

# TEST REPORT

of

FCC Part 2 Subpart J, Part 22 Subpart C/H,  
Part 24 Subpart E, Part 27 Subpart C and Part 90 Subpart R  
IC RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6,  
RSS-139 Issue 3, RSS-140 Issue 1,  
RSS-199 Issue 3 and RSS-Gen Issue 5

FCC ID: BEJTM05FNNAGM0  
IC Certification: 2703H-TM05FNNAGM0

Equipment Under Test : Telematics Module  
Model Name : TM05FNNAGM0  
Variant Model Name(s) : TM05FNNAGM1  
Applicant : FCC: LG Electronics USA  
: IC: LG ELECTRONICS INC.  
Manufacturer : LG Electronics Inc.  
Date of Receipt : 2022.07.22  
Date of Test(s) : 2022.07.25 ~ 2023.02.16  
Date of Issue : 2023.02.16

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

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
- 3) This test report cannot be reproduced, except in full, without prior written permission of the Company.
- 4) The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

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

Tested by:

Teo 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 Emissions -----	11
3. Conducted Output Power -----	26
4. Occupied Bandwidth -----	41
5. Peak-Average Ratio -----	56
6. Spurious Emissions at Antenna Terminal -----	74
7. Band Edge and Emission Mask -----	85
8. Frequency Stability -----	153

## 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

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

Phone No. : +82 31 688 0901  
 Fax No. : +82 31 688 0921

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

### 1.4. Description of EUT

<b>Kind of Product</b>	Telematics Module
<b>Model Name</b>	TM05FNNAGM0
<b>Variant Model Name</b>	TM05FNNAGM1
<b>Serial Number</b>	Conducted: 351015130056680 Radiated: 351015130065751
<b>Power Supply</b>	DC 3.90 V
<b>Rated Power</b>	LTE Band 2, 7, 13, 14: 24 dB m LTE Band 5, 12: 24.2 dB m LTE Band 4, 66: 23.5 dB m
<b>Frequency Range</b>	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 14: 788 MHz ~ 798 MHz LTE Band 66: 1 710 MHz ~ 1 780 MHz
<b>Modulation Technique</b>	QPSK, 16QAM, 64QAM
<b>Antenna Type</b>	External Antenna
<b>Antenna Gain*</b>	Refer to the clause 1.14
<b>H/W Version</b>	REV.D
<b>S/W Version</b>	SW168
<b>FVIN</b>	N/A

### 1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMA100B	106887	Oct. 13, 2022	Annual	Oct. 13, 2023
Signal Generator	R&S	SMBV100A	255834	May 25, 2022	Annual	May 25, 2023
Spectrum Analyzer	R&S	FSV30	103210	Dec. 07, 2022	Annual	Dec. 07, 2023
Spectrum Analyzer	Agilent	N9020A	MY53421758	Aug. 26, 2022	Annual	Aug. 26, 2023
Mobile Test Unit	R&S	CMW 500	144034	Feb. 21, 2022	Annual	Feb. 21, 2023
Communication Analyzer	Anritsu	MT8821C	6262192291	Oct. 11, 2022	Annual	Oct. 11, 2023
Power Meter	Anritsu	ML2495A	1223004	Nov. 29, 2022	Annual	Nov. 29, 2023
Power Sensor	Anritsu	MA2411B	1207272	May 27, 2022	Annual	May 27, 2023
Temperature Chamber	ESPEC CORP.	SH-662	93000533	Jun. 02, 2022	Annual	Jun. 02, 2023
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-1	May 13, 2022	Annual	May 13, 2023
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000-40SS	7	Mar. 04, 2022	Annual	Mar. 04, 2023
High Pass Filter	Wainwright Instrument GmbH	WHKX2.2/12.75G-10SS	8	Mar. 04, 2022	Annual	Mar. 04, 2023
High Pass Filter	Wainwright Instrument GmbH	WHKX3.0/18G-6SS	21	Jun. 09, 2022	Annual	Jun. 09, 2023
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	11	Oct. 24, 2022	Annual	Oct. 24, 2023
BRIDGE COUPLER	MARKI MICROWAVE INC	CBR16-0012	1542	May 06, 2022	Annual	May 06, 2023
Directional Coupler	KRYTAR	152613	122660	Jul. 06, 2022	Annual	Jul. 06, 2023
DC Power Supply	Agilent	U8002A	MY49030063	Jan. 20, 2023	Annual	Jan. 20, 2024
Preamplifier	H.P.	8447F	2944A03909	Aug. 04, 2022	Annual	Aug. 04, 2023
Preamplifier	R&S	SCU 18	10117	Jun. 13, 2022	Annual	Jun. 13, 2023
Preamplifier	TESTEK	TK-PA1840H	130016	Jan. 11, 2023	Annual	Jan. 11, 2024
Test Receiver	R&S	ESCI 7	100911	Feb. 23, 2022	Annual	Feb. 23, 2023
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 23, 2021	Biennial	Aug. 23, 2023
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	Feb. 09, 2023	Annual	Feb. 09, 2024
Horn Antenna	R&S	HF906	100326	Feb. 18, 2022	Annual	Feb. 18, 2023
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA 9170	9170-540	Nov. 30, 2022	Annual	Nov. 30, 2023
Antenna Master	Innco systems GmbH	MA4640-XP-ET	MA4640/536/383 30516/L	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/383 30516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	MWX221-NMSNMS (4 m)	J1023142	Oct. 04, 2022	Semi-Annual	Apr. 04, 2023
Coaxial Cable	Qualwave Inc.	QA500-18-NN-10 (10 m)	22200114	Oct. 04, 2022	Semi-Annual	Apr. 04, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182287	Aug. 18, 2022	Semi-Annual	Feb. 18, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182288	Aug. 18, 2022	Semi-Annual	Feb. 18, 2023
Coaxial Cable	RADIALL	TESTPRO 3	182291	Aug. 18, 2022	Semi-Annual	Feb. 18, 2023

**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:

<b>APPLIED STANDARD: FCC Part 2, 22, 24, 27 and 90 / IC RSS-Gen Issue 5, RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3, RSS-140 Issue 1 and RSS-199 Issue 3</b>			
Section in FCC	Section in IC	Test Item(s)	Result
§2.1046 §22.913(a)(5) §24.232(c) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) §27.50(h)(2) §90.542(a)(7)	RSS-130 Issue 2 4.6 RSS-132 Issue 3 5.4 RSS-133 Issue 6 6.4 RSS-139 Issue 3 6.5 RSS-140 Issue 1 4.3 RSS-199 Issue 3 4.4	E.R.P. / E.I.R.P.	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(f) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.543(e) §90.543(f)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-140 Issue 1 4.4 RSS-199 Issue 3 4.5	Radiated Spurious Emissions	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 RSS-132 Issue 3 5.4 RSS-133 Issue 6 6.4 RSS-139 Issue 3 6.5 RSS-140 Issue 1 4.3 RSS-199 Issue 3 4.4	Peak-Average Ratio	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.543(e)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-140 Issue 1 4.4 RSS-199 Issue 3 4.5	Spurious Emission at Antenna Terminal	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(c)(4) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.543(e)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-140 Issue 1 4.4 RSS-199 Issue 3 4.5	Band Edge and Emission Mask	Complied
§2.1055 §22.355 §24.235 §27.54 §90.213(a)	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-140 Issue 1 4.2 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 $\mu$ 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 4 (1 710 MHz ~ 1 755 MHz) is covered by LTE Band 66 (1 710 MHz ~ 1 780 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 4 as well as Band 66.

## 1.9. Manufacturer Declaration

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

## 1.10. Worst Case Configuration and Mode

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

The peak to average ratio were tested only 64QAM modulation as worst case.

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

### 1.11. Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation			RB #			
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	
Conducted Output Power	2	V	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	V	
	7	V	V	V			V	V	V	V	V	V	V	V	V	V	
	12	V	V	V	V	V	V	V			V	V	V	V	V	V	
	13	V	V	V			V	V			V	V	V	V	V	V	
	14	V	V	V			V	V			V	V	V	V	V	V	
	66/4	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
Frequency Stability	2	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V	
	5	-	V	-	-	-	V	-			V	-	-	-	-	V	
	7	-	V	-			V	-	-	-	V	-	-	-	-	V	
	12	-	V	-	-	-	V	-			V	-	-	-	-	V	
	13	-	V	-			V	-			V	-	-	-	-	V	
	14	-	V	-			V	-			V	-	-	-	-	V	
	66/4	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V	
Occupied Bandwidth	2	-	V	-	V	V	V	V	V	V	V	V	-	-	-	V	
	5	-	V	-	V	V	V	V			V	V	-	-	-	V	
	7	-	V	-			V	V	V	V	V	V	-	-	-	V	
	12	-	V	-	V	V	V	V			V	V	-	-	-	V	
	13	-	V	-			V	V			V	V	-	-	-	V	
	14	-	V	-			V	V			V	V	-	-	-	V	
	66/4	-	V	-	V	V	V	V	V	V	V	V	-	-	-	V	
Peak-to-Average Ratio	2	V	V	V	V	V	V	V	V	V	-	-	V	-	-	V	
	5	V	V	V	V	V	V	V			-	-	V	-	-	V	
	7	V	V	V			V	V	V	V	-	-	V	-	-	V	
	12	V	V	V	V	V	V	V			-	-	V	-	-	V	
	13	V	V	V			V	V			-	-	V	-	-	V	
	14	V	V	V			V	V			-	-	V	-	-	V	
	66/4	V	V	V	V	V	V	V	V	V	-	-	V	-	-	V	
Band edge	2	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	
	7	V	V	V			V	V	V	V	V	V	-	V	-	V	
	12	V	V	V	V	V	V	V			V	V	-	V	-	V	
	13	V	V	V			V	V			V	V	-	V	-	V	
	14	V	V	V			V	V			V	V	-	V	-	V	
	66/4	V	V	V	V	V	V	V	V	V	V	V	-	V	-	V	
Spurious at antenna terminal & Radiated Spurious Emissions	2	V	V	V	Worst case												
	5	V	V	V	Worst case												
	7	V	V	V	Worst case												
	12	V	V	V	Worst case												
	13	V	V	V	Worst case												
	14	V	V	V	Worst case												
	66/4	V	V	V	Worst case												

### 1.12. Measurement Uncertainty

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

Parameter	Uncertainty	
RF Output Power	0.32 dB	
Occupied Bandwidth	3.90 kHz	
Conducted Spurious Emissions	0.61 dB	
Peak to Average Ratio	0.60 dB	
Frequency Stability	5.97 kHz	
Radiated Emission, 9 kHz to 30 MHz	H	3.40 dB
	V	3.40 dB
Radiated Emission, below 1 GHz	H	4.50 dB
	V	5.10 dB
Radiated Emission, above 1 GHz	H	3.70 dB
	V	3.90 dB

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

### 1.13. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL003820	2023.02.16	Initial

### 1.14. Antenna Information

Band	Operating Frequency (MHz)	Antenna Peak Gain (dB i)
LTE 2	1 850 ~ 1 910	5.12
LTE 5	824 ~ 849	0.37
LTE 7	2 500 ~ 2 570	5.99
LTE 12	699 ~ 716	-1.05
LTE 13	777 ~ 787	-0.53
LTE 14	788 ~ 798	-0.53
LTE 66/4	1 710 ~ 1 780	5.54



### 1.15. 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	23.35	5.12	28.47	0.703	1M09G7D
		16QAM			22.68		27.80	0.603	1M10D7D
	3	QPSK	1 851.5	1 908.5	23.33		28.45	0.700	2M69G7D
		16QAM			22.78		27.90	0.617	2M70D7D
	5	QPSK	1 852.5	1 907.5	23.21		28.33	0.681	4M51G7D
		16QAM			22.62		27.74	0.594	4M49D7D
	10	QPSK	1 855	1 905	23.34		28.46	0.701	8M92G7D
		16QAM			22.56		27.68	0.586	8M95D7D
	15	QPSK	1 857.5	1 902.5	23.15		28.27	0.671	13M5G7D
		16QAM			22.56		27.68	0.586	13M5D7D
	20	QPSK	1 860	1 900	23.23		28.35	0.684	17M9G7D
		16QAM			22.57		27.69	0.587	17M9D7D
5	1.4	QPSK	824.7	848.3	24.81	0.37	23.03	0.201	1M09G7D
		16QAM			24.27		22.49	0.177	1M09D7D
	3	QPSK	825.5	847.5	24.86		23.08	0.203	2M69G7D
		16QAM			24.30		22.52	0.179	2M69D7D
	5	QPSK	826.5	846.5	24.91		23.13	0.206	4M49G7D
		16QAM			24.27		22.49	0.177	4M53D7D
	10	QPSK	829	844	24.90		23.12	0.205	8M92G7D
		16QAM			24.23		22.45	0.176	8M95D7D
7	5	QPSK	2 502.5	2 567.5	24.03	5.99	30.02	1.005	4M53G7D
		16QAM			23.46		29.45	0.881	4M51D7D
	10	QPSK	2 505	2 565	24.12		30.11	1.026	8M92G7D
		16QAM			23.53		29.52	0.895	8M95D7D
	15	QPSK	2 507.5	2 562.5	24.19		30.18	1.042	13M5G7D
		16QAM			23.78		29.77	0.948	13M4D7D
	20	QPSK	2 510	2 560	24.33		30.32	1.076	17M9G7D
		16QAM			23.70		29.69	0.931	17M9D7D
12	1.4	QPSK	699.7	715.3	24.87	-1.05	21.67	0.147	1M09G7D
		16QAM			24.25		21.05	0.127	1M09D7D
	3	QPSK	700.5	714.5	24.92		21.72	0.149	2M68G7D
		16QAM			24.38		21.18	0.131	2M69D7D
	5	QPSK	701.5	713.5	25.06		21.86	0.153	4M51G7D
		16QAM			24.41		21.21	0.132	4M51D7D
	10	QPSK	704	711	25.09		21.89	0.155	8M95G7D
		16QAM			24.45		21.25	0.133	8M95D7D

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		
13	5	QPSK	779.5	784.5	24.75	-0.53	22.07	0.161	4M53G7D		
		16QAM			24.17		21.49	0.141	4M49D7D		
	10	QPSK	782		24.66		21.98	0.158	8M92G7D		
		16QAM			23.97		21.29	0.135	8M92D7D		
	14	5	QPSK	790.5	795.5		24.98	-0.53	22.30	0.170	4M50G7D
			16QAM				24.40		21.72	0.149	4M51D7D
10		QPSK	793		24.99	22.31	0.170		8M95G7D		
		16QAM			24.48	21.80	0.151		8M93D7D		
66/4		1.4	QPSK	1 710.7	1 779.3	23.05	5.54		28.59	0.723	1M09G7D
			16QAM			22.52			28.06	0.640	1M09D7D
	3	QPSK	1 711.5	1 778.5	22.97	28.51		0.710	2M69G7D		
		16QAM			22.32	27.86		0.611	2M69D7D		
	5	QPSK	1 712.5	1 777.5	23.24	28.78		0.755	4M51G7D		
		16QAM			22.57	28.11		0.647	4M49D7D		
	10	QPSK	1 715	1 775	23.22	28.76		0.752	8M95G7D		
		16QAM			22.61	28.15		0.653	8M95D7D		
	15	QPSK	1 717.5	1 772.5	23.32	28.86		0.769	13M5G7D		
		16QAM			22.59	28.13		0.650	13M5D7D		
	20	QPSK	1 720	1 770	23.25	28.79		0.757	18M0G7D		
		16QAM			22.56	28.10		0.646	17M9D7D		

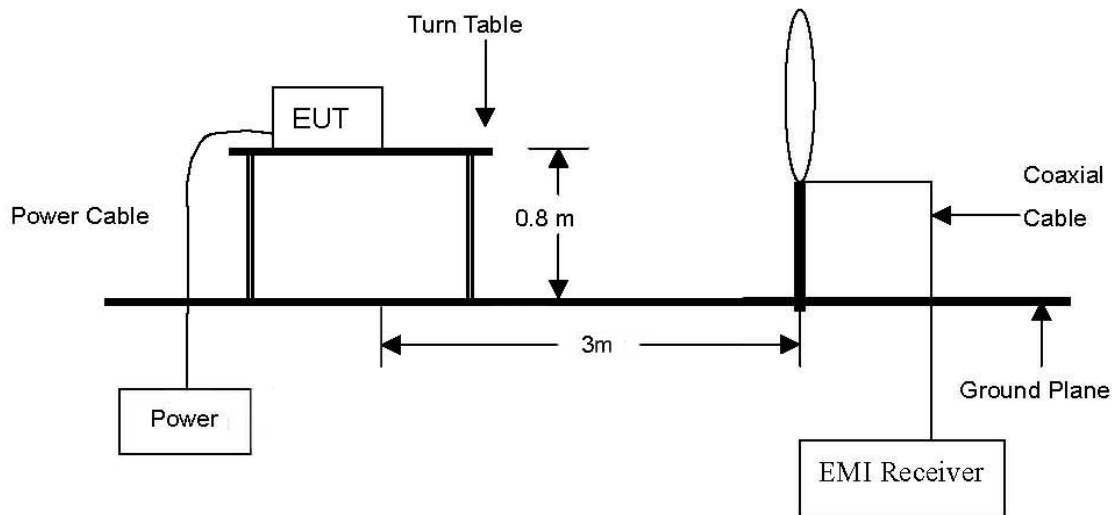
### 1.16. Information of Variant Model

Model Name		Description
Basic Model	TM05FNNAGM0	- Dual GNSS
Variant Model	TM05FNNAGM1	- Same RF circuit and PCB as basic model, except GNSS part - Single GNSS

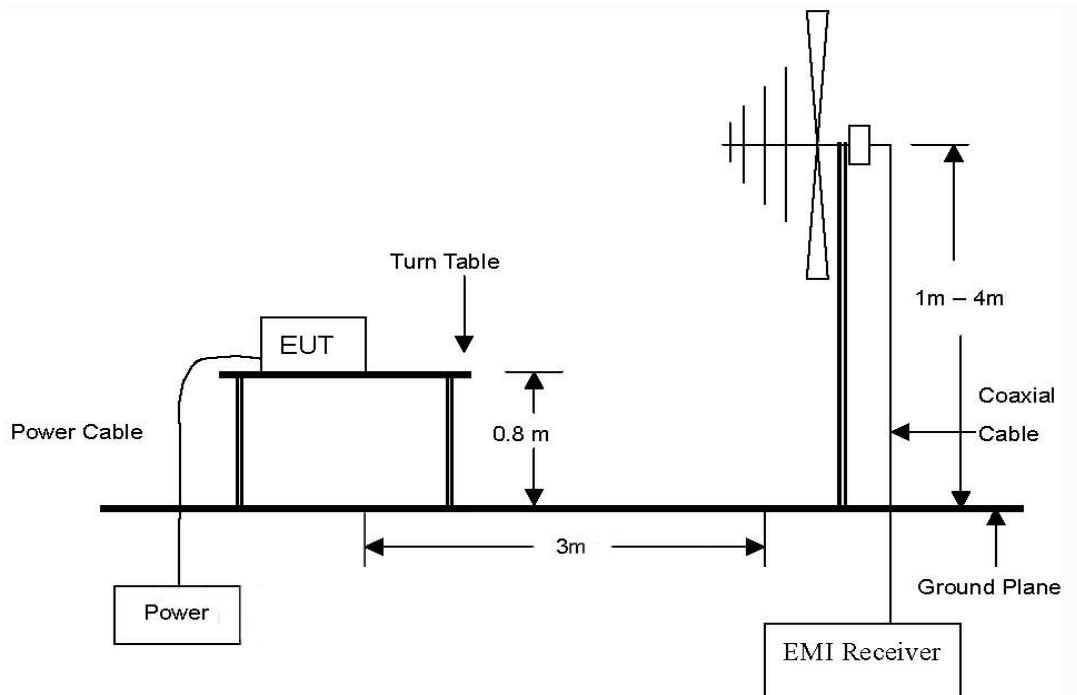
## 2. E.R.P. / E.I.R.P. & Radiated Spurious Emissions

### 2.1. Test setup

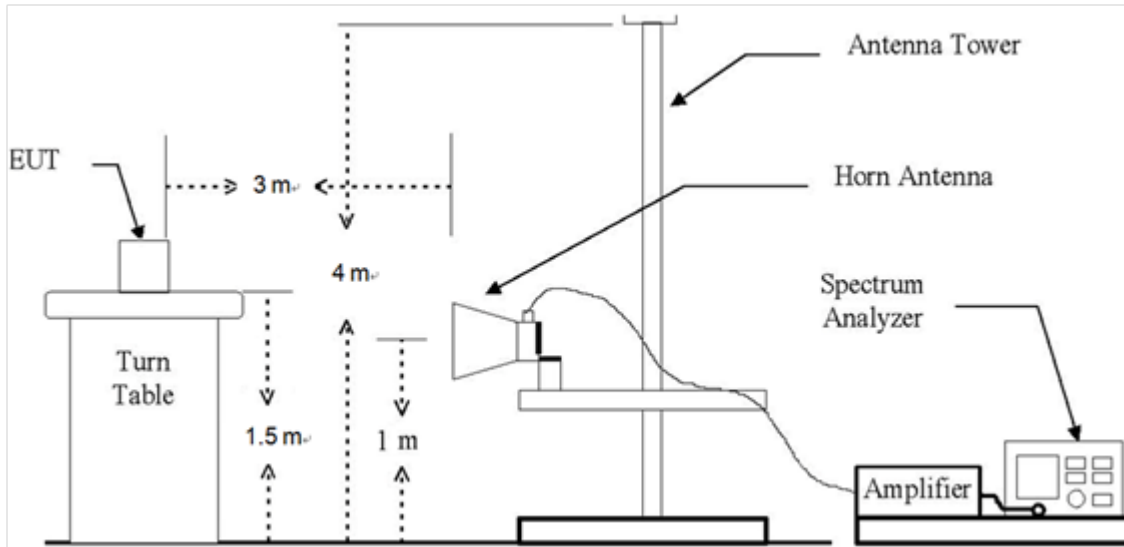
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz.



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



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



## 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)(10), Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.
- §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.
- §90.542(a)(7), Portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

#### 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. Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.
- 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-140 Issue 1  
4.3, The equivalent radiated power (e.r.p.) for control and mobile equipment shall not exceed 30 W. The e.r.p. for portable equipment including handheld devices shall not exceed 3 W.
- 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 Radiated Spurious Emissions

#### 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.
- §90.543(e), For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the 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, in accordance with the following:
  - (1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations.
  - (2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
  - (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log (P)$  dB.
  - (4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

- §90.543(f), For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics 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.

**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 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-140 Issue 1

4.4, The power of any unwanted emission outside the bands 758-768 MHz and 788-798 MHz shall be attenuated below the transmitter output power P in dB W as follows, where p is the transmitter output power in watts:

a) For any frequency between 769-775 MHz and 799-806 MHz:

i)  $76 + 10 \log(p)$ , dB in a 6.25 kHz band for fixed and base station equipment

ii)  $65 + 10 \log(p)$ , dB in a 6.25 kHz band for mobile and portable/hand-held equipment

b) For any frequency between 775-788 MHz, above 806 MHz, and below 758 MHz:  $43 + 10 \log(p)$ , dB in a bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency bands 758-768 MHz and 788-798 MHz, a resolution bandwidth of 30 kHz may be employed.

In addition, the equivalent isotropically radiated power (e.i.r.p.) of all emissions, including harmonics in the band 1 559-1 610 MHz, shall not exceed  $-70$  dB W /MHz for wideband emissions, and  $-80$  dB W /kHz for discrete emissions of less than 700 Hz bandwidth.

- 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:

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 (dB W), by at least  $43 + 10 \log_{10} p$  for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dB W), 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 2 490.5 MHz and 2 496 MHz, and  $55 + 10 \log_{10} p$  at or below 2 490.5 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 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 x RBW,  
Detector = RMS, trace mode = max hold, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
11. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
12. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

## 2.4. Test results

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

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

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 ~ 1 910	23.35	0.216	5.12	28.47	0.703			2 W E.I.R.P.
5	824 ~ 849	24.91	0.310	0.37	25.28	0.337	23.13	0.206	7 W E.R.P.
7	2 500 ~ 2 570	24.33	0.271	5.99	30.32	1.076			2 W E.I.R.P.
12	699 ~ 716	25.09	0.323	-1.05	24.04	0.254	21.89	0.155	3 W E.R.P.
13	777 ~ 787	24.75	0.299	-0.53	24.22	0.264	22.07	0.161	3 W E.R.P.
14	788 ~ 798	24.99	0.316	-0.53	24.46	0.279	22.31	0.170	3 W E.R.P.
66/4	1 710 ~ 1 780	23.32	0.215	5.54	28.86	0.769			1 W E.I.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 emissions

#### LTE band 2 (1.4 MHz - QPSK)

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 850.7 MHz)									
3 701.64	46.71	V	32.10	-31.98	46.83	-95.26	-48.43	-13	35.43
3 982.75	42.15	V	32.03	-31.23	42.95	-95.26	-52.31	-13	39.31
5 552.39	45.16	V	33.90	-28.40	50.66	-95.26	-44.60	-13	31.60
6 383.58	46.77	V	34.60	-25.69	55.68	-95.26	-39.58	-13	26.58
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (1 880.0 MHz)									
3 760.25	45.21	V	32.16	-31.96	45.41	-95.26	-49.85	-13	36.85
3 982.40	40.79	V	32.04	-31.23	41.60	-95.26	-53.66	-13	40.66
5 640.02	39.22	V	33.90	-27.55	45.57	-95.26	-49.69	-13	36.69
6 384.02	49.19	V	34.60	-25.69	58.10	-95.26	<b>-37.16</b>	-13	24.16
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-
High Channel (1 909.3 MHz)									
3 818.95	45.37	V	32.04	-31.53	45.88	-95.26	-49.38	-13	36.38
3 985.60	41.72	V	32.03	-31.25	42.50	-95.26	-52.76	-13	39.76
5 728.39	37.05	V	33.96	-27.36	43.65	-95.26	-51.61	-13	38.61
6 384.24	48.78	V	34.60	-25.69	57.69	-95.26	-37.57	-13	24.57
Above 6 400.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 5 (5 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.5 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (836.5 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
High Channel (846.5 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 7 (20 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 510.0 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (2 535.0 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-
High Channel (2 560.0 MHz)									
Below 1 000.00	Not detected	-	-	-	-	-	-	-	-
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 12 (10 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (704.0 MHz)									
2 125.21	64.17	H	27.55	-35.30	56.42	-97.41	-40.99	-13	27.99
2 152.22	65.22	V	27.60	-35.13	57.69	-97.41	-39.72	-13	26.72
Above 2 200.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (707.5 MHz)									
2 135.69	67.03	H	27.57	-35.24	59.36	-97.41	-38.05	-13	25.05
2 135.78	68.18	V	27.57	-35.24	60.51	-97.41	<b>-36.90</b>	-13	23.90
Above 2 200.00	Not detected	-	-	-	-	-	-	-	-
High Channel (711.0 MHz)									
2 146.19	65.10	H	27.59	-35.19	57.50	-97.41	-39.91	-13	26.91
2 146.30	67.33	V	27.59	-35.18	59.74	-97.41	-37.67	-13	24.67
Above 2 200.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 13 (5 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.R.P./E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (779.5 MHz)									
1 554.73	58.48	H	25.32	-38.80	45.00	-97.41	-52.41	-13	39.41
1 554.71	57.39	V	25.32	-38.80	43.91	-97.41	-53.50	-13	40.50
2 332.16	53.07	H	27.80	-34.48	46.39	-97.41	-51.02	-13	38.02
2 331.94	52.63	V	27.80	-34.47	45.96	-97.41	-51.45	-13	38.45
3 886.68	42.36	V	32.17	-31.29	43.24	-97.41	-54.17	-13	41.17
Above 3 900.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (782.0 MHz)									
1 559.70	59.15	H	25.34	-38.77	45.72	-95.26	-49.54	-40	9.54
1 559.57	59.86	V	25.34	-38.77	46.43	-95.26	<b>-48.83</b>	-40	8.83
2 339.50	53.67	H	27.80	-34.53	46.94	-97.41	-50.47	-13	37.47
2 339.47	55.52	V	27.80	-34.53	48.79	-97.41	-48.62	-13	35.62
3 898.95	43.75	V	32.20	-31.48	44.47	-97.41	-52.94	-13	39.94
Above 3 900.00	Not detected	-	-	-	-	-	-	-	-
High Channel (784.5 MHz)									
1 564.82	57.21	H	25.36	-38.75	43.82	-95.26	-51.44	-40	11.44
1 564.78	58.28	V	25.36	-38.75	44.89	-95.26	-50.37	-40	10.37
2 347.09	55.04	H	27.80	-34.58	48.26	-97.41	-49.15	-13	36.15
2 346.88	58.41	V	27.80	-34.58	51.63	-97.41	-45.78	-13	32.78
3 912.07	43.79	V	32.18	-31.66	44.31	-97.41	-53.10	-13	40.10
Above 4 000.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 14 (10 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.R.P./E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Middle Channel (793.0 MHz)									
1 586.27	62.09	H	25.45	-38.65	48.89	-95.26	<b>-46.37</b>	-40	6.37
1 586.12	57.25	V	25.44	-38.65	44.04	-95.26	-51.22	-40	11.22
2 379.16	54.27	H	27.97	-34.56	47.68	-97.41	-49.73	-13	36.73
2 379.39	55.67	V	27.98	-34.56	49.09	-97.41	-48.32	-13	35.32
3 965.31	46.25	V	32.07	-31.28	47.04	-97.41	-50.37	-13	37.37
Above 4 000.00	Not detected	-	-	-	-	-	-	-	-

**LTE band 66/4 (15 MHz - QPSK)**

Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 717.5 MHz)									
3 448.37	68.32	H	31.09	-36.75	62.66	-95.26	-32.60	-13	19.60
3 448.36	74.08	V	31.09	-36.75	68.42	-95.26	-26.84	-13	13.84
5 172.45	56.00	H	33.39	-35.33	54.06	-95.26	-41.20	-13	28.20
5 172.49	62.52	V	33.39	-35.33	60.58	-95.26	-34.68	-13	21.68
6 986.67	67.48	H	35.47	-33.06	69.89	-95.26	-25.37	-13	12.37
6 896.49	75.98	V	35.30	-33.52	77.76	-95.26	<b>-17.50</b>	-13	4.50
8 620.74	66.34	H	36.64	-33.89	69.09	-95.26	-26.17	-13	13.17
8 620.75	71.39	V	36.64	-33.89	74.14	-95.26	-21.12	-13	8.12
10 344.82	55.82	H	37.80	-30.66	62.96	-95.26	-32.30	-13	19.30
10 344.93	60.83	V	37.80	-30.66	67.97	-95.26	-27.29	-13	14.29
12 068.90	57.44	H	38.50	-29.87	66.07	-95.26	-29.19	-13	16.19
12 068.85	58.69	V	38.50	-29.87	67.32	-95.26	-27.94	-13	14.94
13 793.23	44.45	H	40.50	-28.52	56.43	-95.26	-38.83	-13	25.83
13 793.38	46.94	V	40.50	-28.52	58.92	-95.26	-36.34	-13	23.34
15 517.44	49.89	H	40.03	-25.47	64.45	-95.26	-30.81	-13	17.81
15 517.38	50.47	V	40.03	-25.47	65.03	-95.26	-30.23	-13	17.23
17 241.62	44.63	H	42.48	-24.26	62.85	-95.26	-32.41	-13	19.41
17 241.62	43.07	V	42.48	-24.26	61.29	-95.26	-33.97	-13	20.97
Above 17 300.00	Not detected	-	-	-	-	-	-	-	-



Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Middle Channel (1 745.0 MHz)									
3 503.31	53.77	H	31.09	-36.68	48.18	-95.26	-47.08	-13	34.08
3 503.29	65.92	V	31.09	-36.68	60.33	-95.26	-34.93	-13	21.93
5 255.06	56.17	H	33.62	-35.06	54.73	-95.26	-40.53	-13	27.53
5 254.86	63.67	V	33.62	-35.07	62.22	-95.26	-33.04	-13	20.04
7 006.58	54.38	H	35.50	-33.08	56.80	-95.26	-38.46	-13	25.46
7 006.71	62.30	V	35.50	-33.08	64.72	-95.26	-30.54	-13	17.54
8 758.48	47.25	H	37.02	-33.62	50.65	-95.26	-44.61	-13	31.61
8 758.32	51.26	V	37.02	-33.62	54.66	-95.26	-40.60	-13	27.60
10 509.72	48.10	H	37.70	-31.05	54.75	-95.26	-40.51	-13	27.51
10 510.13	49.21	V	37.70	-31.05	55.86	-95.26	-39.40	-13	26.40
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-
Frequency (MHz)	Measured Level (dB $\mu$ V)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB $\mu$ V/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
High Channel (1 772.5 MHz)									
3 558.28	51.90	H	31.05	-36.98	45.97	-95.26	-49.29	-13	36.29
3 558.32	60.85	V	31.05	-36.98	54.92	-95.26	-40.34	-13	27.34
5 337.59	53.17	H	33.88	-34.70	52.35	-95.26	-42.91	-13	29.91
5 337.49	58.35	V	33.87	-34.70	57.52	-95.26	-37.74	-13	24.74
7 116.40	45.48	H	35.60	-32.98	48.10	-95.26	-47.16	-13	34.16
7 116.43	52.82	V	35.60	-32.98	55.44	-95.26	-39.82	-13	26.82
8 895.54	40.97	H	37.11	-33.12	44.96	-95.26	-50.30	-13	37.30
8 895.77	44.03	V	37.11	-33.12	48.02	-95.26	-47.24	-13	34.24
Above 8 900.00	Not detected	-	-	-	-	-	-	-	-

**Remark;**

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dB $\mu$ V/m) = Measured Level (dB $\mu$ V) + Antenna Factor (dB/m) + AMP (dB) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dB $\mu$ V/m) + CF (dB).
4. E.R.P. (dB m) = E (dB $\mu$ V/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 10<sup>th</sup> 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

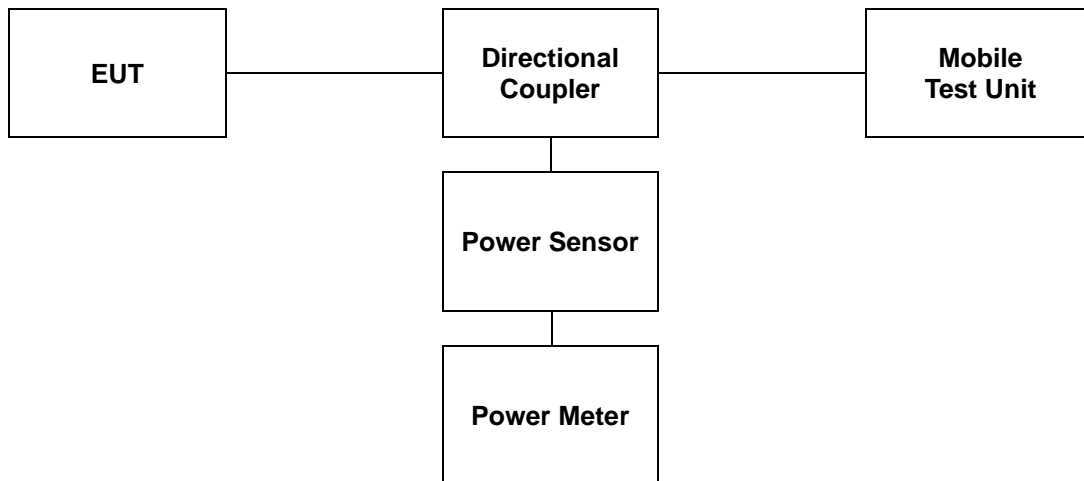
#### 3.1. Limit

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										
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power						
				18607 (1 850.7 MHz)		18900 (1 880.0 MHz)		19193 (1 909.3 MHz)		
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	
1.4	QPSK	1	0	22.78	0.190	23.30	0.214	22.66	0.185	
		1	3	22.87	0.194	<b>23.35</b>	<b>0.216</b>	22.81	0.191	
		1	5	22.74	0.188	23.29	0.213	22.76	0.189	
		3	0	22.77	0.189	23.30	0.214	22.68	0.185	
		3	2	22.81	0.191	23.34	0.216	22.76	0.189	
		3	3	22.74	0.188	23.29	0.213	22.87	0.194	
	16QAM	6	0	21.81	0.152	22.38	0.173	21.93	0.156	
		1	0	22.04	0.160	22.65	0.184	21.98	0.158	
		1	3	22.15	0.164	<b>22.68</b>	<b>0.185</b>	21.95	0.157	
		1	5	22.06	0.161	22.68	0.185	21.92	0.156	
		3	0	21.83	0.152	22.46	0.176	21.65	0.146	
		3	2	21.89	0.155	22.51	0.178	21.64	0.146	
	64QAM	3	3	21.82	0.152	22.49	0.177	21.64	0.146	
		6	0	20.90	0.123	21.42	0.139	21.57	0.144	
		1	0	21.44	0.139	21.23	0.133	21.40	0.138	
		1	3	<b>21.53</b>	<b>0.142</b>	21.35	0.136	21.40	0.138	
		1	5	21.49	0.141	21.36	0.137	21.48	0.141	
		3	0	21.39	0.138	21.15	0.130	21.32	0.136	
	3	QPSK	3	2	21.38	0.137	21.33	0.136	21.41	0.138
			3	3	21.34	0.136	21.16	0.131	21.38	0.137
			6	0	20.25	0.106	20.14	0.103	20.29	0.107
			1	0	23.31	0.214	23.00	0.200	23.04	0.201
			1	7	23.32	0.215	22.99	0.199	23.01	0.200
			1	14	<b>23.33</b>	<b>0.215</b>	23.13	0.206	23.04	0.201
16QAM		8	0	22.37	0.173	22.02	0.159	22.12	0.163	
		8	4	22.38	0.173	22.14	0.164	22.10	0.162	
		8	7	22.34	0.171	22.14	0.164	22.12	0.163	
		15	0	22.32	0.171	22.14	0.164	22.13	0.163	
		1	0	22.65	0.184	22.24	0.167	22.34	0.171	
		1	7	<b>22.78</b>	<b>0.190</b>	22.46	0.176	22.24	0.167	
64QAM	1	14	22.77	0.189	22.44	0.175	22.42	0.175		
	8	0	21.36	0.137	21.11	0.129	21.16	0.131		
	8	4	21.39	0.138	21.19	0.132	21.21	0.132		
	8	7	21.40	0.138	21.16	0.131	21.16	0.131		
	15	0	21.32	0.136	21.10	0.129	21.16	0.131		
	1	0	21.40	0.138	21.30	0.135	20.52	0.113		
64QAM	1	7	21.51	0.142	21.39	0.138	20.41	0.110		
	1	14	<b>21.62</b>	<b>0.145</b>	21.40	0.138	20.50	0.112		
	8	0	20.31	0.107	20.11	0.103	19.47	0.089		
	8	4	20.39	0.109	20.21	0.105	19.54	0.090		
	8	7	20.35	0.108	20.18	0.104	19.56	0.090		
	15	0	20.33	0.108	20.15	0.104	19.48	0.089		

LTE Band 2									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				18625 (1 852.5 MHz)		18900 (1 880.0 MHz)		19175 (1 907.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	23.18	0.208	22.92	0.196	22.89	0.195
		1	12	23.18	0.208	23.02	0.200	22.95	0.197
		1	24	<b>23.21</b>	<b>0.209</b>	23.07	0.203	22.98	0.199
		12	0	22.25	0.168	21.99	0.158	21.99	0.158
		12	6	22.27	0.169	22.11	0.163	22.04	0.160
		12	13	22.27	0.169	22.06	0.161	22.08	0.161
	25	0	22.25	0.168	22.10	0.162	22.01	0.159	
	16QAM	1	0	22.54	0.179	22.30	0.170	22.22	0.167
		1	12	22.53	0.179	22.37	0.173	22.34	0.171
		1	24	<b>22.62</b>	<b>0.183</b>	22.47	0.177	22.45	0.176
		12	0	21.28	0.134	21.06	0.128	21.09	0.129
		12	6	21.36	0.137	21.17	0.131	21.05	0.127
		12	13	21.34	0.136	21.13	0.130	21.12	0.129
	25	0	21.32	0.136	21.15	0.130	21.04	0.127	
	64QAM	1	0	21.35	0.136	21.33	0.136	20.41	0.110
		1	12	21.52	0.142	21.34	0.136	20.46	0.111
		1	24	<b>21.63</b>	<b>0.146</b>	21.42	0.139	20.56	0.114
		12	0	20.34	0.108	20.15	0.104	19.35	0.086
12		6	20.33	0.108	20.20	0.105	19.43	0.088	
12		13	20.33	0.108	20.17	0.104	19.51	0.089	
25	0	20.33	0.108	20.16	0.104	19.36	0.086		

LTE Band 2									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				18650 (1 855.0 MHz)		18900 (1 880.0 MHz)		19150 (1 905.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	<b>23.34</b>	<b>0.216</b>	23.09	0.204	22.94	0.197
		1	25	23.10	0.204	22.99	0.199	23.00	0.200
		1	49	23.20	0.209	23.08	0.203	22.99	0.199
		25	0	22.22	0.167	22.03	0.160	22.03	0.160
		25	12	22.21	0.166	22.14	0.164	22.02	0.159
		25	25	22.24	0.167	22.11	0.163	22.11	0.163
	50	0	22.22	0.167	22.12	0.163	22.02	0.159	
	16QAM	1	0	<b>22.56</b>	<b>0.180</b>	22.35	0.172	22.23	0.167
		1	25	22.49	0.177	22.26	0.168	22.36	0.172
		1	49	22.49	0.177	22.45	0.176	22.33	0.171
		25	0	21.27	0.134	21.04	0.127	21.06	0.128
		25	12	21.28	0.134	21.15	0.130	21.08	0.128
		25	25	21.28	0.134	21.13	0.130	21.18	0.131
	50	0	21.25	0.133	21.16	0.131	21.06	0.128	
	64QAM	1	0	21.08	0.128	21.29	0.135	20.81	0.121
		1	25	21.47	0.140	21.31	0.135	20.42	0.110
		1	49	21.40	0.138	<b>21.49</b>	<b>0.141</b>	20.53	0.113
		25	0	20.34	0.108	20.15	0.104	19.44	0.088
25		12	20.34	0.108	20.19	0.104	19.38	0.087	
25		25	20.32	0.108	20.20	0.105	19.42	0.087	
50	0	20.25	0.106	20.18	0.104	19.34	0.086		

LTE Band 2									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				18675 (1 857.5 MHz)		18900 (1 880.0 MHz)		19125 (1 902.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	<b>23.15</b>	<b>0.207</b>	23.03	0.201	22.98	0.199
		1	36	23.09	0.204	22.94	0.197	22.90	0.195
		1	74	23.14	0.206	22.92	0.196	23.01	0.200
		36	0	22.25	0.168	22.03	0.160	22.03	0.160
		36	18	22.23	0.167	22.05	0.160	22.08	0.161
		36	37	22.23	0.167	22.11	0.163	22.13	0.163
		75	0	22.24	0.167	22.09	0.162	22.00	0.158
	16QAM	1	0	<b>22.56</b>	<b>0.180</b>	22.47	0.177	22.42	0.175
		1	36	22.52	0.179	22.40	0.174	22.39	0.173
		1	74	22.50	0.178	22.45	0.176	22.38	0.173
		36	0	21.25	0.133	21.07	0.128	21.04	0.127
		36	18	21.28	0.134	21.17	0.131	21.09	0.129
		36	37	21.27	0.134	21.17	0.131	21.16	0.131
	64QAM	1	0	<b>21.47</b>	<b>0.140</b>	21.43	0.139	21.16	0.131
		1	36	21.44	0.139	21.39	0.138	20.51	0.112
		1	74	21.37	0.137	21.32	0.136	20.44	0.111
		36	0	20.29	0.107	20.11	0.103	19.74	0.094
		36	18	20.30	0.107	20.15	0.104	19.52	0.090
36		37	20.33	0.108	20.21	0.105	19.42	0.087	
75		0	20.30	0.107	20.24	0.106	19.47	0.089	

LTE Band 2									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				18700 (1 860.0 MHz)		18900 (1 880.0 MHz)		19100 (1 900.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	<b>23.23</b>	<b>0.210</b>	23.02	0.200	23.15	0.207
		1	50	23.10	0.204	23.07	0.203	22.99	0.199
		1	99	23.07	0.203	23.11	0.205	23.01	0.200
		50	0	22.19	0.166	22.05	0.160	22.02	0.159
		50	25	22.22	0.167	22.14	0.164	22.16	0.164
		50	50	22.23	0.167	22.17	0.165	22.09	0.162
		100	0	22.21	0.166	22.13	0.163	22.14	0.164
	16QAM	1	0	<b>22.57</b>	<b>0.181</b>	22.43	0.175	22.34	0.171
		1	50	22.53	0.179	22.30	0.170	22.41	0.174
		1	99	22.41	0.174	22.38	0.173	22.36	0.172
		50	0	21.27	0.134	21.07	0.128	21.08	0.128
		50	25	21.28	0.134	21.15	0.130	21.16	0.131
		50	50	21.29	0.135	21.17	0.131	21.15	0.130
	64QAM	1	0	<b>21.50</b>	<b>0.141</b>	21.39	0.138	21.36	0.137
		1	50	21.44	0.139	21.31	0.135	20.81	0.121
		1	99	21.39	0.138	21.38	0.137	20.55	0.114
		50	0	20.29	0.107	20.17	0.104	20.11	0.103
		50	25	20.31	0.107	20.24	0.106	19.65	0.092
50		50	20.29	0.107	20.23	0.105	19.41	0.087	
100		0	20.26	0.106	20.23	0.105	19.56	0.090	

LTE Band 5									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20407 (824.7 MHz)		20525 (836.5 MHz)		20643 (848.3 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	24.72	0.296	24.64	0.291	24.69	0.294
		1	3	24.79	0.301	<b>24.81</b>	<b>0.303</b>	24.67	0.293
		1	5	24.65	0.292	24.67	0.293	24.61	0.289
		3	0	24.75	0.299	24.72	0.296	24.70	0.295
		3	2	24.78	0.301	24.79	0.301	24.68	0.294
		3	3	24.66	0.292	24.70	0.295	24.61	0.289
		6	0	23.85	0.243	23.82	0.241	23.74	0.237
	16QAM	1	0	24.15	0.260	24.04	0.254	24.06	0.255
		1	3	<b>24.27</b>	<b>0.267</b>	24.15	0.260	24.14	0.259
		1	5	24.11	0.258	24.07	0.255	23.98	0.250
		3	0	23.92	0.247	23.92	0.247	23.86	0.243
		3	2	23.98	0.250	23.93	0.247	23.90	0.245
		3	3	23.94	0.248	23.94	0.248	23.86	0.243
		6	0	22.92	0.196	22.89	0.195	22.83	0.192
	64QAM	1	0	23.05	0.202	22.98	0.199	22.24	0.167
		1	3	<b>23.13</b>	<b>0.206</b>	23.03	0.201	22.38	0.173
		1	5	22.99	0.199	23.00	0.200	22.37	0.173
		3	0	22.91	0.195	22.94	0.197	22.36	0.172
		3	2	22.99	0.199	23.01	0.200	22.55	0.180
		3	3	22.92	0.196	22.91	0.195	22.54	0.179
		6	0	21.88	0.154	21.91	0.155	21.38	0.137

LTE Band 5									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20415 (825.5 MHz)		20525 (836.5 MHz)		20635 (847.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	24.81	0.303	24.79	0.301	<b>24.86</b>	<b>0.306</b>
		1	7	24.80	0.302	24.81	0.303	24.69	0.294
		1	14	24.72	0.296	24.79	0.301	24.67	0.293
		8	0	23.92	0.247	23.85	0.243	23.89	0.245
		8	4	23.95	0.248	23.95	0.248	23.88	0.244
		8	7	23.86	0.243	23.86	0.243	23.83	0.242
		15	0	23.88	0.244	23.91	0.246	23.87	0.244
	16QAM	1	0	<b>24.30</b>	<b>0.269</b>	24.18	0.262	24.19	0.262
		1	7	24.27	0.267	24.14	0.259	24.04	0.254
		1	14	24.13	0.259	24.18	0.262	24.08	0.256
		8	0	23.01	0.200	22.91	0.195	22.97	0.198
		8	4	22.99	0.199	23.02	0.200	22.94	0.197
		15	0	22.93	0.196	22.94	0.197	22.93	0.196
	64QAM	1	0	23.14	0.206	23.06	0.202	22.32	0.171
		1	7	<b>23.16</b>	<b>0.207</b>	23.12	0.205	22.30	0.170
		1	14	22.99	0.199	23.10	0.204	22.44	0.175
		8	0	21.98	0.158	21.95	0.157	21.15	0.130
		8	4	21.96	0.157	22.03	0.160	21.31	0.135
		15	0	21.97	0.157	21.97	0.157	21.43	0.139

LTE Band 5									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20425 (826.5 MHz)		20525 (836.5 MHz)		20625 (846.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.89	0.308	24.83	0.304	24.87	0.307
		1	12	24.72	0.296	<b>24.91</b>	<b>0.310</b>	24.75	0.299
		1	24	24.77	0.300	24.80	0.302	24.68	0.294
		12	0	24.00	0.251	23.89	0.245	23.89	0.245
		12	6	23.95	0.248	23.93	0.247	23.88	0.244
		12	13	23.85	0.243	23.93	0.247	23.82	0.241
	25	0	23.93	0.247	23.92	0.247	23.85	0.243	
	16QAM	1	0	<b>24.27</b>	<b>0.267</b>	24.21	0.264	24.20	0.263
		1	12	24.15	0.260	24.25	0.266	24.12	0.258
		1	24	24.16	0.261	24.20	0.263	24.17	0.261
		12	0	22.98	0.199	22.96	0.198	22.94	0.197
		12	6	23.00	0.200	23.00	0.200	22.94	0.197
		12	13	22.91	0.195	23.00	0.200	22.88	0.194
	25	0	22.96	0.198	22.95	0.197	22.85	0.193	
	64QAM	1	0	23.19	0.208	23.17	0.207	22.40	0.174
		1	12	<b>23.35</b>	<b>0.216</b>	23.11	0.205	22.32	0.171
		1	24	23.13	0.206	23.13	0.206	22.41	0.174
		12	0	22.03	0.160	21.98	0.158	21.18	0.131
12		6	21.99	0.158	22.01	0.159	21.19	0.132	
12		13	21.91	0.155	22.00	0.158	21.27	0.134	
25	0	21.99	0.158	21.99	0.158	21.17	0.131		

LTE Band 5									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20450 (829.0 MHz)		20525 (836.5 MHz)		20600 (844.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	<b>24.90</b>	<b>0.309</b>	24.80	0.302	24.83	0.304
		1	25	24.70	0.295	24.88	0.308	24.67	0.293
		1	49	24.72	0.296	24.71	0.296	24.62	0.290
		25	0	23.98	0.250	23.88	0.244	23.82	0.241
		25	12	23.92	0.247	23.98	0.250	23.83	0.242
		25	25	23.80	0.240	23.89	0.245	23.78	0.239
	50	0	23.93	0.247	23.97	0.249	23.78	0.239	
	16QAM	1	0	<b>24.23</b>	<b>0.265</b>	24.18	0.262	24.16	0.261
		1	25	24.14	0.259	24.19	0.262	24.05	0.254
		1	49	24.13	0.259	24.12	0.258	24.13	0.259
		25	0	22.96	0.198	22.90	0.195	22.90	0.195
		25	12	22.96	0.198	22.96	0.198	22.91	0.195
		25	25	22.87	0.194	23.01	0.200	22.84	0.192
	50	0	22.92	0.196	23.03	0.201	22.77	0.189	
	64QAM	1	0	23.19	0.208	23.17	0.207	22.33	0.171
		1	25	<b>23.32</b>	<b>0.215</b>	23.03	0.201	22.28	0.169
		1	49	23.11	0.205	23.06	0.202	22.38	0.173
		25	0	21.98	0.158	21.96	0.157	21.10	0.129
25		12	21.94	0.156	22.05	0.160	21.14	0.130	
25		25	21.90	0.155	22.00	0.158	21.22	0.132	
50	0	21.97	0.157	21.96	0.157	21.11	0.129		

LTE Band 7									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20775 (2 502.5 MHz)		21100 (2 535.0 MHz)		21425 (2 567.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	<b>24.03</b>	<b>0.253</b>	24.02	0.252	23.83	0.242
		1	12	23.97	0.249	23.91	0.246	23.65	0.232
		1	24	23.96	0.249	23.97	0.249	23.51	0.224
		12	0	23.12	0.205	23.15	0.207	22.98	0.199
		12	6	23.10	0.204	23.06	0.202	23.01	0.200
		12	13	23.11	0.205	23.13	0.206	22.87	0.194
	25	0	23.09	0.204	23.06	0.202	22.86	0.193	
	16QAM	1	0	23.40	0.219	<b>23.46</b>	<b>0.222</b>	23.27	0.212
		1	12	23.22	0.210	23.25	0.211	23.12	0.205
		1	24	23.40	0.219	23.31	0.214	22.93	0.196
		12	0	22.22	0.167	22.10	0.162	22.08	0.161
		12	6	22.09	0.162	22.13	0.163	22.16	0.164
		12	13	22.12	0.163	22.09	0.162	22.09	0.162
	25	0	22.10	0.162	22.09	0.162	21.99	0.158	
	64QAM	1	0	23.13	0.206	<b>23.28</b>	<b>0.213</b>	23.15	0.207
		1	12	23.15	0.207	23.20	0.209	23.07	0.203
		1	24	23.22	0.210	23.22	0.210	22.92	0.196
		12	0	22.18	0.165	22.14	0.164	22.02	0.159
12		6	22.13	0.163	22.08	0.161	22.19	0.166	
12		13	22.15	0.164	22.06	0.161	22.08	0.161	
25	0	22.11	0.163	22.14	0.164	22.09	0.162		

LTE Band 7									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20800 (2 505.0 MHz)		21100 (2 535.0 MHz)		21400 (2 565.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	24.02	0.252	<b>24.12</b>	<b>0.258</b>	24.03	0.253
		1	25	24.04	0.254	24.11	0.258	23.83	0.242
		1	49	24.01	0.252	23.98	0.250	23.61	0.230
		25	0	23.13	0.206	23.24	0.211	23.16	0.207
		25	12	23.22	0.210	23.23	0.210	23.10	0.204
		25	25	23.19	0.208	23.21	0.209	22.96	0.198
	50	0	23.21	0.209	23.18	0.208	22.97	0.198	
	16QAM	1	0	23.39	0.218	<b>23.53</b>	<b>0.225</b>	23.47	0.222
		1	25	23.38	0.218	23.37	0.217	23.34	0.216
		1	49	23.48	0.223	23.38	0.218	23.06	0.202
		25	0	22.08	0.161	22.19	0.166	22.18	0.165
		25	12	22.23	0.167	22.22	0.167	22.20	0.166
		25	25	22.12	0.163	22.20	0.166	22.15	0.164
	50	0	22.30	0.170	22.24	0.167	22.19	0.166	
	64QAM	1	0	23.45	0.221	23.39	0.218	23.37	0.217
		1	25	23.47	0.222	<b>23.48</b>	<b>0.223</b>	23.25	0.211
		1	49	23.46	0.222	23.48	0.223	22.98	0.199
		25	0	22.16	0.164	22.20	0.166	22.19	0.166
25		12	22.33	0.171	22.21	0.166	22.24	0.167	
25		25	22.23	0.167	22.19	0.166	22.15	0.164	
50	0	22.22	0.167	22.32	0.171	22.11	0.163		



LTE Band 7									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20825 (2 507.5 MHz)		21100 (2 535.0 MHz)		21375 (2 562.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	24.08	0.256	<b>24.19</b>	<b>0.262</b>	24.18	0.262
		1	36	24.06	0.255	24.05	0.254	23.90	0.245
		1	74	24.10	0.257	23.96	0.249	23.62	0.230
		36	0	23.28	0.213	23.28	0.213	23.37	0.217
		36	18	23.35	0.216	23.28	0.213	23.32	0.215
		36	37	23.28	0.213	23.17	0.207	23.15	0.207
		75	0	23.28	0.213	23.24	0.211	23.23	0.210
	16QAM	1	0	23.50	0.224	23.55	0.226	<b>23.78</b>	<b>0.239</b>
		1	36	23.37	0.217	23.44	0.221	23.32	0.215
		1	74	23.51	0.224	23.48	0.223	23.04	0.201
		36	0	22.25	0.168	22.30	0.170	22.38	0.173
		36	18	22.32	0.171	22.26	0.168	22.42	0.175
		36	37	22.35	0.172	22.20	0.166	22.35	0.172
	64QAM	75	0	22.30	0.170	22.26	0.168	22.38	0.173
		1	0	23.60	0.229	23.36	0.217	<b>23.60</b>	<b>0.229</b>
		1	36	23.38	0.218	23.37	0.217	23.24	0.211
		1	74	23.37	0.217	23.20	0.209	23.01	0.200
		36	0	22.22	0.167	22.31	0.170	22.24	0.167
36		18	22.34	0.171	22.21	0.166	22.18	0.165	
36		37	22.25	0.168	22.20	0.166	22.27	0.169	
75	0	22.32	0.171	22.28	0.169	22.19	0.166		

LTE Band 7									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				20850 (2 510.0 MHz)		21100 (2 535.0 MHz)		21350 (2 560.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	24.30	0.269	24.27	0.267	<b>24.33</b>	<b>0.271</b>
		1	50	24.26	0.267	24.18	0.262	24.29	0.269
		1	99	24.30	0.269	24.20	0.263	23.93	0.247
		50	0	23.36	0.217	23.39	0.218	23.40	0.219
		50	25	23.42	0.220	23.38	0.218	23.54	0.226
		50	50	23.46	0.222	23.36	0.217	23.24	0.211
		100	0	23.46	0.222	23.44	0.221	23.43	0.220
	16QAM	1	0	23.60	0.229	23.65	0.232	<b>23.70</b>	<b>0.234</b>
		1	50	23.55	0.226	23.57	0.228	23.57	0.228
		1	99	23.55	0.226	23.56	0.227	23.28	0.213
		50	0	22.39	0.173	22.31	0.170	22.45	0.176
		50	25	22.52	0.179	22.45	0.176	22.49	0.177
		50	50	22.37	0.173	22.44	0.175	22.38	0.173
	64QAM	100	0	22.46	0.176	22.37	0.173	22.33	0.171
		1	0	22.18	0.165	<b>23.57</b>	<b>0.228</b>	22.66	0.185
		1	50	22.51	0.178	23.48	0.223	21.92	0.156
		1	99	22.53	0.179	23.44	0.221	21.65	0.146
		50	0	21.33	0.136	22.37	0.173	21.04	0.127
50		25	21.53	0.142	22.43	0.175	20.90	0.123	
50		50	21.46	0.140	22.30	0.170	20.74	0.119	
100	0	21.35	0.136	22.38	0.173	20.81	0.121		

LTE Band 12										
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power						
				23017 (699.7 MHz)		23095 (707.5 MHz)		23173 (715.3 MHz)		
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	
1.4	QPSK	1	0	24.80	0.302	24.74	0.298	24.78	0.301	
		1	3	<b>24.87</b>	<b>0.307</b>	24.72	0.296	24.74	0.298	
		1	5	24.78	0.301	24.73	0.297	24.73	0.297	
		3	0	24.84	0.305	24.74	0.298	24.73	0.297	
		3	2	24.85	0.305	24.84	0.305	24.72	0.296	
		3	3	24.82	0.303	24.82	0.303	24.72	0.296	
	16QAM	6	0	23.87	0.244	24.74	0.298	24.72	0.296	
		1	0	24.13	0.259	24.12	0.258	24.11	0.258	
		1	3	<b>24.25</b>	<b>0.266</b>	24.17	0.261	24.15	0.260	
		1	5	24.20	0.263	24.18	0.262	24.16	0.261	
		3	0	23.91	0.246	24.15	0.260	24.10	0.257	
		3	2	23.98	0.250	24.18	0.262	24.05	0.254	
	64QAM	3	3	23.91	0.246	24.22	0.264	24.09	0.256	
		6	0	22.98	0.199	24.11	0.258	24.08	0.256	
		1	0	23.05	0.202	23.11	0.205	23.01	0.200	
		1	3	<b>23.14</b>	<b>0.206</b>	23.09	0.204	23.02	0.200	
		1	5	23.01	0.200	23.04	0.201	22.96	0.198	
		3	0	23.02	0.200	23.10	0.204	22.99	0.199	
	1.4	64QAM	3	2	23.05	0.202	23.10	0.204	23.00	0.200
			3	3	23.00	0.200	23.08	0.203	23.00	0.200
			6	0	21.90	0.155	23.08	0.203	23.08	0.203

LTE Band 12										
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power						
				23025 (700.5 MHz)		23095 (707.5 MHz)		23165 (714.5 MHz)		
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)	
3	QPSK	1	0	<b>24.92</b>	<b>0.310</b>	24.87	0.307	24.79	0.301	
		1	7	24.91	0.310	24.82	0.303	24.74	0.298	
		1	14	24.90	0.309	24.82	0.303	24.75	0.299	
		8	0	24.90	0.309	23.95	0.248	24.71	0.296	
		8	4	24.86	0.306	24.01	0.252	24.72	0.296	
		8	7	24.87	0.307	23.90	0.245	24.69	0.294	
		15	0	23.93	0.247	23.99	0.251	24.70	0.295	
	16QAM	1	0	24.34	0.272	24.30	0.269	24.09	0.256	
		1	7	<b>24.38</b>	<b>0.274</b>	24.26	0.267	24.12	0.258	
		1	14	24.21	0.264	24.20	0.263	24.17	0.261	
		8	0	24.03	0.253	23.02	0.200	24.08	0.256	
		8	4	24.10	0.257	23.03	0.201	24.07	0.255	
		8	7	24.06	0.255	22.94	0.197	24.10	0.257	
	64QAM	15	0	23.00	0.200	22.99	0.199	24.07	0.255	
		1	0	23.22	0.210	23.27	0.212	22.99	0.199	
		1	7	<b>23.28</b>	<b>0.213</b>	23.19	0.208	23.04	0.201	
		1	14	23.18	0.208	23.12	0.205	22.94	0.197	
		8	0	23.09	0.204	21.98	0.158	23.00	0.200	
		8	4	23.10	0.204	22.04	0.160	23.00	0.200	
		8	7	23.04	0.201	21.99	0.158	22.98	0.199	
	3	64QAM	15	0	22.02	0.159	22.02	0.159	23.09	0.204

LTE Band 12									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				23035 (701.5 MHz)		23095 (707.5 MHz)		23155 (713.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.99	0.316	24.94	0.312	24.94	0.312
		1	12	<b>25.06</b>	<b>0.321</b>	25.03	0.318	24.87	0.307
		1	24	25.01	0.317	24.95	0.313	24.91	0.310
		12	0	25.00	0.316	24.95	0.313	24.04	0.254
		12	6	25.01	0.317	24.95	0.313	24.00	0.251
		12	13	24.98	0.315	24.94	0.312	24.00	0.251
	25	0	24.94	0.312	23.98	0.250	24.00	0.251	
	16QAM	1	0	24.30	0.269	24.29	0.269	24.25	0.266
		1	12	24.34	0.272	24.31	0.270	24.26	0.267
		1	24	24.38	0.274	<b>24.41</b>	<b>0.276</b>	24.23	0.265
		12	0	24.20	0.263	24.10	0.257	23.07	0.203
		12	6	24.18	0.262	24.12	0.258	23.01	0.200
		12	13	24.19	0.262	24.10	0.257	23.03	0.201
	25	0	24.07	0.255	23.06	0.202	23.02	0.200	
	64QAM	1	0	23.34	0.216	23.31	0.214	23.29	0.213
		1	12	23.34	0.216	23.32	0.215	23.40	0.219
		1	24	<b>23.41</b>	<b>0.219</b>	23.32	0.215	23.09	0.204
		12	0	23.20	0.209	23.12	0.205	22.09	0.162
12		6	23.18	0.208	23.12	0.205	22.07	0.161	
12		13	23.19	0.208	23.11	0.205	22.06	0.161	
25	0	23.12	0.205	22.09	0.162	22.05	0.160		

LTE Band 12									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				23060 (704.0 MHz)		23095 (707.5 MHz)		23130 (711.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	25.03	0.318	25.02	0.318	25.06	0.321
		1	25	25.01	0.317	24.93	0.311	25.03	0.318
		1	49	<b>25.09</b>	<b>0.323</b>	25.05	0.320	25.00	0.316
		25	0	25.02	0.318	24.93	0.311	25.04	0.319
		25	12	25.00	0.316	25.02	0.318	25.03	0.318
		25	25	25.08	0.322	25.00	0.316	24.98	0.315
	50	0	24.97	0.314	24.02	0.252	24.06	0.255	
	16QAM	1	0	24.40	0.275	24.42	0.277	24.31	0.270
		1	25	24.39	0.275	24.31	0.270	24.40	0.275
		1	49	<b>24.45</b>	<b>0.279</b>	24.34	0.272	24.28	0.268
		25	0	24.20	0.263	24.13	0.259	24.23	0.265
		25	12	24.07	0.255	24.16	0.261	24.13	0.259
		25	25	24.42	0.277	24.13	0.259	24.10	0.257
	50	0	24.10	0.257	23.02	0.200	23.11	0.205	
	64QAM	1	0	23.32	0.215	23.20	0.209	<b>23.39</b>	<b>0.218</b>
		1	25	23.20	0.209	23.11	0.205	23.33	0.215
		1	49	23.37	0.217	23.31	0.214	23.27	0.212
		25	0	23.31	0.214	23.15	0.207	23.12	0.205
25		12	23.20	0.209	23.15	0.207	23.16	0.207	
25		25	23.29	0.213	23.23	0.210	23.08	0.203	
50	0	23.21	0.209	22.09	0.162	22.07	0.161		

LTE Band 13									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				23205 (779.5 MHz)		23230 (782.0 MHz)		23255 (784.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	<b>24.75</b>	<b>0.299</b>	24.50	0.282	24.20	0.263
		1	12	24.57	0.286	24.49	0.281	24.16	0.261
		1	24	24.58	0.287	24.57	0.286	24.16	0.261
		12	0	23.65	0.232	23.65	0.232	24.16	0.261
		12	6	23.69	0.234	23.64	0.231	24.14	0.259
		12	13	23.86	0.243	23.65	0.232	24.15	0.260
	25	0	23.70	0.234	23.69	0.234	24.16	0.261	
	16QAM	1	0	23.91	0.246	23.89	0.245	<b>24.17</b>	<b>0.261</b>
		1	12	23.96	0.249	23.83	0.242	24.16	0.261
		1	24	23.92	0.247	23.95	0.248	24.15	0.260
		12	0	22.77	0.189	22.74	0.188	24.15	0.260
		12	6	22.75	0.188	22.75	0.188	24.16	0.261
		12	13	22.74	0.188	22.76	0.189	24.15	0.260
	25	0	22.79	0.190	22.72	0.187	24.16	0.261	
	64QAM	1	0	22.81	0.191	22.88	0.194	24.14	0.259
		1	12	22.79	0.190	22.87	0.194	<b>24.17</b>	<b>0.261</b>
		1	24	22.84	0.192	22.89	0.195	24.13	0.259
		12	0	21.75	0.150	21.78	0.151	24.16	0.261
12		6	21.81	0.152	21.78	0.151	24.13	0.259	
12		13	21.76	0.150	21.78	0.151	24.13	0.259	
25	0	21.79	0.151	21.76	0.150	24.13	0.259		

LTE Band 13									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
						23230 (782.0 MHz)			
						(dB m)	(W)		
10	QPSK	1	0	-	-	24.65	0.292	-	-
		1	25	-	-	<b>24.66</b>	<b>0.292</b>	-	-
		1	49	-	-	24.64	0.291	-	-
		25	0	-	-	23.72	0.236	-	-
		25	12	-	-	23.73	0.236	-	-
		25	25	-	-	23.70	0.234	-	-
	50	0	-	-	23.72	0.236	-	-	
	16QAM	1	0	-	-	<b>23.97</b>	<b>0.249</b>	-	-
		1	25	-	-	23.92	0.247	-	-
		1	49	-	-	23.87	0.244	-	-
		25	0	-	-	22.77	0.189	-	-
		25	12	-	-	22.77	0.189	-	-
		25	25	-	-	22.74	0.188	-	-
	50	0	-	-	22.73	0.187	-	-	
	64QAM	1	0	-	-	<b>23.00</b>	<b>0.200</b>	-	-
		1	25	-	-	22.96	0.198	-	-
		1	49	-	-	22.98	0.199	-	-
		25	0	-	-	21.77	0.150	-	-
25		12	-	-	21.77	0.150	-	-	
25		25	-	-	21.80	0.151	-	-	
50	0	-	-	21.74	0.149	-	-		

LTE Band 14									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				23305 (790.5 MHz)		23330 (793.0 MHz)		23355 (795.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	24.88	0.308	24.90	0.309	24.95	0.313
		1	12	24.92	0.310	<b>24.98</b>	<b>0.315</b>	24.98	0.315
		1	24	24.90	0.309	24.87	0.307	24.78	0.301
		12	0	24.11	0.258	23.93	0.247	23.94	0.248
		12	6	24.09	0.256	24.00	0.251	24.04	0.254
		12	13	23.98	0.250	23.97	0.249	23.95	0.248
		25	0	24.00	0.251	23.95	0.248	23.91	0.246
	16QAM	1	0	24.30	0.269	24.26	0.267	<b>24.40</b>	<b>0.275</b>
		1	12	24.27	0.267	24.27	0.267	24.22	0.264
		1	24	24.32	0.270	24.18	0.262	24.10	0.257
		12	0	23.06	0.202	22.95	0.197	23.01	0.200
		12	6	23.14	0.206	23.05	0.202	23.02	0.200
		12	13	23.03	0.201	22.92	0.196	22.94	0.197
	64QAM	25	0	23.08	0.203	22.92	0.196	22.96	0.198
		1	0	23.13	0.206	23.12	0.205	23.06	0.202
		1	12	23.10	0.204	23.15	0.207	<b>23.19</b>	<b>0.208</b>
		1	24	23.16	0.207	23.10	0.204	23.07	0.203
		12	0	22.14	0.164	21.98	0.158	22.01	0.159
		12	6	22.15	0.164	22.07	0.161	22.02	0.159
		12	13	22.05	0.160	22.07	0.161	21.98	0.158
	25	0	22.03	0.160	21.99	0.158	21.90	0.155	

LTE Band 14									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
						23330 (793.0 MHz)			
						(dB m)	(W)		
10	QPSK	1	0	-	-	24.96	0.313	-	-
		1	25	-	-	<b>24.99</b>	<b>0.316</b>	-	-
		1	49	-	-	24.87	0.307	-	-
		25	0	-	-	23.99	0.251	-	-
		25	12	-	-	23.95	0.248	-	-
		25	25	-	-	23.96	0.249	-	-
		50	0	-	-	23.97	0.249	-	-
	16QAM	1	0	-	-	<b>24.48</b>	<b>0.281</b>	-	-
		1	25	-	-	24.29	0.269	-	-
		1	49	-	-	24.12	0.258	-	-
		25	0	-	-	23.06	0.202	-	-
		25	12	-	-	23.03	0.201	-	-
		25	25	-	-	23.07	0.203	-	-
	64QAM	50	0	-	-	23.00	0.200	-	-
		1	0	-	-	23.19	0.208	-	-
		1	25	-	-	23.11	0.205	-	-
		1	49	-	-	<b>23.20</b>	<b>0.209</b>	-	-
		25	0	-	-	22.07	0.161	-	-
		25	12	-	-	21.97	0.157	-	-
		25	25	-	-	21.99	0.158	-	-
	50	0	-	-	21.95	0.157	-	-	

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				131979 (1 710.7 MHz)		132322 (1 745.0 MHz)		132665 (1 779.3 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
1.4	QPSK	1	0	22.92	0.196	23.00	0.200	23.01	0.200
		1	3	23.01	0.200	23.02	0.200	23.02	0.200
		1	5	23.02	0.200	23.02	0.200	<b>23.05</b>	<b>0.202</b>
		3	0	22.97	0.198	23.02	0.200	23.04	0.201
		3	2	23.03	0.201	23.05	0.202	23.04	0.201
		3	3	23.01	0.200	23.05	0.202	23.02	0.200
		6	0	22.04	0.160	23.00	0.200	23.01	0.200
	16QAM	1	0	22.23	0.167	22.27	0.169	<b>22.52</b>	<b>0.179</b>
		1	3	22.25	0.168	22.41	0.174	22.47	0.177
		1	5	22.32	0.171	22.34	0.171	22.40	0.174
		3	0	22.00	0.158	22.36	0.172	22.40	0.174
		3	2	22.12	0.163	22.42	0.175	22.49	0.177
		3	3	22.02	0.159	22.45	0.176	22.45	0.176
		6	0	21.14	0.130	22.38	0.173	22.42	0.175
	64QAM	1	0	21.23	0.133	21.37	0.137	<b>21.48</b>	<b>0.141</b>
		1	3	21.32	0.136	21.26	0.134	21.29	0.135
		1	5	21.25	0.133	21.39	0.138	21.34	0.136
		3	0	21.13	0.130	21.30	0.135	21.35	0.136
		3	2	21.23	0.133	21.35	0.136	21.35	0.136
		3	3	21.17	0.131	21.35	0.136	21.37	0.137
		6	0	20.07	0.102	21.34	0.136	21.34	0.136

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				131987 (1 711.5 MHz)		132322 (1 745.0 MHz)		132657 (1 778.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
3	QPSK	1	0	22.87	0.194	22.77	0.189	22.75	0.188
		1	7	22.92	0.196	22.78	0.190	22.87	0.194
		1	14	<b>22.97</b>	<b>0.198</b>	22.78	0.190	22.94	0.197
		8	0	22.81	0.191	21.86	0.153	21.89	0.155
		8	4	22.88	0.194	21.98	0.158	21.89	0.155
		8	7	22.86	0.193	21.90	0.155	21.87	0.154
		15	0	21.91	0.155	21.93	0.156	21.88	0.154
	16QAM	1	0	22.09	0.162	22.06	0.161	22.18	0.165
		1	7	22.26	0.168	22.13	0.163	22.24	0.167
		1	14	<b>22.32</b>	<b>0.171</b>	22.15	0.164	22.25	0.168
		8	0	21.92	0.156	20.92	0.124	20.90	0.123
		8	4	22.04	0.160	21.04	0.127	20.90	0.123
		15	0	20.98	0.125	20.98	0.125	20.94	0.124
	64QAM	1	0	21.09	0.129	21.00	0.126	21.04	0.127
		1	7	21.08	0.128	21.07	0.128	<b>21.21</b>	<b>0.132</b>
		1	14	21.13	0.130	21.14	0.130	21.13	0.130
		8	0	20.93	0.124	19.96	0.099	19.92	0.098
		8	4	21.10	0.129	20.04	0.101	19.93	0.098
		15	0	21.01	0.126	19.99	0.100	19.99	0.100
	15	0	19.94	0.099	19.98	0.100	19.94	0.099	

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				131997 (1 712.5 MHz)		132322 (1 745.0 MHz)		132647 (1 777.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
5	QPSK	1	0	22.96	0.198	23.01	0.200	23.14	0.206
		1	12	23.04	0.201	23.12	0.205	<b>23.24</b>	<b>0.211</b>
		1	24	23.03	0.201	23.14	0.206	23.19	0.208
		12	0	22.94	0.197	23.05	0.202	22.23	0.167
		12	6	22.98	0.199	23.06	0.202	22.34	0.171
		12	13	22.98	0.199	23.11	0.205	22.33	0.171
	16QAM	25	0	22.93	0.196	22.14	0.164	22.28	0.169
		1	0	22.31	0.170	22.30	0.170	22.45	0.176
		1	12	22.40	0.174	22.40	0.174	22.55	0.180
		1	24	22.47	0.177	22.54	0.179	<b>22.57</b>	<b>0.181</b>
		12	0	22.17	0.165	22.13	0.163	21.28	0.134
		12	6	22.16	0.164	22.20	0.166	21.33	0.136
	64QAM	12	13	22.21	0.166	22.25	0.168	21.30	0.135
		25	0	22.13	0.163	21.13	0.130	21.34	0.136
		1	0	21.32	0.136	21.28	0.134	21.41	0.138
		1	12	21.28	0.134	21.50	0.141	21.44	0.139
		1	24	21.34	0.136	21.47	0.140	<b>21.53</b>	<b>0.142</b>
		12	0	21.21	0.132	21.20	0.132	20.30	0.107
	12	6	21.17	0.131	21.22	0.132	20.44	0.111	
	12	13	21.13	0.130	21.25	0.133	20.39	0.109	
	25	0	21.02	0.126	20.24	0.106	20.32	0.108	

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				132022 (1 715.0 MHz)		132322 (1 745.0 MHz)		132622 (1 775.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
10	QPSK	1	0	23.17	0.207	23.05	0.202	23.19	0.208
		1	25	23.06	0.202	23.08	0.203	<b>23.22</b>	<b>0.210</b>
		1	49	23.15	0.207	23.14	0.206	23.10	0.204
		25	0	23.07	0.203	23.08	0.203	23.16	0.207
		25	12	23.04	0.201	23.12	0.205	23.19	0.208
		25	25	23.01	0.200	23.07	0.203	23.15	0.207
	16QAM	50	0	23.01	0.200	22.11	0.163	22.22	0.167
		1	0	22.38	0.173	22.51	0.178	<b>22.61</b>	<b>0.182</b>
		1	25	22.42	0.175	22.55	0.180	22.60	0.182
		1	49	22.54	0.179	22.41	0.174	22.55	0.180
		25	0	22.15	0.164	22.23	0.167	22.26	0.168
		25	12	22.26	0.168	22.34	0.171	22.28	0.169
	64QAM	25	25	22.32	0.171	22.26	0.168	22.29	0.169
		50	0	22.20	0.166	21.18	0.131	21.25	0.133
		1	0	21.30	0.135	21.34	0.136	<b>21.41</b>	<b>0.138</b>
		1	25	21.24	0.133	21.27	0.134	21.34	0.136
		1	49	21.29	0.135	21.40	0.138	21.39	0.138
		25	0	21.11	0.129	21.20	0.132	21.28	0.134
	25	12	21.17	0.131	21.16	0.131	21.29	0.135	
	25	25	21.19	0.132	21.17	0.131	21.35	0.136	
	50	0	21.14	0.130	20.18	0.104	20.29	0.107	

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				132047 (1 717.5 MHz)		132322 (1 745.0 MHz)		132597 (1 772.5 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
15	QPSK	1	0	23.00	0.200	23.03	0.201	23.15	0.207
		1	36	23.03	0.201	23.08	0.203	23.12	0.205
		1	74	23.03	0.201	23.03	0.201	<b>23.32</b>	<b>0.215</b>
		36	0	23.00	0.200	23.05	0.202	23.11	0.205
		36	18	22.94	0.197	23.01	0.200	23.14	0.206
		36	37	22.93	0.196	23.02	0.200	23.19	0.208
	75	0	22.95	0.197	23.06	0.202	22.22	0.167	
	16QAM	1	0	22.35	0.172	22.41	0.174	22.49	0.177
		1	36	22.37	0.173	22.41	0.174	22.55	0.180
		1	74	22.28	0.169	22.28	0.169	<b>22.59</b>	<b>0.182</b>
		36	0	22.07	0.161	22.28	0.169	22.21	0.166
		36	18	22.03	0.160	22.19	0.166	22.25	0.168
		36	37	22.04	0.160	22.19	0.166	22.30	0.170
	75	0	22.17	0.165	22.10	0.162	21.19	0.132	
	64QAM	1	0	21.25	0.133	21.25	0.133	21.41	0.138
		1	36	21.24	0.133	21.33	0.136	21.33	0.136
		1	74	21.20	0.132	21.21	0.132	<b>21.52</b>	<b>0.142</b>
		36	0	21.18	0.131	21.13	0.130	21.22	0.132
36		18	21.15	0.130	21.09	0.129	21.22	0.132	
36		37	21.11	0.129	21.15	0.130	21.29	0.135	
75	0	21.06	0.128	21.08	0.128	20.19	0.104		

LTE Band 66/4									
Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Output Power					
				132072 (1 720.0 MHz)		132322 (1 745.0 MHz)		132572 (1 770.0 MHz)	
				(dB m)	(W)	(dB m)	(W)	(dB m)	(W)
20	QPSK	1	0	23.01	0.200	23.11	0.205	23.15	0.207
		1	50	23.07	0.203	23.10	0.204	23.16	0.207
		1	99	22.97	0.198	22.95	0.197	<b>23.25</b>	<b>0.211</b>
		50	0	23.12	0.205	23.16	0.207	23.25	0.211
		50	25	23.04	0.201	23.13	0.206	23.13	0.206
		50	50	23.03	0.201	23.10	0.204	23.09	0.204
	100	0	23.06	0.202	23.15	0.207	22.18	0.165	
	16QAM	1	0	22.44	0.175	22.38	0.173	22.44	0.175
		1	50	22.45	0.176	22.45	0.176	<b>22.56</b>	<b>0.180</b>
		1	99	22.38	0.173	22.36	0.172	22.47	0.177
		50	0	22.19	0.166	22.24	0.167	22.26	0.168
		50	25	22.20	0.166	22.22	0.167	22.23	0.167
		50	50	22.20	0.166	22.24	0.167	22.19	0.166
	100	0	22.24	0.167	22.29	0.169	21.21	0.132	
	64QAM	1	0	21.19	0.132	21.39	0.138	21.34	0.136
		1	50	21.31	0.135	<b>21.43</b>	<b>0.139</b>	21.41	0.138
		1	99	21.23	0.133	21.27	0.134	21.41	0.138
		50	0	21.29	0.135	21.23	0.133	21.30	0.135
50		25	21.23	0.133	21.17	0.131	21.25	0.133	
50		50	21.17	0.131	21.15	0.130	21.21	0.132	
100	0	21.09	0.129	21.20	0.132	20.20	0.105		



## 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).

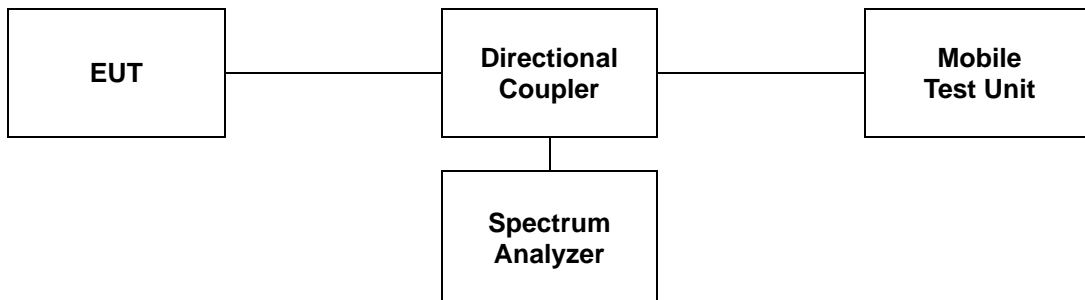
**IC**

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).



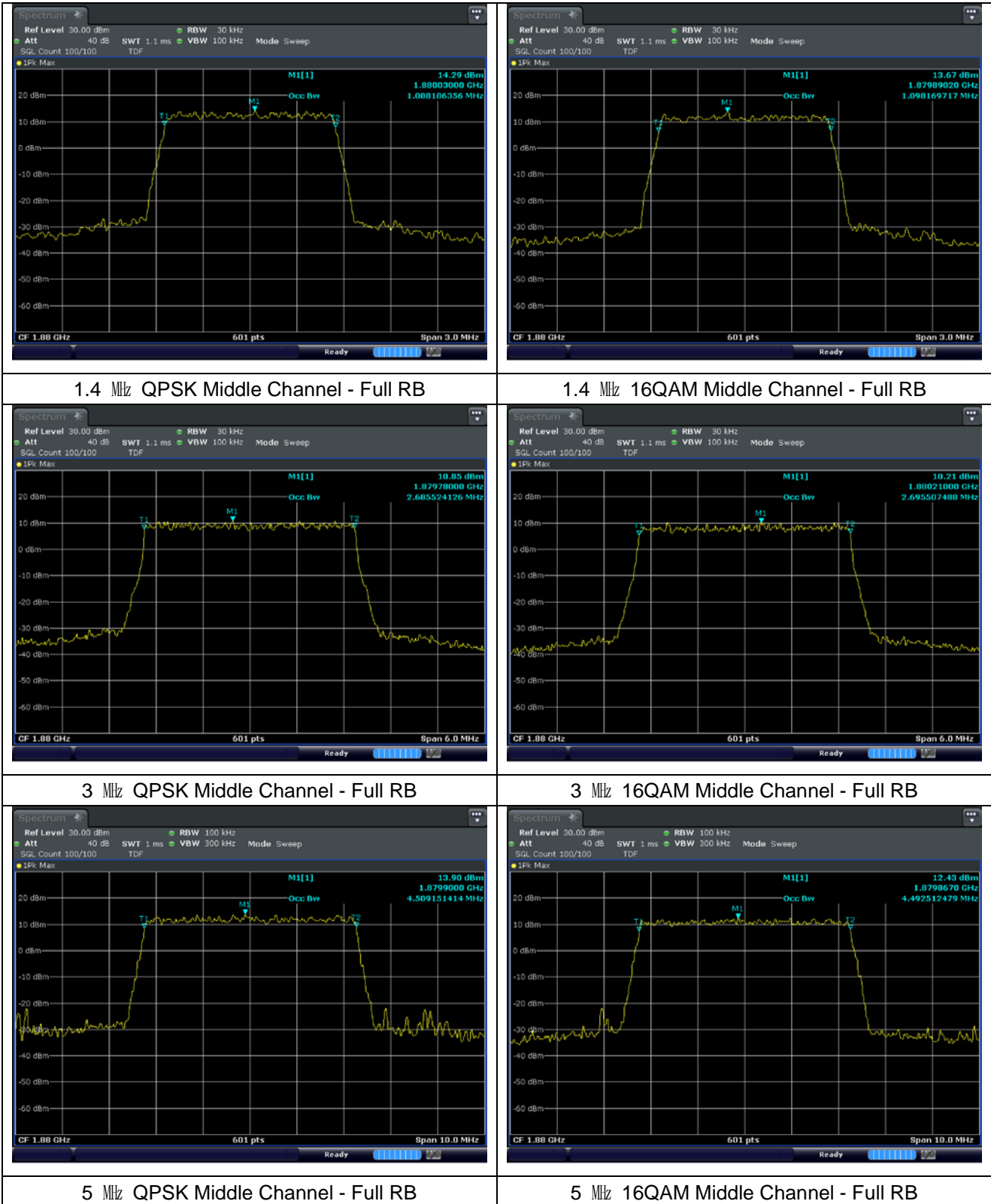
### 4.3 Test Results

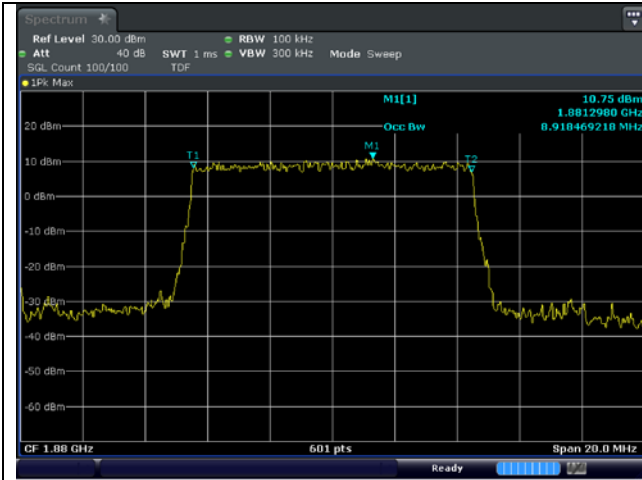
Ambient temperature : (23 ± 1) °C  
 Relative humidity : 47 % R.H.

Band	Bandwidth (MHz)	Frequency (MHz)	Occupied Bandwidth (MHz)	
			QPSK	16QAM
2	1.4	1 880.0	1.088	1.098
	3		2.686	2.696
	5		4.509	4.493
	10		8.918	8.952
	15		13.527	13.478
	20		17.903	17.903
5	1.4	836.5	1.088	1.093
	3		2.686	2.686
	5		4.493	4.526
	10		8.918	8.952
7	5	2 535.0	4.526	4.509
	10		8.918	8.952
	15		13.478	13.428
	20		17.903	17.903
12	1.4	707.5	1.088	1.088
	3		2.676	2.686
	5		4.509	4.509
	10		8.952	8.952
13	5	782.0	4.526	4.493
	10		8.918	8.918
14	5	793.0	4.496	4.505
	10		8.951	8.931
66/4	1.4	1 745.0	1.088	1.093
	3		2.686	2.686
	5		4.509	4.493
	10		8.952	8.952
	15		13.478	13.478
	20		17.970	17.903

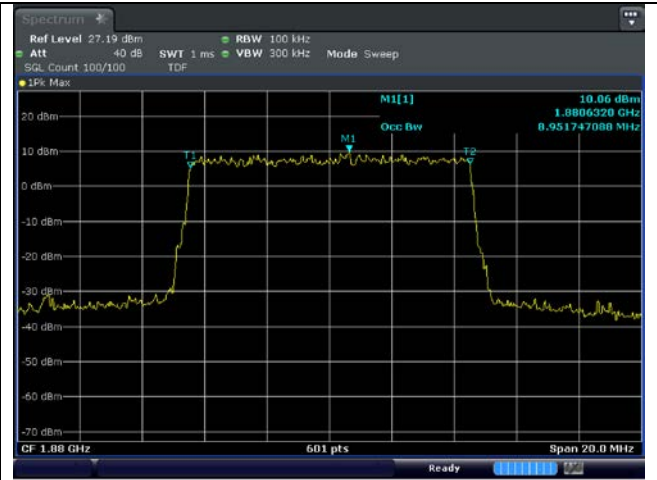
**- Test plots**

**LTE band 2**

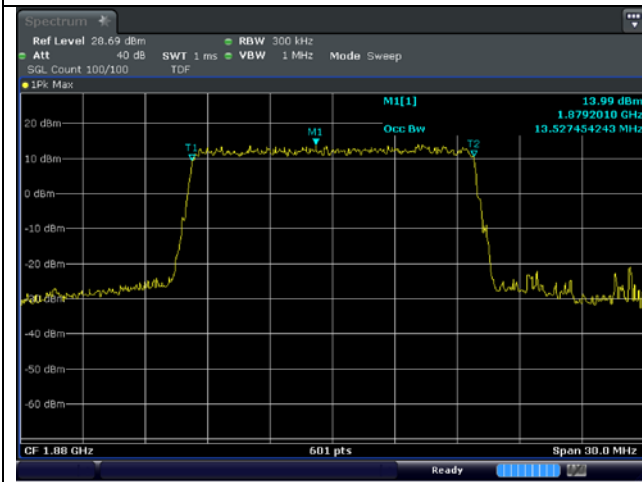




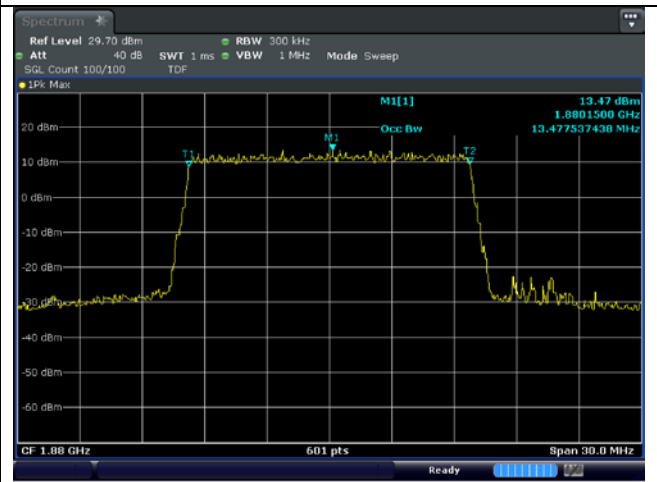
10 MHz QPSK Middle Channel - Full RB



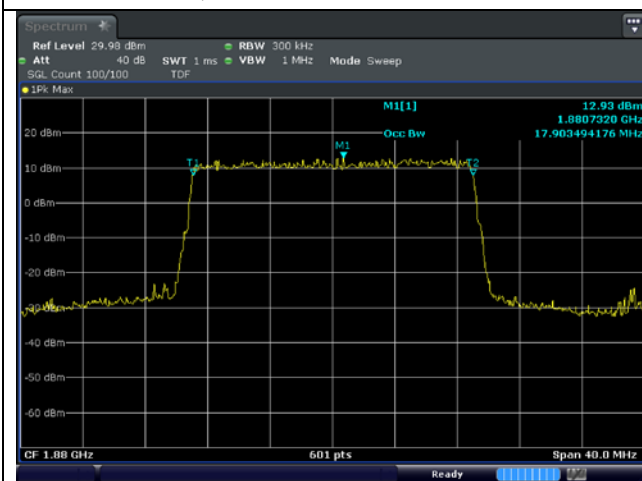
10 MHz 16QAM Middle Channel - Full RB



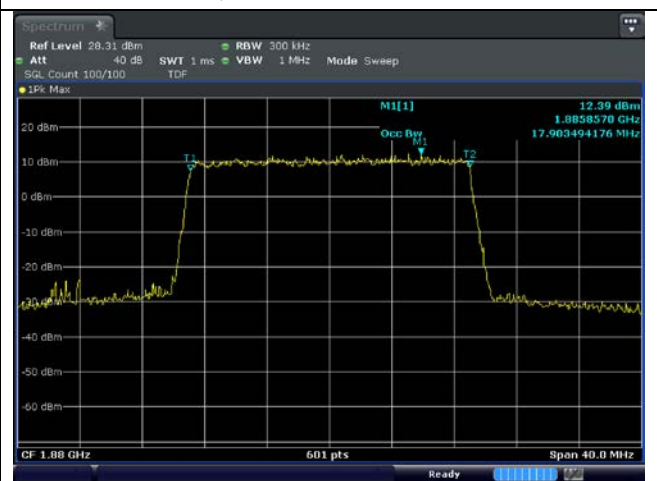
15 MHz QPSK Middle Channel - Full RB



15 MHz 16QAM Middle Channel - Full RB

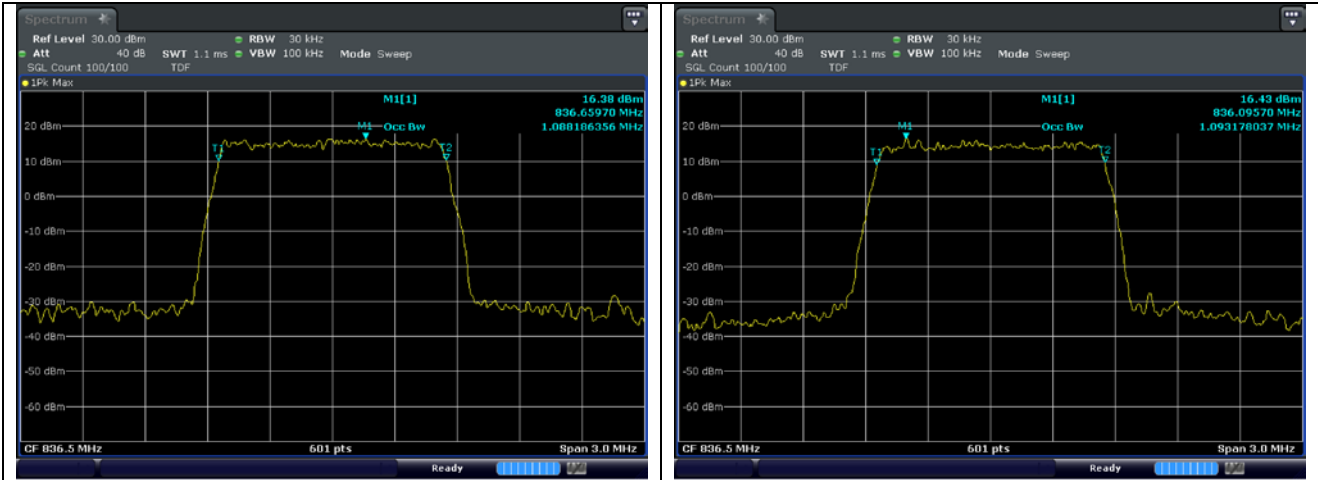


20 MHz QPSK Middle Channel - Full RB



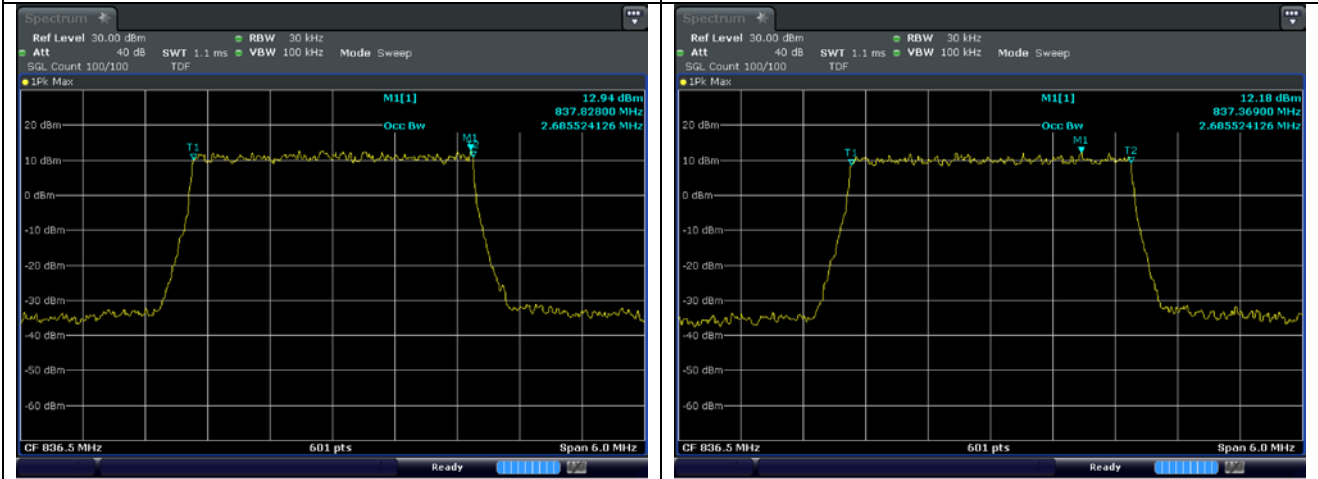
20 MHz 16QAM Middle Channel - Full RB

**LTE band 5**



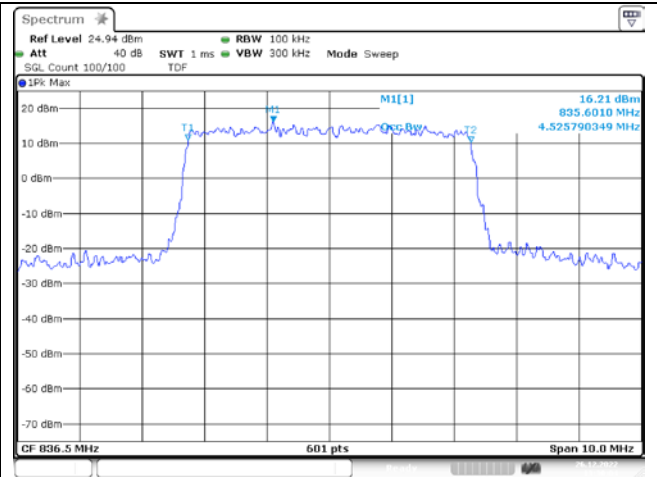
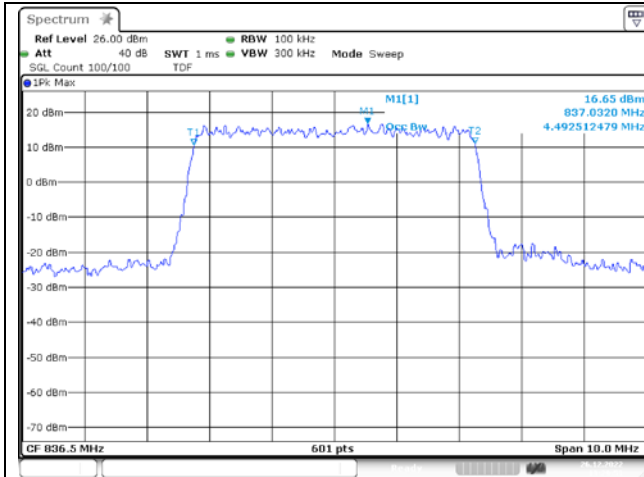
1.4 MHz QPSK Middle Channel - Full RB

1.4 MHz 16QAM Middle Channel - Full RB



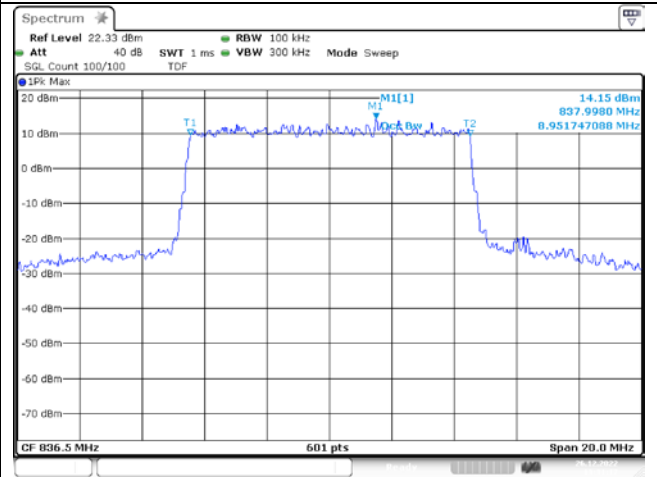
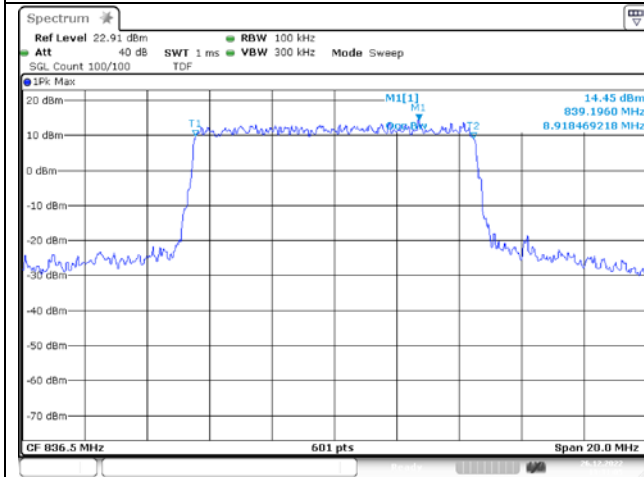
3 MHz QPSK Middle Channel - Full RB

3 MHz 16QAM Middle Channel - Full RB



5 MHz QPSK Middle Channel - Full RB

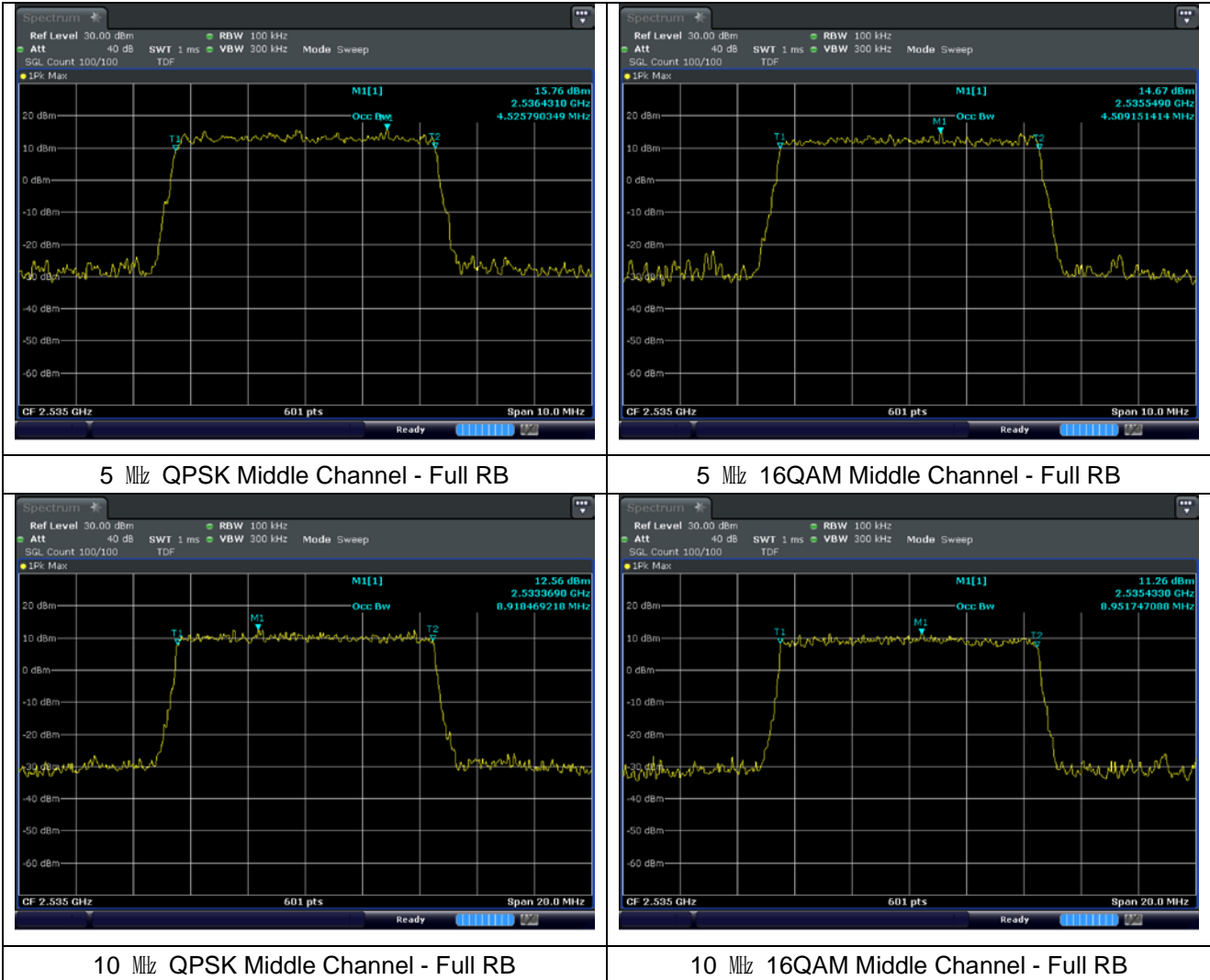
5 MHz 16QAM Middle Channel - Full RB



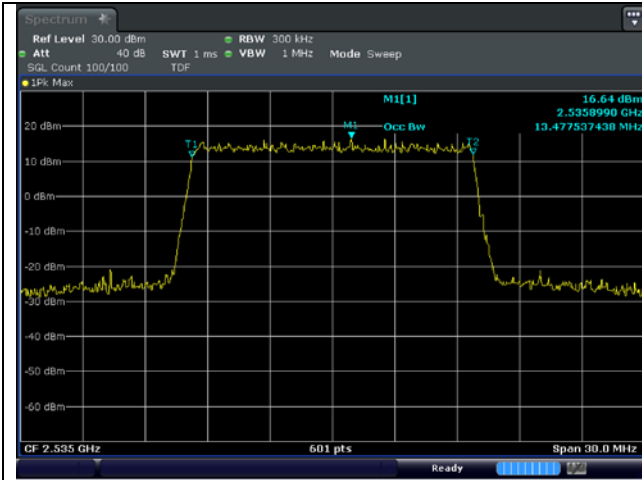
10 MHz QPSK Middle Channel - Full RB

10 MHz 16QAM Middle Channel - Full RB

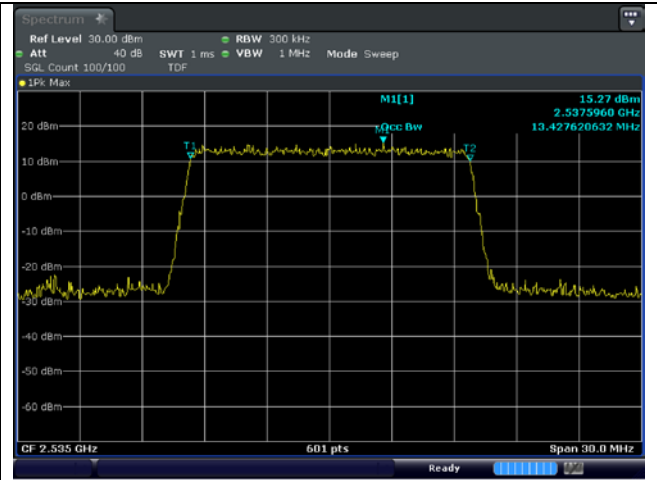
**LTE band 7**



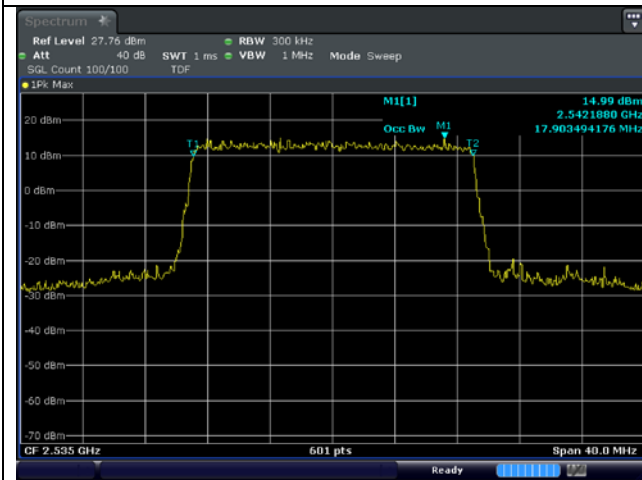




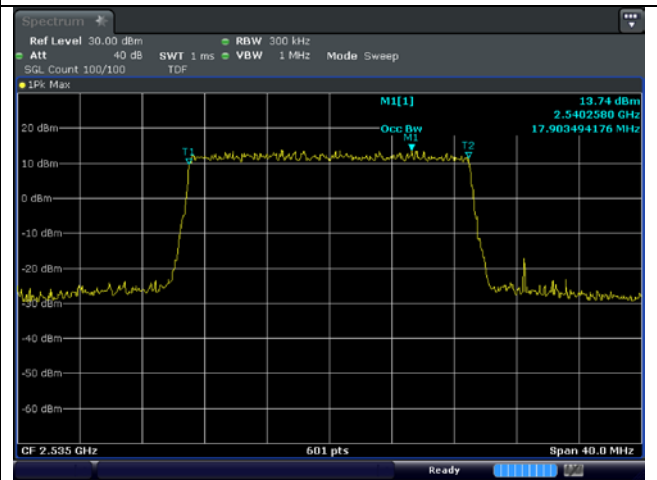
15 MHz QPSK Middle Channel - Full RB



15 MHz 16QAM Middle Channel - Full RB

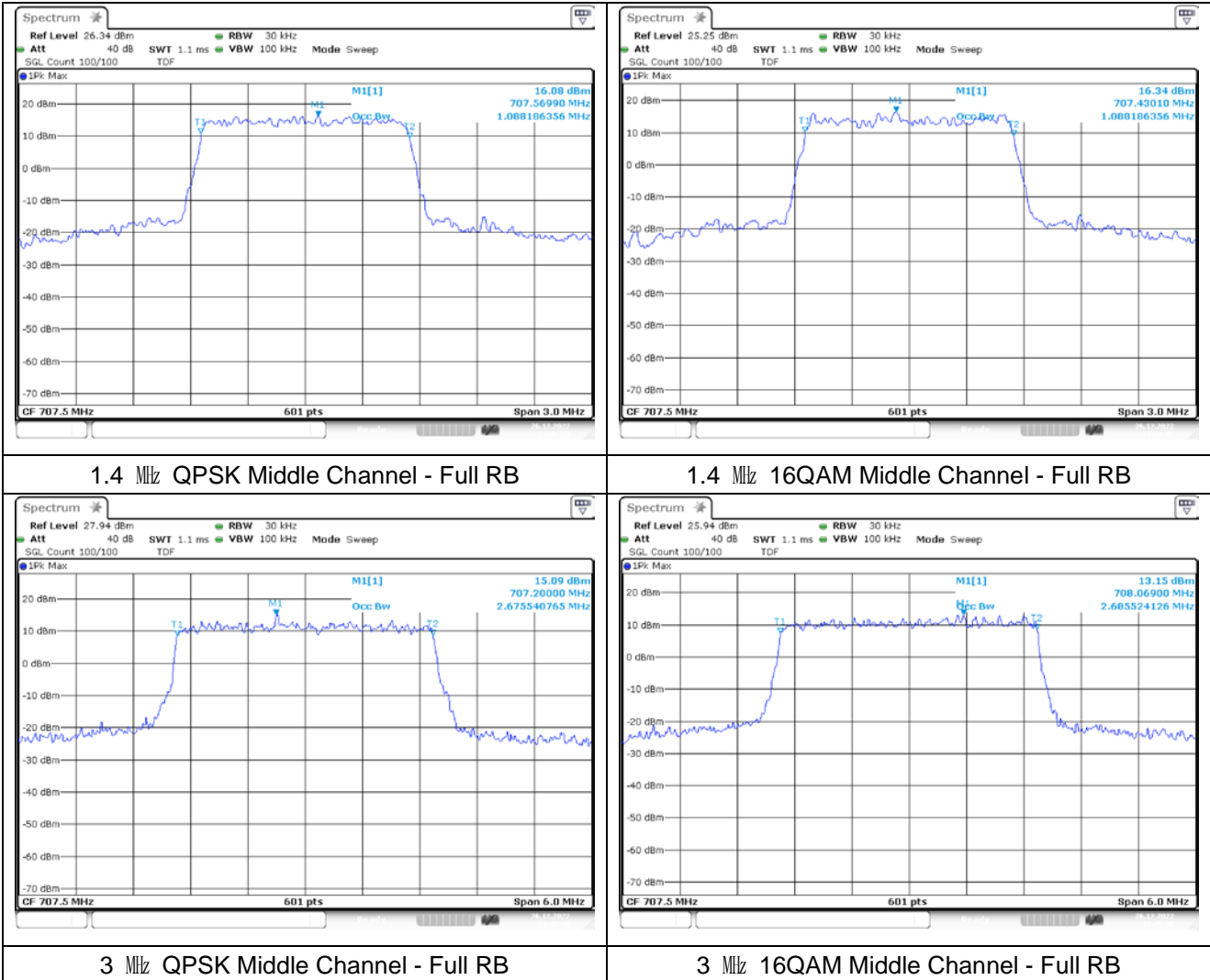


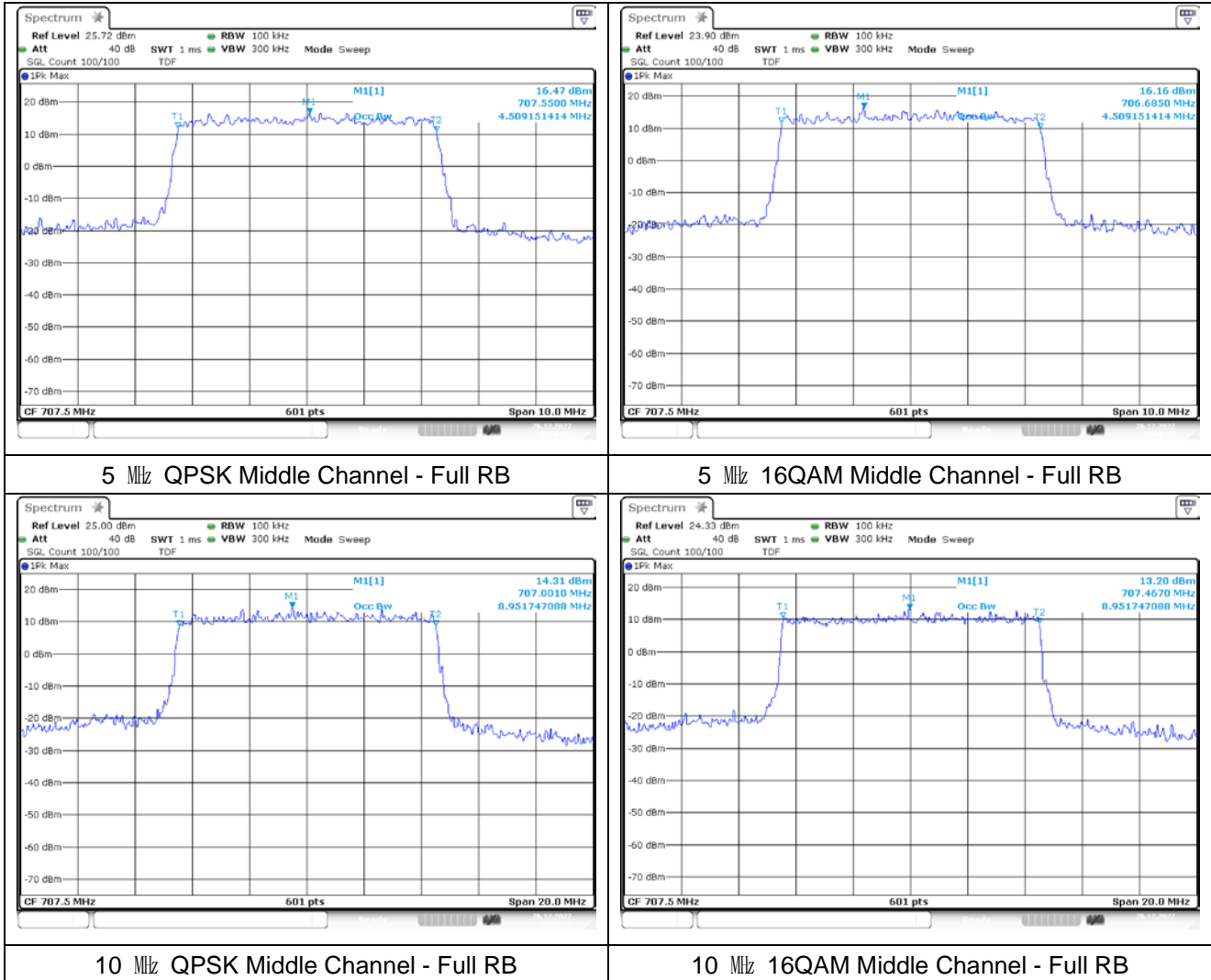
20 MHz QPSK Middle Channel - Full RB



20 MHz 16QAM Middle Channel - Full RB

**LTE band 12**

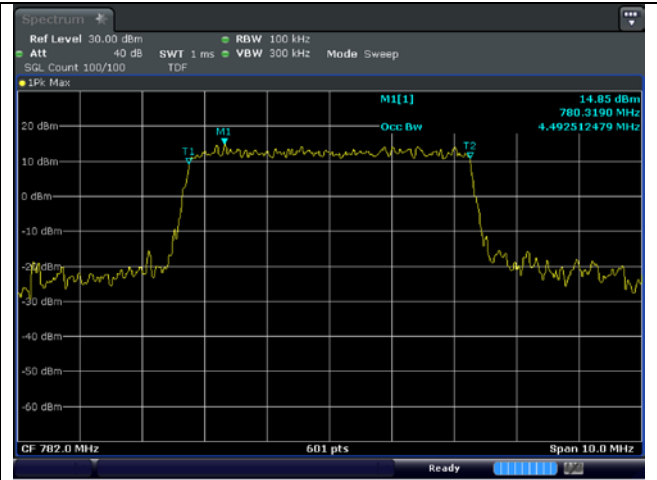




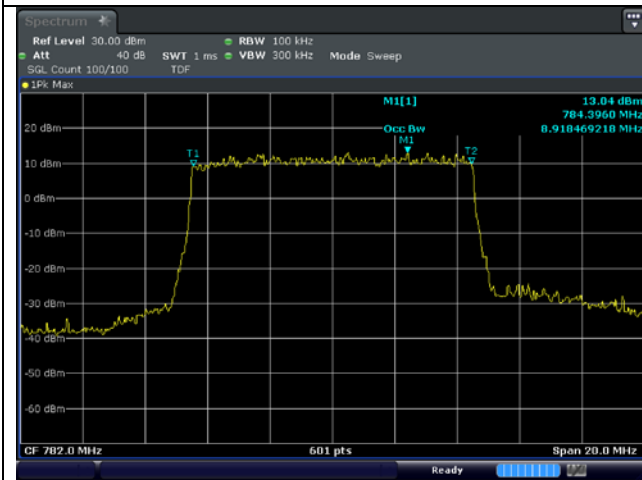
**LTE band 13**



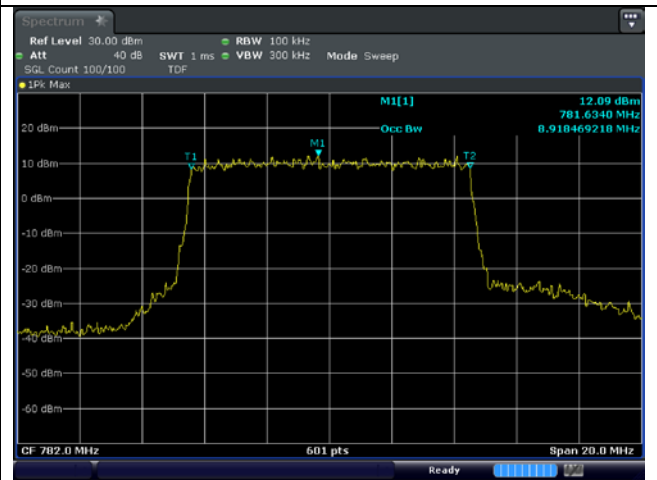
5 MHz QPSK Middle Channel - Full RB



5 MHz 16QAM Middle Channel - Full RB

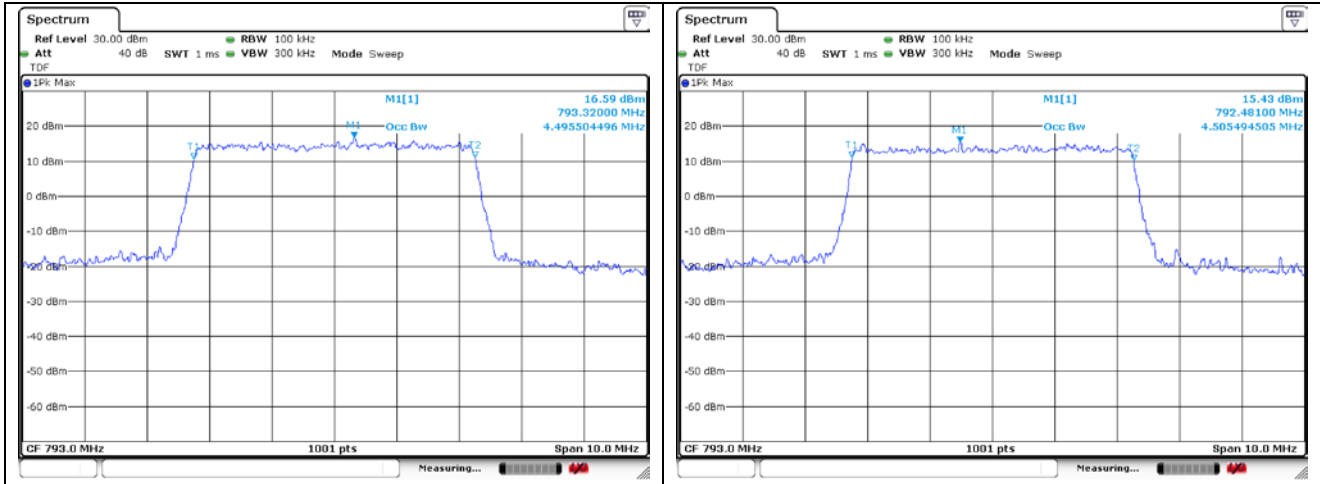


10 MHz QPSK Middle Channel - Full RB



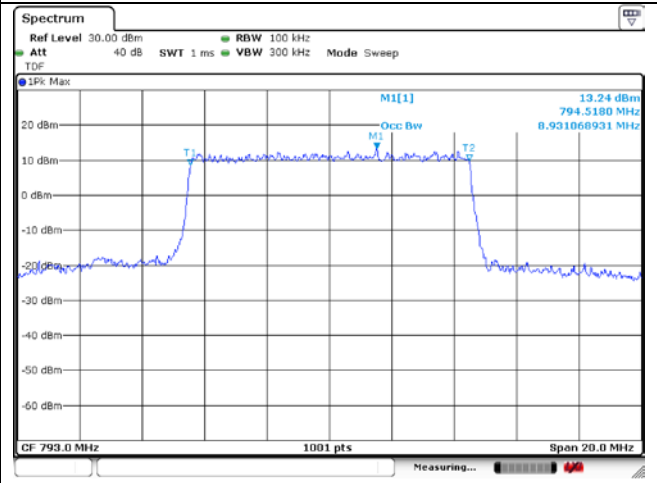
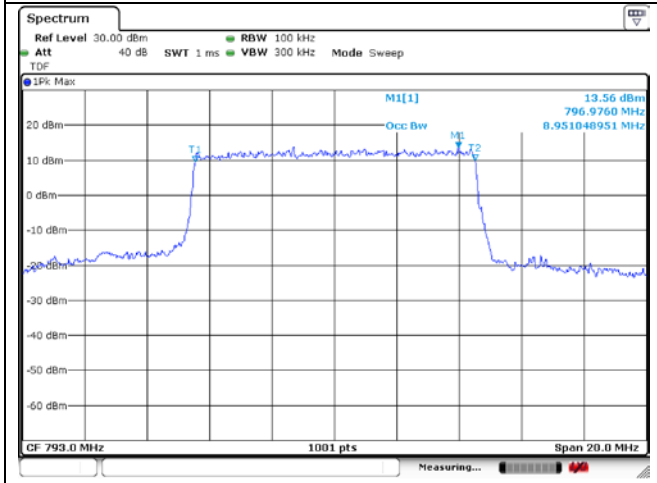
10 MHz 16QAM Middle Channel - Full RB

LTE band 14



5 MHz QPSK Middle Channel - Full RB

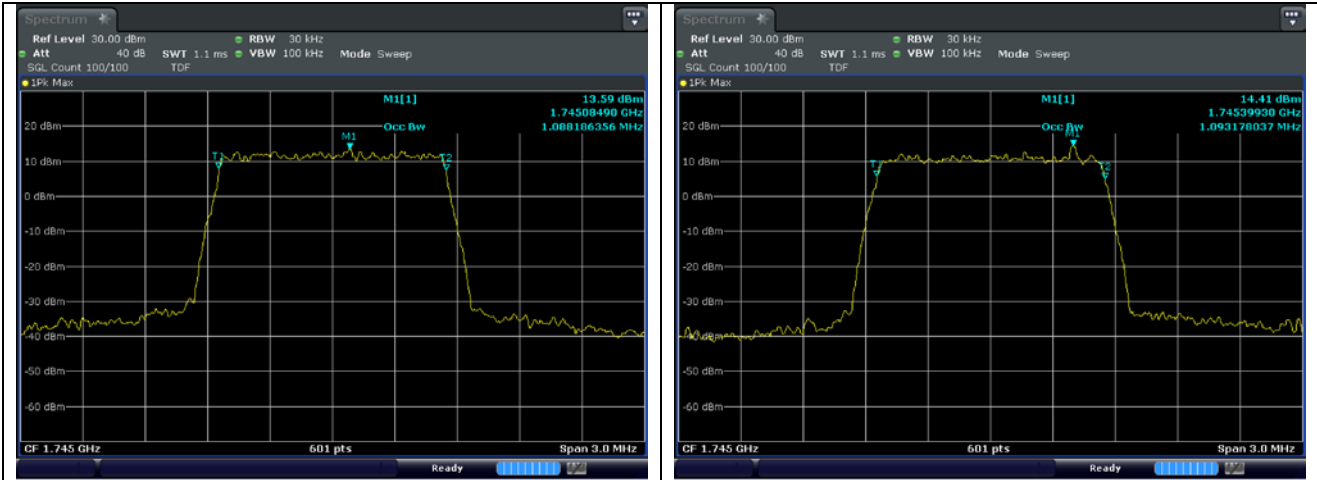
5 MHz 16QAM Middle Channel - Full RB



10 MHz QPSK Middle Channel - Full RB

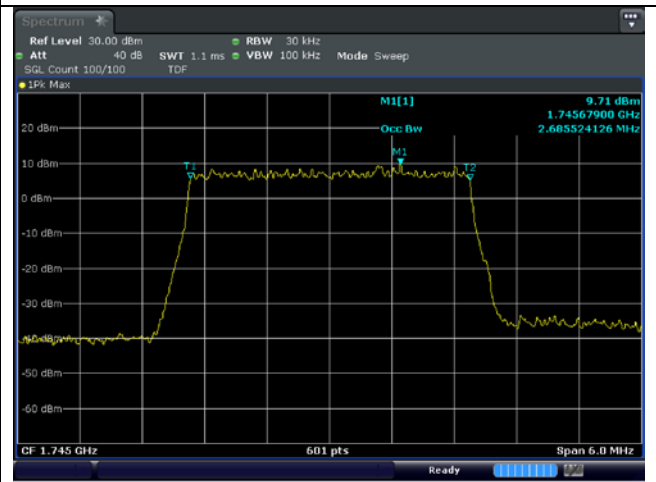
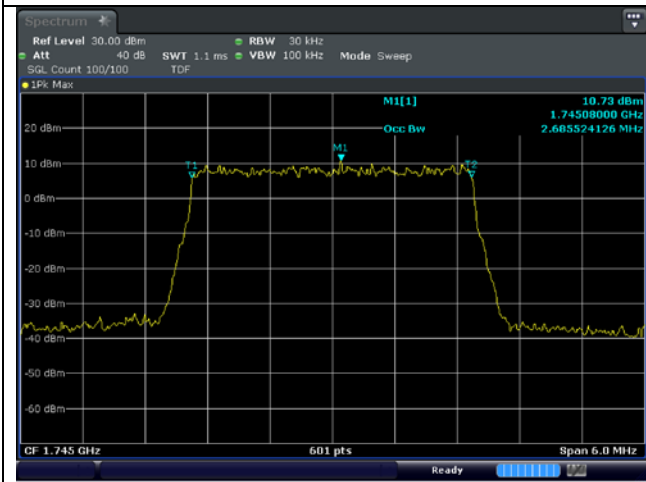
10 MHz 16QAM Middle Channel - Full RB

**LTE band 66/4**



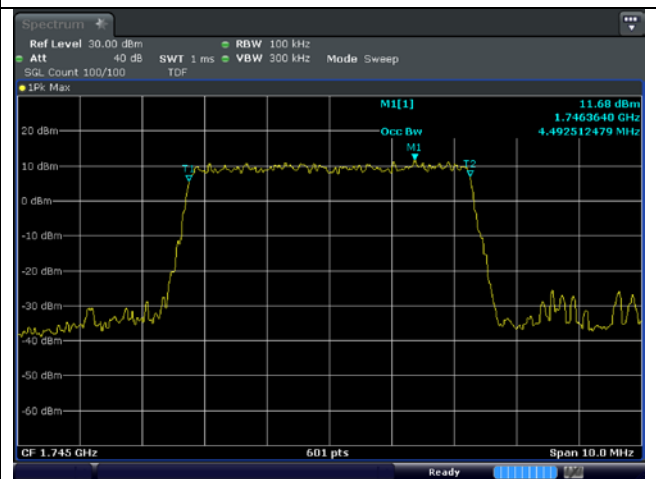
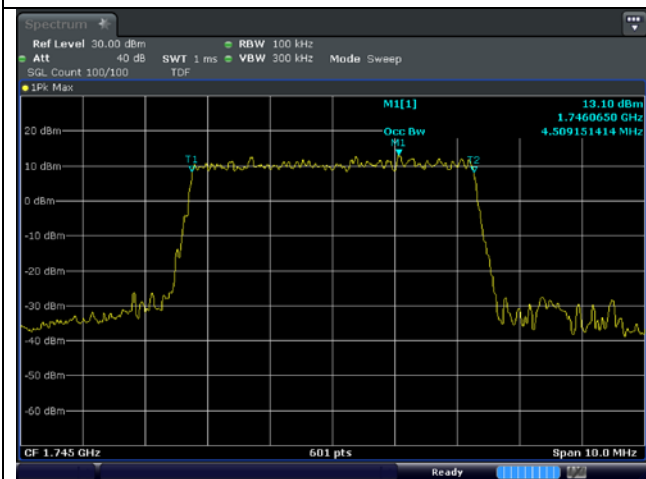
1.4 MHz QPSK Middle Channel - Full RB

1.4 MHz 16QAM Middle Channel - Full RB



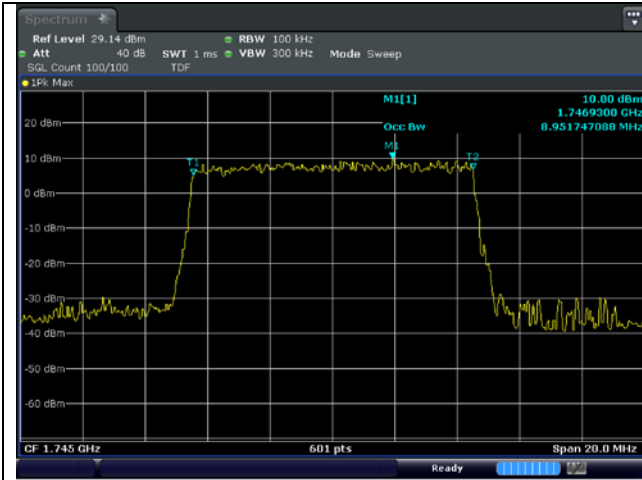
3 MHz QPSK Middle Channel - Full RB

3 MHz 16QAM Middle Channel - Full RB

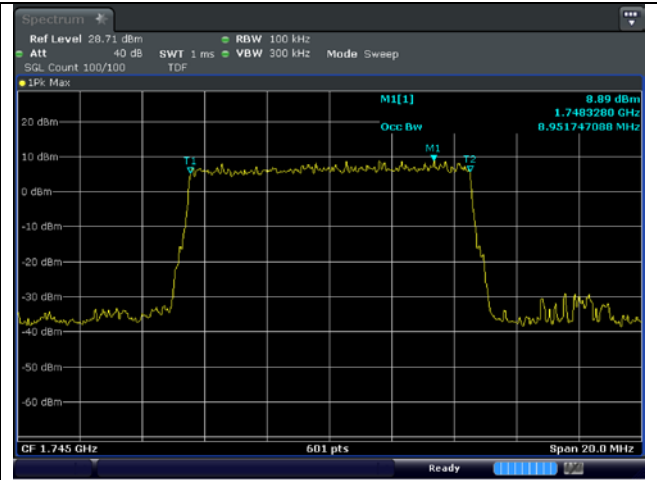


5 MHz QPSK Middle Channel - Full RB

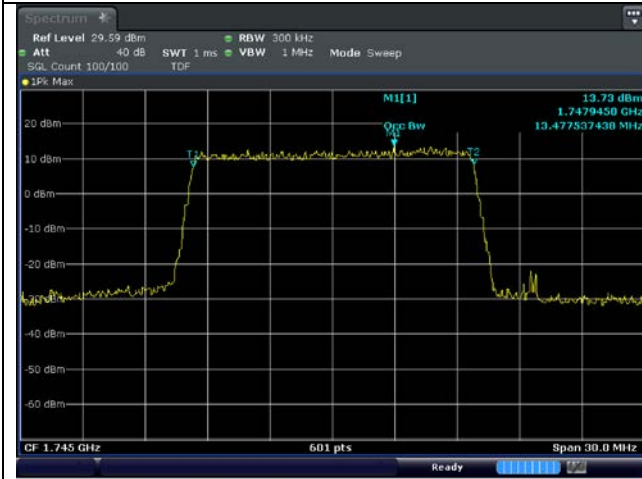
5 MHz 16QAM Middle Channel - Full RB



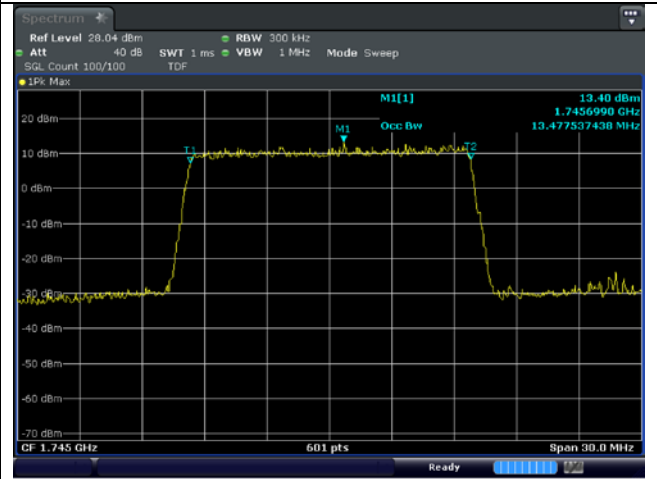
10 MHz QPSK Middle Channel - Full RB



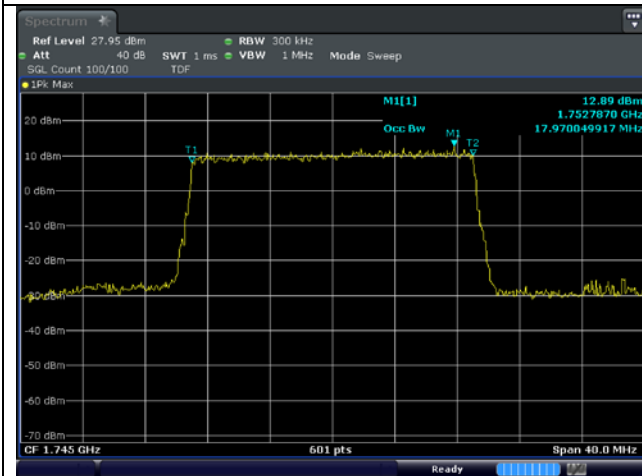
10 MHz 16QAM Middle Channel - Full RB



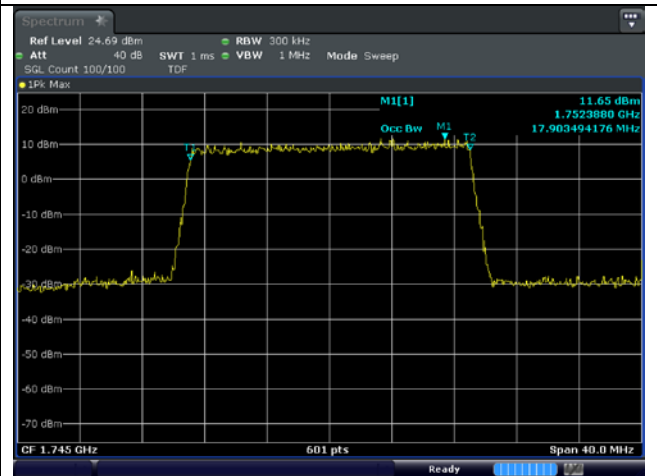
15 MHz QPSK Middle Channel - Full RB



15 MHz 16QAM Middle Channel - Full RB



20 MHz QPSK Middle Channel - Full RB



20 MHz 16QAM Middle Channel - Full RB