TEST REPORT

No. I19Z61557-WMD03

for

LG Electronics USA,Inc

Multi-band GSM/WCDMA/LTE phone with Bluetooth, Wlan and NFC

Model Name: LM-X540EMW

FCC ID: ZNFX540EMW

with

Issued Date: 2019-09-27

TESTING
NVLAP LAB CODE 600118-0

Note:

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I19Z61557-WMD03	Rev.0	1st edition	2019-09-25
I19Z61557-WMD03	Rev.1	Remove the result of FDD 2/5/12/13/66	2019-09-27

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1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

Location 2: CTTL (Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road, Haidian District, Beijing, P. R. China 100191

Location 3: CTTL (BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project data

Testing Start Date: 2019-08-20

Testing End Date: 2019-09-17

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1.5. Signature

Dong Yuan

(Prepared this test report)

Zhou Yu

(Reviewed this test report)

Zhao Hui Lin

Deputy Director of the laboratory

(Approved this test report)

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2. Client Information

2.1. Applicant Information

Company Name: LG Electronics USA,Inc
Address /Post: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

2.2. Manufacturer Information

Company Name: LG Electronics Inc.
Address /Post: LG Twin Towers,128,Yeoui-daero,Yeongdeungpo-gu
Telephone: +82-2-6946-1675

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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, Wlan and NFC
Model Name	LM-X540EMW
FCC ID	ZNFX540EMW
Antenna	Embedded
Output power	23.36dBm maximum EIRP measured for LTE Band 7
Extreme vol. Limits	3.6VDC to 4.2VDC (nominal: 3.85VDC)
Extreme temp. Tolerance	-10°C to +55°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	Date of receipt
UT15a	358619100026413/ 358619100026421	2019-08-20

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery

AE1

Model	BL-T45
Manufacturer	Lishen
Capacitance	4000mAh

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment Under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE phone with Bluetooth, Wlan and NFC with embedded antenna. Manual and specifications of the EUT were provided to fulfil the test.

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4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-18 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI/TIA-102.CAAA -E	DIGITAL C4FMCQPSK TRANSCEIVER MEASUREMENT METHODS	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01

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5. LABORATORY ENVIRONMENT

Control room / conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	>2 MΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber 2 (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 30 ˚C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	>2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Semi-anechoic chamber 2 / Fully-anechoic chamber 3 (10 meters×6.7 meters×6.15 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 30 ˚C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	>2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	<±3.5 dB, 3 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

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6. SUMMARY OF TEST RESULT

6.1. Summary of test results

LTE Band 7

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	BR
4	Occupied Bandwidth	2.1049	BR
5	Emission Bandwidth	27.53	BR
6	Band Edge Compliance	27.53	BR
7	Conducted Spurious Emission	27.53	BR
8	Peak-to-Average Power Ratio	27.50	BR

LTE Band 38

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	BR
4	Occupied Bandwidth	2.1049	BR
5	Emission Bandwidth	27.53	BR
6	Band Edge Compliance	27.53	BR
7	Conducted Spurious Emission	27.53	BR
8	Peak-to-Average Power Ratio	27.50	BR

Terms used in Verdict column

P	Pass. The EUT complies with the essential requirements in the standard.
NP	Not Performed. The test was not performed by CTTL.
NA	Not Applicable. The test was not applicable.
BR	Re-use test data from basic model report.
F	Fail. The EUT does not comply with the essential requirements in the standard.

The Equipment Under Test (EUT) model LM-X540EMW (FCC ID: ZNFX540EMW) is a variant product of LM-X540BMW (FCC ID: ZNFX540HM), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01, spot check measurements were performed on this device. All the test results are derived from test report No. I18Z61530-WMD03. Please refer Annex A for detail spot check verification data and reference data. The spot check test results are consistent with basic model.

For detail differences between two models please refer the Declaration of Changes document.

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6.2. Statements

The test cases listed in section 6.1 of this report for the EUT specified in section 3 were performed by CTTL according to the standards or reference documents in section 4.1

The EUT met all applicable requirements of the standards or reference documents in section 4.1.

This report only deals with the LTE functions among the features described in section 3.

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7. Test Equipment Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	EMI Antenna	VULB9163	9163-235	Schwarzbeck	2019-11-20	1 year
2	EMI Antenna	3117	00058889	ETS-Lindgren	2020-01-12	1 year
3	EMI Antenna	3117	00119024	ETS-Lindgren	2020-02-25	1 year
4	Universal Radio Communication Tester	CMW500	159082	R&S	2019-12-25	1 year
5	Spectrum Analyzer	FSU26	200030	R&S	2020-06-03	1 year
6	EMI Antenna	9117	167	Schwarzbeck	2020-05-27	1 year
8	Climate chamber	SH-242	93008556	ESPEC	2019-12-21	2 year
9	Universal Radio Communication Tester	MT8821C	6201623363	Anritsu	2020-07-11	1 year
10	Radio Communication Analyzer	MT8821C	6201763159	Anritsu	2020-07-23	1 year
11	Test Receiver	E4440A	MY48250642	Agilent	2020-03-18	1 year
12	Test Receiver	N5183A	MY49060052	Agilent	2020-06-24	1 year
13	Universal Radio Communication Tester	CMW500	143008	R&S	2019-11-26	1 year
14	Power Amplifier	5S1G4	0341863	AR	/	

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ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Universal Radio Communication Tester (CMW500) or Anritsu Radio Communication Analyzer (MT8821C) to ensure max power transmission and proper modulation.
In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.
These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

A.1.2.2 Measurement result

LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	22.81	21.88	21.25
		2535	22.92	21.98	21.09
		2502.5	22.96	22.42	21.44
	1 RB low	2567.5	22.82	21.90	21.21
		2535	22.90	21.95	21.15
		2502.5	23.03	22.48	21.49
	50% RB mid	2567.5	21.95	20.99	20.22
		2535	21.96	21.00	20.14
		2502.5	22.14	21.23	20.49
	100% RB	2567.5	21.89	20.85	20.16
		2535	21.93	20.92	20.07
		2502.5	22.08	21.12	20.43
10MHz	1 RB high	2565	22.83	21.87	21.31
		2535	22.90	21.77	21.16
		2505	23.01	22.32	21.41
	1 RB low	2565	22.83	21.83	21.35
		2535	22.91	21.82	21.23
		2505	23.14	22.38	21.58
	50% RB mid	2565	21.90	20.97	20.17

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		2535	21.95	20.97	20.10
		2505	22.12	21.15	20.41
	100% RB	2565	21.89	20.89	20.23
		2535	21.94	20.95	20.12
		2505	22.06	21.14	20.45
15MHz	1 RB high	2562.5	22.81	22.12	21.15
		2535	22.78	21.66	21.07
		2507.5	22.91	22.23	21.29
	1 RB low	2562.5	22.81	22.09	21.39
		2535	22.88	21.75	21.23
		2507.5	23.09	22.36	21.51
	50% RB mid	2562.5	21.97	20.92	20.14
		2535	22.02	20.95	20.11
		2507.5	22.16	21.12	20.37
	100% RB	2562.5	21.93	20.90	20.12
		2535	22.01	20.93	20.10
		2507.5	22.14	21.12	20.31
20MHz	1 RB high	2560	22.74	22.07	21.13
		2535	22.75	22.24	20.92
		2510	22.81	22.20	21.09
	1 RB low	2560	22.71	22.06	21.02
		2535	22.83	22.29	21.03
		2510	22.99	22.33	21.38
	50% RB mid	2560	21.89	20.87	20.18
		2535	21.94	20.98	20.30
		2510	22.07	21.08	20.24
	100% RB	2560	21.82	20.83	20.08
		2535	21.87	20.93	19.99
		2510	22.04	21.04	20.15

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LTE band 38

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2617.5	23.67	22.61	21.80
		2595.0	23.15	22.20	21.09
		2572.5	23.01	21.96	21.14
	1 RB low	2617.5	22.89	21.82	20.94
		2595.0	23.03	22.01	21.07
		2572.5	22.95	21.93	21.21
	50% RB mid	2617.5	22.78	21.81	20.95
		2595.0	23.94	23.04	21.99
		2572.5	23.79	22.80	21.98
	100% RB	2617.5	23.77	22.73	21.92
		2595.0	23.82	23.02	22.05
		2572.5	23.78	22.78	22.08
10MHz	1 RB high	2615.0	23.76	22.67	21.95
		2595.0	23.03	22.04	21.16
		2575.0	22.92	21.93	21.19
	1 RB low	2615.0	22.84	21.80	21.03
		2595.0	22.98	22.06	21.08
		2575.0	22.94	21.95	21.15
	50% RB mid	2615.0	22.82	21.82	21.01
		2595.0	23.86	22.93	21.88
		2575.0	23.68	22.71	21.88
	100% RB	2615.0	23.68	22.65	21.85
		2595.0	23.79	22.88	22.01
		2575.0	23.69	22.72	22.02
15MHz	1 RB high	2612.5	23.69	22.65	21.85
		2595.0	22.97	21.98	21.02
		2577.5	22.94	21.91	21.07
	1 RB low	2612.5	22.81	21.71	20.92
		2595.0	22.99	21.97	21.05
		2577.5	22.90	21.89	21.08
	50% RB mid	2612.5	22.80	21.76	20.92
		2595.0	23.87	22.71	21.85
		2577.5	23.77	22.92	21.81
	100% RB	2612.5	23.69	22.70	21.85
		2595.0	23.75	22.61	21.94
		2577.5	23.72	22.82	21.95
20MHz	1 RB high	2610.0	23.60	22.58	21.86

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		2595.0	22.96	21.99	21.06
		2580.0	22.90	21.96	21.07
	1 RB low	2610.0	22.78	21.73	20.98
		2595.0	22.91	21.86	21.06
		2580.0	22.86	21.86	21.10
	50% RB mid	2610.0	22.73	21.73	21.02
		2595.0	23.67	22.61	21.80
		2580.0	23.15	22.20	21.09
	100% RB	2610.0	23.01	21.96	21.14
		2595.0	22.89	21.82	20.94
		2580.0	23.03	22.01	21.07

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A.1.3 Radiated

A.1.3.1 Description

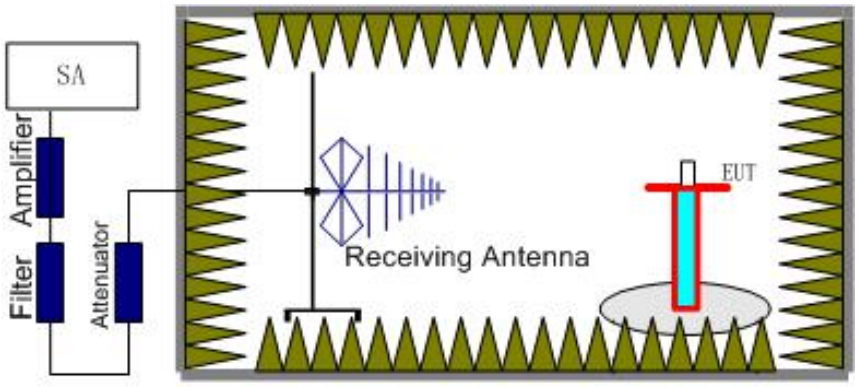
This is the test for the maximum radiated power from the EUT.

Rule Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP.".

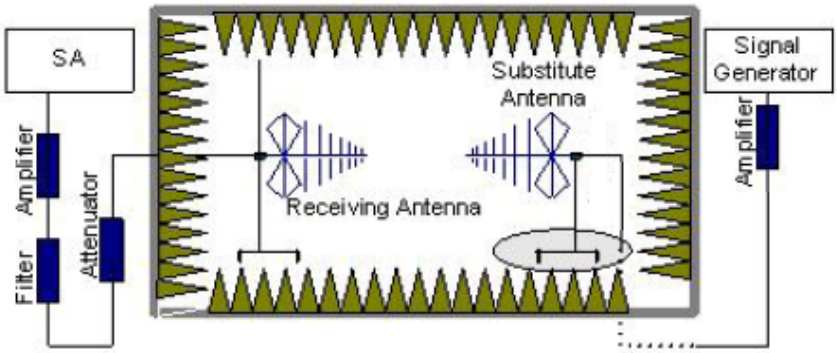
A.1.3.2 Method of Measurement

The measurements procedures in TIA-603E-2016 are used.

1. EUT was placed on a 1.5-meter-high non-conductive stand at a 3-meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360 and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with rms detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded.

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The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.
   The cable loss (P_{cl}), the substitution antenna Gain (G_a) and the amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power (EIRP) = P_{Mea} - P_{Ag} - P_{cl} - G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP - 2.15.

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A.1.3.3 Measurement result

Spot Check Measurement Results:

LTE Band 7- EIRP

Limits: ≤33 dBm (2W)

LTE Band 7_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-27.51	3.58	45.68	6.10	20.69	33.00	12.31	H
2535.00	-25.51	3.63	44.82	6.16	21.84	33.00	11.16	H
2567.50	-26.92	3.65	44.92	6.22	20.57	33.00	12.43	H

LTE Band 7_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-27.48	3.59	45.64	6.11	20.68	33.00	12.32	H
2535.00	-25.46	3.63	44.82	6.16	21.89	33.00	11.11	H
2565.00	-27.07	3.65	44.97	6.22	20.47	33.00	12.53	H

LTE Band 7_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-26.80	3.59	44.92	6.11	20.64	33.00	12.36	H
2535.00	-25.50	3.63	44.82	6.16	21.85	33.00	11.15	H
2562.50	-27.76	3.65	45.67	6.21	20.47	33.00	12.53	H

LTE Band 7_20 MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-26.87	3.58	45.36	6.12	21.03	33.00	11.97	H
2535.00	-25.40	3.63	44.82	6.16	21.95	33.00	11.05	H
2560.00	-27.97	3.64	45.98	6.21	20.58	33.00	12.42	H

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LTE Band 7_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-28.32	3.58	45.68	6.10	19.88	33.00	13.12	H
2535.00	-26.29	3.63	44.82	6.16	21.06	33.00	11.94	H
2567.50	-27.69	3.65	44.92	6.22	19.80	33.00	13.20	H

LTE Band 7_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-28.29	3.59	45.64	6.11	19.87	33.00	13.13	H
2535.00	-26.24	3.63	44.82	6.16	21.11	33.00	11.89	H
2565.00	-27.84	3.65	44.97	6.22	19.70	33.00	13.30	H

LTE Band 7_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-27.58	3.59	44.92	6.11	19.86	33.00	13.14	H
2535.00	-26.25	3.63	44.82	6.16	21.10	33.00	11.90	H
2562.50	-28.52	3.65	45.67	6.21	19.71	33.00	13.29	H

LTE Band 7_20 MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-27.64	3.58	45.36	6.12	20.26	33.00	12.74	H
2535.00	-26.16	3.63	44.82	6.16	21.19	33.00	11.81	H
2560.00	-28.71	3.64	45.98	6.21	19.84	33.00	13.16	H

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LTE Band 7_5MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-29.27	3.58	45.68	6.10	18.93	33.00	14.07	H
2535.00	-27.34	3.63	44.82	6.16	20.01	33.00	12.99	H
2567.50	-28.77	3.65	44.92	6.22	18.72	33.00	14.28	H

LTE Band 7_10MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-29.34	3.59	45.64	6.11	18.82	33.00	14.18	H
2535.00	-27.29	3.63	44.82	6.16	20.06	33.00	12.94	H
2565.00	-28.92	3.65	44.97	6.22	18.62	33.00	14.38	H

LTE Band 7_15MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-28.64	3.59	44.92	6.11	18.80	33.00	14.20	H
2535.00	-27.31	3.63	44.82	6.16	20.04	33.00	12.96	H
2562.50	-29.60	3.65	45.67	6.21	18.63	33.00	14.37	H

LTE Band 7_20 MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-28.70	3.58	45.36	6.12	19.20	33.00	13.80	H
2535.00	-27.24	3.63	44.82	6.16	20.11	33.00	12.89	H
2560.00	-29.78	3.64	45.98	6.21	18.77	33.00	14.23	H

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LTE Band 38- EIRP

Limits: ≤33dBm (2W)

LTE Band 38_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-31.44	3.66	44.92	6.23	16.05	33.00	16.95	H
2595.00	-31.32	3.69	44.91	6.27	16.17	33.00	16.83	H
2617.50	-32.20	3.68	44.94	6.31	15.37	33.00	17.63	H

LTE Band 38_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-31.36	3.66	44.92	6.23	16.13	33.00	16.87	H
2595.00	-31.30	3.69	44.91	6.27	16.19	33.00	16.81	H
2615.00	-31.99	3.68	44.94	6.31	15.58	33.00	17.42	H

LTE Band 38_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-31.54	3.66	44.92	6.23	15.95	33.00	17.05	H
2595.00	-31.40	3.69	44.91	6.27	16.09	33.00	16.91	H
2612.50	-32.03	3.68	44.94	6.30	15.53	33.00	17.47	H

LTE Band 38_20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-31.49	3.67	44.92	6.24	16.00	33.00	17.00	H
2595.00	-31.28	3.69	44.91	6.27	16.21	33.00	16.79	H
2610.00	-31.93	3.68	44.94	6.30	15.63	33.00	17.37	H

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LTE Band 38_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-32.34	3.66	44.92	6.23	15.15	33.00	17.85	H
2595.00	-32.20	3.69	44.91	6.27	15.29	33.00	17.71	H
2617.50	-33.10	3.68	44.94	6.31	14.47	33.00	18.53	H

LTE Band 38_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-32.26	3.66	44.92	6.23	15.23	33.00	17.77	H
2595.00	-32.17	3.69	44.91	6.27	15.32	33.00	17.68	V
2615.00	-32.87	3.68	44.94	6.31	14.70	33.00	18.30	H

LTE Band 38_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-32.42	3.66	44.92	6.23	15.07	33.00	17.93	H
2595.00	-32.29	3.69	44.91	6.27	15.20	33.00	17.80	H
2612.50	-32.91	3.68	44.94	6.30	14.65	33.00	18.35	H

LTE Band 38_20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-32.39	3.67	44.92	6.24	15.10	33.00	17.90	H
2595.00	-32.16	3.69	44.91	6.27	15.33	33.00	17.67	H
2610.00	-32.82	3.68	44.94	6.30	14.74	33.00	18.26	H

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LTE Band 38_5MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-33.31	3.66	44.92	6.23	14.18	33.00	18.82	H
2595.00	-33.20	3.69	44.91	6.27	14.29	33.00	18.71	H
2617.50	-34.08	3.68	44.94	6.31	13.49	33.00	19.51	H

LTE Band 38_10MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-33.25	3.66	44.92	6.23	14.24	33.00	18.76	H
2595.00	-33.18	3.69	44.91	6.27	14.31	33.00	18.69	H
2615.00	-33.88	3.68	44.94	6.31	13.69	33.00	19.31	H

LTE Band 38_15MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-33.41	3.66	44.92	6.23	14.08	33.00	18.92	H
2595.00	-33.27	3.69	44.91	6.27	14.22	33.00	18.78	H
2612.50	-33.90	3.68	44.94	6.30	13.66	33.00	19.34	H

LTE Band 38_20MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-33.37	3.67	44.92	6.24	14.12	33.00	18.88	H
2595.00	-33.16	3.69	44.91	6.27	14.33	33.00	18.67	H
2610.00	-33.81	3.68	44.94	6.30	13.75	33.00	19.25	H

Peak EIRP (dBm) = P_{Mea}(-25.40dBm) - G_a (-3.63dBi) - P_{Ag} (-44.82dB) - P_{cl} (6.16dB) = 21.95dBm

ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwidths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

Note: Expanded measurement uncertainty is U = 2.84 dB, k = 2.

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Reference Measurement Results from basic model:

LTE Band 7- EIRP

Limits: ≤33 dBm (2W)

LTE Band 7_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-24.84	3.58	45.68	6.10	23.36	33.00	9.64	H
2535.00	-24.49	3.63	44.82	6.16	22.86	33.00	10.14	H
2567.50	-26.90	3.65	44.92	6.22	20.59	33.00	12.41	H

LTE Band 7_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-25.00	3.59	45.64	6.11	23.16	33.00	9.84	H
2535.00	-24.59	3.63	44.82	6.16	22.76	33.00	10.24	H
2565.00	-26.90	3.65	44.97	6.22	20.64	33.00	12.36	V

LTE Band 7_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-24.55	3.59	44.92	6.11	22.89	33.00	10.11	H
2535.00	-24.66	3.63	44.82	6.16	22.69	33.00	10.31	H
2562.50	-27.66	3.65	45.67	6.21	20.57	33.00	12.43	V

LTE Band 7_20 MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-25.00	3.58	45.36	6.12	22.90	33.00	10.10	H
2535.00	-24.55	3.63	44.82	6.16	22.80	33.00	10.20	H
2560.00	-27.71	3.64	45.98	6.21	20.84	33.00	12.16	H

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LTE Band 7_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-25.82	3.58	45.68	6.10	22.38	33.00	10.62	H
2535.00	-25.43	3.63	44.82	6.16	21.92	33.00	11.08	H
2567.50	-27.73	3.65	44.92	6.22	19.76	33.00	13.24	V

LTE Band 7_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-26.06	3.59	45.64	6.11	22.10	33.00	10.90	H
2535.00	-25.61	3.63	44.82	6.16	21.74	33.00	11.26	H
2565.00	-27.81	3.65	44.97	6.22	19.73	33.00	13.27	V

LTE Band 7_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-25.64	3.59	44.92	6.11	21.80	33.00	11.20	H
2535.00	-25.58	3.63	44.82	6.16	21.77	33.00	11.23	H
2562.50	-28.57	3.65	45.67	6.21	19.66	33.00	13.34	H

LTE Band 7_20 MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-26.05	3.58	45.36	6.12	21.85	33.00	11.15	H
2535.00	-25.46	3.63	44.82	6.16	21.89	33.00	11.11	H
2560.00	-28.76	3.64	45.98	6.21	19.79	33.00	13.21	H

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LTE Band 7_5MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2502.50	-26.71	3.58	45.68	6.10	21.49	33.00	11.51	H
2535.00	-26.95	3.63	44.82	6.16	20.40	33.00	12.60	H
2567.50	-28.79	3.65	44.92	6.22	18.70	33.00	14.30	H

LTE Band 7_10MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.00	-27.03	3.59	45.64	6.11	21.13	33.00	11.87	H
2535.00	-26.93	3.63	44.82	6.16	20.42	33.00	12.58	H
2565.00	-28.84	3.65	44.97	6.22	18.70	33.00	14.30	V

LTE Band 7_15MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2507.50	-26.60	3.59	44.92	6.11	20.84	33.00	12.16	H
2535.00	-26.72	3.63	44.82	6.16	20.63	33.00	12.37	H
2562.50	-29.63	3.65	45.67	6.21	18.60	33.00	14.40	H

LTE Band 7_20 MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2510.00	-26.95	3.58	45.36	6.12	20.95	33.00	12.05	H
2535.00	-26.58	3.63	44.82	6.16	20.77	33.00	12.23	H
2560.00	-29.84	3.64	45.98	6.21	18.71	33.00	14.29	H

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LTE Band 38- EIRP

Limits: ≤33dBm (2W)

LTE Band 38_5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-29.87	3.66	44.92	6.23	17.62	33.00	15.38	H
2595.00	-29.53	3.69	44.91	6.27	17.96	33.00	15.04	V
2617.50	-29.83	3.68	44.94	6.31	17.74	33.00	15.26	V

LTE Band 38_10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-29.58	3.66	44.92	6.23	17.91	33.00	15.09	H
2595.00	-29.55	3.69	44.91	6.27	17.94	33.00	15.06	V
2615.00	-29.45	3.68	44.94	6.31	18.12	33.00	14.88	V

LTE Band 38_15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-29.91	3.66	44.92	6.23	17.58	33.00	15.42	H
2595.00	-29.61	3.69	44.91	6.27	17.88	33.00	15.12	V
2612.50	-29.65	3.68	44.94	6.30	17.91	33.00	15.09	V

LTE Band 38_20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-29.98	3.67	44.92	6.24	17.51	33.00	15.49	H
2595.00	-29.60	3.69	44.91	6.27	17.89	33.00	15.11	V
2610.00	-29.74	3.68	44.94	6.30	17.82	33.00	15.18	V

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LTE Band 38_5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-30.70	3.66	44.92	6.23	16.79	33.00	16.21	H
2595.00	-30.35	3.69	44.91	6.27	17.14	33.00	15.86	H
2617.50	-30.68	3.68	44.94	6.31	16.89	33.00	16.11	H

LTE Band 38_10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-30.53	3.66	44.92	6.23	16.96	33.00	16.04	H
2595.00	-30.48	3.69	44.91	6.27	17.01	33.00	15.99	V
2615.00	-30.52	3.68	44.94	6.31	17.05	33.00	15.95	H

LTE Band 38_15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-30.77	3.66	44.92	6.23	16.72	33.00	16.28	H
2595.00	-30.52	3.69	44.91	6.27	16.97	33.00	16.03	H
2612.50	-30.70	3.68	44.94	6.30	16.86	33.00	16.14	H

LTE Band 38_20MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-30.84	3.67	44.92	6.24	16.65	33.00	16.35	H
2595.00	-30.51	3.69	44.91	6.27	16.98	33.00	16.02	H
2610.00	-30.80	3.68	44.94	6.30	16.76	33.00	16.24	H

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LTE Band 38_5MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2572.50	-31.79	3.66	44.92	6.23	15.70	33.00	17.30	H
2595.00	-31.71	3.69	44.91	6.27	15.78	33.00	17.22	V
2617.50	-31.71	3.68	44.94	6.31	15.86	33.00	17.14	V

LTE Band 38_10MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2575.00	-31.76	3.66	44.92	6.23	15.73	33.00	17.27	H
2595.00	-31.82	3.69	44.91	6.27	15.67	33.00	17.33	V
2615.00	-31.41	3.68	44.94	6.31	16.16	33.00	16.84	V

LTE Band 38_15MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2577.50	-32.75	3.66	44.92	6.23	14.74	33.00	18.26	H
2595.00	-31.89	3.69	44.91	6.27	15.60	33.00	17.40	V
2612.50	-31.82	3.68	44.94	6.30	15.74	33.00	17.26	V

LTE Band 38_20MHz_64QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2580.00	-32.79	3.67	44.92	6.24	14.70	33.00	18.30	H
2595.00	-31.87	3.69	44.91	6.27	15.62	33.00	17.38	V
2610.00	-31.91	3.68	44.94	6.30	15.65	33.00	17.35	V

Peak EIRP (dBm) = P_{Mea}(-24.84dBm) - G_a (-6.10dBi) - P_{Ag} (-45.68dB) - P_{cl} (3.58dB) = 23.36dBm

ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwidths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

Note: Expanded measurement uncertainty is U = 2.84 dB, k = 2.

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A.2 EMISSION LIMIT

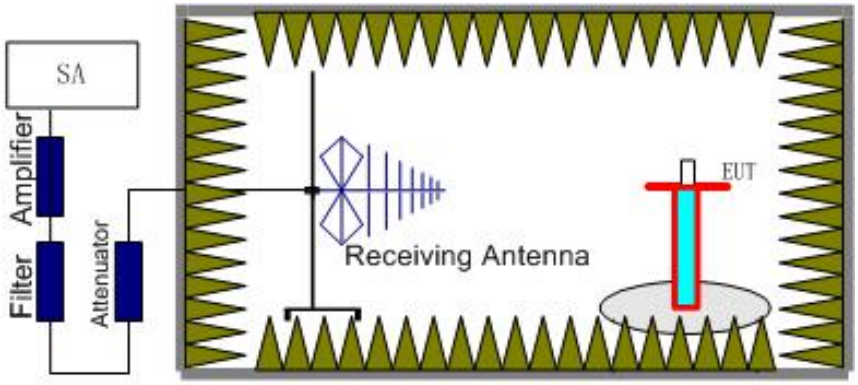
A.2.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully anechoic chamber FAC-3.

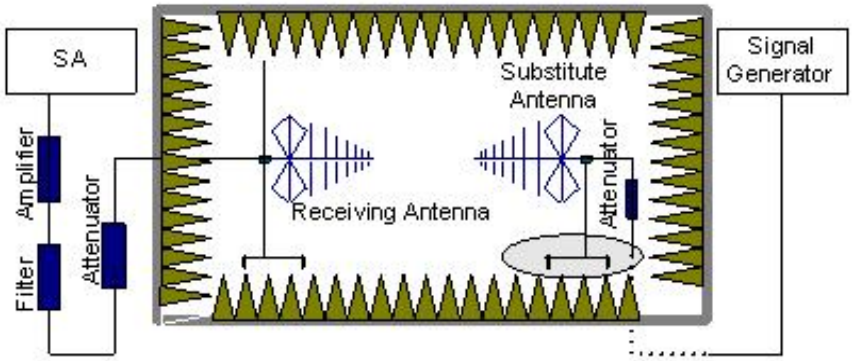
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 7 38.

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5-meter-high non-conductive stand at a 3-meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360 and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is

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connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power (EIRP)=P_{Mea}+ P_{pl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP - 2.15dB.

A.2.2 Measurement Limit

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (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 (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (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.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 7 38. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 7 38 into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The range of evaluated frequency is from 30MHz to 26GHz.

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Spot Check Measurement Results:

LTE Band 7, 5 MHz, QPSK, Channel 20775

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5009.02	-58.12	6.59	9.91	-54.80	-25.00	29.80	V
7513.01	-53.83	8.34	12.21	-49.96	-25.00	24.96	H
10017.01	-50.89	9.23	12.91	-47.21	-25.00	22.21	V
12521.01	-48.85	10.23	13.21	-45.87	-25.00	20.87	V
15023.00	-45.91	11.25	13.99	-43.17	-25.00	18.17	V
17536.00	-43.27	12.86	14.95	-41.18	-25.00	16.18	H

LTE Band 7, 5 MHz, QPSK, Channel 21100

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5066.02	-57.88	6.68	9.99	-54.57	-25.00	29.57	V
7598.01	-55.18	7.98	12.28	-50.88	-25.00	25.88	H
10155.01	-51.27	9.37	12.96	-47.68	-25.00	22.68	H
12691.01	-48.73	10.31	13.31	-45.73	-25.00	20.73	V
15209.00	-46.16	11.39	13.87	-43.68	-25.00	18.68	V
17756.00	-43.81	12.49	15.26	-41.04	-25.00	16.04	H

LTE Band 7, 5 MHz, QPSK, Channel 21425

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5142.02	-56.91	6.87	10.10	-53.68	-25.00	28.68	H
7708.01	-54.37	8.42	12.37	-50.42	-25.00	25.42	H
10277.01	-51.31	9.56	13.01	-47.86	-25.00	22.86	V
12853.01	-49.31	10.63	13.41	-46.53	-25.00	21.53	V
15397.00	-46.34	11.39	13.76	-43.97	-25.00	18.97	H
17964.00	-43.47	12.89	15.55	-40.81	-25.00	15.81	H

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LTE Band 38, 5MHz, QPSK, Channel 37775

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5134.02	-57.25	6.86	10.09	-54.02	-25.00	29.02	V
7721.01	-54.06	8.40	12.38	-50.08	-25.00	25.08	V
10295.01	-52.39	9.63	13.02	-49.00	-25.00	24.00	H
12885.01	-49.42	10.55	13.43	-46.54	-25.00	21.54	V
15417.00	-45.53	11.42	13.75	-43.20	-25.00	18.20	V
17997.00	-44.22	12.90	15.60	-41.52	-25.00	16.52	H

LTE Band 38, 5MHz, QPSK, Channel 38000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
6461.02	-55.71	7.54	10.96	-52.29	-25.00	27.29	V
9053.01	-54.33	9.06	13.13	-50.26	-25.00	25.26	H
11666.01	-50.12	9.67	13.07	-46.72	-25.00	21.72	H
14242.01	-46.28	10.92	14.45	-42.75	-25.00	17.75	V
15561.00	-45.69	11.50	13.70	-43.49	-25.00	18.49	V
16859.00	-42.59	12.04	13.74	-40.89	-25.00	15.89	V

LTE Band 38, 5MHz, QPSK, Channel 38225

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
6539.02	-55.60	7.56	11.05	-52.11	-25.00	27.11	H
9191.01	-53.62	8.93	13.21	-49.34	-25.00	24.34	H
11800.01	-49.43	10.12	13.04	-46.51	-25.00	21.51	H
14398.00	-45.90	11.04	14.42	-42.52	-25.00	17.52	H
15680.00	-46.27	11.58	13.70	-44.15	-25.00	19.15	H
17002.00	-41.21	12.38	13.80	-39.79	-25.00	14.79	H

Note: The maximum value of expanded measurement uncertainty for this test item is U = 5.16 dB, k = 2.

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Reference Measurement Results from basic model:

LTE Band 7, 5 MHz, QPSK, Channel 20775

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4994.02	-58.08	6.61	9.89	-54.80	-25.00	29.80	V
7515.01	-54.90	8.33	12.21	-51.02	-25.00	26.02	H
10021.01	-48.29	9.24	12.91	-44.62	-25.00	19.62	H
12516.01	-49.66	10.22	13.21	-46.67	-25.00	21.67	H
15022.00	-46.18	11.24	13.99	-43.43	-25.00	18.43	V
17531.00	-43.38	12.84	14.94	-41.28	-25.00	16.28	H

LTE Band 7, 5 MHz, QPSK, Channel 21100

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5079.02	-57.74	6.71	10.01	-54.44	-25.00	29.44	V
7610.01	-53.91	8.02	12.29	-49.64	-25.00	24.64	H
10150.01	-47.80	9.38	12.96	-44.22	-25.00	19.22	H
12657.01	-49.38	10.37	13.29	-46.46	-25.00	21.46	H
15207.00	-45.71	11.39	13.88	-43.22	-25.00	18.22	V
17755.00	-44.43	12.49	15.26	-41.66	-25.00	16.66	V

LTE Band 7, 5 MHz, QPSK, Channel 21425

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5149.02	-56.88	6.88	10.11	-53.65	-25.00	28.65	H
7698.01	-54.91	8.42	12.36	-50.97	-25.00	25.97	V
10277.01	-49.81	9.56	13.01	-46.36	-25.00	21.36	V
12820.01	-49.70	10.71	13.39	-47.02	-25.00	22.02	H
15403.00	-45.93	11.40	13.76	-43.57	-25.00	18.57	V
17969.00	-42.89	12.89	15.56	-40.22	-25.00	15.22	H

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LTE Band 38, 5MHz, QPSK, Channel 37775

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5169.02	-57.54	6.91	10.14	-54.31	-25.00	29.31	H
7694.01	-53.92	8.40	12.36	-49.96	-25.00	24.96	H
10292.01	-51.68	9.62	13.02	-48.28	-25.00	23.28	V
12888.01	-49.67	10.54	13.43	-46.78	-25.00	21.78	V
15443.00	-46.30	11.45	13.73	-44.02	-25.00	19.02	V
17995.00	-43.97	12.90	15.59	-41.28	-25.00	16.28	H

LTE Band 38, 5MHz, QPSK, Channel 38000

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5163.02	-57.44	6.90	10.13	-54.21	-25.00	29.21	V
7817.01	-55.51	8.31	12.45	-51.37	-25.00	26.37	H
10396.01	-50.36	9.79	13.06	-47.09	-25.00	22.09	H
12989.01	-48.69	10.47	13.49	-45.67	-25.00	20.67	V
15546.00	-45.02	11.51	13.70	-42.83	-25.00	17.83	V
16848.00	-41.94	12.06	13.74	-40.26	-25.00	15.26	V

LTE Band 38, 5MHz, QPSK, Channel 38225

Frequency (MHz)	P_{Mea} (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5238.02	-57.51	7.00	10.23	-54.28	-25.00	29.28	H
7854.01	-54.66	8.36	12.48	-50.54	-25.00	25.54	H
10473.01	-51.36	9.69	13.09	-47.96	-25.00	22.96	H
13115.01	-48.49	10.87	13.66	-45.70	-25.00	20.70	H
15681.00	-46.06	11.58	13.70	-43.94	-25.00	18.94	H
16992.00	-42.40	12.34	13.80	-40.94	-25.00	15.94	V

Note: The maximum value of expanded measurement uncertainty for this test item is U = 5.16 dB, k = 2.

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A.3 FREQUENCY STABILITY

A.3.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER and Anritsu MT8821C Radio Communication Analyzer.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -10℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 or MT8821C, and in a simulated call on middle channel for LTE band 7 38, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 ℃increments from -10℃ to +50℃. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.2VDC, with a nominal voltage of 3.85VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress.

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A.3.2 Measurement results

LTE Band 7, 10MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)			Frequency error (ppm)		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3.6	5.95	-22.73	-10.1	0.0023	0.0090	-0.0043
3.85	-15.34	-16.61	-7.3	0.0061	0.0066	-0.0031
4.2	-10.46	-18.14	-6.7	0.0041	0.0072	-0.0029

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)			Frequency error (ppm)		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
50	-11.24	-13.98	-11.5	0.0044	0.0055	-0.0049
40	-12.72	-16.14	-9.5	0.0050	0.0064	-0.0041
30	-9.80	-15.05	-10.9	0.0039	0.0059	-0.0047
20	-11.99	-17.07	-4.1	0.0047	0.0067	-0.0018
10	-12.35	-17.90	-6.4	0.0049	0.0071	-0.0028
0	-18.04	-15.45	-7.0	0.0071	0.0061	-0.0030
-10	-19.83	-17.15	-10.6	0.0078	0.0068	-0.0046

LTE Band 38, 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Voltage

Voltage (V)	Frequency error (Hz)			Frequency error (ppm)		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
3.6	-15.95	-13.38	3.6	0.0061	0.0052	0.0014
3.85	-11.99	-19.81	-7.8	0.0046	0.0076	-0.0030
4.2	-17.28	-18.98	3.4	0.0067	0.0073	0.0013

Frequency Error vs Temperature

Temperature (℃)	Frequency error (Hz)			Frequency error (ppm)		
	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
50	-13.10	-16.21	-3.5	0.0050	0.0062	-0.0013
40	-15.76	-14.16	-2.9	0.0061	0.0055	-0.0011
30	-15.18	-15.55	1.4	0.0058	0.0060	0.0005
20	-23.69	-10.90	-5.1	0.0091	0.0042	-0.0020
10	-17.05	-13.62	-7.4	0.0066	0.0052	-0.0029
0	-15.28	-19.88	5.6	0.0059	0.0077	0.0022
-10	-14.31	-17.72	-8.7	0.0055	0.0068	-0.0034

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A.4 OCCUPIED BANDWIDTH

A.4.1 Occupied Bandwidth Results

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

The measurement method is from KDB 971168 4.2:

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 (i.e., two to five times the OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) Set the detection mode to peak, and the trace mode to max hold.

e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

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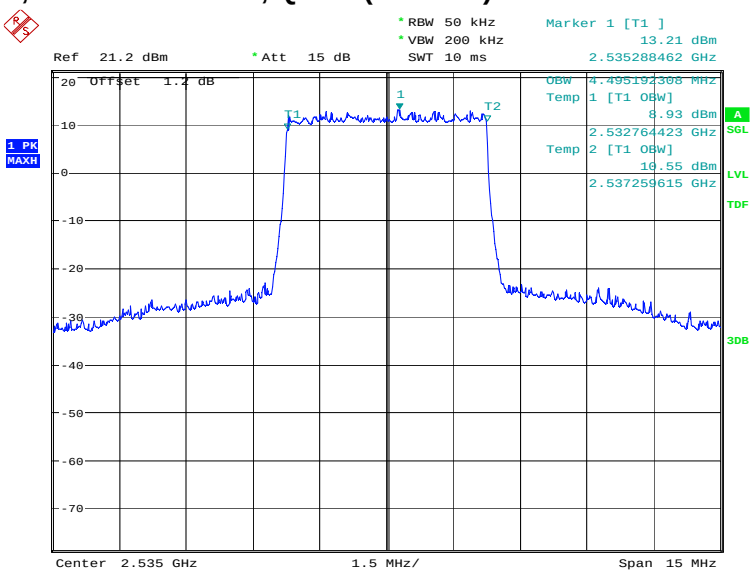
LTE band 7, 5MHz (99%)

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2535.0	QPSK	16QAM	64QAM
	4495.19	4471.15	4471.15

LTE band 7, 5MHz Bandwidth, QPSK (99% BW)



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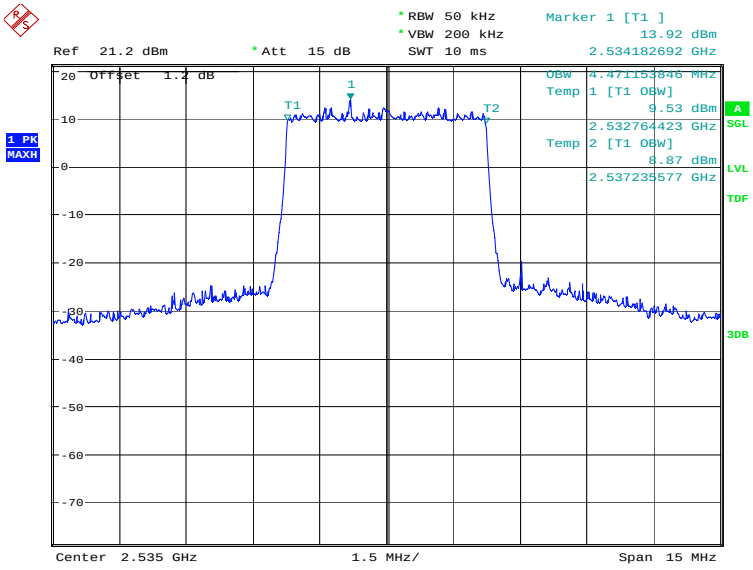
LTE band 7, 5MHz Bandwidth, 16QAM (99% BW)



Date: 21.AUG.2019 18:49:51

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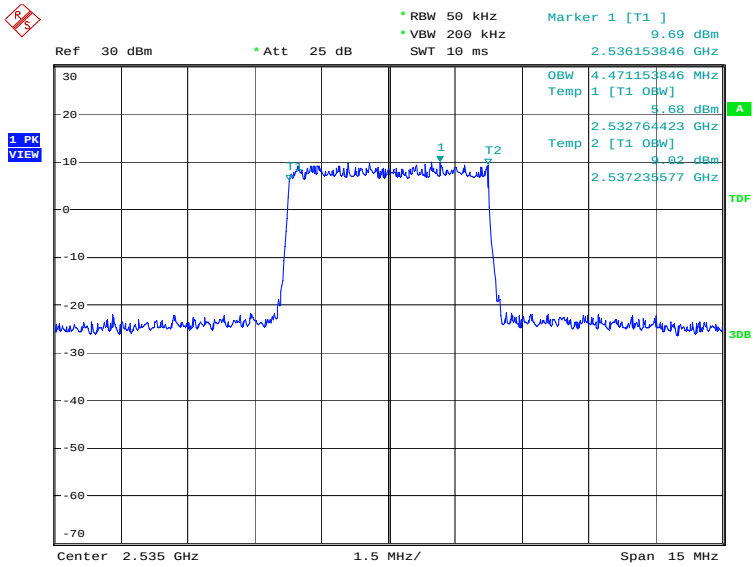
LTE band 7, 5MHz Bandwidth,64QAM (99% BW)



Date: 28.AUG.2019 15:25:51

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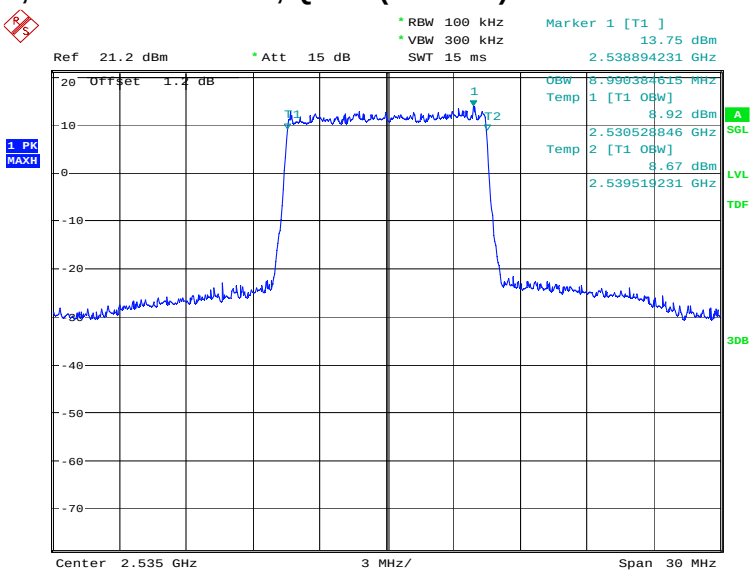
LTE band 7, 10MHz (99%)

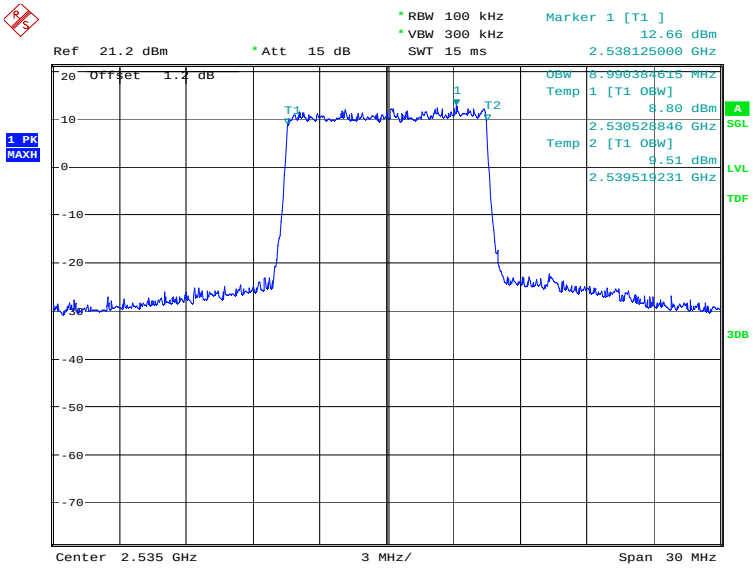
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2535.0	QPSK	16QAM	64QAM
	8990.38	8990.38	8990.38

LTE band 7, 10MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 18:52:04

LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)



Date: 21.AUG.2019 18:53:29

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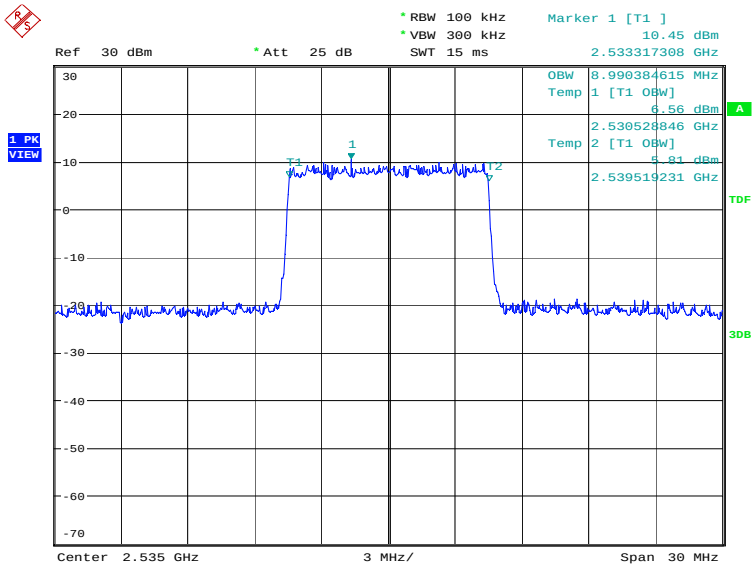
LTE band 7, 10MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:03:28

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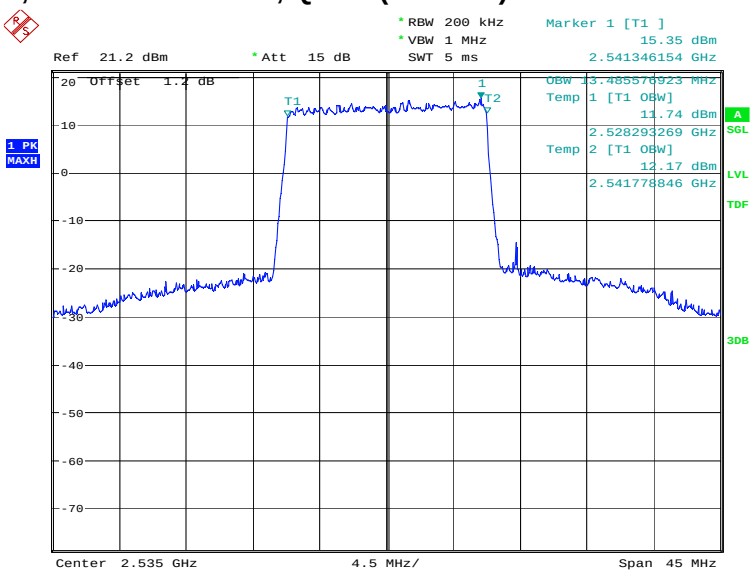
LTE band 7, 15MHz (99%)

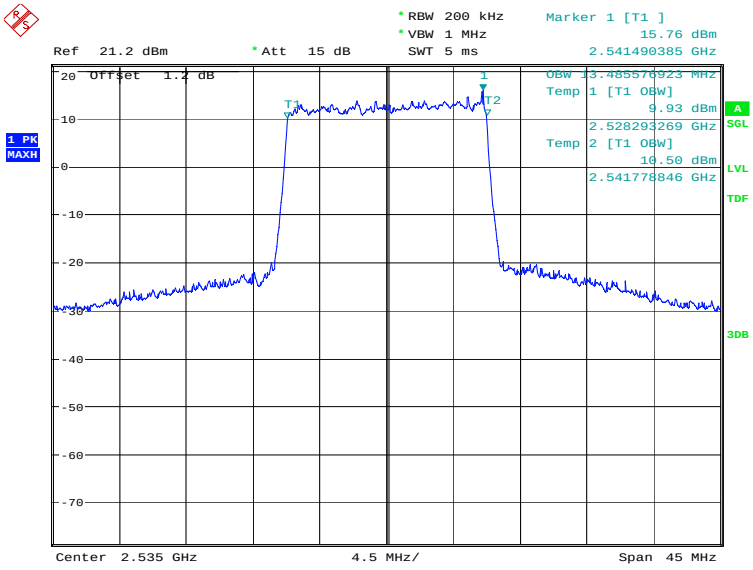
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2535.0	QPSK	16QAM	64QAM
	13485.58	13485.58	13485.58

LTE band 7, 15MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 18:55:42

LTE band 7, 15MHz Bandwidth, 16QAM (99% BW)



Date: 21.AUG.2019 18:57:07

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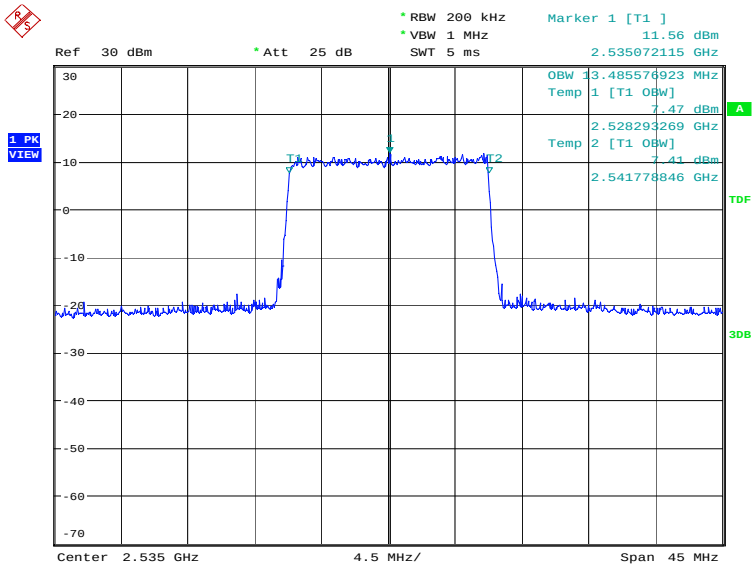
LTE band 7, 15MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:04:43

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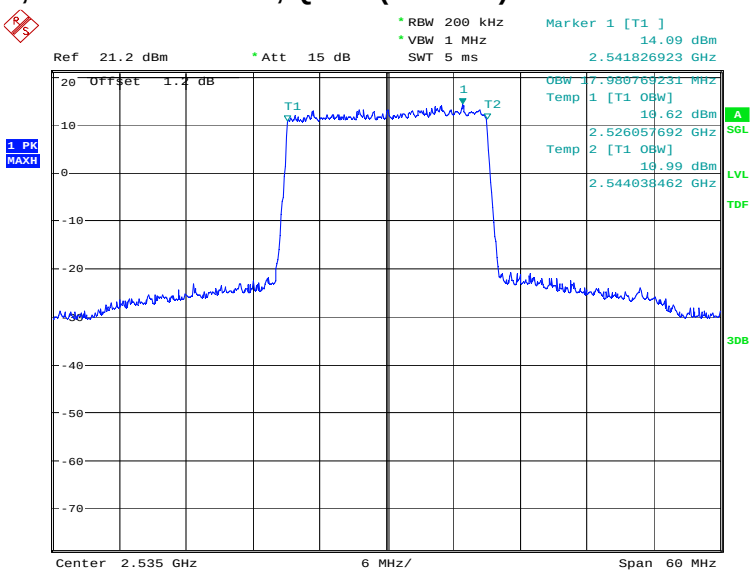
LTE band 7, 20MHz (99%)

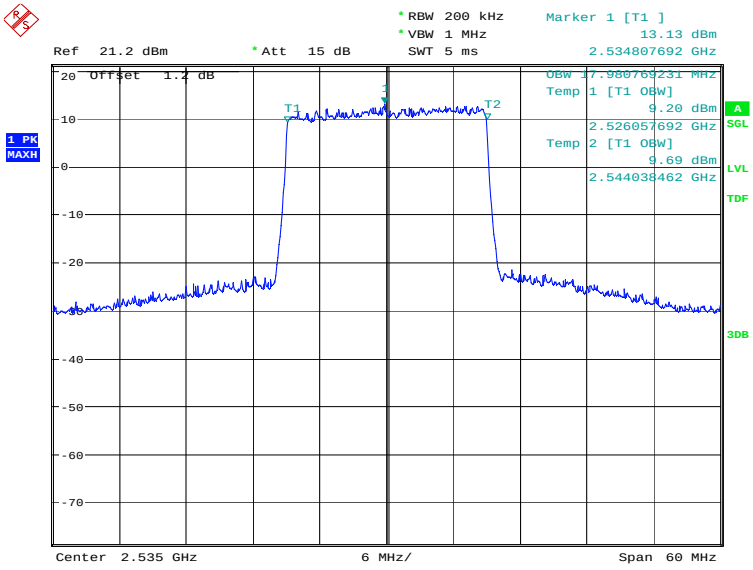
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2535.0	QPSK	16QAM	64QAM
	17980.77	17980.77	17980.77

LTE band 7, 20MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 18:59:21

LTE band 7, 20MHz Bandwidth, 16QAM (99% BW)



Date: 21.AUG.2019 19:00:45

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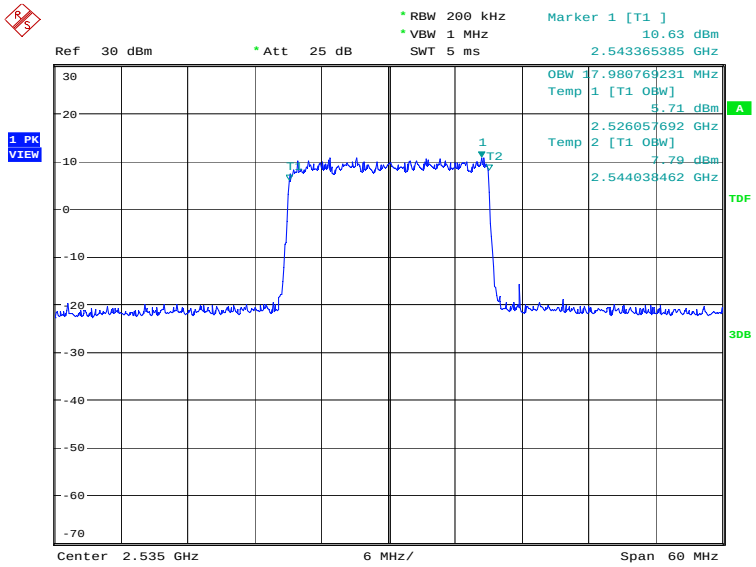
LTE band 7, 20MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:06:11

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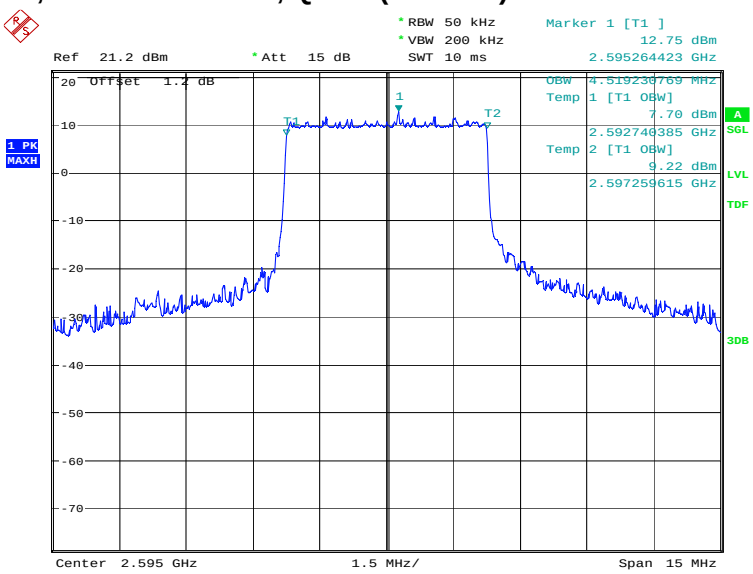
LTE band 38, 5MHz (99%)

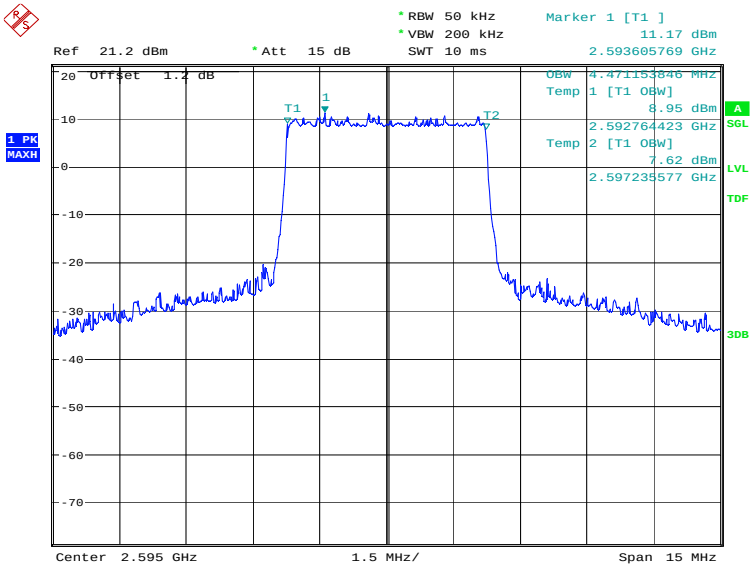
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2595.0	QPSK	16QAM	64QAM
	4519.23	4471.15	4495.19

LTE band 38, 5MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 19:24:56

LTE band 38, 5MHz Bandwidth,16QAM (99% BW)



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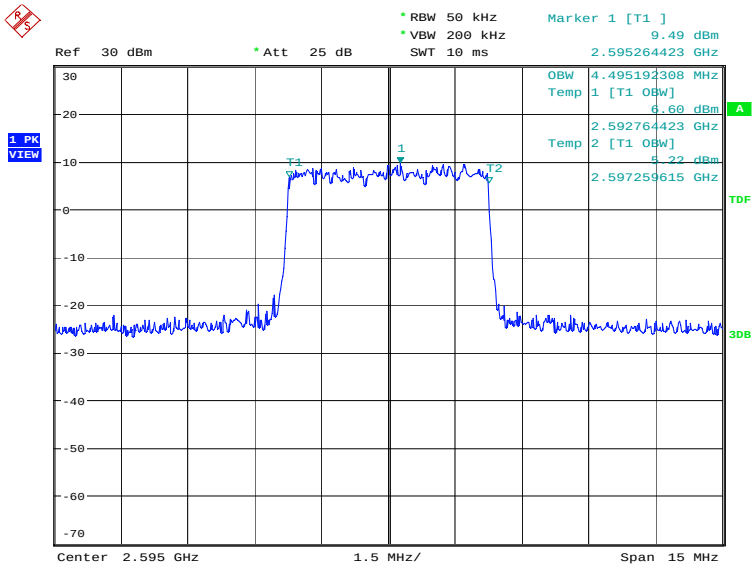
LTE band 38, 5MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:10:55

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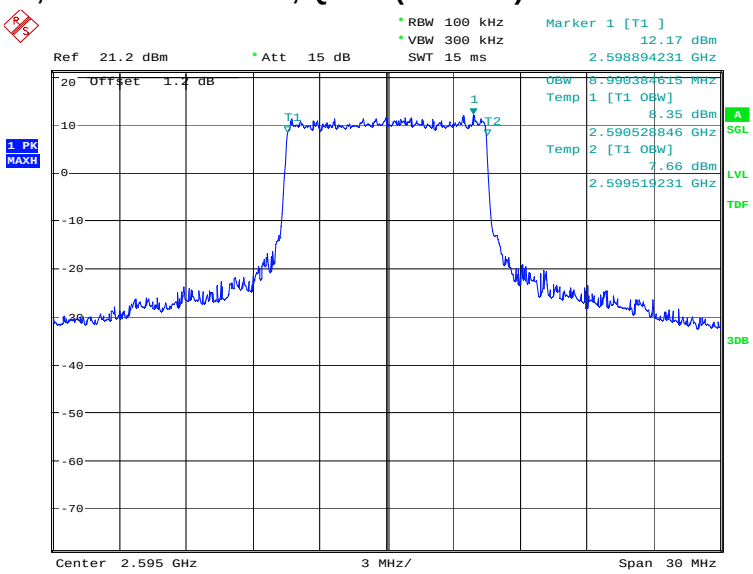
LTE band 38, 10MHz (99%)

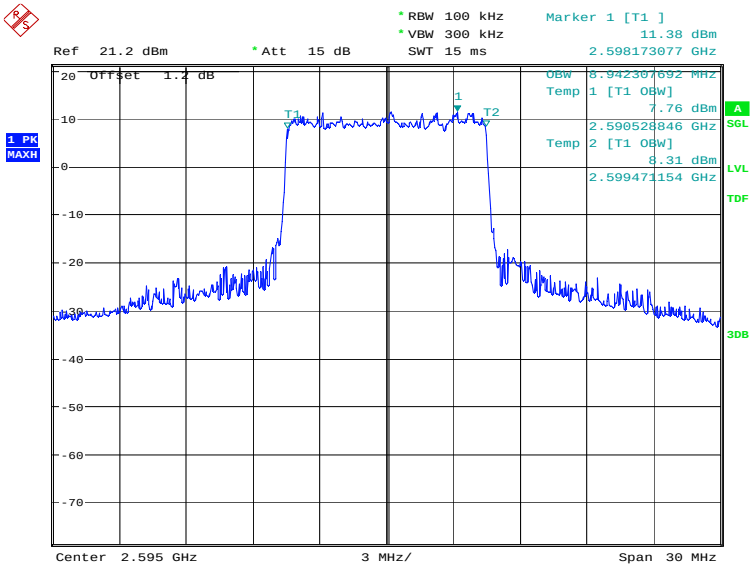
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2595.0	QPSK	16QAM	64QAM
	8990.38	8942.31	8990.38

LTE band 38, 10MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 19:27:46

LTE band 38, 10MHz Bandwidth,16QAM (99% BW)



Date: 21.AUG.2019 19:29:11

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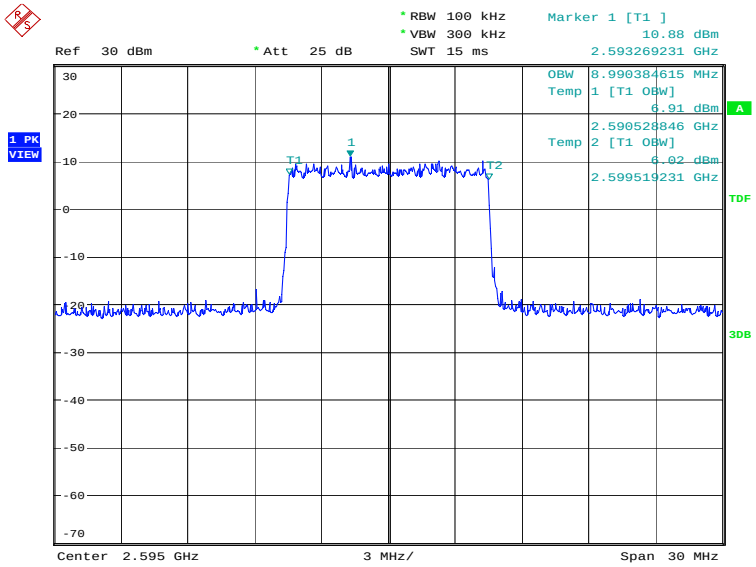
LTE band 38, 10MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:12:13

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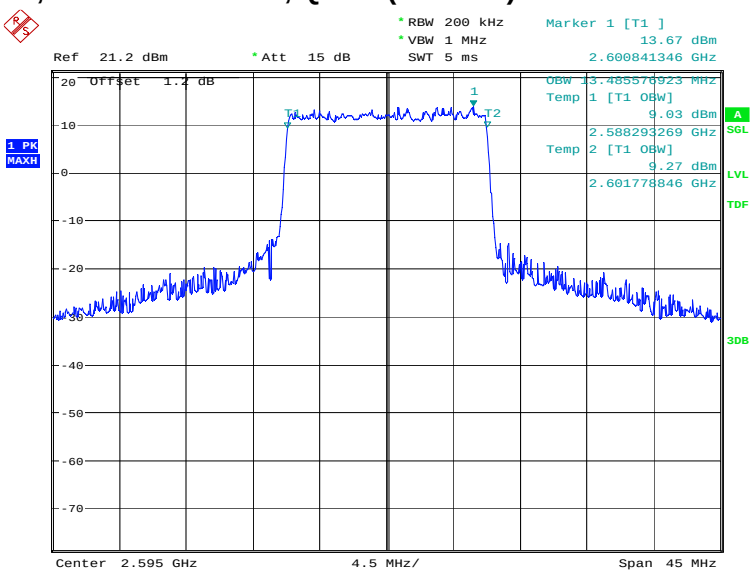
LTE band 38,15MHz (99%)

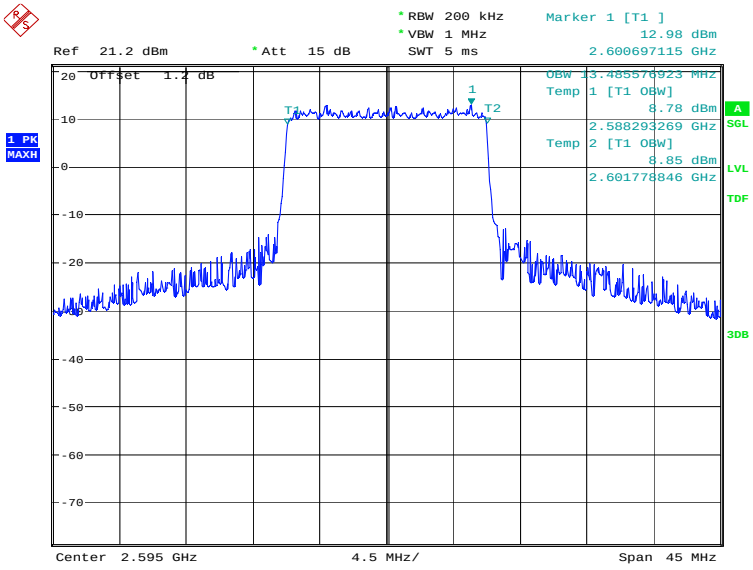
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2595.0	QPSK	16QAM	64QAM
	13485.58	13485.58	13485.58

LTE band 38,15MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 19:30:37

LTE band 38, 15MHz Bandwidth,16QAM (99% BW)



Date: 21.AUG.2019 19:32:01

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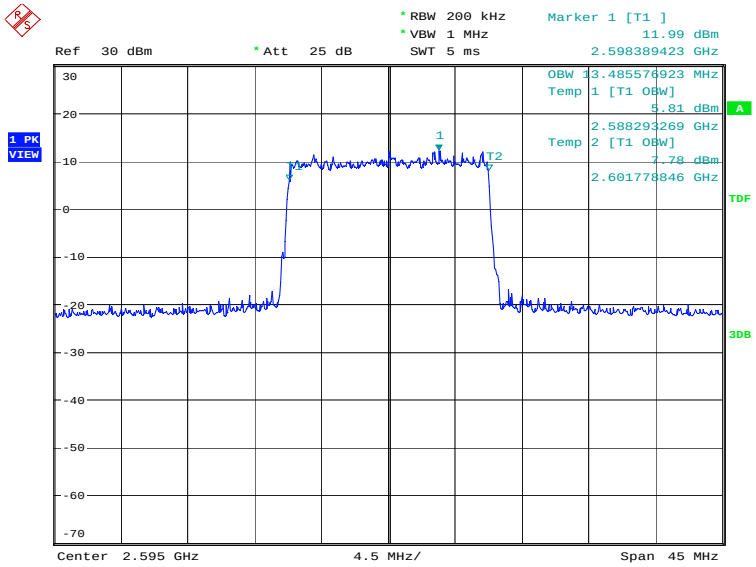
LTE band 38, 15MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:13:37

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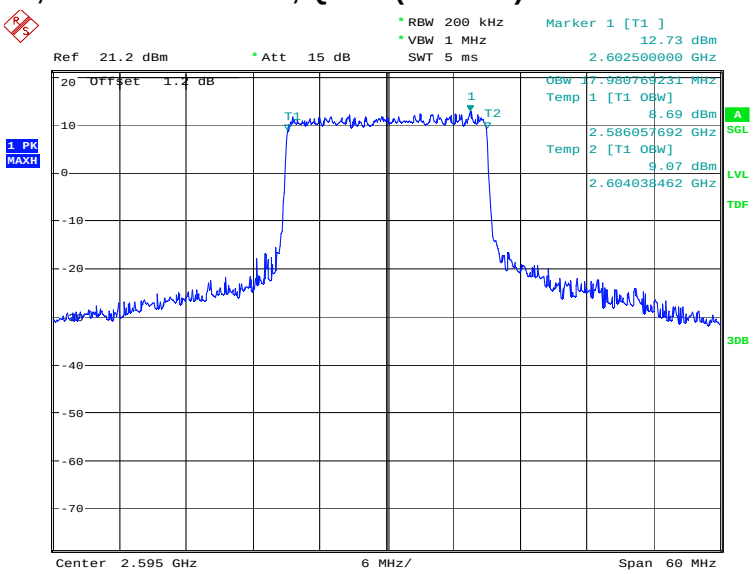
LTE band 38, 20MHz (99%)

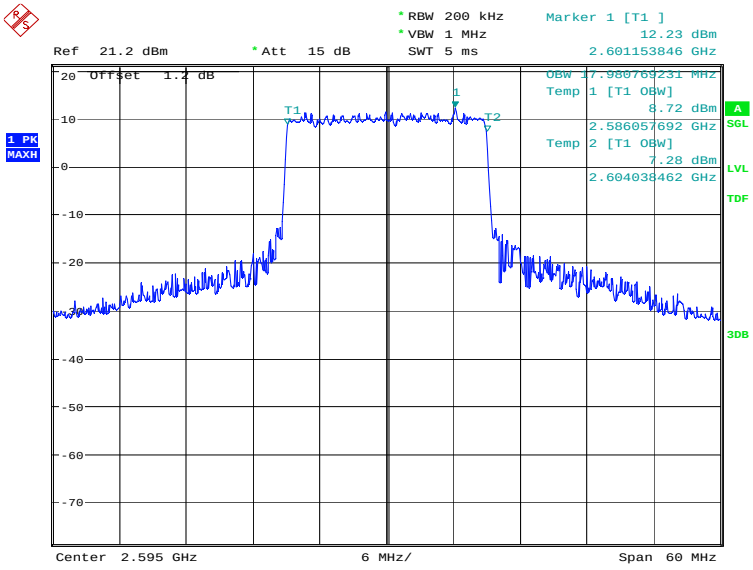
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
2595.0	QPSK	16QAM	64QAM
	17980.77	17980.77	17980.77

LTE band 38, 20MHz Bandwidth, QPSK (99% BW)



Date: 21.AUG.2019 19:34:15

LTE band 38, 20MHz Bandwidth,16QAM (99% BW)



Date: 21.AUG.2019 19:35:40

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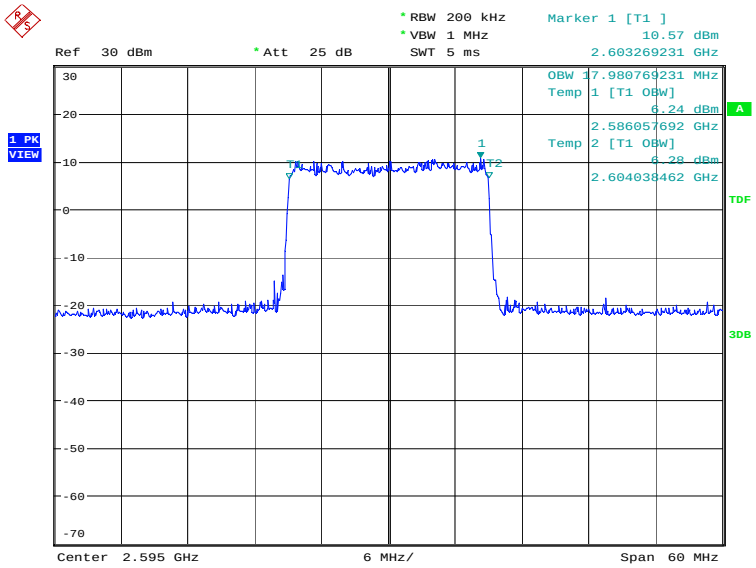
LTE band 38, 20MHz Bandwidth, 64QAM (99% BW)



Date: 28.AUG.2019 15:14:57

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A.5 EMISSION BANDWIDTH

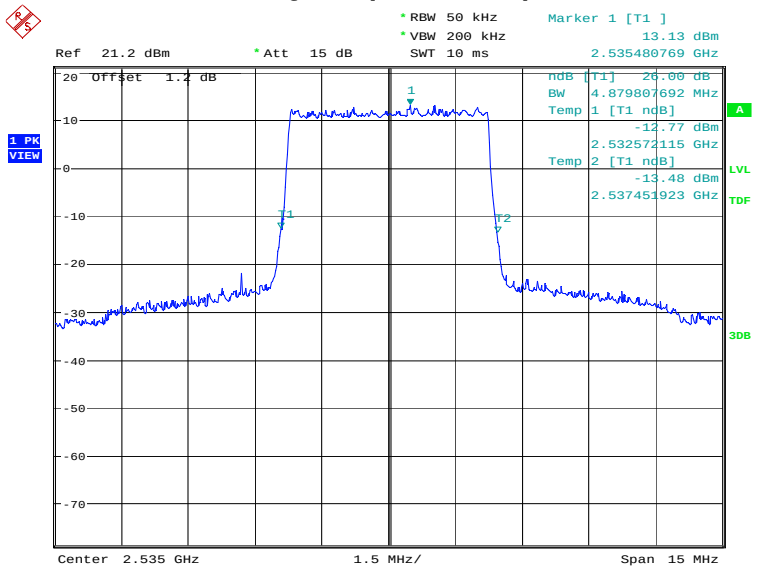
A.5.1Emission Bandwidth Results

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

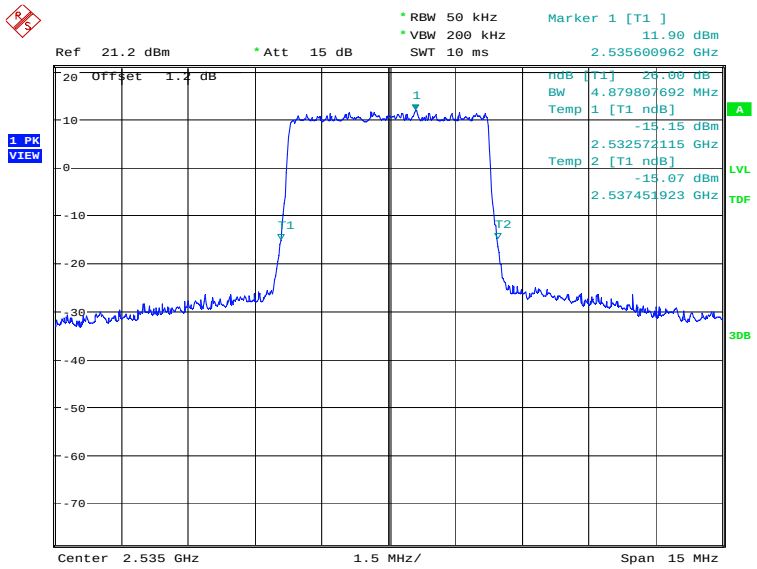
LTE band 7, 5MHz (-26dBc)

Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2535.0	QPSK	16QAM	64QAM
	4879.81	4879.81	4855.77

LTE band 7, 5MHz Bandwidth, QPSK (-26dBc BW)



LTE band 7, 5MHz Bandwidth,16QAM (-26dBc BW)



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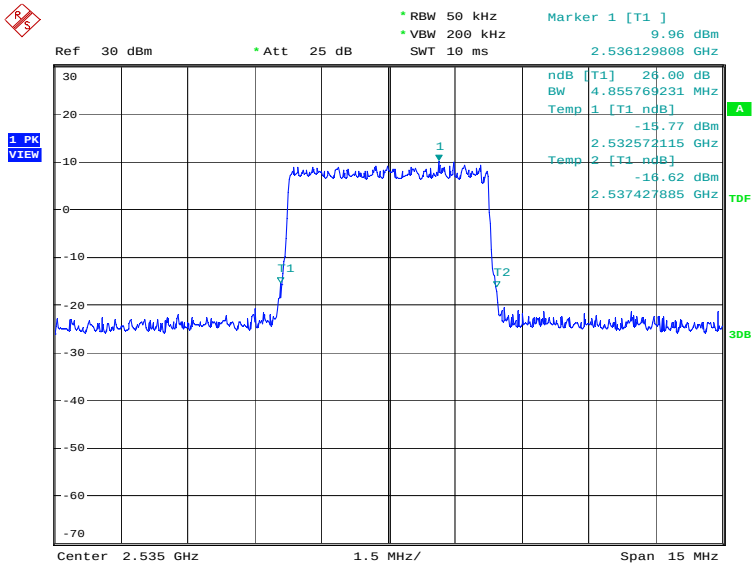
LTE band 7, 5MHz Bandwidth,64QAM (-26dBc BW)



Date: 28.AUG.2019 15:02:39

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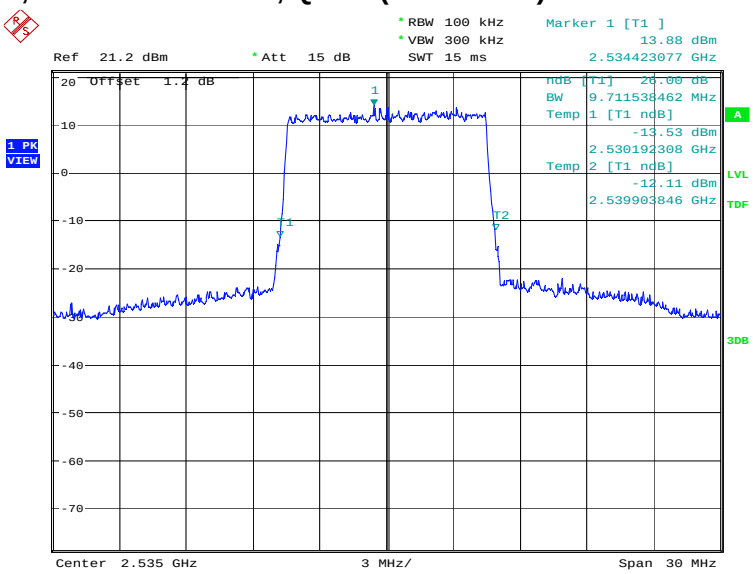
LTE band 7, 10MHz (-26dBc)

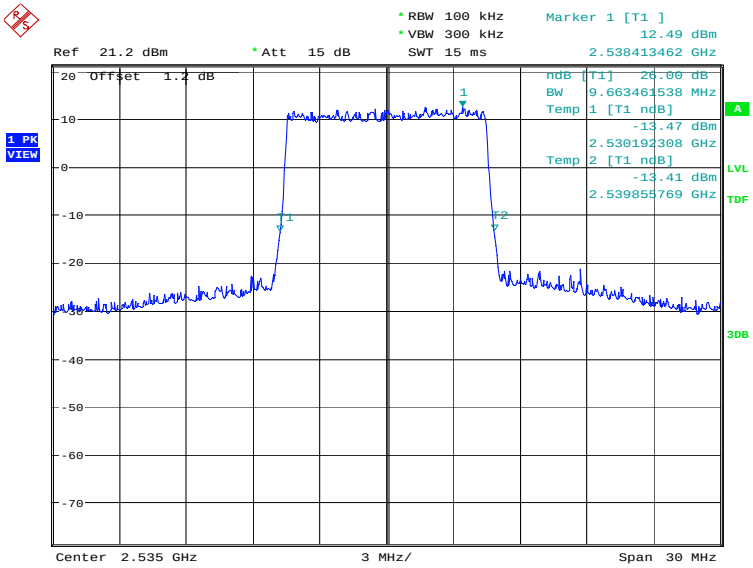
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2535.0	QPSK	16QAM	64QAM
	9711.54	9663.46	9615.38

LTE band 7, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 19:55:55

LTE band 7, 10MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 19:57:20

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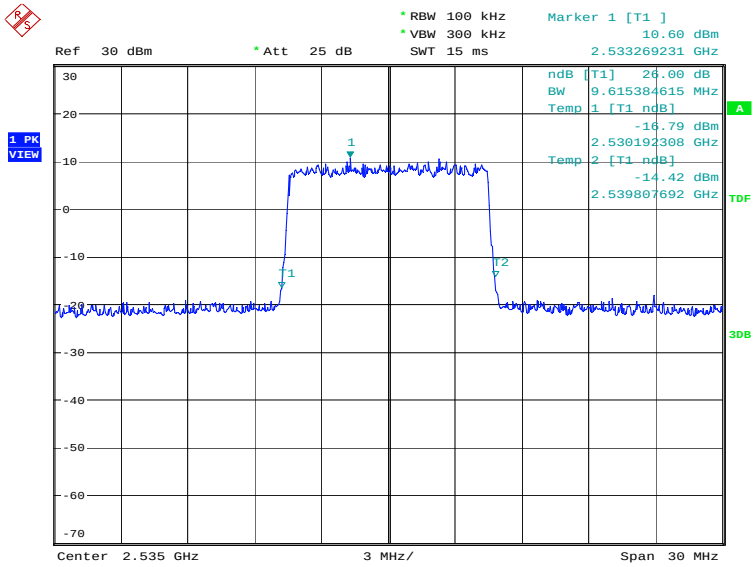
LTE band 7, 10MHz Bandwidth, 64QAM (-26dBc BW)



Date: 28.AUG.2019 15:03:49

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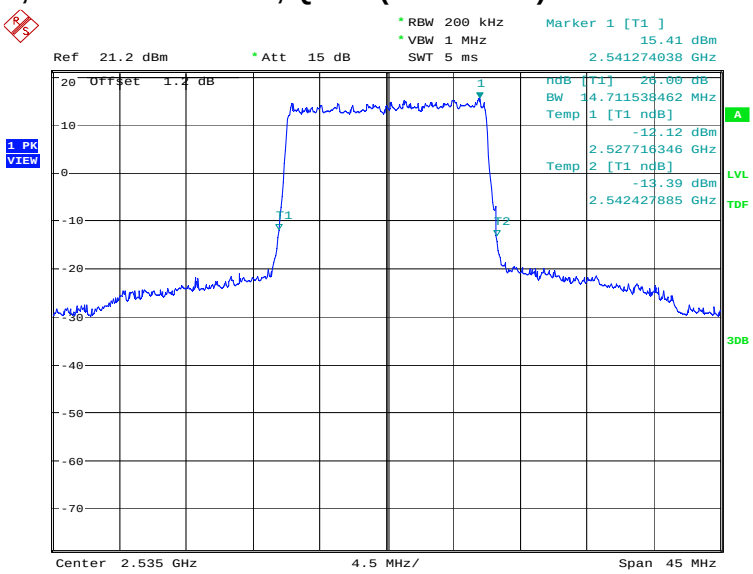
LTE band 7, 15MHz (-26dBc)

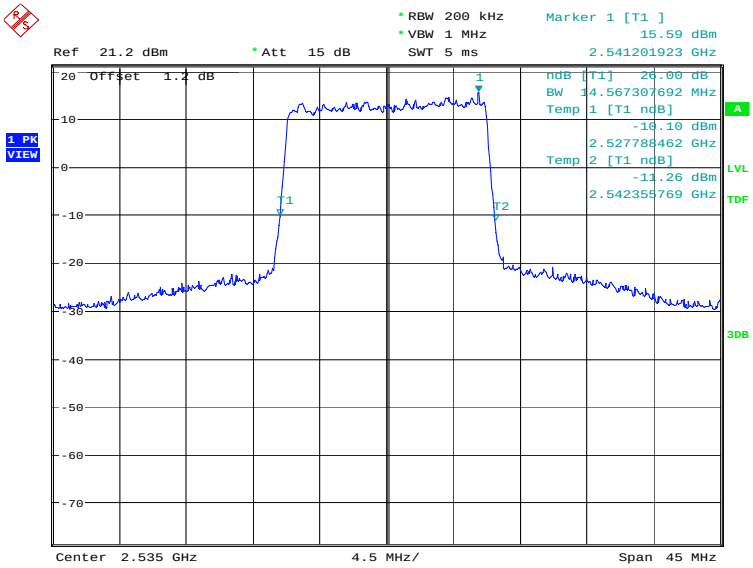
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2535.0	QPSK	16QAM	64QAM
	14711.54	14567.31	14711.54

LTE band 7, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 19:59:34

LTE band 7, 15MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:00:59

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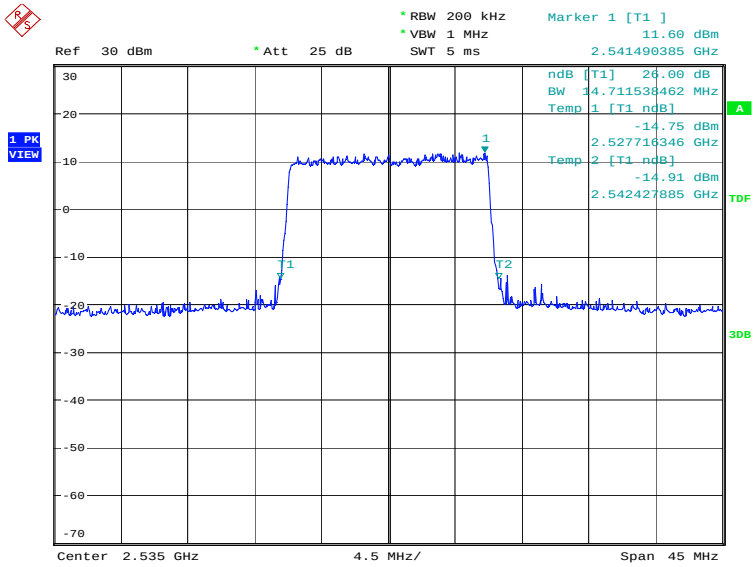
LTE band 7, 15MHz Bandwidth, 64QAM (-26dBc BW)



Date: 28.AUG.2019 15:05:08

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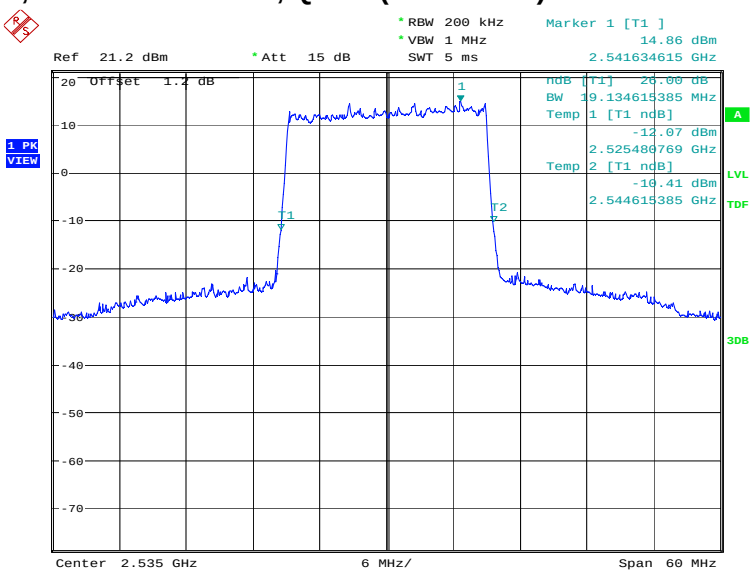
LTE band 7, 20MHz (-26dBc)

Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2535.0	QPSK	16QAM	64QAM
	19134.62	19134.62	19134.62

LTE band 7, 20MHz Bandwidth, QPSK (-26dBc BW)



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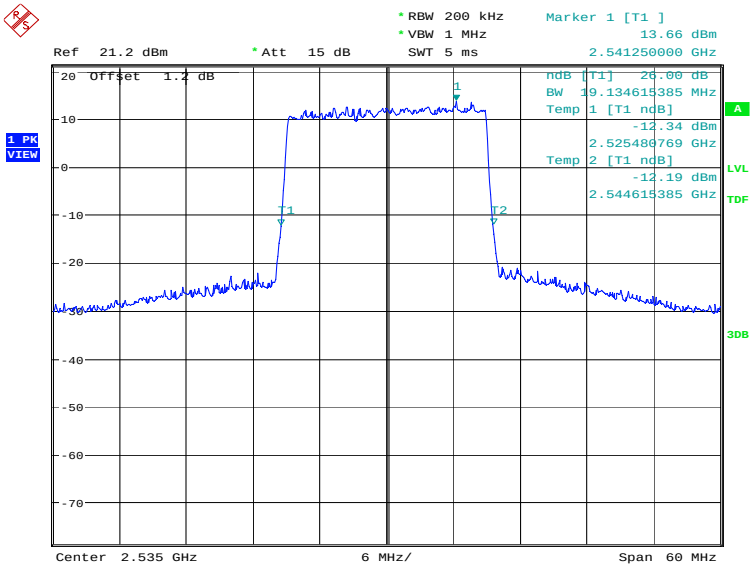
LTE band 7, 20MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:04:38

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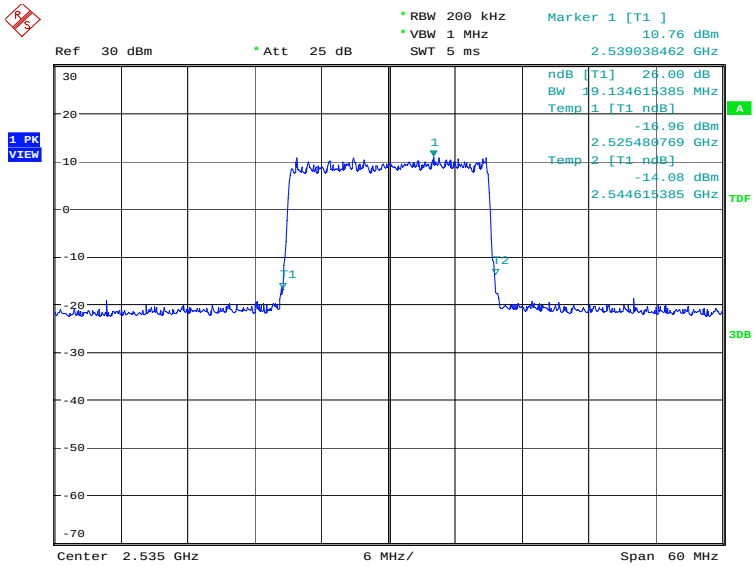
LTE band 7, 20MHz Bandwidth, 64QAM (-26dBc BW)



Date: 28.AUG.2019 15:06:33

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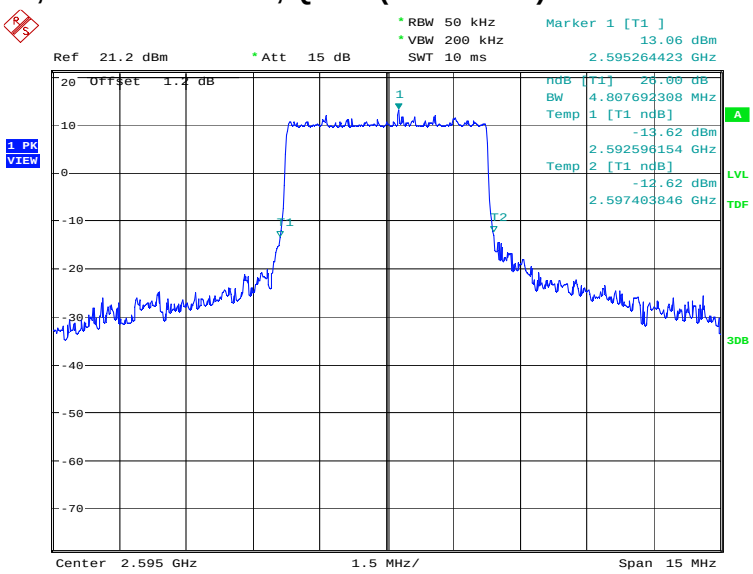
LTE band 38, 5MHz (-26dBc)

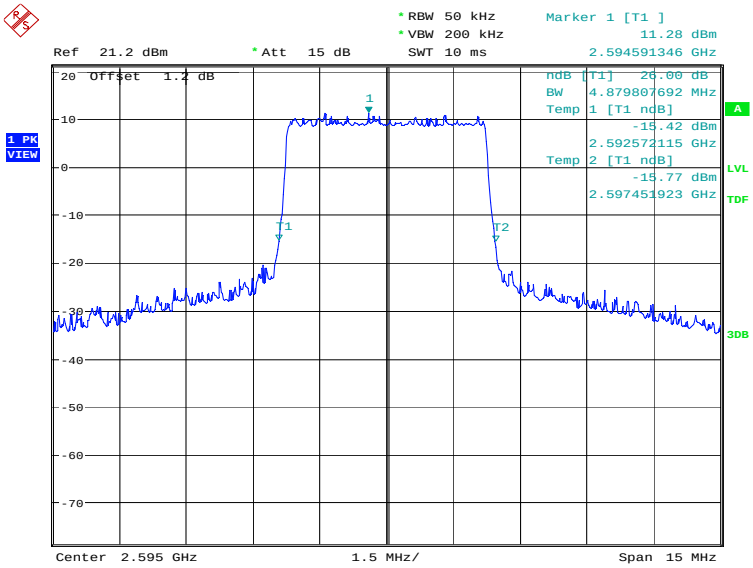
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2595.0	QPSK	16QAM	64QAM
	4807.69	4879.81	4831.73

LTE band 38, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 20:28:54

LTE band 38, 5MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:30:19

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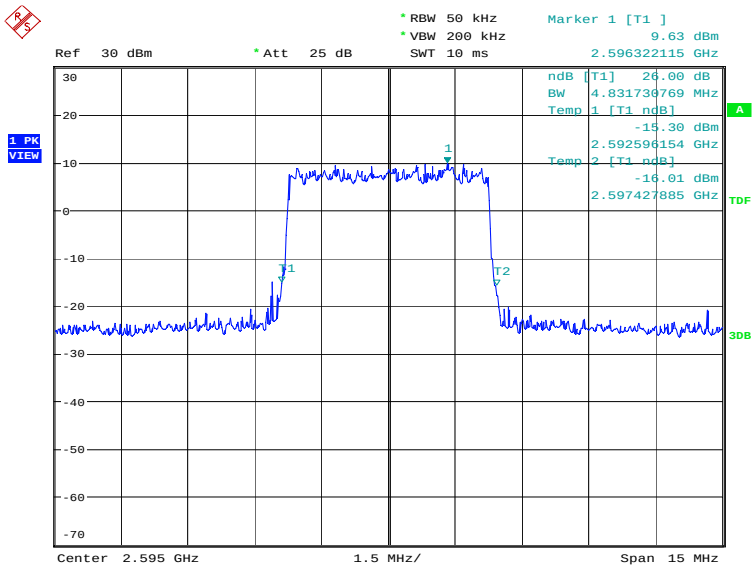
LTE band 38, 5MHz Bandwidth,64QAM (-26dBc BW)



Date: 28.AUG.2019 15:11:17

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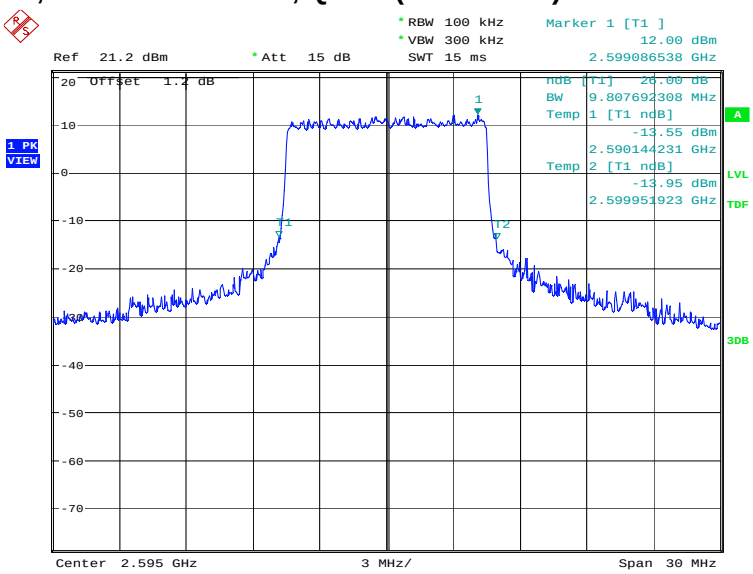
LTE band 38, 10MHz (-26dBc)

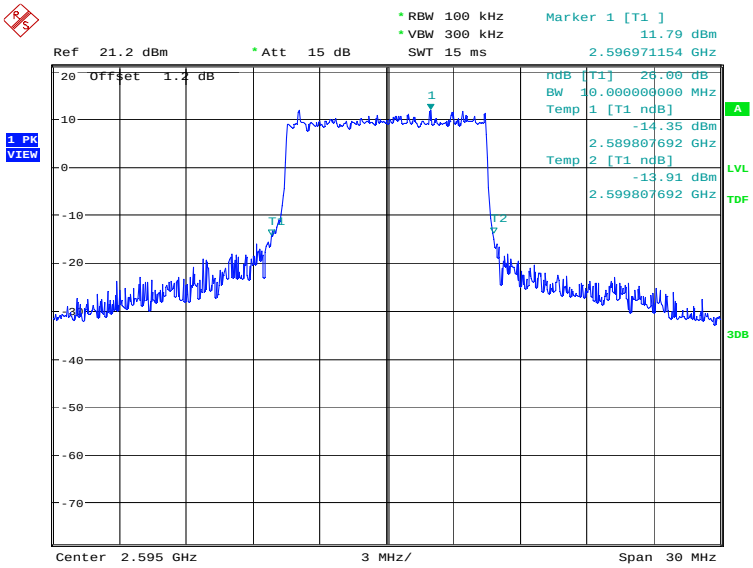
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2595.0	QPSK	16QAM	64QAM
	9807.69	10000.00	9711.54

LTE band 38, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 20:32:33

LTE band 38, 10MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:33:58

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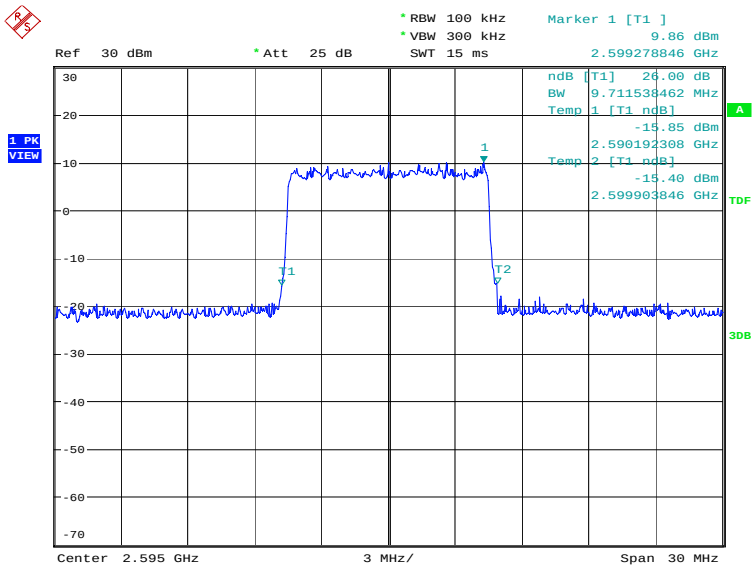
LTE band 38, 10MHz Bandwidth,64QAM (-26dBc BW)



Date: 28.AUG.2019 15:12:40

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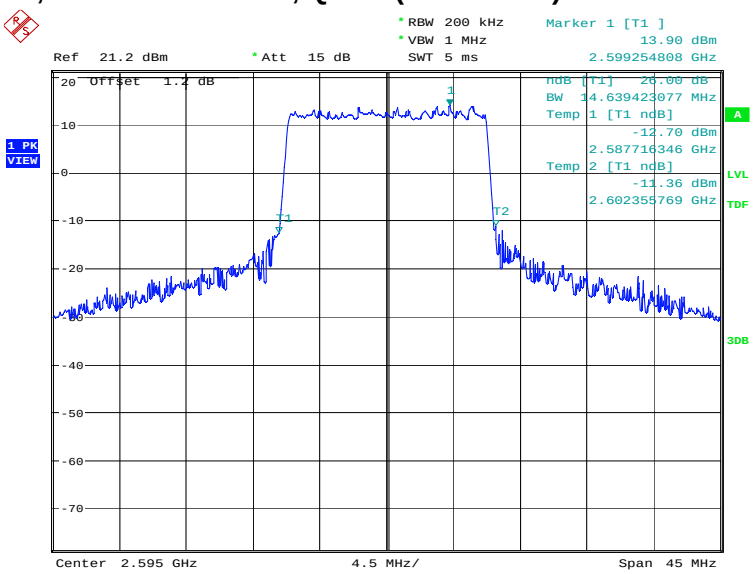
LTE band 38, 15MHz (-26dBc)

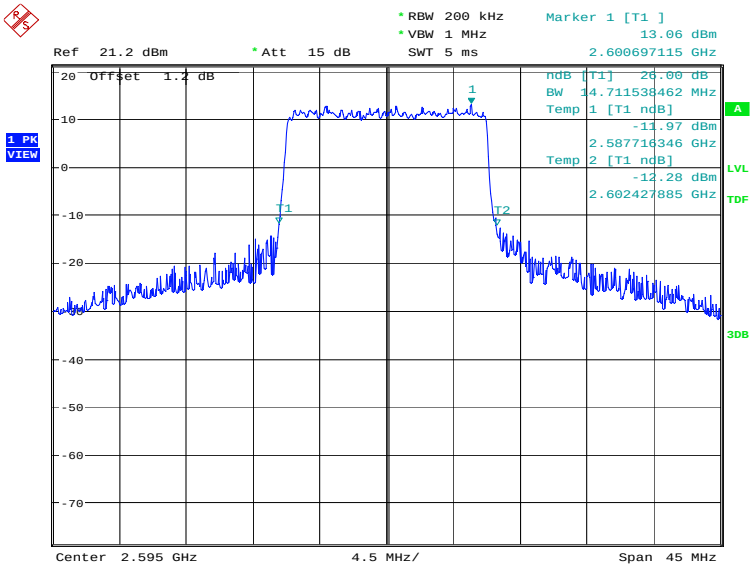
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2595.0	QPSK	16QAM	64QAM
	14639.42	14711.54	14495.19

LTE band 38, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 20:35:25

LTE band 38, 15MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:36:50

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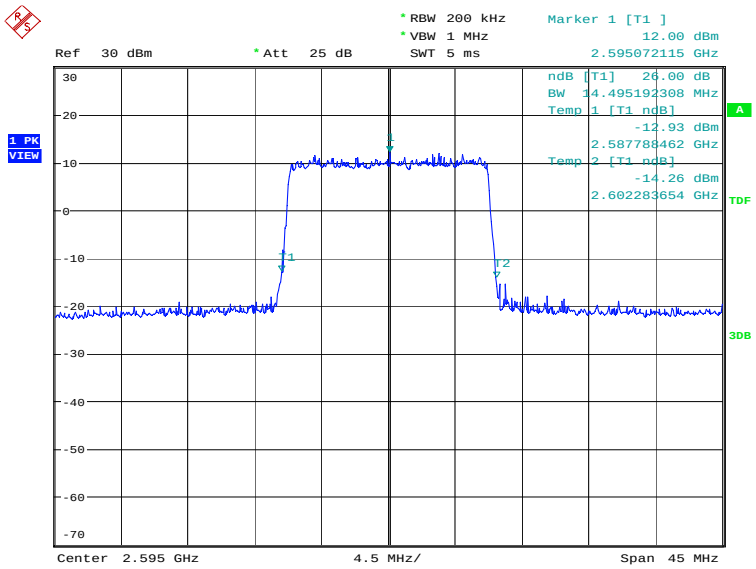
LTE band 38, 15MHz Bandwidth,64QAM (-26dBc BW)



Date: 28.AUG.2019 15:14:05

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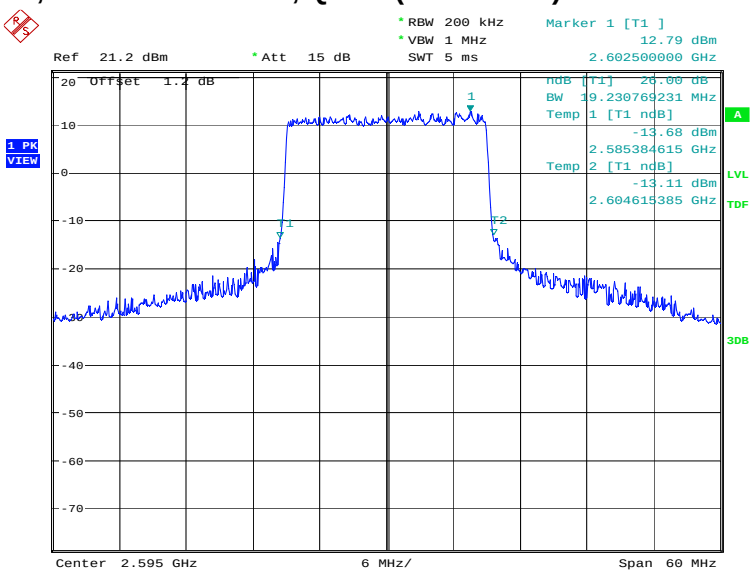
LTE band 38, 20MHz (-26dBc)

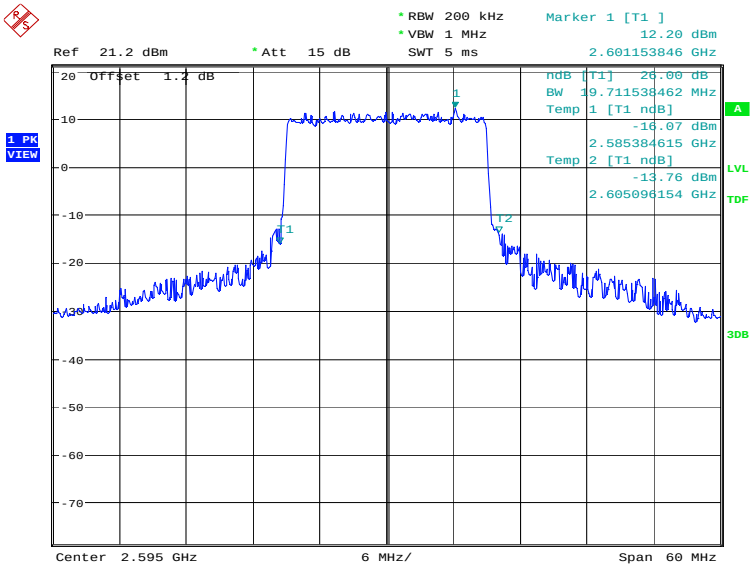
Frequency (MHz)	Occupied Bandwidth (-26dBc) (kHz)		
2595.0	QPSK	16QAM	64QAM
	19230.77	19711.54	19230.77

LTE band 38, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 21.AUG.2019 20:39:04

LTE band 38, 20MHz Bandwidth,16QAM (-26dBc BW)



Date: 21.AUG.2019 20:40:29

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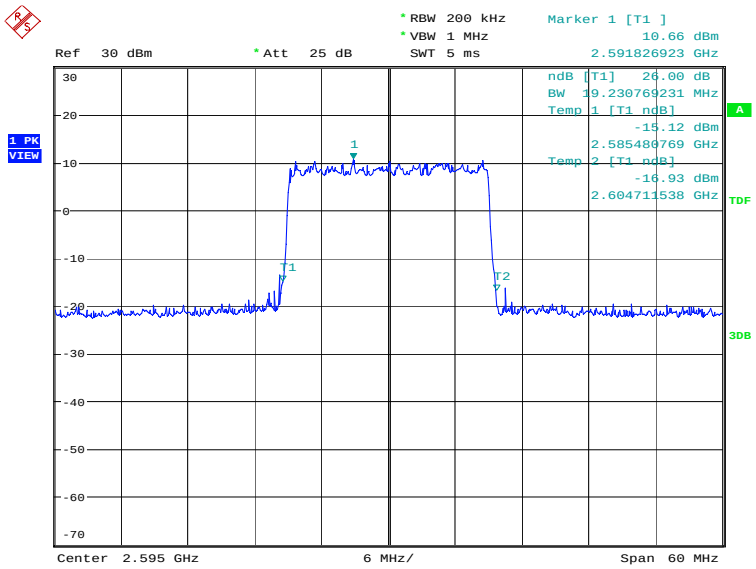
LTE band 38, 20MHz Bandwidth,64QAM (-26dBc BW)



Date: 28.AUG.2019 15:15:27

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A.6 BAND EDGE COMPLIANCE

A.6.1 Measurement limit

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (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 (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (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.

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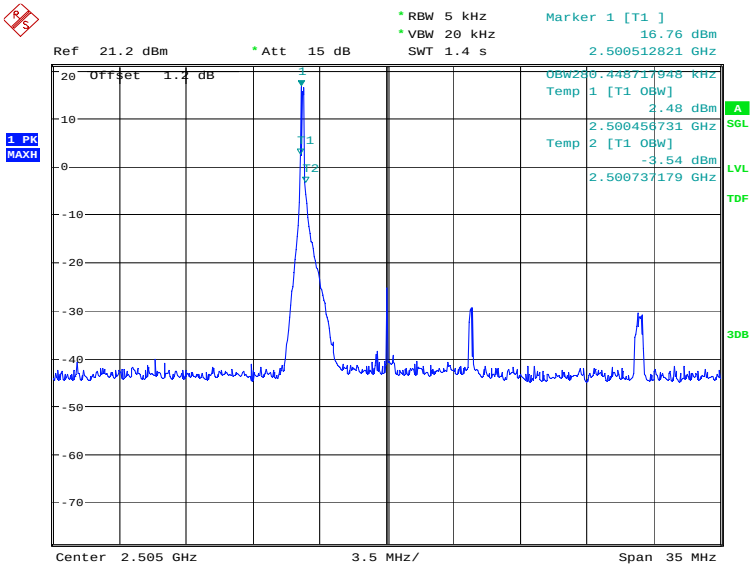
A.6.2 Measurement result

Only the worst case result is given below

LTE band 7

OBW: 1RB-low_offset



Date: 10.SEP.2019 12:01:36

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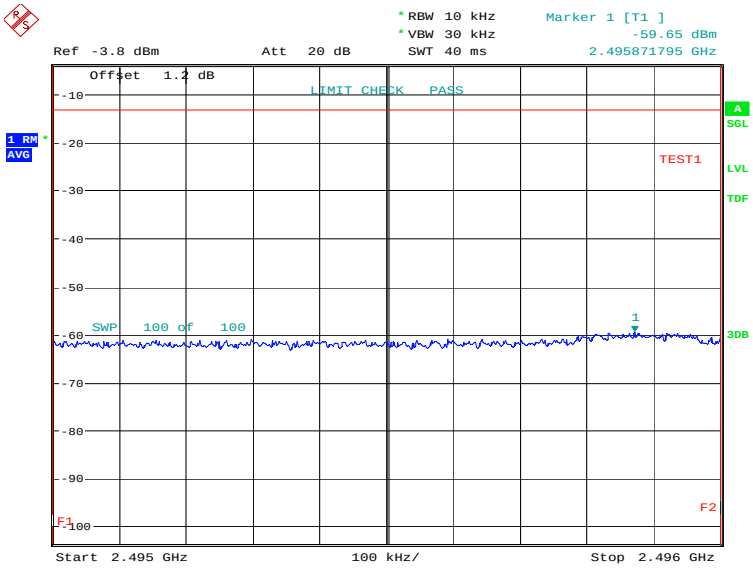
LOW BAND EDGE BLOCK-1RB-low_offset



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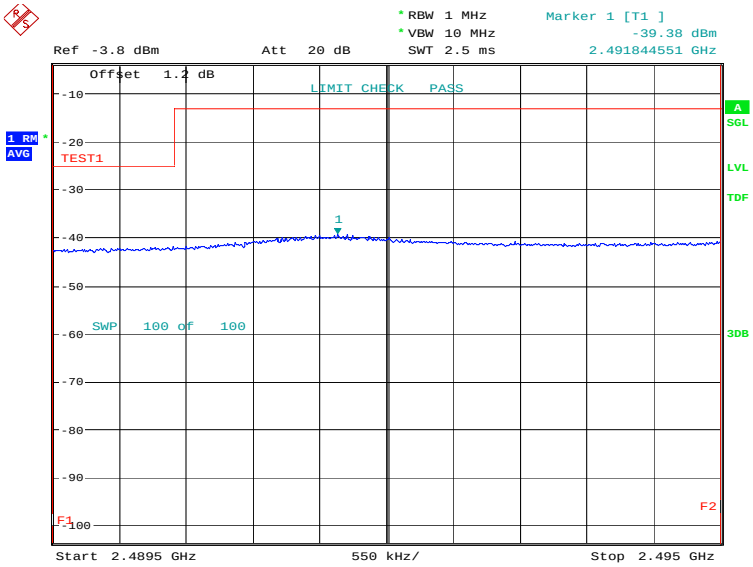

Date: 10.SEP.2019 12:02:12

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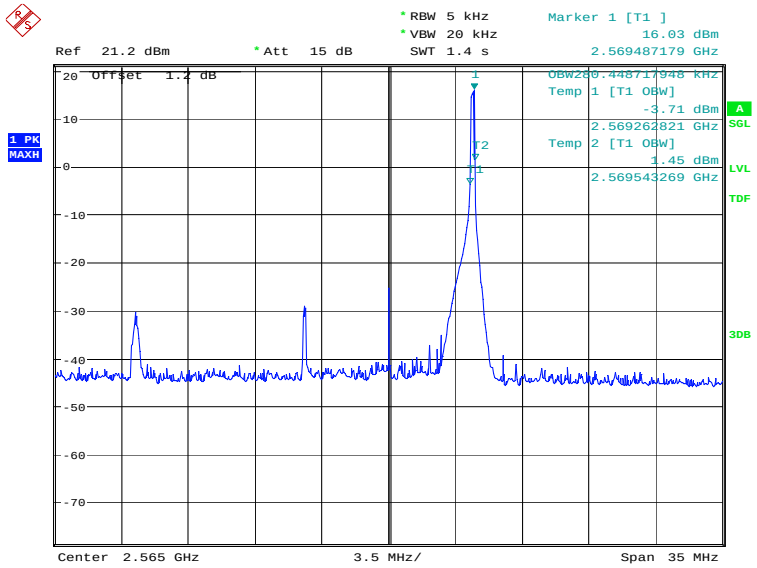

Date: 10.SEP.2019 12:05:14

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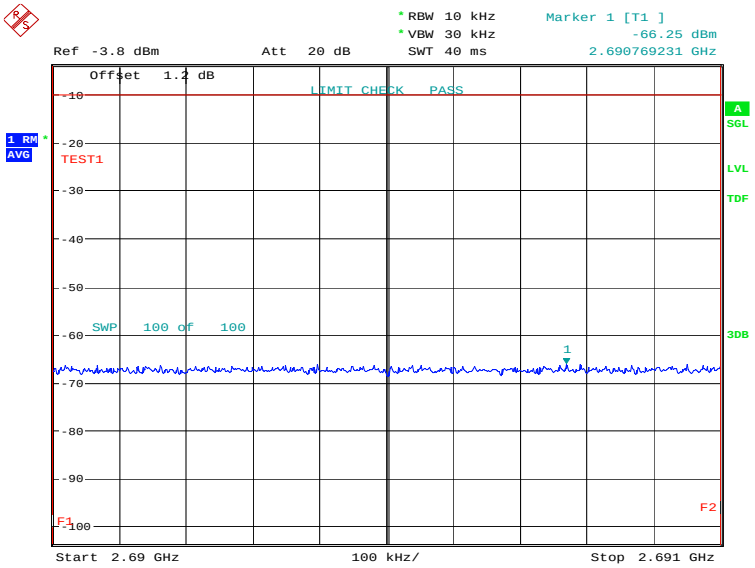
HIGH BAND EDGE BLOCK-1RB-high_offset



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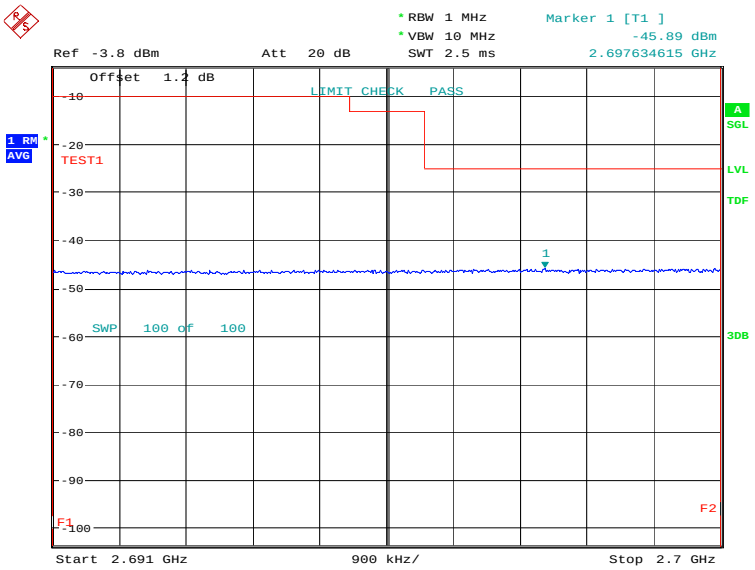

Date: 10.SEP.2019 12:05:49

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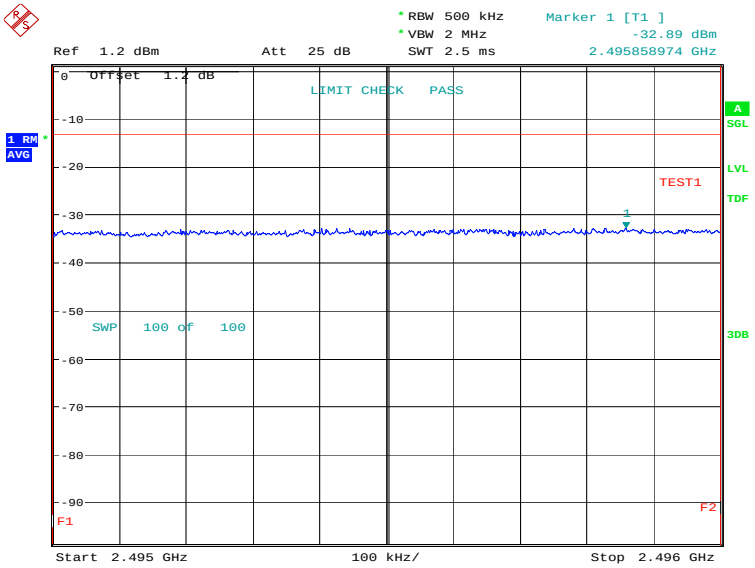
LOW BAND EDGE BLOCK-20MHz-100%RB



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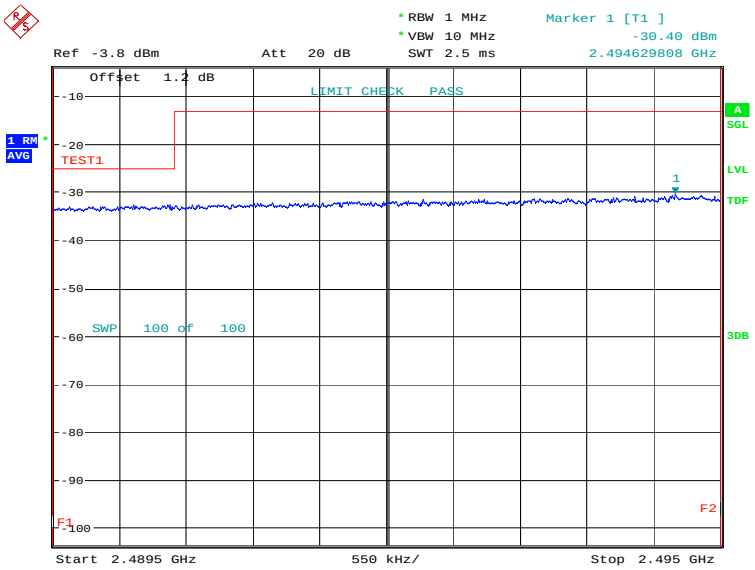

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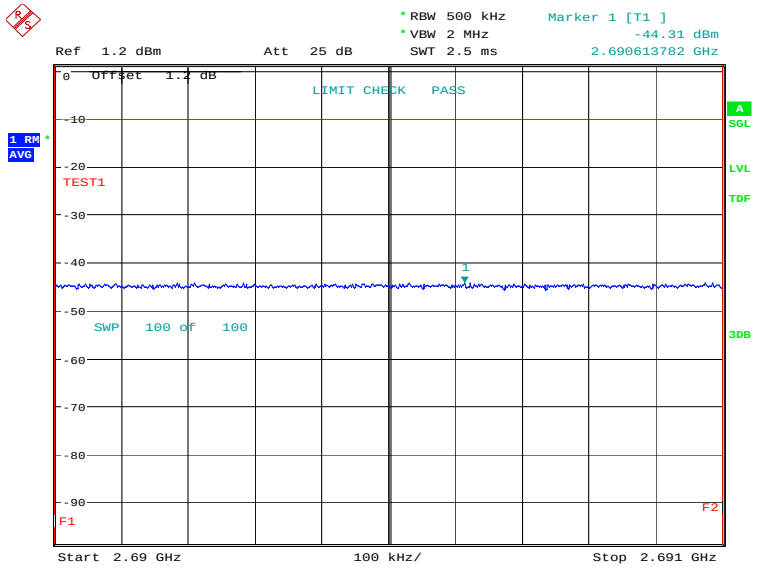
HIGH BAND EDGE BLOCK-20MHz-100%RB



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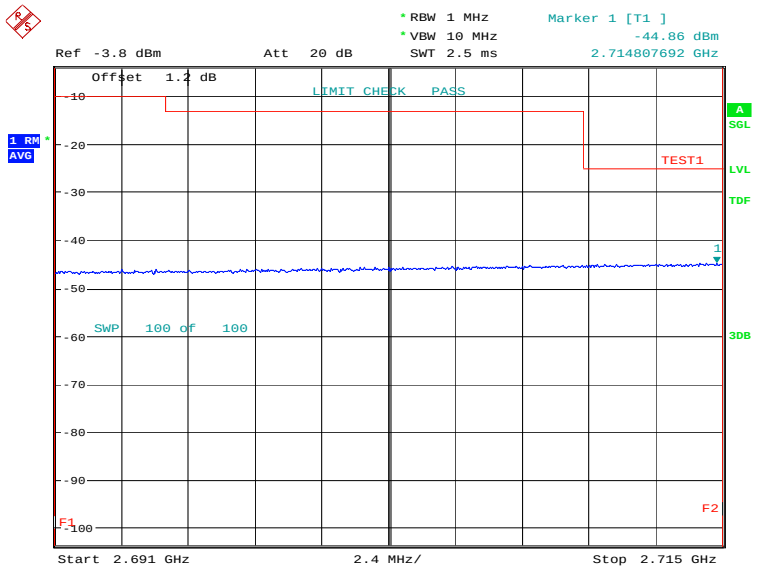

Date: 10.SEP.2019 12:06:50

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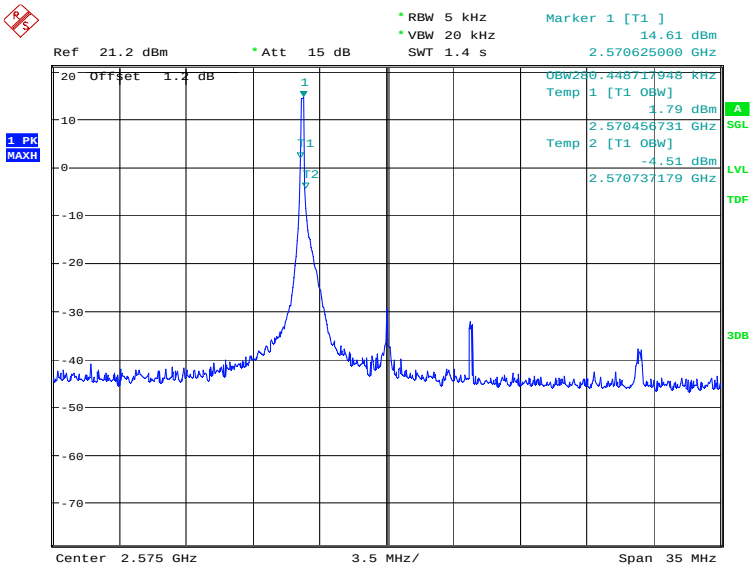
LTE band 38

OBW: 1RB-low_offset



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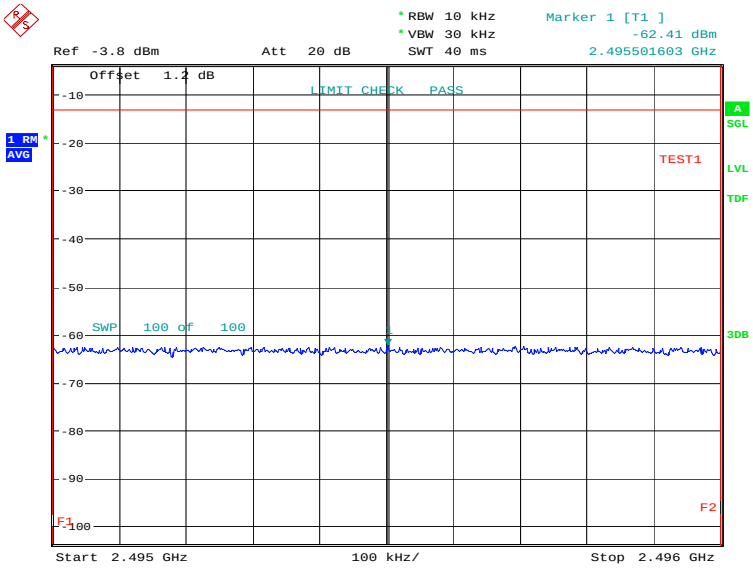
LOW BAND EDGE BLOCK-1RB-low_offset



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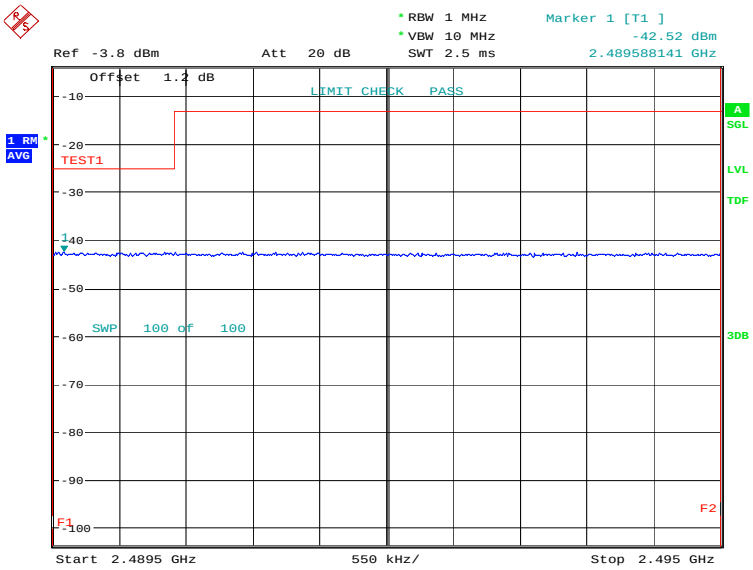

Date: 10.SEP.2019 12:19:49

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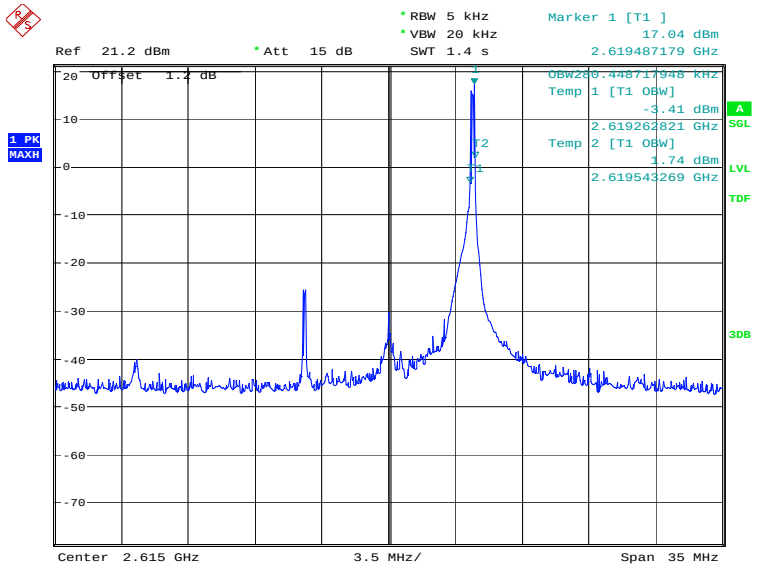
OBW: 1RB-high_offset



Date: 10.SEP.2019 12:22:50

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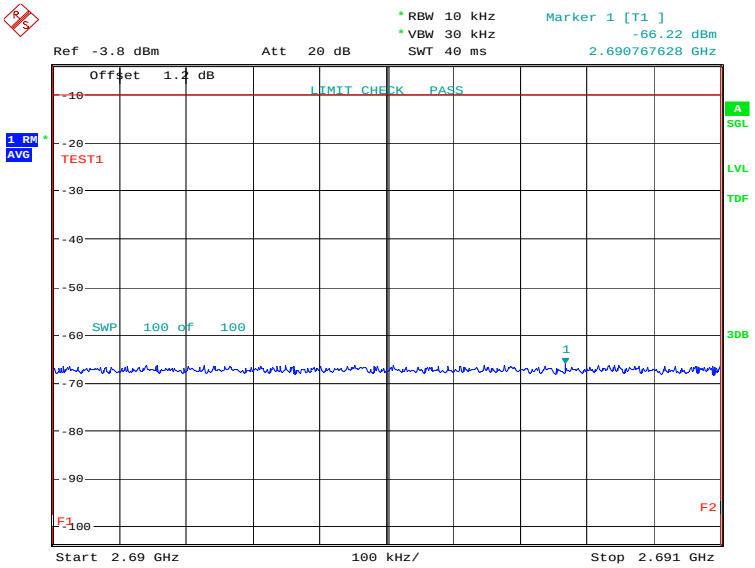
HIGH BAND EDGE BLOCK-1RB-high_offset



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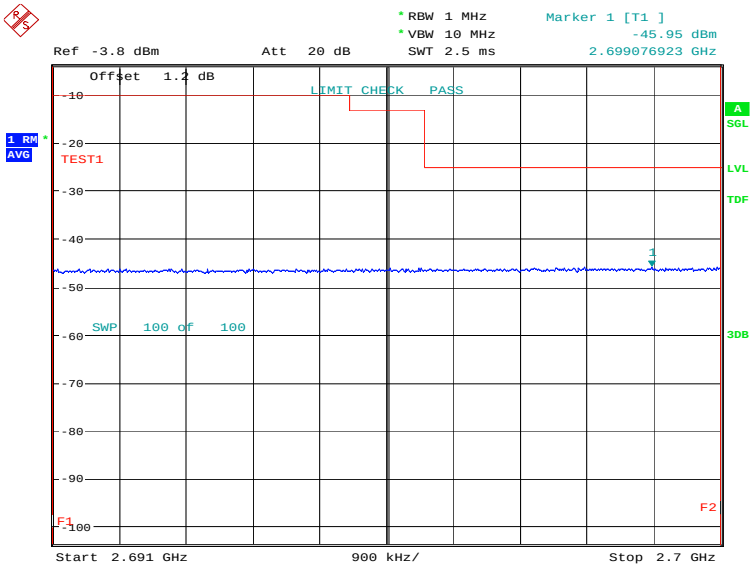

Date: 10.SEP.2019 12:23:26

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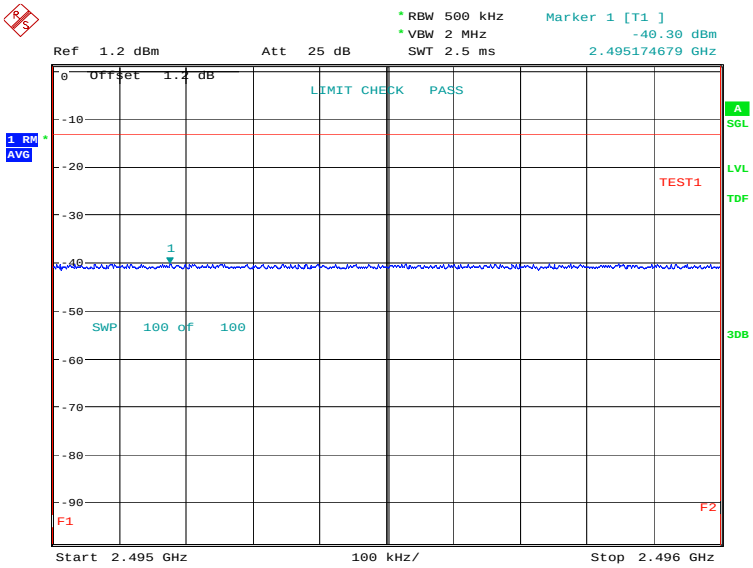
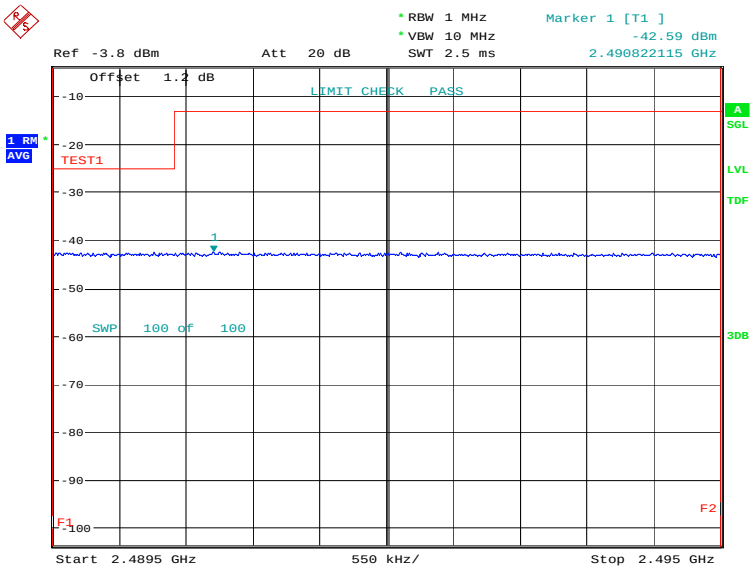
LOW BAND EDGE BLOCK-20MHz-100%RB



Date: 10.SEP.2019 12:20:35



Date: 10.SEP.2019 12:20:50

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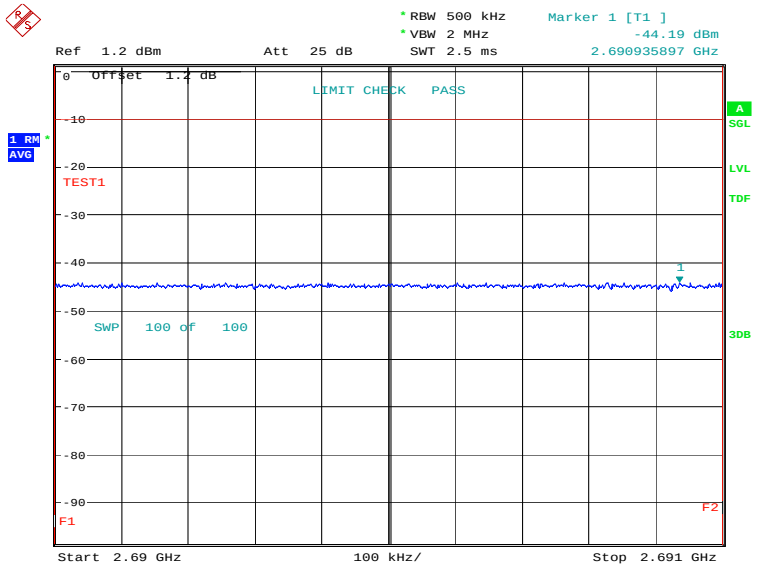
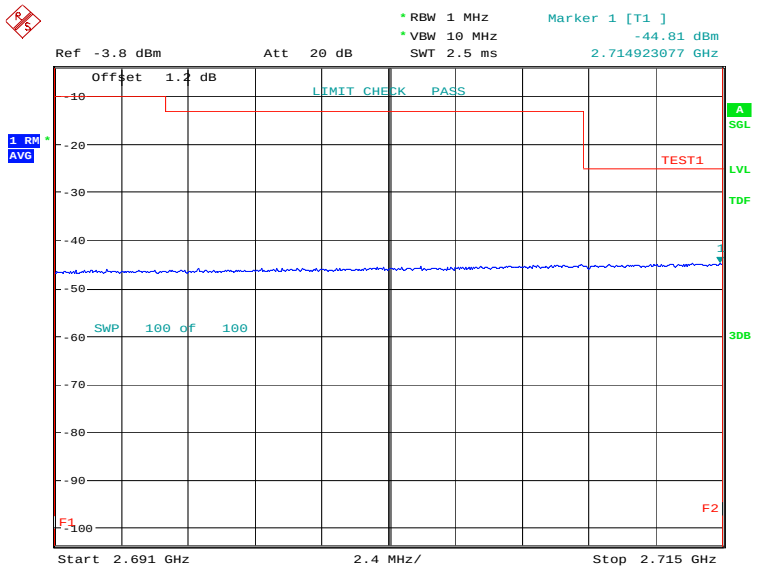
HIGH BAND EDGE BLOCK-20MHz-100%RB



Date: 10.SEP.2019 12:24:12



Date: 10.SEP.2019 12:24:27

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A.7 CONDUCTED SPURIOUS EMISSION

A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

A. 7.2 Measurement Limit

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (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 (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (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.

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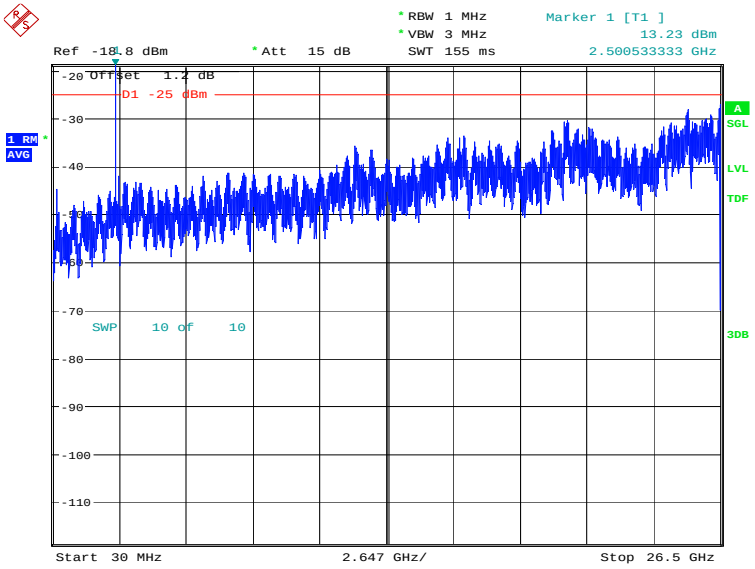
A. 7.2 Measurement result

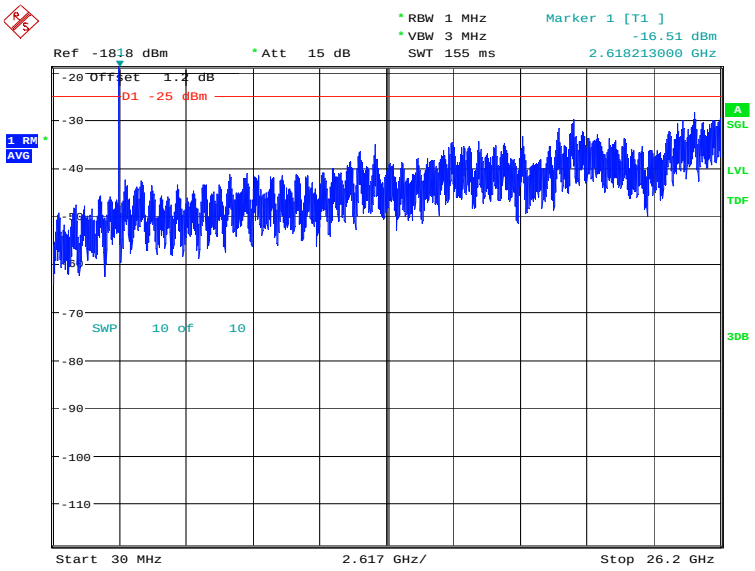
Only the worst case result is given below

LTE band 7: 30MHz – 26.5GHz



Date: 10.SEP.2019 12:26:50

LTE band 38: 30MHz – 26.2GHz



Date: 10.SEP.2019 13:10:45

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A.8 PEAK-TO-AVERAGE POWER RATIO

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7.1:

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ⩾ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1ms;

e) Record the maximum PAPR level associated with a probability of 0.1%.

A.8.1 Measurement limit

not exceed 13 dB

A.8.2 Measurement results

LTE band 7, 20MHz

Frequency (MHz)	PAPR (dB)		
2535.0	QPSK	16QAM	64QAM
	6.86	7.50	7.31

LTE band 38, 20MHz

Frequency (MHz)	PAPR (dB)		
2595.0	QPSK	16QAM	64QAM
	8.14	9.01	8.97

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ANNEX B: Accreditation Certificate

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2018-09-28 through 2019-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****

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