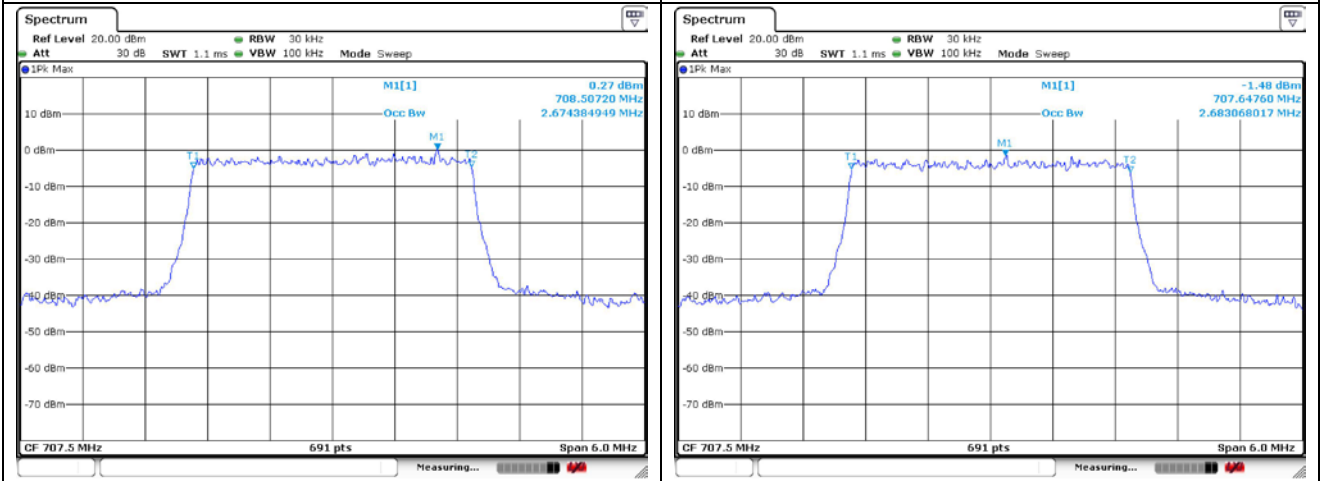


LTE band 12



1.4 MHz QPSK Middle Channel - Full RB

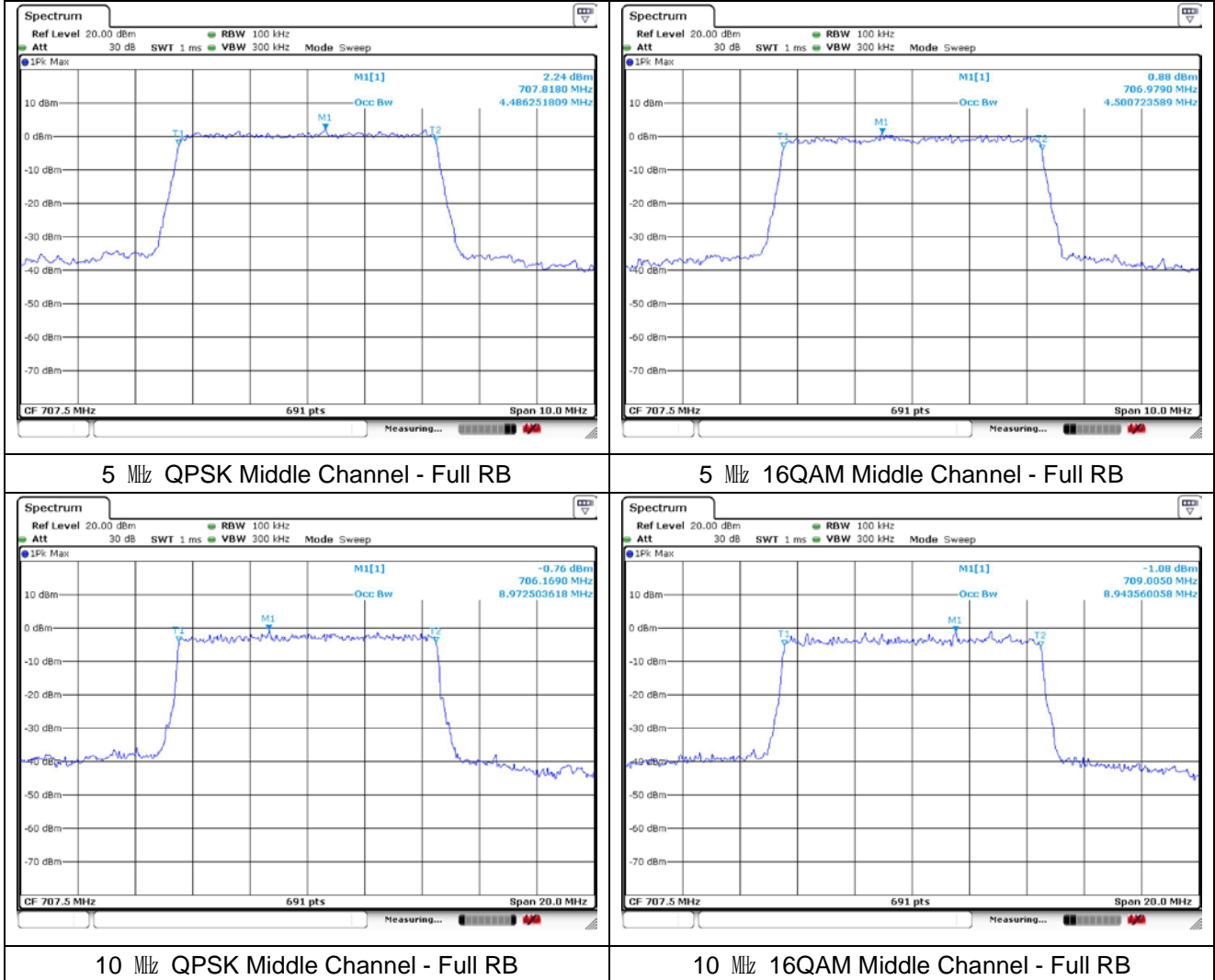
1.4 MHz 16QAM Middle Channel - Full RB



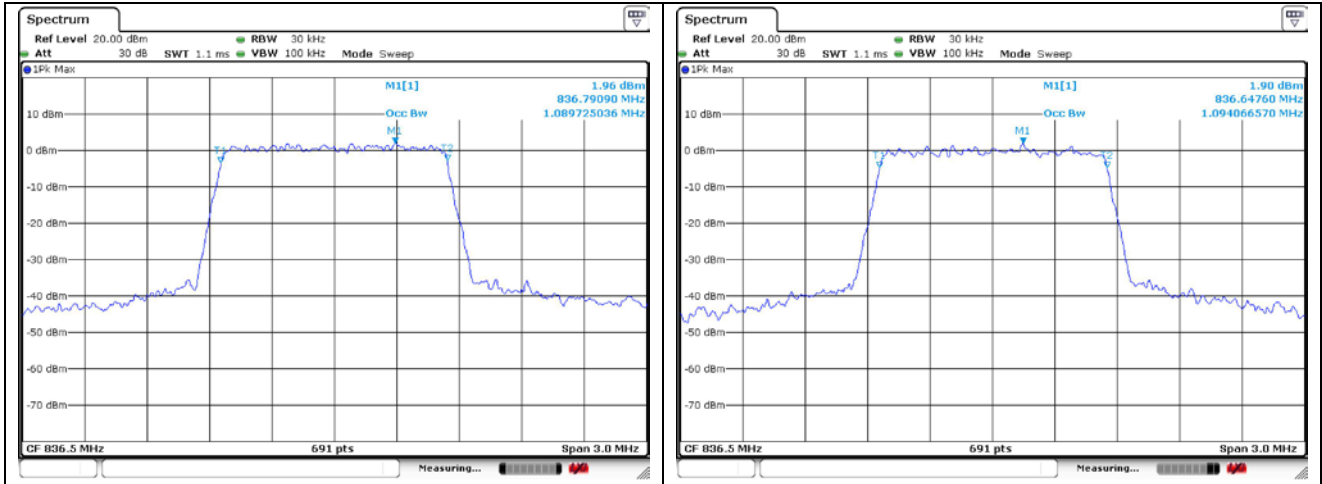
3 MHz QPSK Middle Channel - Full RB

3 MHz 16QAM Middle Channel - Full RB

LTE band 12

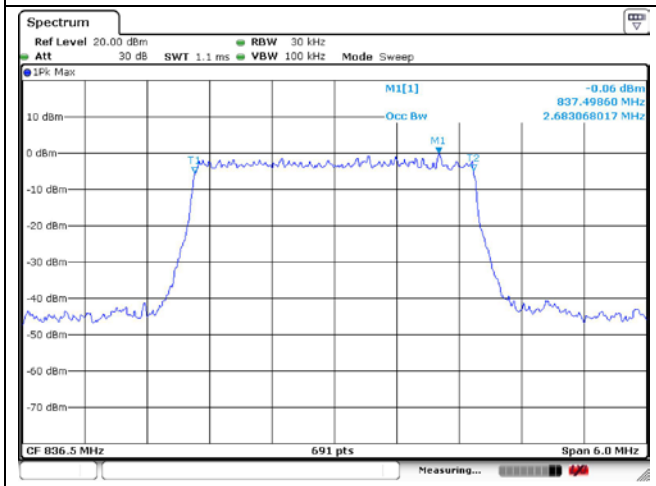


LTE band 26/5

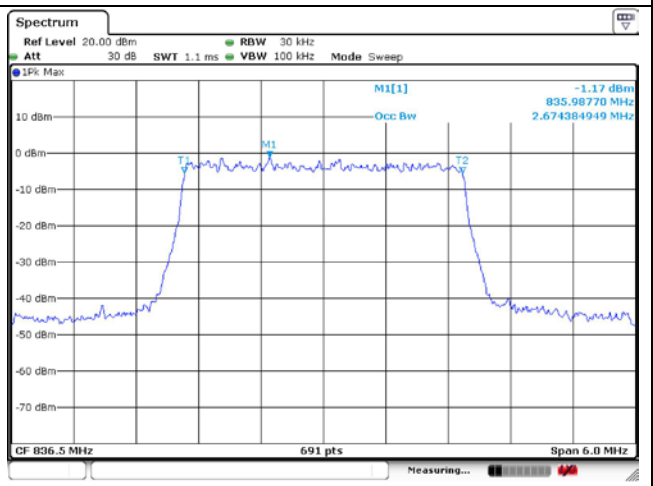


1.4 MHz QPSK Middle Channel - Full RB

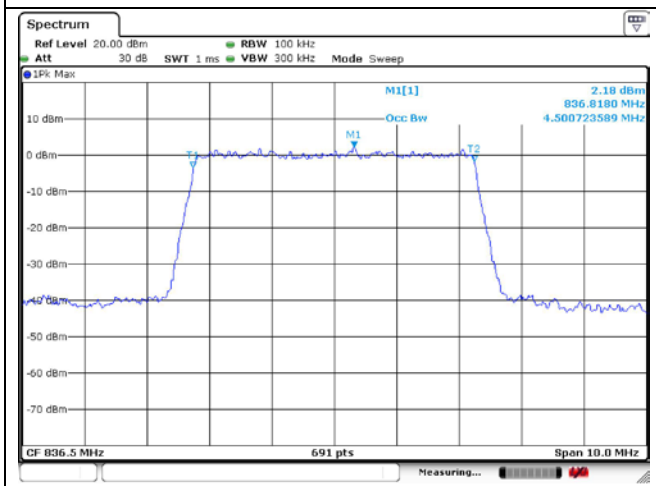
1.4 MHz 16QAM Middle Channel - Full RB



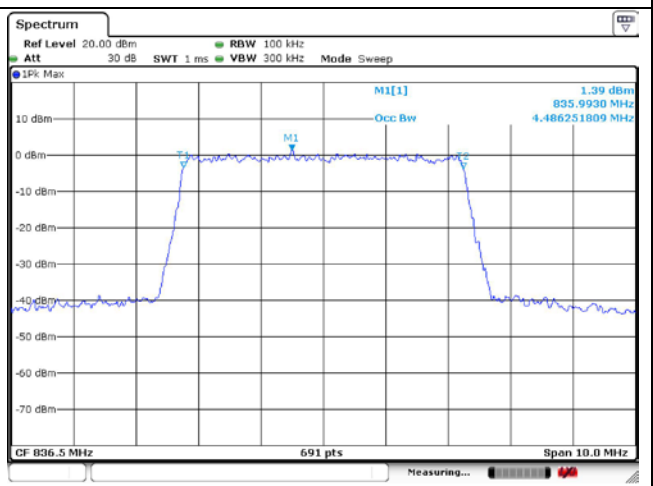
3 MHz QPSK Middle Channel - Full RB



3 MHz 16QAM Middle Channel - Full RB

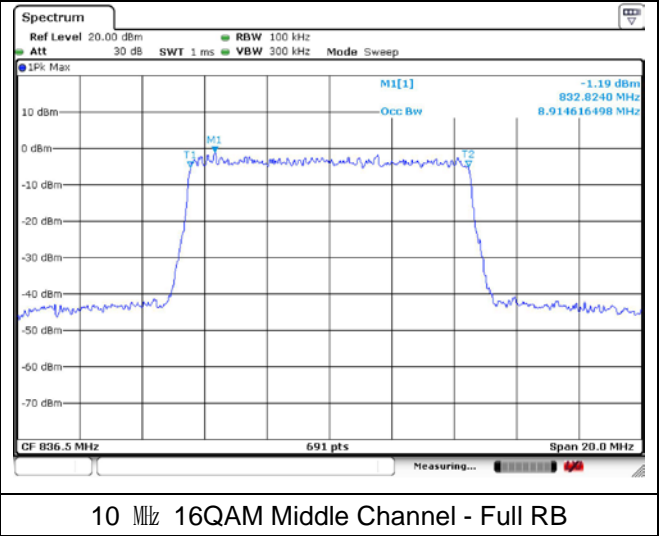
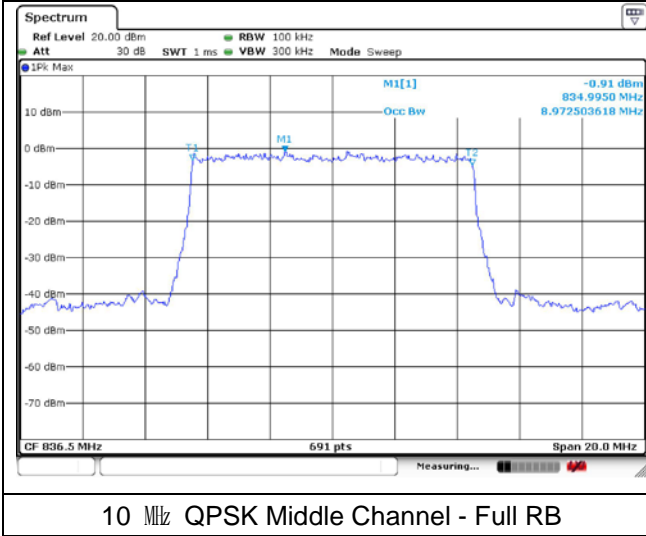


5 MHz QPSK Middle Channel - Full RB

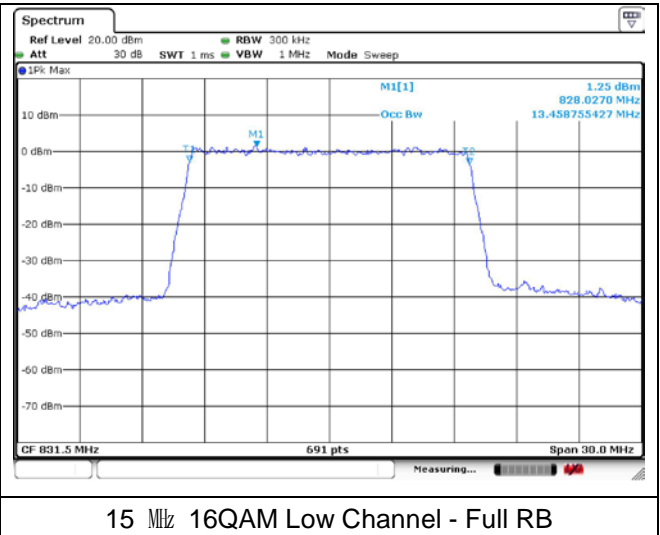
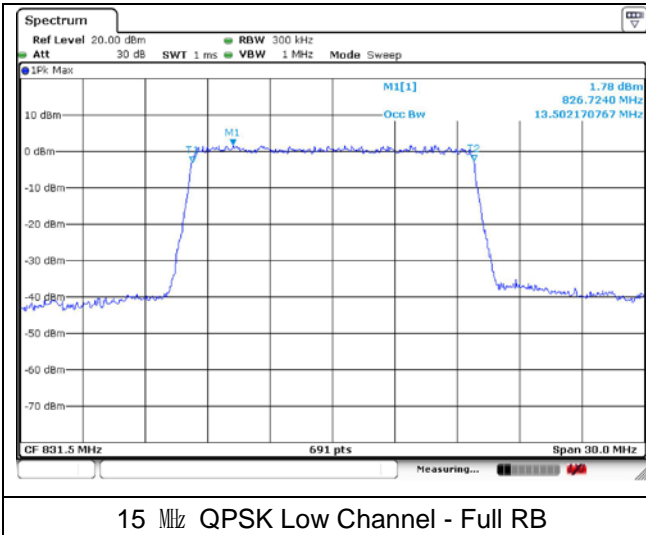


5 MHz 16QAM Middle Channel - Full RB

LTE band 26/5



LTE band 26



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 3

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 6

6.4, the transmitter's peak-to-average power ratio (PAPR) 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 3

6.5, 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 3

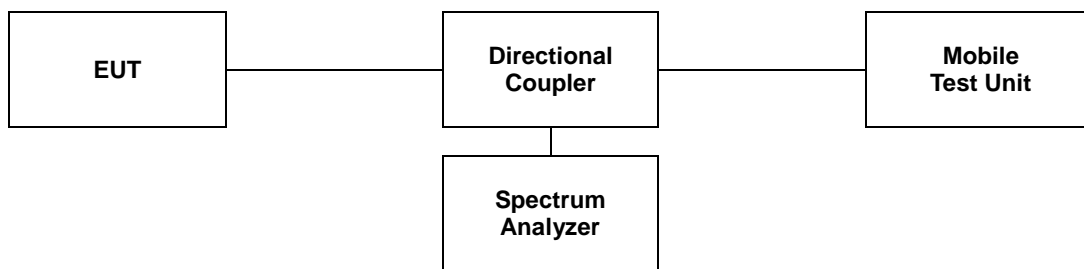
4.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

5.2. Test Procedure

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

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

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



5.3 Test Results

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

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
2	1.4	1 850.7	5.19	5.80
		1 880.0	5.25	5.91
		1 909.3	5.28	5.97
	3	1 851.5	4.78	5.68
		1 880.0	4.84	5.68
		1 908.5	4.87	5.88
	5	1 852.5	4.81	5.68
		1 880.0	4.81	5.74
		1 907.5	4.78	5.80
	10	1 855.0	4.75	5.65
		1 880.0	4.72	5.77
		1 905.0	4.81	5.74
	15	1 857.5	4.93	5.71
		1 880.0	4.90	5.68
		1 902.5	4.84	5.77
	20	1 860.0	4.75	5.83
		1 880.0	4.72	5.74
		1 900.0	4.78	5.77

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
4	1.4	1 710.7	5.19	5.80
		1 732.5	4.99	5.97
		1 754.3	5.28	5.94
	3	1 711.5	4.61	5.65
		1 732.5	4.87	5.83
		1 753.5	4.78	5.71
	5	1 712.5	4.75	5.68
		1 732.5	5.01	5.77
		1 752.5	4.84	5.68
	10	1 715.0	4.75	5.65
		1 732.5	4.81	5.77
		1 750.0	4.75	5.59
	15	1 717.5	4.84	5.80
		1 732.5	5.01	5.77
		1 747.5	4.75	5.54
20	1 720.0	4.93	5.80	
	1 732.5	4.90	5.77	
	1 745.0	4.58	5.42	

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
7	5	2 502.5	4.99	6.03
		2 535.0	4.90	5.88
		2 567.5	5.01	5.97
	10	2 505.0	5.04	5.83
		2 535.0	4.90	5.88
		2 565.0	4.99	5.97
	15	2 507.5	5.07	6.00
		2 535.0	5.01	5.94
		2 562.5	5.13	5.97
	20	2 510.0	4.99	5.94
		2 535.0	4.93	5.88
		2 560.0	4.87	5.77

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
12	1.4	699.7	5.45	6.03
		707.5	5.48	6.06
		715.3	5.42	5.94
	3	700.5	4.87	5.97
		707.5	4.99	6.03
		714.5	4.75	5.88
	5	701.5	4.90	5.83
		707.5	5.07	5.91
		713.5	5.01	5.86
	10	704.0	5.01	5.86
		707.5	5.04	5.94
		711.0	4.87	5.94

Band	Bandwidth (MHz)	Frequency (MHz)	PAR (dB)	
			QPSK	16QAM
26/5	1.4	824.7	5.16	6.00
		836.5	5.28	5.86
		848.3	4.99	5.83
	3	825.5	4.87	5.88
		836.5	4.78	5.74
		847.5	4.72	5.91
	5	826.5	4.75	5.77
		836.5	4.81	5.74
		846.5	4.99	5.86
	10	829.0	4.90	5.77
		836.5	4.96	5.83
		844.0	4.87	5.86
26	15	831.5	4.99	5.77
		841.5	5.19	6.00