LTE TEST REPORT

No. 24T04Z101773-006

for

TCL Communication Ltd.

Smart Phone

Model Name: T442J

FCC ID: 2ACCJB227

with

Hardware Version: V1.0C

Software Version: 442JLA11_FCC

Issued Date: 2024-08-15

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

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

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

©Copyright. All rights reserved by CTTL

REPORT HISTORY

Report Number	Revision	Description	Issue Date
24T04Z101773-006	Rev.0	1st edition	2024-08-15

Note: the latest revision of the test report supersedes all previous version.

©Copyright. All rights reserved by CTTL.

CONTENTS

1. TEST LABORATORY 4
1.1. INTRODUCTION & ACCREDITATION 4
1.2. TESTING LOCATION 4
1.3. TESTING ENVIRONMENT 4
1.4. PROJECT DATA 4
1.5. SIGNATURE 4
2. CLIENT INFORMATION 6
2.1. APPLICANT INFORMATION 6
2.2. MANUFACTURER INFORMATION 6
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) 7
3.1. ABOUT EUT 7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST 7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST 7
4. REFERENCE DOCUMENTS 8
4.1. DOCUMENTS SUPPLIED BY APPLICANT 8
4.2. REFERENCE DOCUMENTS FOR TESTING 8
5. SUMMARY OF TEST RESULT 9
6. TEST EQUIPMENT UTILIZED 12
ANNEX A: MEASUREMENT RESULTS 13
A.1 OUTPUT POWER 13
A.2 EMISSION LIMIT 42
A.3 FREQUENCY STABILITY 54
A.4 OCCUPIED BANDWIDTH 59
A.5 EMISSION BANDWIDTH 95
A.6 BAND EDGE COMPLIANCE 131
A.7 CONDUCTED SPURIOUS EMISSION 181
A.8 PEAK-TO-AVERAGE POWER RATIO 188
ANNEX B: ACCREDITATION CERTIFICATE 189

©Copyright. All rights reserved by CTTL.

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA 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 (BDA)

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

1.3. Testing Environment

Normal Temperature: 15-35℃

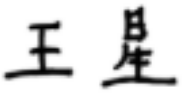
Relative Humidity: 20-75%

1.4. Project Data

Testing Start Date: 2024-07-29

Testing End Date: 2024-08-15

1.5. Signature



Wang Xing

(Prepared this test report)

Zhou Yu

(Reviewed this test report)

Zhao Hui Lin

(Approved this test report)

©Copyright. All rights reserved by CTTL.

©Copyright. All rights reserved by CTTL.

2. Client Information

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Ting Wang
Email:	ting.wang.hz@tcl.com
Telephone:	+86 752 2639091
Fax:	0086-755-36612000-81722

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Ting Wang
Email:	ting.wang.hz@tcl.com
Telephone:	+86 752 2639091
Fax:	0086-755-36612000-81722

©Copyright. All rights reserved by CTTL.

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

3.1. About EUT

Description	Smart Phone
Model Name	T442J
FCC ID	2ACCJB227
Antenna	Embedded
Output power	17.62 dBm maximum EIRP measured for LTE Band 2
Extreme Voltage	3.6VDC to 4.4VDC (nominal: 3.85VDC)
Extreme Temperature	-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	HW Version	SW Version	Date of receipt
UT10a	353191950999664/ 353191950999672	V1.0C	442JLA11_FCC	2024-07-29
UT12a	353191950999839/ 353191950999821	V1.0C	442JLA11_FCC	2024-08-05
UT01a	353191950999680/ 353191950999698	V1.0C	442JLA11_FCC	2024-07-29

UT01a was used for emission limit test and other EUTs were used for other testing cases.
*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	TLp049HB
Manufacturer	Shenzhen Aerospace Electronic Co.,Ltd
Capacitance	5000mAh

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

©Copyright. All rights reserved by CTTL.

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters are supplied by the customer, which are the bases of testing. CAICT is not responsible for the accuracy of customer supplied technical information that may affect the test results (for example, antenna gain and loss of customer supplied cable).

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-23 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-23 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-23 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-23 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	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

©Copyright. All rights reserved by CTTL.

5. Summary of Test Result

LTE Band 2

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	24.232	P
2	Emission Limit	2.1051/24.238	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	24.238	P
6	Band Edge Compliance	24.238	P
7	Conducted Spurious Emission	24.238	P
8	Peak-to-Average Power Ratio	24.232	P

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	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 12 (17)

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	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

©Copyright. All rights reserved by CTTL.

LTE Band 13

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	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 26(814MHz~824MHz)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	90.635	P
2	Emission Limit	2.1051/90.691	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	2.1049	P
6	Band Edge Compliance	90.691	P
7	Conducted Spurious Emission	90.691	P

LTE Band 26(824MHz~849MHz) (5)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	22.913	P
2	Emission Limit	2.1051/22.917	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	22.917	P
6	Band Edge Compliance	22.917	P
7	Conducted Spurious Emission	22.917	P

©Copyright. All rights reserved by CTTL.

LTE Band 41 (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	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 66 (4)

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	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

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.

All the test results are based on normal power.

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.

Band 66, Band 26 and Band 12 overlaps the entire frequency range of Band 4, Band 5 and Band 17. Therefore, test data provided in this report covers Band 4, Band 5, Band 17 as well as Band 66, Band 26, Band 12.

LTE Band 41 is tested by power class 3.

Explanation of worst-case configuration

The worst-case scenario for all measurements is based on the conducted output power measurement investigation results. Output power was measured on QPSK, 16QAM and 64QAM modulations. It was found that QPSK was the worst case. All testing was performed using QPSK modulations to represent the worst case unless otherwise stated. The test results shown in the following sections represent the worst case emission.

©Copyright. All rights reserved by CTTL.

6. Test Equipment Utilized

Description	Type	Series Number	Manufacture	Cal Due Date	Calibration Interval
Wideband Radio Communication Tester	CMW500	159082	R&S	2024-12-28	1 year
Spectrum Analyzer	FSU	200030	R&S	2025-05-08	1 year
Climate chamber	SH-241	92004642	ESPEC	2024-10-15	1 year
Spectrum Analyzer	FSV30	101525	R&S	2025-01-18	1 year
Antenna	VULB9163	9163-482	Schwarzbeck	2025-05-19	1 year
Antenna	9117	167	Schwarzbeck	2024-10-15	1 year
Antenna	LB-7180-NF	J2030013000005	A-INFO	2025-05-16	1 year
Antenna	3115	00146404	ETS-Lindgren	2025-05-16	1 year
Signal Generator	N5183A	MY49060052	Agilent	2024-09-14	1 year
Universal Radio Communication Tester	CMW500	143008	R&S	2025-01-18	1 year

©Copyright. All rights reserved by CTTL.

Annex A: Measurement Results

A.1 Output Power

A.1.1 Summary

During the process of testing, the EUT was controlled via communication tester 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.

The results below include a correction factor for cable loss that is provided by the customer.

A.1.2.2 Measurement Result

LTE band 2

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1909.3	17.07	16.25	14.99
		1880.0	17.28	15.70	14.49
		1850.7	17.29	15.85	15.41
	1 RB low	1909.3	17.10	16.23	14.98
		1880.0	17.32	15.70	14.59
		1850.7	17.24	15.98	15.31
	50% RB mid	1909.3	17.28	16.54	14.91
		1880.0	17.41	16.23	14.55
		1850.7	17.47	16.59	15.22
	100% RB	1909.3	16.31	15.06	13.75
		1880.0	16.32	14.95	13.89
		1850.7	16.50	15.44	13.92
3MHz	1 RB high	1908.5	17.09	16.29	14.96
		1880.0	17.27	15.58	14.39
		1851.5	17.26	15.88	15.02
	1 RB low	1908.5	17.09	16.40	15.21
		1880.0	17.30	15.73	14.47
		1851.5	17.40	15.99	15.35
	50% RB mid	1908.5	16.29	15.50	13.65
		1880.0	16.28	15.29	13.97
		1851.5	16.45	15.82	13.95
	100% RB	1908.5	16.37	15.44	13.78

©Copyright. All rights reserved by CTTL.

		1880.0	16.24	15.09	13.91
		1851.5	16.43	15.78	13.90
5MHz	1 RB high	1907.5	17.29	16.30	15.10
		1880.0	17.13	16.14	15.24
		1852.5	17.21	16.30	14.87
	1 RB low	1907.5	17.33	16.39	15.09
		1880.0	17.02	16.34	14.96
		1852.5	17.31	16.53	15.26
	50% RB mid	1907.5	16.30	15.77	13.77
		1880.0	16.32	15.14	14.00
		1852.5	16.42	15.52	13.99
	100% RB	1907.5	16.42	15.58	13.69
		1880.0	16.22	15.10	13.81
		1852.5	16.44	15.57	13.81
10MHz	1 RB high	1905.0	17.17	15.96	15.04
		1880.0	17.34	15.90	15.36
		1855.0	17.35	15.85	14.98
	1 RB low	1905.0	17.23	15.90	15.23
		1880.0	17.40	15.95	14.86
		1855.0	17.55	16.03	15.32
	50% RB mid	1905.0	16.51	15.54	13.87
		1880.0	16.32	15.40	13.85
		1855.0	16.47	15.61	13.82
	100% RB	1905.0	16.42	15.37	13.81
		1880.0	16.28	15.24	13.96
		1855.0	16.44	15.30	13.90
15MHz	1 RB high	1902.5	17.13	16.39	14.96
		1880.0	17.43	16.29	15.57
		1857.5	17.21	16.79	15.20
	1 RB low	1902.5	17.08	16.28	14.95
		1880.0	17.43	16.45	14.98
		1857.5	17.34	16.57	15.28
	50% RB mid	1902.5	16.36	15.64	13.85
		1880.0	16.39	15.22	13.66
		1857.5	16.59	15.57	13.67
	100% RB	1902.5	16.34	15.75	13.66
		1880.0	16.40	15.25	13.84
		1857.5	16.48	15.45	13.83
20MHz	1 RB high	1900.0	17.48	15.84	14.88
		1880.0	17.62	15.82	14.58
		1860.0	17.35	16.29	14.98
	1 RB low	1900.0	17.41	15.80	15.30
		1880.0	17.37	15.84	15.00

©Copyright. All rights reserved by CTTL.

		1860.0	17.29	16.66	15.44
	50% RB mid	1900.0	16.52	15.40	13.84
		1880.0	16.49	15.35	13.79
		1860.0	16.59	15.52	13.85
	100% RB	1900.0	16.44	15.41	13.86
		1880.0	16.43	15.32	13.79
		1860.0	16.42	15.51	13.81

©Copyright. All rights reserved by CTTL.

LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	15.56	14.66	14.02
		2535.0	15.63	14.72	14.40
		2502.5	15.62	14.72	14.06
	1 RB low	2567.5	15.63	14.77	14.20
		2535.0	15.58	14.72	14.36
		2502.5	15.59	14.75	14.05
	50% RB mid	2567.5	14.61	13.65	12.28
		2535.0	14.71	14.06	12.39
		2502.5	14.99	14.15	12.80
	100% RB	2567.5	14.68	13.58	12.21
		2535.0	14.67	14.37	12.36
		2502.5	15.15	14.34	12.76
10MHz	1 RB high	2565.0	15.68	14.76	14.00
		2535.0	15.49	15.21	13.74
		2505.0	15.56	14.77	14.13
	1 RB low	2565.0	15.58	14.63	13.91
		2535.0	15.47	15.09	13.64
		2505.0	15.53	14.75	13.68
	50% RB mid	2565.0	14.74	14.17	12.04
		2535.0	14.72	14.02	11.92
		2505.0	14.74	13.95	12.90
	100% RB	2565.0	14.80	13.95	12.45
		2535.0	14.60	14.09	12.29
		2505.0	14.72	13.76	12.36
15MHz	1 RB high	2562.5	15.59	15.33	13.95
		2535.0	15.54	14.77	14.17
		2507.5	15.58	14.71	14.20
	1 RB low	2562.5	15.57	15.21	13.71
		2535.0	15.51	15.03	14.13
		2507.5	15.46	14.66	13.72
	50% RB mid	2562.5	14.73	13.99	12.34
		2535.0	14.79	14.18	11.91
		2507.5	14.63	13.75	12.68
	100% RB	2562.5	14.82	14.17	12.37
		2535.0	14.66	14.13	12.26
		2507.5	14.65	13.68	12.34
20MHz	1 RB high	2560.0	15.61	14.81	13.91
		2535.0	15.69	15.33	14.17
		2510.0	15.67	14.80	14.38
	1 RB low	2560.0	15.56	14.58	13.58

©Copyright. All rights reserved by CTTL.

		2535.0	15.37	14.88	13.51
		2510.0	15.59	14.66	13.76
	50% RB mid	2560.0	14.66	13.73	12.72
		2535.0	14.70	14.13	11.75
		2510.0	14.72	14.12	12.78
	100% RB	2560.0	14.74	13.70	12.27
		2535.0	14.71	14.12	12.32
		2510.0	14.68	14.13	12.41

©Copyright. All rights reserved by CTTL.

LTE band 12

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	715.3	23.26	22.09	20.96
		707.5	23.26	22.21	21.39
		699.7	23.14	21.66	21.08
	1 RB low	715.3	23.26	22.26	20.96
		707.5	23.10	22.53	21.51
		699.7	23.20	21.69	21.09
	50% RB mid	715.3	23.27	22.60	20.71
		707.5	23.40	22.66	21.17
		699.7	23.26	22.54	20.74
	100% RB	715.3	22.35	20.96	20.01
		707.5	22.33	21.50	20.09
		699.7	22.36	21.14	20.01
3MHz	1 RB high	714.5	23.23	22.30	20.77
		707.5	23.22	22.21	21.49
		700.5	23.33	21.80	21.12
	1 RB low	714.5	23.31	22.23	20.97
		707.5	23.15	22.58	21.38
		700.5	23.11	21.74	20.95
	50% RB mid	714.5	22.30	21.35	19.84
		707.5	22.32	21.78	20.57
		700.5	22.37	21.51	20.10
	100% RB	714.5	22.36	21.43	20.02
		707.5	22.27	21.79	19.95
		700.5	22.25	21.42	19.79
5MHz	1 RB high	713.5	23.32	21.72	20.98
		707.5	23.23	21.78	21.11
		701.5	23.32	22.41	21.00
	1 RB low	713.5	23.30	21.89	20.89
		707.5	23.26	22.13	21.47
		701.5	23.26	22.26	21.03
	50% RB mid	713.5	22.29	21.32	19.94
		707.5	22.33	21.78	20.81
		701.5	22.27	21.43	20.13
	100% RB	713.5	22.42	21.56	19.85
		707.5	22.43	21.88	19.99
		701.5	22.28	21.63	19.76
10MHz	1 RB high	711.0	23.29	22.20	20.81
		707.5	23.28	21.91	20.81
		704.0	23.27	22.26	21.14
	1 RB low	711.0	23.18	22.52	21.12

©Copyright. All rights reserved by CTTL.

		707.5	23.25	21.68	20.76
		704.0	23.14	22.36	20.88
	50% RB mid	711.0	22.37	21.56	20.32
		707.5	22.43	21.89	20.59
		704.0	22.36	21.57	19.70
	100% RB	711.0	22.34	21.33	19.88
		707.5	22.34	21.68	19.84
		704.0	22.31	21.38	20.03

LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	22.95	21.56	20.79
		782.0	22.85	22.00	20.75
		779.5	22.88	21.53	20.60
	1 RB low	784.5	22.96	21.51	20.70
		782.0	22.84	21.99	21.14
		779.5	23.09	21.71	20.76
	50% RB mid	784.5	22.02	21.10	20.01
		782.0	21.96	21.08	19.94
		779.5	22.15	21.49	19.90
	100% RB	784.5	21.96	21.31	19.75
		782.0	21.93	21.20	19.74
		779.5	21.99	21.64	19.67
10MHz	1 RB high	782.0	22.82	22.09	20.64
	1 RB low	782.0	23.06	22.22	20.84
	50% RB mid	782.0	22.00	20.99	19.83
	100% RB	782.0	21.92	21.00	19.72

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	823.3	23.47	23.09	22.23
		819.0	23.38	22.41	21.66
		814.7	23.39	22.99	22.09
	1 RB low	823.3	23.49	23.06	22.36
		819.0	23.31	22.59	22.29
		814.7	23.44	22.46	21.74
	50% RB mid	823.3	22.98	21.96	21.94
		819.0	22.85	21.82	21.76
		814.7	22.90	21.96	21.89
	100% RB	823.3	21.88	20.95	20.99
		819.0	21.74	20.83	20.83
		814.7	21.88	20.90	20.95
3MHz	1 RB high	822.5	23.29	23.21	22.48
		819.0	23.30	23.05	22.33
		815.5	23.25	23.09	22.34
	1 RB low	822.5	23.29	23.14	22.46
		819.0	23.17	23.05	22.29
		815.5	23.35	23.20	22.47
	50% RB mid	822.5	21.79	20.79	20.85
		819.0	21.80	20.74	20.77
		815.5	21.80	20.82	21.08
	100% RB	822.5	21.83	20.85	20.98
		819.0	21.88	20.86	20.81
		815.5	21.81	20.97	20.90
5MHz	1 RB high	821.5	23.35	22.09	21.74
		819.0	23.27	22.02	21.76
		816.5	23.38	21.97	21.75
	1 RB low	821.5	23.32	21.95	21.73
		819.0	23.29	21.96	21.62
		816.5	23.42	22.11	21.83
	50% RB mid	821.5	21.92	20.83	20.91
		819.0	21.75	20.81	20.84
		816.5	21.78	20.77	21.19
	100% RB	821.5	21.82	20.94	20.95
		819.0	21.78	20.90	20.89
		816.5	21.75	20.87	21.22
10MHz	1 RB high	819.0	23.35	23.27	22.54
	1 RB low	819.0	23.35	23.21	22.61
	50% RB mid	819.0	21.95	20.78	20.94
	100% RB	819.0	21.92	20.85	20.94

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	23.46	22.76	22.29
		836.5	23.42	22.42	21.72
		824.7	23.44	22.81	22.28
	1 RB low	848.3	23.39	22.72	22.29
		836.5	23.42	22.99	22.46
		824.7	23.45	22.79	22.30
	50% RB mid	848.3	22.87	21.86	21.75
		836.5	22.91	21.97	21.90
		824.7	22.98	21.94	22.29
	100% RB	848.3	21.99	20.86	21.36
		836.5	21.94	20.97	21.37
		824.7	21.97	21.00	20.89
3MHz	1 RB high	847.5	23.25	23.08	22.43
		836.5	23.30	23.15	22.58
		825.5	23.33	23.22	22.66
	1 RB low	847.5	23.37	23.20	22.50
		836.5	23.28	23.19	22.54
		825.5	23.37	23.27	22.55
	50% RB mid	847.5	21.76	20.92	21.26
		836.5	21.94	20.94	21.23
		825.5	21.80	20.83	21.21
	100% RB	847.5	21.84	20.79	20.91
		836.5	21.93	20.96	21.31
		825.5	21.95	20.88	20.93
5MHz	1 RB high	846.5	23.29	22.07	21.78
		836.5	23.34	22.60	21.81
		826.5	23.36	22.04	21.80
	1 RB low	846.5	23.39	22.06	21.78
		836.5	23.35	22.51	21.85
		826.5	23.36	22.11	21.86
	50% RB mid	846.5	21.92	20.85	21.02
		836.5	21.93	20.91	21.30
		826.5	21.78	20.91	21.26
	100% RB	846.5	21.87	20.99	21.02
		836.5	21.93	21.03	21.35
		826.5	21.81	20.99	21.37
10MHz	1 RB high	844.0	23.35	22.68	22.48
		836.5	23.44	23.42	22.49
		829.0	23.24	23.08	22.71
	1 RB low	844.0	23.37	22.81	22.53

©Copyright. All rights reserved by CTTL.

		836.5	23.34	23.36	22.43
		829.0	23.34	23.17	22.68
	50% RB mid	844.0	21.97	20.94	21.02
		836.5	22.01	20.92	21.09
		829.0	22.06	20.82	21.32
	100% RB	844.0	21.96	20.98	21.05
		836.5	21.90	21.04	21.35
		829.0	21.97	20.86	20.93
15MHz	1 RB high	841.5	23.40	23.33	22.55
		836.5	23.44	23.40	22.56
		831.5	23.32	23.15	22.67
	1 RB low	841.5	23.33	23.26	22.54
		836.5	23.42	23.29	22.53
		831.5	23.28	23.14	22.66
	50% RB mid	841.5	21.89	20.97	21.28
		836.5	22.00	20.95	21.03
		831.5	21.90	20.85	20.97
	100% RB	841.5	21.97	20.99	21.00
		836.5	21.92	21.07	21.25
		831.5	21.99	20.95	21.24

©Copyright. All rights reserved by CTTL.

LTE band 41

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	18.46	16.42	16.21
		2593.0	18.35	16.74	16.14
		2498.5	18.32	16.80	16.09
	1 RB low	2687.5	18.32	16.88	16.21
		2593.0	18.20	16.74	15.99
		2498.5	18.31	16.73	16.09
	50% RB mid	2687.5	17.35	16.19	16.38
		2593.0	17.34	16.16	16.29
		2498.5	17.35	16.33	16.47
	100% RB	2687.5	17.33	16.34	16.48
		2593.0	17.22	16.23	16.37
		2498.5	17.38	16.39	16.37
10MHz	1 RB high	2685.0	18.37	16.81	16.18
		2593.0	18.25	16.71	16.09
		2501.0	18.29	16.79	16.11
	1 RB low	2685.0	18.45	16.86	16.20
		2593.0	18.29	16.78	15.94
		2501.0	18.31	16.70	16.10
	50% RB mid	2685.0	17.45	16.33	16.32
		2593.0	17.26	16.22	16.20
		2501.0	17.24	16.40	16.46
	100% RB	2685.0	17.37	16.35	16.44
		2593.0	17.29	16.27	16.37
		2501.0	17.26	16.45	16.45
15MHz	1 RB high	2682.5	18.36	16.86	16.15
		2593.0	18.25	16.69	16.13
		2503.5	18.30	16.78	16.10
	1 RB low	2682.5	18.30	16.91	16.18
		2593.0	18.22	16.77	15.99
		2503.5	18.34	16.83	16.16
	50% RB mid	2682.5	17.36	16.32	16.33
		2593.0	17.27	16.24	16.26
		2503.5	17.31	16.28	16.46
	100% RB	2682.5	17.41	16.40	16.40
		2593.0	17.39	16.41	16.39
		2503.5	17.35	16.36	16.42
20MHz	1 RB high	2680.0	18.25	16.85	16.17
		2593.0	18.25	16.78	16.13
		2506.0	18.30	16.87	16.12
	1 RB low	2680.0	18.32	16.47	16.19

©Copyright. All rights reserved by CTTL.

		2593.0	18.34	16.65	15.95
		2506.0	18.30	16.75	16.13
	50% RB mid	2680.0	17.37	16.36	16.34
		2593.0	17.36	16.31	16.25
		2506.0	17.35	16.48	16.43
	100% RB	2680.0	17.39	16.37	16.43
		2593.0	17.43	16.33	16.42
		2506.0	17.38	16.44	16.41

©Copyright. All rights reserved by CTTL.

LTE band 66

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1779.3	18.25	17.00	16.08
		1745.0	18.52	17.24	16.14
		1710.7	18.30	17.60	16.23
	1 RB low	1779.3	18.23	16.99	16.20
		1745.0	18.55	17.21	16.12
		1710.7	18.37	17.61	16.18
	50% RB mid	1779.3	18.33	17.68	16.02
		1745.0	18.75	17.81	16.01
		1710.7	18.48	17.77	16.17
	100% RB	1779.3	17.43	16.17	15.02
		1745.0	17.67	16.48	15.30
		1710.7	17.55	16.28	15.37
3MHz	1 RB high	1778.5	18.27	17.01	16.02
		1745.0	18.52	17.72	16.49
		1711.5	18.84	17.92	16.51
	1 RB low	1778.5	18.27	17.20	16.22
		1745.0	18.57	17.73	16.26
		1711.5	18.49	17.54	16.15
	50% RB mid	1778.5	17.49	16.55	15.40
		1745.0	17.72	16.90	15.37
		1711.5	17.57	16.64	15.12
	100% RB	1778.5	17.46	16.55	15.05
		1745.0	17.69	16.90	15.30
		1711.5	17.54	16.69	15.07
5MHz	1 RB high	1777.5	18.07	17.57	16.11
		1745.0	18.56	17.01	16.29
		1712.5	18.50	17.60	16.27
	1 RB low	1777.5	18.25	17.41	16.06
		1745.0	18.59	17.10	16.15
		1712.5	18.43	17.59	16.28
	50% RB mid	1777.5	17.80	16.69	15.35
		1745.0	17.53	16.87	15.40
		1712.5	17.97	16.95	15.29
	100% RB	1777.5	17.79	16.92	15.30
		1745.0	17.60	17.00	15.22
		1712.5	17.85	17.10	15.47
10MHz	1 RB high	1775.0	18.29	17.53	16.13
		1745.0	18.59	17.50	16.41
		1715.0	18.87	17.38	16.48
	1 RB low	1775.0	18.52	17.76	16.42

©Copyright. All rights reserved by CTTL.

		1745.0	18.63	17.58	16.43
		1715.0	18.51	17.10	16.15
	50% RB mid	1775.0	17.50	16.39	14.86
		1745.0	17.66	16.74	15.20
		1715.0	17.60	16.86	15.56
	100% RB	1775.0	17.42	16.51	15.09
		1745.0	17.61	16.78	15.09
		1715.0	17.56	16.65	15.15
15MHz	1 RB high	1772.5	18.11	17.03	16.10
		1745.0	18.54	17.53	16.41
		1717.5	18.42	17.58	16.27
	1 RB low	1772.5	18.32	17.14	16.33
		1745.0	18.71	17.87	16.58
		1717.5	18.38	17.57	16.29
	50% RB mid	1772.5	17.45	16.73	14.69
		1745.0	17.64	16.80	14.94
		1717.5	17.89	16.82	15.20
	100% RB	1772.5	17.42	16.72	14.94
		1745.0	17.68	16.75	15.14
		1717.5	17.86	16.84	15.35
20MHz	1 RB high	1770.0	18.14	17.00	16.13
		1745.0	18.42	17.42	15.89
		1720.0	18.59	17.60	16.41
	1 RB low	1770.0	18.49	17.13	16.38
		1745.0	18.55	17.83	16.18
		1720.0	18.65	17.59	16.20
	50% RB mid	1770.0	17.46	16.58	14.77
		1745.0	17.31	16.88	15.09
		1720.0	17.71	16.79	15.43
	100% RB	1770.0	17.51	16.58	14.87
		1745.0	17.89	16.86	15.16
		1720.0	17.69	16.85	15.24

©Copyright. All rights reserved by CTTL.

A.1.3 Radiated

A.1.3.1 Description

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

FDD Band 2: Part 24.232(c) specifies "Mobile and portable stations are limited to 2 watts EIRP".

FDD Band 7/TDD Band 41: Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP".

FDD Band 12: Part 27.50(c)(10) specifies "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".

FDD Band 13: Part 27.50(b) specifies "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".

LTE Band 26(814MHz~824MHz): Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts".

FDD Band 26(824MHz~849MHz): Part 22.913(a) specifies "The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts".

FDD Band 66: Part 27.50(d)(4) specifies "Fixed, mobile, and portable(handheld) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP".

A.1.3.2 Method of Measurement

According to KDB 412172 D01 and ANSI C63.26 the relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\mathbf{ERP\ or\ EIRP} = \mathbf{P_T} + \mathbf{G_T} - \mathbf{L_C}$$

where;

- $\mathbf{ERP\ or\ EIRP} =$ effective radiated power or equivalent isotropically radiated power(expressed in the same units as P_T.
- $\mathbf{P_T} =$ transmitter output power, in this report the unit express as dBm;
- $\mathbf{G_T} =$ gain of the transmitting antenna, in dBd(ERP) or dBi(EIRP);
- $\mathbf{L_C} =$ signal attenuation in the connecting cable between the transmitter and antenna, in dB.

Alternatively, the EIRP can be determined from Equation above and then converted to ERP based on the maximum antenna gain relationship by applying the following equation:

$$\mathbf{ERP} = \mathbf{EIRP} - \mathbf{2.15dB}$$

Note: The antenna gain information was provided by the client. The laboratory is not responsible for identifying its authenticity during the test.

©Copyright. All rights reserved by CTTL.

A.1.3.3 Limits and Measurement Results

LTE Band 2-EIRP

Limits: ≤33dBm(2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			EIRP(dBm)(Gt-Lc =0)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	1909.3	17.07	16.25	14.99	17.07	16.25	14.99
		1880	17.28	15.70	14.49	17.28	15.70	14.49
		1850.7	17.29	15.85	15.41	17.29	15.85	15.41
	1 RB low	1909.3	17.10	16.23	14.98	17.10	16.23	14.98
		1880	17.32	15.70	14.59	17.32	15.70	14.59
		1850.7	17.24	15.98	15.31	17.24	15.98	15.31
	50% RB mid	1909.3	17.28	16.54	14.91	17.28	16.54	14.91
		1880	17.41	16.23	14.55	17.41	16.23	14.55
		1850.7	17.47	16.59	15.22	17.47	16.59	15.22
	100% RB	1909.3	16.31	15.06	13.75	16.31	15.06	13.75
		1880	16.32	14.95	13.89	16.32	14.95	13.89
		1850.7	16.50	15.44	13.92	16.50	15.44	13.92
3MHz	1 RB high	1908.5	17.09	16.29	14.96	17.09	16.29	14.96
		1880	17.27	15.58	14.39	17.27	15.58	14.39
		1851.5	17.26	15.88	15.02	17.26	15.88	15.02
	1 RB low	1908.5	17.09	16.40	15.21	17.09	16.40	15.21
		1880	17.30	15.73	14.47	17.30	15.73	14.47
		1851.5	17.40	15.99	15.35	17.40	15.99	15.35
	50% RB mid	1908.5	16.29	15.50	13.65	16.29	15.50	13.65
		1880	16.28	15.29	13.97	16.28	15.29	13.97
		1851.5	16.45	15.82	13.95	16.45	15.82	13.95
	100% RB	1908.5	16.37	15.44	13.78	16.37	15.44	13.78
		1880	16.24	15.09	13.91	16.24	15.09	13.91
		1851.5	16.43	15.78	13.90	16.43	15.78	13.90
5MHz	1 RB high	1907.5	17.29	16.30	15.10	17.29	16.30	15.10
		1880	17.13	16.14	15.24	17.13	16.14	15.24
		1852.5	17.21	16.30	14.87	17.21	16.30	14.87
	1 RB low	1907.5	17.33	16.39	15.09	17.33	16.39	15.09
		1880	17.02	16.34	14.96	17.02	16.34	14.96
		1852.5	17.31	16.53	15.26	17.31	16.53	15.26
	50% RB mid	1907.5	16.30	15.77	13.77	16.30	15.77	13.77
		1880	16.32	15.14	14.00	16.32	15.14	14.00
		1852.5	16.42	15.52	13.99	16.42	15.52	13.99
	100% RB	1907.5	16.42	15.58	13.69	16.42	15.58	13.69
		1880	16.22	15.10	13.81	16.22	15.10	13.81
		1852.5	16.44	15.57	13.81	16.44	15.57	13.81
10MHz	1 RB high	1905	17.17	15.96	15.04	17.17	15.96	15.04
		1880	17.34	15.90	15.36	17.34	15.90	15.36

©Copyright. All rights reserved by CTTL.

		1855	17.35	15.85	14.98	17.35	15.85	14.98
	1 RB low	1905	17.23	15.90	15.23	17.23	15.90	15.23
		1880	17.40	15.95	14.86	17.40	15.95	14.86
		1855	17.55	16.03	15.32	17.55	16.03	15.32
	50% RB mid	1905	16.51	15.54	13.87	16.51	15.54	13.87
		1880	16.32	15.40	13.85	16.32	15.40	13.85
		1855	16.47	15.61	13.82	16.47	15.61	13.82
	100% RB	1905	16.42	15.37	13.81	16.42	15.37	13.81
		1880	16.28	15.24	13.96	16.28	15.24	13.96
		1855	16.44	15.30	13.90	16.44	15.30	13.90
15MHz	1 RB high	1902.5	17.13	16.39	14.96	17.13	16.39	14.96
		1880	17.43	16.29	15.57	17.43	16.29	15.57
		1857.5	17.21	16.79	15.20	17.21	16.79	15.20
	1 RB low	1902.5	17.08	16.28	14.95	17.08	16.28	14.95
		1880	17.43	16.45	14.98	17.43	16.45	14.98
		1857.5	17.34	16.57	15.28	17.34	16.57	15.28
	50% RB mid	1902.5	16.36	15.64	13.85	16.36	15.64	13.85
		1880	16.39	15.22	13.66	16.39	15.22	13.66
		1857.5	16.59	15.57	13.67	16.59	15.57	13.67
	100% RB	1902.5	16.34	15.75	13.66	16.34	15.75	13.66
		1880	16.40	15.25	13.84	16.40	15.25	13.84
		1857.5	16.48	15.45	13.83	16.48	15.45	13.83
20MHz	1 RB high	1900	17.48	15.84	14.88	17.48	15.84	14.88
		1880	17.62	15.82	14.58	17.62	15.82	14.58
		1860	17.35	16.29	14.98	17.35	16.29	14.98
	1 RB low	1900	17.41	15.80	15.30	17.41	15.80	15.30
		1880	17.37	15.84	15.00	17.37	15.84	15.00
		1860	17.29	16.66	15.44	17.29	16.66	15.44
	50% RB mid	1900	16.52	15.40	13.84	16.52	15.40	13.84
		1880	16.49	15.35	13.79	16.49	15.35	13.79
		1860	16.59	15.52	13.85	16.59	15.52	13.85
	100% RB	1900	16.44	15.41	13.86	16.44	15.41	13.86
		1880	16.43	15.32	13.79	16.43	15.32	13.79
		1860	16.42	15.51	13.81	16.42	15.51	13.81

©Copyright. All rights reserved by CTTL.

LTE Band 7-EIRP

Limits: ≤33dBm(2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			EIRP(dBm)(Gt-Lc =-1)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	15.56	14.66	14.02	14.56	13.66	13.02
		2535	15.63	14.72	14.40	14.63	13.72	13.40
		2502.5	15.62	14.72	14.06	14.62	13.72	13.06
	1 RB low	2567.5	15.63	14.77	14.20	14.63	13.77	13.20
		2535	15.58	14.72	14.36	14.58	13.72	13.36
		2502.5	15.59	14.75	14.05	14.59	13.75	13.05
	50% RB mid	2567.5	14.61	13.65	12.28	13.61	12.65	11.28
		2535	14.71	14.06	12.39	13.71	13.06	11.39
		2502.5	14.99	14.15	12.80	13.99	13.15	11.80
	100% RB	2567.5	14.68	13.58	12.21	13.68	12.58	11.21
		2535	14.67	14.37	12.36	13.67	13.37	11.36
		2502.5	15.15	14.34	12.76	14.15	13.34	11.76
10MHz	1 RB high	2565	15.68	14.76	14.00	14.68	13.76	13.00
		2535	15.49	15.21	13.74	14.49	14.21	12.74
		2505	15.56	14.77	14.13	14.56	13.77	13.13
	1 RB low	2565	15.58	14.63	13.91	14.58	13.63	12.91
		2535	15.47	15.09	13.64	14.47	14.09	12.64
		2505	15.53	14.75	13.68	14.53	13.75	12.68
	50% RB mid	2565	14.74	14.17	12.04	13.74	13.17	11.04
		2535	14.72	14.02	11.92	13.72	13.02	10.92
		2505	14.74	13.95	12.90	13.74	12.95	11.90
	100% RB	2565	14.80	13.95	12.45	13.80	12.95	11.45
		2535	14.60	14.09	12.29	13.60	13.09	11.29
		2505	14.72	13.76	12.36	13.72	12.76	11.36
15MHz	1 RB high	2562.5	15.59	15.33	13.95	14.59	14.33	12.95
		2535	15.54	14.77	14.17	14.54	13.77	13.17
		2507.5	15.58	14.71	14.20	14.58	13.71	13.20
	1 RB low	2562.5	15.57	15.21	13.71	14.57	14.21	12.71
		2535	15.51	15.03	14.13	14.51	14.03	13.13
		2507.5	15.46	14.66	13.72	14.46	13.66	12.72
	50% RB mid	2562.5	14.73	13.99	12.34	13.73	12.99	11.34
		2535	14.79	14.18	11.91	13.79	13.18	10.91
		2507.5	14.63	13.75	12.68	13.63	12.75	11.68
	100% RB	2562.5	14.82	14.17	12.37	13.82	13.17	11.37
		2535	14.66	14.13	12.26	13.66	13.13	11.26
		2507.5	14.65	13.68	12.34	13.65	12.68	11.34
20MHz	1 RB high	2560	15.61	14.81	13.91	14.61	13.81	12.91
		2535	15.69	15.33	14.17	14.69	14.33	13.17
		2510	15.67	14.80	14.38	14.67	13.80	13.38

©Copyright. All rights reserved by CTTL.

	1 RB low	2560	15.56	14.58	13.58	14.56	13.58	12.58
		2535	15.37	14.88	13.51	14.37	13.88	12.51
		2510	15.59	14.66	13.76	14.59	13.66	12.76
	50% RB mid	2560	14.66	13.73	12.72	13.66	12.73	11.72
		2535	14.70	14.13	11.75	13.70	13.13	10.75
		2510	14.72	14.12	12.78	13.72	13.12	11.78
	100% RB	2560	14.74	13.70	12.27	13.74	12.70	11.27
		2535	14.71	14.12	12.32	13.71	13.12	11.32
		2510	14.68	14.13	12.41	13.68	13.13	11.41

©Copyright. All rights reserved by CTTL.

LTE Band 12-ERP

Limits: ≤34.77dBm(3W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			ERP(dBm)(Gt-Lc =-5)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	715.3	23.26	22.09	20.96	16.11	14.94	13.81
		707.5	23.26	22.21	21.39	16.11	15.06	14.24
		699.7	23.14	21.66	21.08	15.99	14.51	13.93
	1 RB low	715.3	23.26	22.26	20.96	16.11	15.11	13.81
		707.5	23.10	22.53	21.51	15.95	15.38	14.36
		699.7	23.20	21.69	21.09	16.05	14.54	13.94
	50% RB mid	715.3	23.27	22.60	20.71	16.12	15.45	13.56
		707.5	23.40	22.66	21.17	16.25	15.51	14.02
		699.7	23.26	22.54	20.74	16.11	15.39	13.59
	100% RB	715.3	22.35	20.96	20.01	15.20	13.81	12.86
		707.5	22.33	21.50	20.09	15.18	14.35	12.94
		699.7	22.36	21.14	20.01	15.21	13.99	12.86
3MHz	1 RB high	714.5	23.23	22.30	20.77	16.08	15.15	13.62
		707.5	23.22	22.21	21.49	16.07	15.06	14.34
		700.5	23.33	21.80	21.12	16.18	14.65	13.97
	1 RB low	714.5	23.31	22.23	20.97	16.16	15.08	13.82
		707.5	23.15	22.58	21.38	16.00	15.43	14.23
		700.5	23.11	21.74	20.95	15.96	14.59	13.80
	50% RB mid	714.5	22.30	21.35	19.84	15.15	14.20	12.69
		707.5	22.32	21.78	20.57	15.17	14.63	13.42
		700.5	22.37	21.51	20.10	15.22	14.36	12.95
	100% RB	714.5	22.36	21.43	20.02	15.21	14.28	12.87
		707.5	22.27	21.79	19.95	15.12	14.64	12.80
		700.5	22.25	21.42	19.79	15.10	14.27	12.64
5MHz	1 RB high	713.5	23.32	21.72	20.98	16.17	14.57	13.83
		707.5	23.23	21.78	21.11	16.08	14.63	13.96
		701.5	23.32	22.41	21.00	16.17	15.26	13.85
	1 RB low	713.5	23.30	21.89	20.89	16.15	14.74	13.74
		707.5	23.26	22.13	21.47	16.11	14.98	14.32
		701.5	23.26	22.26	21.03	16.11	15.11	13.88
	50% RB mid	713.5	22.29	21.32	19.94	15.14	14.17	12.79
		707.5	22.33	21.78	20.81	15.18	14.63	13.66
		701.5	22.27	21.43	20.13	15.12	14.28	12.98
	100% RB	713.5	22.42	21.56	19.85	15.27	14.41	12.70
		707.5	22.43	21.88	19.99	15.28	14.73	12.84
		701.5	22.28	21.63	19.76	15.13	14.48	12.61
10MHz	1 RB high	711	23.29	22.20	20.81	16.14	15.05	13.66
		707.5	23.28	21.91	20.81	16.13	14.76	13.66
		704	22.27	22.26	21.14	15.12	15.11	13.99

©Copyright. All rights reserved by CTTL.

	1 RB low	711	23.18	22.52	21.12	16.03	15.37	13.97
		707.5	23.25	21.68	20.76	16.10	14.53	13.61
		704	23.14	22.36	20.88	15.99	15.21	13.73
	50% RB mid	711	22.37	21.56	20.32	15.22	14.41	13.17
		707.5	22.43	21.89	20.59	15.28	14.74	13.44
		704	22.36	21.57	19.70	15.21	14.42	12.55
	100% RB	711	22.34	21.33	19.88	15.19	14.18	12.73
		707.5	22.34	21.68	19.84	15.19	14.53	12.69
		704	22.31	21.38	20.03	15.16	14.23	12.88

LTE Band 13-ERP

Limits: ≤34.77dBm(3W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			ERP(dBm)(Gt-Lc =-5)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	22.95	21.56	20.79	15.80	14.41	13.64
		782	22.85	22.00	20.75	15.70	14.85	13.60
		779.5	22.88	21.53	20.60	15.73	14.38	13.45
	1 RB low	784.5	22.96	21.51	20.70	15.81	14.36	13.55
		782	22.84	21.99	21.14	15.69	14.84	13.99
		779.5	23.09	21.71	20.76	15.94	14.56	13.61
	50% RB mid	784.5	22.02	21.10	20.01	14.87	13.95	12.86
		782	21.96	21.08	19.94	14.81	13.93	12.79
		779.5	22.15	21.49	19.90	15.00	14.34	12.75
	100% RB	784.5	21.96	21.31	19.75	14.81	14.16	12.60
		782	21.93	21.20	19.74	14.78	14.05	12.59
		779.5	21.99	21.64	19.67	14.84	14.49	12.52
10MHz	1 RB high	782	22.82	22.09	20.64	15.67	14.94	13.49
	1 RB low	782	23.06	22.22	20.84	15.91	15.07	13.69
	50% RB mid	782	22.00	20.99	19.83	14.85	13.84	12.68
	100% RB	782	21.92	21.00	19.72	14.77	13.85	12.57

©Copyright. All rights reserved by CTTL.

LTE Band 26(814MHz~824MHz)-ERP

Limits: ≤50dBm(100W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			ERP(dBm)(Gt-Lc =-5)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	823.3	23.47	23.09	22.23	16.32	15.94	15.08
		819	23.38	22.41	21.66	16.23	15.26	14.51
		814.7	23.39	22.99	22.09	16.24	15.84	14.94
	1 RB low	823.3	23.49	23.06	22.36	16.34	15.91	15.21
		819	23.31	22.59	22.29	16.16	15.44	15.14
		814.7	23.44	22.46	21.74	16.29	15.31	14.59
	50% RB mid	823.3	22.98	21.96	21.94	15.83	14.81	14.79
		819	22.85	21.82	21.76	15.70	14.67	14.61
		814.7	22.90	21.96	21.89	15.75	14.81	14.74
	100% RB	823.3	21.88	20.95	20.99	14.73	13.80	13.84
		819	21.74	20.83	20.83	14.59	13.68	13.68
		814.7	21.88	20.90	20.95	14.73	13.75	13.80
3MHz	1 RB high	822.5	23.29	23.21	22.48	16.14	16.06	15.33
		819	23.30	23.05	22.33	16.15	15.90	15.18
		815.5	23.25	23.09	22.34	16.10	15.94	15.19
	1 RB low	822.5	23.29	23.14	22.46	16.14	15.99	15.31
		819	23.17	23.05	22.29	16.02	15.90	15.14
		815.5	23.35	23.20	22.47	16.20	16.05	15.32
	50% RB mid	822.5	21.79	20.79	20.85	14.64	13.64	13.70
		819	21.80	20.74	20.77	14.65	13.59	13.62
		815.5	21.80	20.82	21.08	14.65	13.67	13.93
	100% RB	822.5	21.83	20.85	20.98	14.68	13.70	13.83
		819	21.88	20.86	20.81	14.73	13.71	13.66
		815.5	21.81	20.97	20.90	14.66	13.82	13.75
5MHz	1 RB high	821.5	23.35	22.09	21.74	16.20	14.94	14.59
		819	23.27	22.02	21.76	16.12	14.87	14.61
		816.5	23.38	21.97	21.75	16.23	14.82	14.60
	1 RB low	821.5	23.32	21.95	21.73	16.17	14.80	14.58
		819	23.29	21.96	21.62	16.14	14.81	14.47
		816.5	23.42	22.11	21.83	16.27	14.96	14.68
	50% RB mid	821.5	21.92	20.83	20.91	14.77	13.68	13.76
		819	21.75	20.81	20.84	14.60	13.66	13.69
		816.5	21.78	20.77	21.19	14.63	13.62	14.04
	100% RB	821.5	21.82	20.94	20.95	14.67	13.79	13.80
		819	21.78	20.90	20.89	14.63	13.75	13.74
		816.5	21.75	20.87	21.22	14.60	13.72	14.07
10MHz	1 RB high	819	23.35	23.27	22.54	16.20	16.12	15.39
	1 RB low	819	23.35	23.21	22.61	16.20	16.06	15.46

©Copyright. All rights reserved by CTTL.

	50% RB mid	819	21.95	20.78	20.94	14.80	13.63	13.79
	100% RB	819	21.92	20.85	20.94	14.77	13.70	13.79

©Copyright. All rights reserved by CTTL.

LTE Band 26(824MHz-849MHz）-ERP

Limits: ≤38.45dBm(7W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			ERP(dBm)(Gt-Lc =-5)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	23.46	22.76	22.29	16.31	15.61	15.14
		836.5	23.42	22.42	21.72	16.27	15.27	14.57
		824.7	23.44	22.81	22.28	16.29	15.66	15.13
	1 RB low	848.3	23.39	22.72	22.29	16.24	15.57	15.14
		836.5	23.42	22.99	22.46	16.27	15.84	15.31
		824.7	23.45	22.79	22.30	16.30	15.64	15.15
	50% RB mid	848.3	22.87	21.86	21.75	15.72	14.71	14.60
		836.5	22.91	21.97	21.90	15.76	14.82	14.75
		824.7	22.98	21.94	22.29	15.83	14.79	15.14
	100% RB	848.3	21.99	20.86	21.36	14.84	13.71	14.21
		836.5	21.94	20.97	21.37	14.79	13.82	14.22
		824.7	21.97	21.00	20.89	14.82	13.85	13.74
3MHz	1 RB high	847.5	23.25	23.08	22.43	16.10	15.93	15.28
		836.5	23.30	23.15	22.58	16.15	16.00	15.43
		825.5	23.33	23.22	22.66	16.18	16.07	15.51
	1 RB low	847.5	23.37	23.20	22.50	16.22	16.05	15.35
		836.5	23.28	23.19	22.54	16.13	16.04	15.39
		825.5	23.37	23.27	22.55	16.22	16.12	15.40
	50% RB mid	847.5	21.76	20.92	21.26	14.61	13.77	14.11
		836.5	21.94	20.94	21.23	14.79	13.79	14.08
		825.5	21.80	20.83	21.21	14.65	13.68	14.06
	100% RB	847.5	21.84	20.79	20.91	14.69	13.64	13.76
		836.5	21.93	20.96	21.31	14.78	13.81	14.16
		825.5	21.95	20.88	20.93	14.80	13.73	13.78
5MHz	1 RB high	846.5	23.29	22.07	21.78	16.14	14.92	14.63
		836.5	23.34	22.60	21.81	16.19	15.45	14.66
		826.5	23.36	22.04	21.80	16.21	14.89	14.65
	1 RB low	846.5	23.39	22.06	21.78	16.24	14.91	14.63
		836.5	23.35	22.51	21.85	16.20	15.36	14.70
		826.5	23.36	22.11	21.86	16.21	14.96	14.71
	50% RB mid	846.5	21.92	20.85	21.02	14.77	13.70	13.87
		836.5	21.93	20.91	21.30	14.78	13.76	14.15
		826.5	21.78	20.91	21.26	14.63	13.76	14.11
	100% RB	846.5	21.87	20.99	21.02	14.72	13.84	13.87
		836.5	21.93	21.03	21.35	14.78	13.88	14.20
		826.5	21.81	20.99	21.37	14.66	13.84	14.22
10MHz	1 RB high	844	23.35	22.68	22.48	16.20	15.53	15.33
		836.5	23.44	23.42	22.49	16.29	16.27	15.34
		829	23.24	23.08	22.71	16.09	15.93	15.56

©Copyright. All rights reserved by CTTL.

	1 RB low	844	23.37	22.81	22.53	16.22	15.66	15.38
		836.5	23.34	23.36	22.43	16.19	16.21	15.28
		829	23.34	23.17	22.68	16.19	16.02	15.53
	50% RB mid	844	21.97	20.94	21.02	14.82	13.79	13.87
		836.5	22.01	20.92	21.09	14.86	13.77	13.94
		829	22.06	20.82	21.32	14.91	13.67	14.17
	100% RB	844	21.96	20.98	21.05	14.81	13.83	13.90
		836.5	21.90	21.04	21.35	14.75	13.89	14.20
		829	21.97	20.86	20.93	14.82	13.71	13.78
15MHz	1 RB high	841.5	23.40	23.33	22.55	16.25	16.18	15.40
		836.5	23.44	23.40	22.56	16.29	16.25	15.41
		831.5	23.32	23.15	22.67	16.17	16.00	15.52
	1 RB low	841.5	23.33	23.26	22.54	16.18	16.11	15.39
		836.5	23.42	23.29	22.53	16.27	16.14	15.38
		831.5	23.28	23.14	22.66	16.13	15.99	15.51
	50% RB mid	841.5	21.89	20.97	21.28	14.74	13.82	14.13
		836.5	22.00	20.95	21.03	14.85	13.80	13.88
		831.5	21.90	20.85	20.97	14.75	13.70	13.82
	100% RB	841.5	21.97	20.99	21.00	14.82	13.84	13.85
		836.5	21.92	21.07	21.25	14.77	13.92	14.10
		831.5	21.99	20.95	21.24	14.84	13.80	14.09

©Copyright. All rights reserved by CTTL.

LTE Band 41-EIRP

Limits: ≤33dBm(2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			EIRP(dBm)(Gt-Lc =-1)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	18.46	16.42	16.21	17.46	15.42	15.21
		2593	18.35	16.74	16.14	17.35	15.74	15.14
		2498.5	18.32	16.80	16.09	17.32	15.80	15.09
	1 RB low	2687.5	18.32	16.88	16.21	17.32	15.88	15.21
		2593	18.20	16.74	15.99	17.20	15.74	14.99
		2498.5	18.31	16.73	16.09	17.31	15.73	15.09
	50% RB mid	2687.5	17.35	16.19	16.38	16.35	15.19	15.38
		2593	17.34	16.16	16.29	16.34	15.16	15.29
		2498.5	17.35	16.33	16.47	16.35	15.33	15.47
	100% RB	2687.5	17.33	16.34	16.48	16.33	15.34	15.48
		2593	17.22	16.23	16.37	16.22	15.23	15.37
		2498.5	17.38	16.39	16.37	16.38	15.39	15.37
10MHz	1 RB high	2685	18.37	16.81	16.18	17.37	15.81	15.18
		2593	18.25	16.71	16.09	17.25	15.71	15.09
		2501	18.29	16.79	16.11	17.29	15.79	15.11
	1 RB low	2685	18.45	16.86	16.20	17.45	15.86	15.20
		2593	18.29	16.78	15.94	17.29	15.78	14.94
		2501	18.31	16.70	16.10	17.31	15.70	15.10
	50% RB mid	2685	17.45	16.33	16.32	16.45	15.33	15.32
		2593	17.26	16.22	16.20	16.26	15.22	15.20
		2501	17.24	16.40	16.46	16.24	15.40	15.46
	100% RB	2685	17.37	16.35	16.44	16.37	15.35	15.44
		2593	17.29	16.27	16.37	16.29	15.27	15.37
		2501	17.26	16.45	16.45	16.26	15.45	15.45
15MHz	1 RB high	2682.5	18.36	16.86	16.15	17.36	15.86	15.15
		2593	18.25	16.69	16.13	17.25	15.69	15.13
		2503.5	18.30	16.78	16.10	17.30	15.78	15.10
	1 RB low	2682.5	18.30	16.91	16.18	17.30	15.91	15.18
		2593	18.22	16.77	15.99	17.22	15.77	14.99
		2503.5	18.34	16.83	16.16	17.34	15.83	15.16
	50% RB mid	2682.5	17.36	16.32	16.33	16.36	15.32	15.33
		2593	17.27	16.24	16.26	16.27	15.24	15.26
		2503.5	17.31	16.28	16.46	16.31	15.28	15.46
	100% RB	2682.5	17.41	16.40	16.40	16.41	15.40	15.40
		2593	17.39	16.41	16.39	16.39	15.41	15.39
		2503.5	17.35	16.36	16.42	16.35	15.36	15.42
20MHz	1 RB high	2680	18.25	16.85	16.17	17.25	15.85	15.17
		2593	18.25	16.78	16.13	17.25	15.78	15.13
		2506	18.30	16.87	16.12	17.30	15.87	15.12

©Copyright. All rights reserved by CTTL.

	1 RB low	2680	18.32	16.47	16.19	17.32	15.47	15.19
		2593	18.34	16.65	15.95	17.34	15.65	14.95
		2506	18.30	16.75	16.13	17.30	15.75	15.13
	50% RB mid	2680	17.37	16.36	16.34	16.37	15.36	15.34
		2593	17.36	16.31	16.25	16.36	15.31	15.25
		2506	17.35	16.48	16.43	16.35	15.48	15.43
	100% RB	2680	17.39	16.37	16.43	16.39	15.37	15.43
		2593	17.43	16.33	16.42	16.43	15.33	15.42
		2506	17.38	16.44	16.41	16.38	15.44	15.41

©Copyright. All rights reserved by CTTL.

LTE Band 66-EIRP

Limits: ≤30dBm(1W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power(dBm)			EIRP(dBm)(Gt-Lc =-2)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	1779.3	18.25	17.00	16.08	16.25	15.00	14.08
		1745	18.52	17.24	16.14	16.52	15.24	14.14
		1710.7	18.30	17.60	16.23	16.30	15.60	14.23
	1 RB low	1779.3	18.23	16.99	16.20	16.23	14.99	14.20
		1745	18.55	17.21	16.12	16.55	15.21	14.12
		1710.7	18.37	17.61	16.18	16.37	15.61	14.18
	50% RB mid	1779.3	18.33	17.68	16.02	16.33	15.68	14.02
		1745	18.75	17.81	16.01	16.75	15.81	14.01
		1710.7	18.48	17.77	16.17	16.48	15.77	14.17
	100% RB	1779.3	17.43	16.17	15.02	15.43	14.17	13.02
		1745	17.67	16.48	15.30	15.67	14.48	13.30
		1710.7	17.55	16.28	15.37	15.55	14.28	13.37
3MHz	1 RB high	1778.5	18.27	17.01	16.02	16.27	15.01	14.02
		1745	18.52	17.72	16.49	16.52	15.72	14.49
		1711.5	18.84	17.92	16.51	16.84	15.92	14.51
	1 RB low	1778.5	18.27	17.20	16.22	16.27	15.20	14.22
		1745	18.57	17.73	16.26	16.57	15.73	14.26
		1711.5	18.49	17.54	16.15	16.49	15.54	14.15
	50% RB mid	1778.5	17.49	16.55	15.40	15.49	14.55	13.40
		1745	17.72	16.90	15.37	15.72	14.90	13.37
		1711.5	17.57	16.64	15.12	15.57	14.64	13.12
	100% RB	1778.5	17.46	16.55	15.05	15.46	14.55	13.05
		1745	17.69	16.90	15.30	15.69	14.90	13.30
		1711.5	17.54	16.69	15.07	15.54	14.69	13.07
5MHz	1 RB high	1777.5	18.07	17.57	16.11	16.07	15.57	14.11
		1745	18.56	17.01	16.29	16.56	15.01	14.29
		1712.5	18.50	17.60	16.27	16.50	15.60	14.27
	1 RB low	1777.5	18.25	17.41	16.06	16.25	15.41	14.06
		1745	18.59	17.10	16.15	16.59	15.10	14.15
		1712.5	18.43	17.59	16.28	16.43	15.59	14.28
	50% RB mid	1777.5	17.80	16.69	15.35	15.80	14.69	13.35
		1745	17.53	16.87	15.40	15.53	14.87	13.40
		1712.5	17.97	16.95	15.29	15.97	14.95	13.29
	100% RB	1777.5	17.79	16.92	15.30	15.79	14.92	13.30
		1745	17.60	17.00	15.22	15.60	15.00	13.22
		1712.5	17.85	17.10	15.47	15.85	15.10	13.47
10MHz	1 RB high	1775	18.29	17.53	16.13	16.29	15.53	14.13
		1745	18.59	17.50	16.41	16.59	15.50	14.41
		1715	18.87	17.38	16.48	16.87	15.38	14.48

©Copyright. All rights reserved by CTTL.

	1 RB low	1775	18.52	17.76	16.42	16.52	15.76	14.42
		1745	18.63	17.58	16.43	16.63	15.58	14.43
		1715	18.51	17.10	16.15	16.51	15.10	14.15
	50% RB mid	1775	17.50	16.39	14.86	15.50	14.39	12.86
		1745	17.66	16.74	15.20	15.66	14.74	13.20
		1715	17.60	16.86	15.56	15.60	14.86	13.56
	100% RB	1775	17.42	16.51	15.09	15.42	14.51	13.09
		1745	17.61	16.78	15.09	15.61	14.78	13.09
		1715	17.56	16.65	15.15	15.56	14.65	13.15
	1 RB high	1772.5	18.11	17.03	16.10	16.11	15.03	14.10
		1745	18.54	17.53	16.41	16.54	15.53	14.41
		1717.5	18.42	17.58	16.27	16.42	15.58	14.27
	1 RB low	1772.5	18.32	17.14	16.33	16.32	15.14	14.33
		1745	18.71	17.87	16.58	16.71	15.87	14.58
		1717.5	18.38	17.57	16.29	16.38	15.57	14.29
	50% RB mid	1772.5	17.45	16.73	14.69	15.45	14.73	12.69
		1745	17.64	16.80	14.94	15.64	14.80	12.94
		1717.5	17.89	16.82	15.20	15.89	14.82	13.20
	100% RB	1772.5	17.42	16.72	14.94	15.42	14.72	12.94
		1745	17.68	16.75	15.14	15.68	14.75	13.14
		1717.5	17.86	16.84	15.35	15.86	14.84	13.35
20MHz	1 RB high	1770	18.14	17.00	16.13	16.14	15.00	14.13
		1745	18.42	17.42	15.89	16.42	15.42	13.89
		1720	18.59	17.60	16.41	16.59	15.60	14.41
	1 RB low	1770	18.49	17.13	16.38	16.49	15.13	14.38
		1745	18.55	17.83	16.18	16.55	15.83	14.18
		1720	18.65	17.59	16.20	16.65	15.59	14.20
	50% RB mid	1770	17.46	16.58	14.77	15.46	14.58	12.77
		1745	17.31	16.88	15.09	15.31	14.88	13.09
		1720	17.71	16.79	15.43	15.71	14.79	13.43
	100% RB	1770	17.51	16.58	14.87	15.51	14.58	12.87
		1745	17.89	16.86	15.16	15.89	14.86	13.16
		1720	17.69	16.85	15.24	15.69	14.85	13.24

Note: Expanded measurement uncertainty is U = 0.578 dB, *k* = 2.

©Copyright. All rights reserved by CTTL.

A.2 Emission Limit

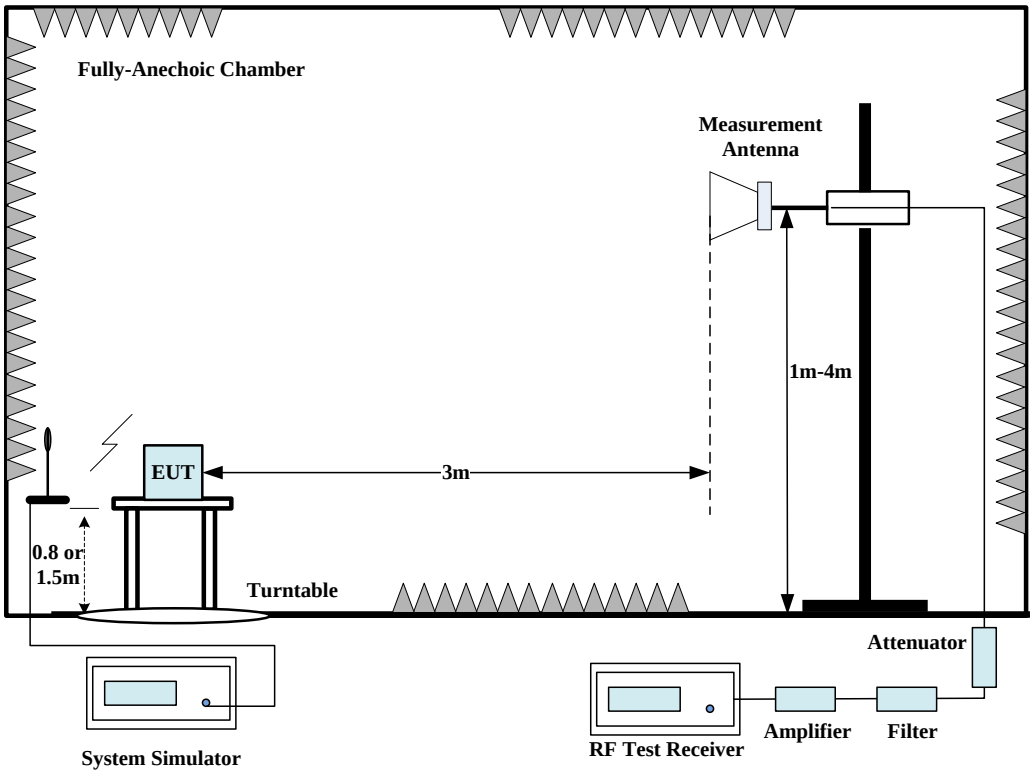
A.2.1 Measurement Method

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

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 each LTE Band.

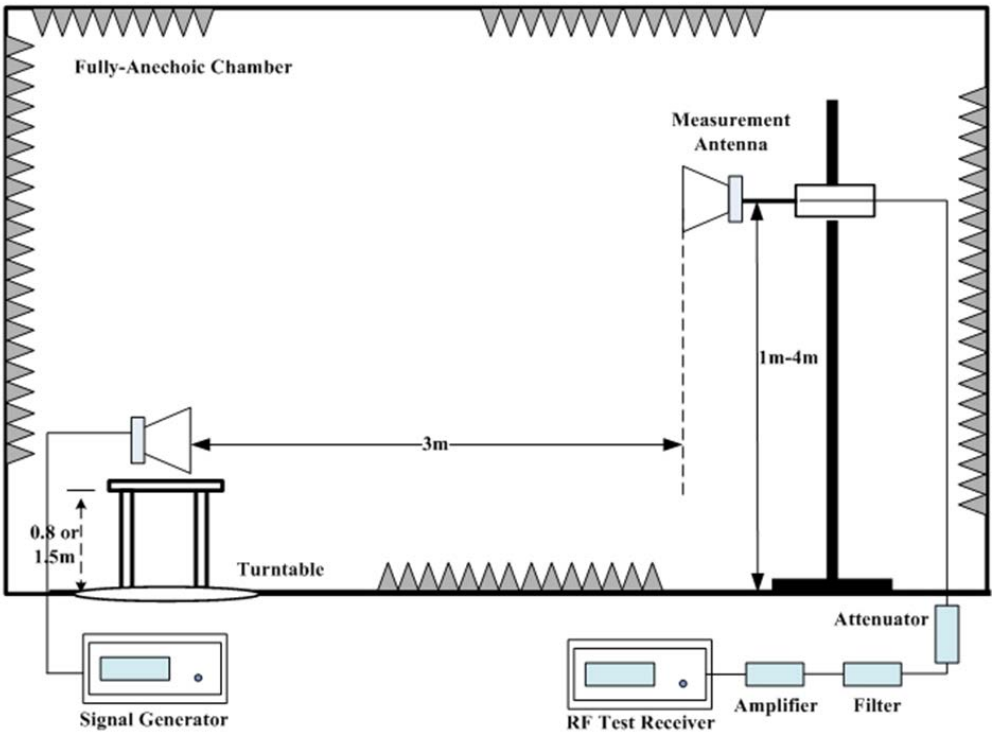
The procedure of radiated spurious emissions is as follows:

For measurements performed at frequencies less than or equal to 1 GHz, the EUT was placed on a 80cm-high non-conductive support; For measurements performed at frequencies above 1GHz,EUT was placed on a 1.5-meter-high non-conductive support. A measurement antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. In the initial test, the height of the measurement antenna was varied from 1 m to 4 m for the relative positioning that produces the maximum radiated signal level. 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.



1. 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).
2. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

©Copyright. All rights reserved by CTTL.



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. The height of measurement antenna varied between 1 m to 4 m to maximize the received signal amplitude for each emission that was detected and measured in the initial test. A power (P_{Mea}) is applied to the input of the substitution antenna and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test was performed with the measurement antenna in both vertical and horizontal polarization.

3. The Path loss (P_{pl}) between the Signal Source and the Substitution Antenna and the Substitution Antenna Gain (G_a) were recorded after test.A amplifier was connected in for the test. The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
4. The measurement results are obtained as described below:

$$\text{Power (EIRP)} = P_{Mea} - P_{pl} + G_a$$

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

A.2.2 Measurement Limit

FDD Band 2: Part 24.238 specifies that 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.

FDD Band 12: Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in

©Copyright. All rights reserved by CTTL.

watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

LTE Band 26(814MHz~824MHz): Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows: For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

FDD Band 26(824MHz~849MHz): Part 22.917 specifies that 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.

FDD Band 7/TDD Band 41: Part 27.53(m) 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.

FDD Band 66: Part 27.53(h) specifies that 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.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of each LTE Band. 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 each LTE Band 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.

©Copyright. All rights reserved by CTTL.

Note 1: Both of Vertical and Horizontal polarizations are evaluated, but only the worst case is recorded in this report.

A.2.4 Measurement Results Table

Frequency	Channel	Frequency Range	Result
LTE Bands	Low	9kHz-26GHz	Pass
	Middle	9kHz-26GHz	Pass
	High	9kHz-26GHz	Pass

A.2.5 Sweep Table

Subrange	RBW	VBW
9~150 kHz	0.2kHz	0.6kHz
150kHz~30MHz	9kHz	27kHz
30MHz~1 GHz	100KHz	300KHz
1~20 GHz	1 MHz	3 MHz

©Copyright. All rights reserved by CTTL.

A.2.6 Measurement Result

LTE Band 2, 1.4MHz,CH18607,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3701.50	-60.25	3.47	10.39	-53.33	-13.00	40.33	H
5552.00	-45.92	5.32	11.20	-40.04	-13.00	27.04	V
7402.50	-36.28	8.08	10.10	-34.26	-13.00	21.26	V
9253.50	-39.80	8.85	11.70	-36.95	-13.00	23.95	V
11105.00	-49.86	9.75	12.60	-47.01	-13.00	34.01	H
12941.00	-49.15	12.47	12.76	-48.86	-13.00	35.86	V

LTE Band 2, 1.4MHz,CH18900,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3760.00	-61.36	3.81	10.16	-55.01	-13.00	42.01	V
5640.00	-47.12	5.61	11.38	-41.35	-13.00	28.35	V
7520.00	-37.91	7.71	10.24	-35.38	-13.00	22.38	V
9400.00	-48.84	9.10	11.50	-46.44	-13.00	33.44	H
11277.00	-48.08	10.64	12.62	-46.10	-13.00	33.10	V
13158.00	-44.70	13.22	12.54	-45.38	-13.00	32.38	V

LTE Band 2, 1.4MHz,CH19193,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3819.00	-60.27	3.93	9.96	-54.24	-13.00	41.24	V
5728.00	-46.19	5.89	11.34	-40.74	-13.00	27.74	V
7637.50	-36.85	6.77	10.38	-33.24	-13.00	20.24	V
9547.00	-46.84	9.11	11.89	-44.06	-13.00	31.06	V
11454.00	-47.04	12.38	12.55	-46.87	-13.00	33.87	V
13358.00	-43.38	13.11	12.44	-44.05	-13.00	31.05	V

©Copyright. All rights reserved by CTTL.

LTE Band 7, 5MHz,CH20775,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5005.00	-53.23	5.15	11.33	-47.05	-25.00	22.05	V
7508.00	-42.26	7.70	10.22	-39.74	-25.00	14.74	V
10011.50	-46.86	9.35	11.79	-44.42	-25.00	19.42	V
12511.50	-49.02	12.37	13.57	-47.82	-25.00	22.82	V
15003.50	-46.34	14.75	14.61	-46.48	-25.00	21.48	H
17521.50	-35.95	19.69	13.12	-42.52	-25.00	17.52	V

LTE Band 7, 5MHz,CH21100,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5070.50	-54.62	5.30	11.60	-48.32	-25.00	23.32	V
7605.50	-39.64	7.58	10.31	-36.91	-25.00	11.91	V
10141.00	-48.52	9.74	11.78	-46.48	-25.00	21.48	H
12686.50	-48.59	11.75	13.13	-47.21	-25.00	22.21	V
15215.00	-46.67	15.69	15.03	-47.33	-25.00	22.33	H
17732.50	-36.59	19.56	13.43	-42.72	-25.00	17.72	H

LTE Band 7, 5MHz,CH21425,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5135.50	-54.82	5.55	11.60	-48.77	-25.00	23.77	V
7703.00	-40.67	6.72	10.61	-36.78	-25.00	11.78	V
10271.00	-43.17	10.75	11.90	-42.02	-25.00	17.02	V
12838.50	-42.83	13.04	12.92	-42.95	-25.00	17.95	V
15406.50	-37.03	14.90	15.41	-36.52	-25.00	11.52	V
17974.50	-34.51	19.99	13.45	-41.05	-25.00	16.05	H

©Copyright. All rights reserved by CTTL.

LTE Band 12, 1.4MHz,CH23017,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2099.50	-45.66	3.52	7.80	2.15	-43.53	-13.00	30.53	H
2799.50	-47.80	5.27	10.40	2.15	-44.82	-13.00	31.82	H
3499.00	-43.87	2.98	10.10	2.15	-38.90	-13.00	25.90	H
4198.50	-56.58	4.16	10.10	2.15	-52.79	-13.00	39.79	H
5597.50	-56.17	5.66	11.30	2.15	-52.68	-13.00	39.68	V
7005.00	-50.05	7.72	10.41	2.15	-49.51	-13.00	36.51	V

LTE Band 12, 1.4MHz,CH23095,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2123.00	-43.14	3.72	8.17	2.15	-40.84	-13.00	27.84	H
2830.50	-42.31	5.03	10.46	2.15	-39.03	-13.00	26.03	H
3538.00	-43.32	3.28	10.25	2.15	-38.50	-13.00	25.50	H
4245.50	-52.48	4.94	10.28	2.15	-49.29	-13.00	36.29	H
6362.50	-54.55	5.95	10.92	2.15	-51.73	-13.00	38.73	H
7062.00	-51.72	6.82	10.45	2.15	-50.24	-13.00	37.24	H

LTE Band 12, 1.4MHz,CH23173,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2156.50	-53.88	3.70	8.68	2.15	-51.05	-13.00	38.05	V
2872.50	-47.89	5.42	10.64	2.15	-44.82	-13.00	31.82	V
4998.50	-56.27	5.17	11.30	2.15	-52.29	-13.00	39.29	H
5717.00	-56.59	5.92	11.37	2.15	-53.29	-13.00	40.29	H
6450.50	-54.35	6.77	10.80	2.15	-52.47	-13.00	39.47	V
7162.50	-51.91	6.73	10.12	2.15	-50.67	-13.00	37.67	H

©Copyright. All rights reserved by CTTL.

LTE Band 13, 5MHz,CH23205,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1559.00	-55.11	3.47	5.39	0.00	-53.19	-40.00	13.19	V
2339.25	-40.16	4.44	5.62	2.15	-41.13	-13.00	28.13	V
3117.50	-54.59	5.38	7.28	2.15	-54.84	-13.00	41.84	V
3897.50	-53.14	6.11	8.76	2.15	-52.64	-13.00	39.64	H
4677.50	-54.84	6.49	9.58	2.15	-53.90	-13.00	40.90	V
5455.00	-54.24	6.89	10.54	2.15	-52.74	-13.00	39.74	V

LTE Band 13, 5MHz,CH23230,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1559.00	-56.39	3.47	5.39	0.00	-54.47	-40.00	14.47	V
2346.70	-42.44	4.45	5.64	2.15	-43.40	-13.00	30.40	H
3127.50	-54.21	5.40	7.31	2.15	-54.45	-13.00	41.45	V
3910.00	-53.52	6.12	8.77	2.15	-53.02	-13.00	40.02	V
4695.00	-54.94	6.50	9.60	2.15	-53.99	-13.00	40.99	H
5470.00	-54.50	6.95	10.56	2.15	-53.04	-13.00	40.04	V

LTE Band 13, 5MHz,CH23255,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1569.20	-63.13	3.48	5.38	0.00	-61.23	-40.00	21.23	V
2353.65	-41.54	4.46	5.66	2.15	-42.49	-13.00	29.49	H
3137.50	-55.41	5.39	7.33	2.15	-55.62	-13.00	42.62	V
3922.50	-55.12	6.12	8.79	2.15	-54.60	-13.00	41.60	H
4705.00	-54.52	6.51	9.61	2.15	-53.57	-13.00	40.57	V
5492.50	-54.95	7.03	10.59	2.15	-53.54	-13.00	40.54	V

©Copyright. All rights reserved by CTTL.

LTE Band 26(824MHz~849MHz), 1.4MHz,CH26797,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1650.00	-55.01	2.59	9.50	2.15	-50.25	-13.00	37.25	V
2474.50	-32.01	4.33	10.35	2.15	-28.14	-13.00	15.14	H
3299.00	-51.57	3.56	10.40	2.15	-46.88	-13.00	33.88	H
6608.00	-52.29	7.02	10.32	2.15	-51.14	-13.00	38.14	H
7434.50	-48.46	7.90	10.10	2.15	-48.41	-13.00	35.41	H
8240.00	-50.43	7.59	11.20	2.15	-48.97	-13.00	35.97	H

LTE Band 26(824MHz~849MHz), 1.4MHz,CH26915,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.00	-55.67	2.78	9.45	2.15	-51.15	-13.00	38.15	H
2510.00	-34.47	4.42	10.30	2.15	-30.74	-13.00	17.74	H
3346.00	-55.88	3.46	10.22	2.15	-51.27	-13.00	38.27	H
6677.50	-52.94	6.35	10.46	2.15	-50.98	-13.00	37.98	V
7536.00	-48.17	7.46	10.27	2.15	-47.51	-13.00	34.51	V
8350.50	-48.29	8.29	11.30	2.15	-47.43	-13.00	34.43	V

LTE Band 26(824MHz~849MHz), 1.4MHz,CH27033,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1696.50	-45.52	2.92	9.41	2.15	-41.18	-13.00	28.18	H
2545.50	-31.53	4.61	10.30	2.15	-27.99	-13.00	14.99	H
3393.00	-53.92	3.53	10.03	2.15	-49.57	-13.00	36.57	H
6787.00	-52.32	6.39	10.37	2.15	-50.49	-13.00	37.49	V
7635.50	-48.49	6.76	10.37	2.15	-47.03	-13.00	34.03	V
8471.00	-49.58	8.03	11.30	2.15	-48.46	-13.00	35.46	V

©Copyright. All rights reserved by CTTL.

LTE Band 26(814MHz~824MHz), 1.4MHz,CH26697,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1629.50	-52.98	2.39	9.34	2.15	-48.18	-13.00	35.18	H
2444.50	-36.33	4.55	10.38	2.15	-32.65	-13.00	19.65	H
5710.50	-56.01	5.93	11.38	2.15	-52.71	-13.00	39.71	H
6507.00	-54.41	6.25	10.60	2.15	-52.21	-13.00	39.21	H
7339.00	-49.88	7.67	9.90	2.15	-49.80	-13.00	36.80	V
8137.00	-49.66	8.22	11.13	2.15	-48.90	-13.00	35.90	V

LTE Band 26(814MHz~824MHz), 1.4MHz,CH26740,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1638.00	-55.01	2.40	9.40	2.15	-50.16	-13.00	37.16	H
2457.50	-32.44	4.42	10.38	2.15	-28.63	-13.00	15.63	H
3276.00	-54.91	3.06	10.40	2.15	-49.72	-13.00	36.72	H
6543.00	-54.24	6.30	10.60	2.15	-52.09	-13.00	39.09	V
7385.50	-48.69	8.18	10.04	2.15	-48.98	-13.00	35.98	H
8198.00	-50.58	7.37	11.20	2.15	-48.90	-13.00	35.90	H

LTE Band 26(814MHz~824MHz), 1.4MHz,CH26783,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1646.50	-56.73	2.62	9.47	2.15	-52.03	-13.00	39.03	V
2470.00	-32.15	4.32	10.36	2.15	-28.26	-13.00	15.26	H
3293.50	-51.90	3.61	10.40	2.15	-47.26	-13.00	34.26	H
6599.50	-52.71	7.10	10.30	2.15	-51.66	-13.00	38.66	V
7411.00	-47.45	8.03	10.10	2.15	-47.53	-13.00	34.53	V
8231.00	-50.31	7.59	11.20	2.15	-48.85	-13.00	35.85	H

©Copyright. All rights reserved by CTTL.

LTE Band 41, 5MHz,CH39675,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4997.50	-51.49	5.17	11.30	-45.36	-25.00	20.36	V
7496.50	-42.62	7.70	10.19	-40.13	-25.00	15.13	V
9994.50	-42.16	9.36	11.79	-39.73	-25.00	14.73	V
12498.00	-48.98	12.35	13.60	-47.73	-25.00	22.73	H
14982.00	-46.53	14.78	14.53	-46.78	-25.00	21.78	H
17489.00	-34.84	19.74	13.09	-41.49	-25.00	16.49	V

LTE Band 41, 5MHz,CH40620,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5186.50	-55.77	5.75	11.67	-49.85	-25.00	24.85	V
7779.00	-40.00	7.37	10.76	-36.61	-25.00	11.61	V
10372.50	-38.46	10.73	11.97	-37.22	-25.00	12.22	V
12965.50	-47.01	12.53	12.73	-46.81	-25.00	21.81	V
15559.00	-39.70	16.71	15.60	-40.81	-25.00	15.81	V
17990.00	-35.56	19.96	13.42	-42.10	-25.00	17.10	V

LTE Band 41, 5MHz,CH41565,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5375.50	-52.83	5.74	11.65	-46.92	-25.00	21.92	H
8063.00	-41.02	7.86	11.13	-37.75	-25.00	12.75	H
10750.50	-47.20	9.83	12.15	-44.88	-25.00	19.88	V
13438.00	-38.72	12.56	12.36	-38.92	-25.00	13.92	V
16115.50	-44.86	17.08	15.10	-46.84	-25.00	21.84	V
17978.50	-35.59	19.98	13.44	-42.13	-25.00	17.13	H

©Copyright. All rights reserved by CTTL.

LTE Band 66, 1.4MHz,CH131979,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5132.50	-57.98	5.56	11.60	-51.94	-13.00	38.94	H
8554.00	-59.10	8.52	11.20	-56.42	-13.00	43.42	V
11972.00	-57.55	12.30	13.04	-56.81	-13.00	43.81	V
13686.00	-53.93	13.00	12.20	-54.73	-13.00	41.73	H
15385.50	-57.53	14.86	15.37	-57.02	-13.00	44.02	H
17121.00	-49.11	18.45	13.48	-54.08	-13.00	41.08	V

LTE Band 66, 1.4MHz,CH132322,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5235.00	-55.03	4.70	11.70	-48.03	-13.00	35.03	H
8725.00	-57.19	8.45	11.10	-54.54	-13.00	41.54	V
10461.50	-57.03	10.35	11.94	-55.44	-13.00	42.44	V
12228.00	-58.25	12.16	13.40	-57.01	-13.00	44.01	H
13952.00	-53.82	14.68	12.15	-56.35	-13.00	43.35	H
17462.50	-46.22	19.26	13.06	-52.42	-13.00	39.42	V

LTE Band 66, 1.4MHz,CH132665,QPSK

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5338.00	-57.56	6.18	11.72	-52.02	-13.00	39.02	V
8897.00	-55.38	8.04	11.59	-51.83	-13.00	38.83	V
12464.50	-58.39	12.83	13.53	-57.69	-13.00	44.69	V
14235.00	-55.45	13.14	12.64	-55.95	-13.00	42.95	H
16019.00	-55.09	17.45	15.34	-57.20	-13.00	44.20	V
17785.50	-47.77	19.55	13.49	-53.83	-13.00	40.83	H

Note: Peak EIRP (dBm) = PMea(dBm) - Path Loss(dB) + Antenna Gain(dBi)

Note: Expanded measurement uncertainty is U = 3.44 dB, *k* = 2.

©Copyright. All rights reserved by CTTL.

A.3 Frequency Stability

A.3.1 Method of Measurement

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage. Two reference points are established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as F_L and F_H respectively.

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 CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500, and in a simulated call on middle channel for each LTE band, 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 -30℃ 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 ℃ decrements from +50℃ to -30℃. 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 the lower, higher and nominal voltage. 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.

©Copyright. All rights reserved by CTTL.

A.3.2 Measurement results

LTE Band 2, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1850.801	1909.199		
50				2.13	0.0011
40				7.04	0.0037
30				-8.03	0.0043
10				2.70	0.0014
0				18.75	0.0100
-10				5.48	0.0029
-20				20.14	0.0107
-30				0.24	0.0001

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1850.801	1909.199	3.76	0.0020
4.4				9.76	0.0052

LTE Band 7, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2500.577	2569.423		
50				6.67	0.0026
40				-2.40	0.0009
30				-1.60	0.0006
10				20.28	0.0080
0				1.36	0.0005
-10				6.24	0.0025
-20				2.60	0.0010
-30				62.64	0.0247

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2500.577	2569.423	-5.31	0.0021
4.4				-9.70	0.0038

©Copyright. All rights reserved by CTTL.

LTE Band 12, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	699.481	715.519		
50				6.65	0.0094
40				-1.22	0.0017
30				-10.50	0.0148
10				-15.61	0.0221
0				-21.07	0.0298
-10				-25.79	0.0365
-20				-29.71	0.0420
-30				14.98	0.0212

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	699.481	715.519	-16.89	0.0239
4.4				-28.34	0.0401

LTE Band 13, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	777.465	786.535		
50				-14.72	0.0188
40				-3.22	0.0041
30				1.76	0.0023
10				10.10	0.0129
0				-44.98	0.0575
-10				-30.46	0.0390
-20				-26.52	0.0339
-30				-25.68	0.0328

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	777.465	786.535	11.76	0.0150
4.4				-25.01	0.0320

©Copyright. All rights reserved by CTTL.

LTE Band 26(814MHz~824MHz), 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	814.389	823.615		
50				-24.00	0.0293
40				-26.56	0.0324
30				-27.24	0.0333
10				-26.98	0.0329
0				-29.78	0.0364
-10				-31.74	0.0388
-20				-33.60	0.0410
-30				-34.46	0.0421

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	814.389	823.615	-7.80	0.0095
4.4				-12.73	0.0155

LTE Band 26(824MHz~849MHz), 15MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	824.553	848.447		
50				-40.94	0.0489
40				-35.98	0.0430
30				-28.30	0.0338
10				-27.35	0.0327
0				-25.84	0.0309
-10				-20.34	0.0243
-20				-16.97	0.0203
-30				-12.59	0.0151

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.553	848.447	1.46	0.0017
4.4				-42.11	0.0503

©Copyright. All rights reserved by CTTL.

LTE Band 41, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2496.417	2689.487		
50				-20.87	0.0080
40				-31.10	0.0120
30				-2.43	0.0009
10				-2.72	0.0010
0				3.66	0.0014
-10				-25.26	0.0097
-20				-7.71	0.0030
-30				-0.72	0.0003

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2496.417	2689.487	-13.63	0.0053
4.4				-8.93	0.0034

LTE Band 66, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1710.801	1779.199		
50				5.09	0.0029
40				14.63	0.0084
30				23.76	0.0136
10				7.80	0.0045
0				-4.06	0.0023
-10				12.13	0.0070
-20				4.65	0.0027
-30				61.03	0.0350

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1710.801	1779.199	8.55	0.0049
4.4				4.92	0.0028

Note: Expanded measurement uncertainty is U = 0.01 PPM, *k* = 2.

©Copyright. All rights reserved by CTTL.

A.4 Occupied Bandwidth

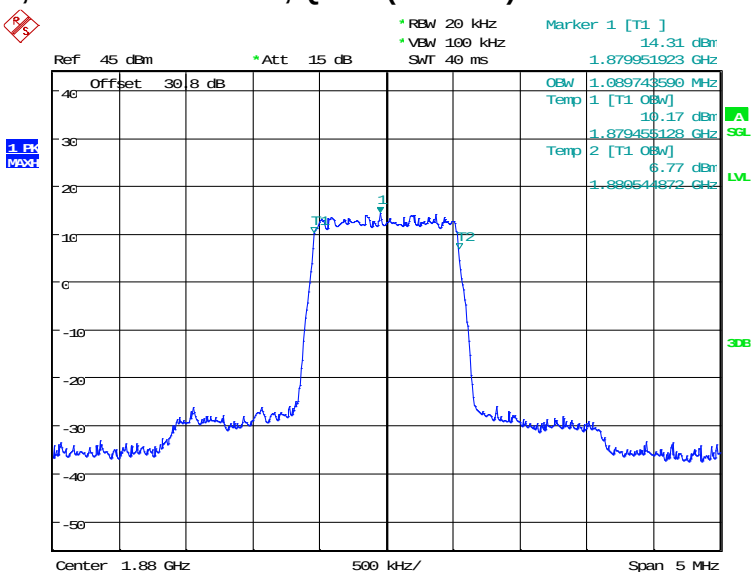
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the mid frequencies frequency. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.
The measurement method is from ANSI C63.26:
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.
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 ≥ 3 × 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.
d) Set the detection mode to peak, and the trace mode to max-hold.

©Copyright. All rights reserved by CTTL.

LTE band 2, 1.4MHz (99%)

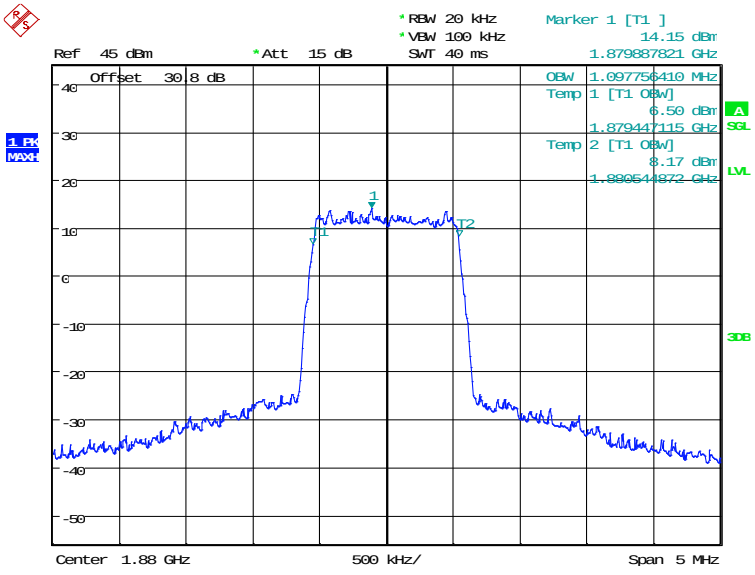
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	1089.74	1097.76

LTE band 2, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:50:12

LTE band 2, 1.4MHz Bandwidth, 16QAM (99% BW)



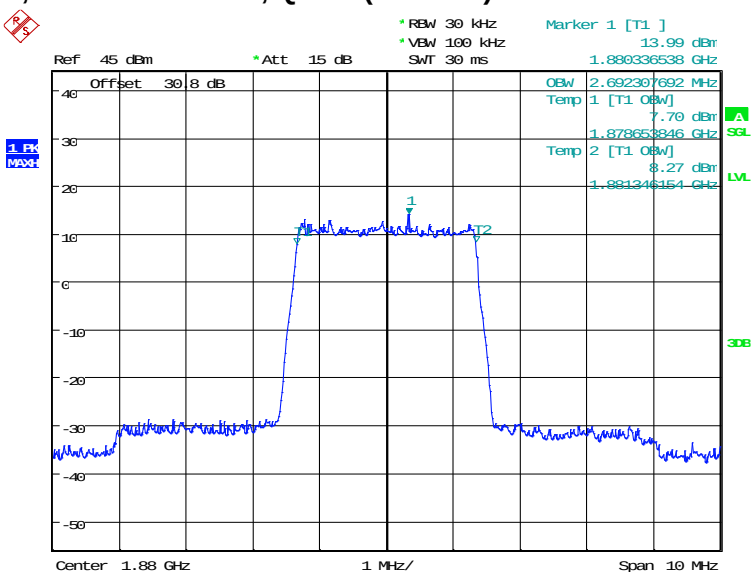
Date: 13.AUG.2024 14:50:53

©Copyright. All rights reserved by CTTL.

LTE band 2, 3MHz (99%)

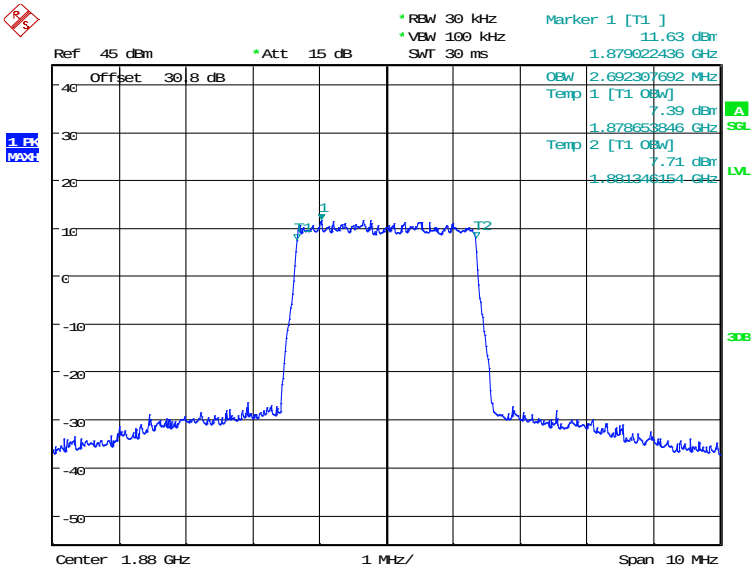
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	2692.31	2692.31

LTE band 2, 3MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:51:35

LTE band 2, 3MHz Bandwidth, 16QAM (99% BW)



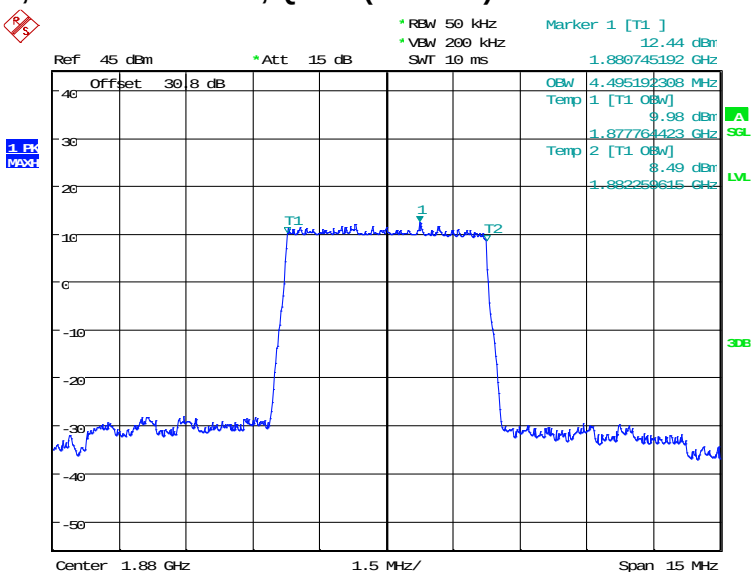
Date: 13.AUG.2024 14:52:15

©Copyright. All rights reserved by CTTL.

LTE band 2, 5MHz (99%)

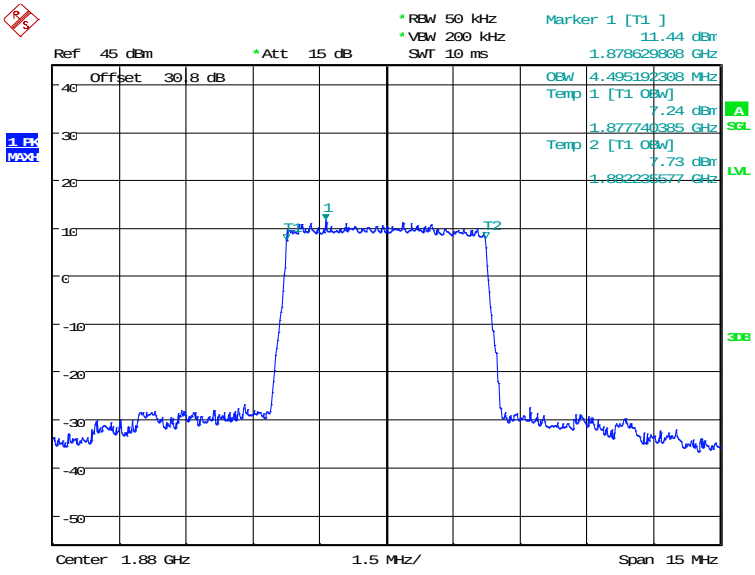
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	4495.19	4495.19

LTE band 2, 5MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:52:57

LTE band 2, 5MHz Bandwidth, 16QAM (99% BW)



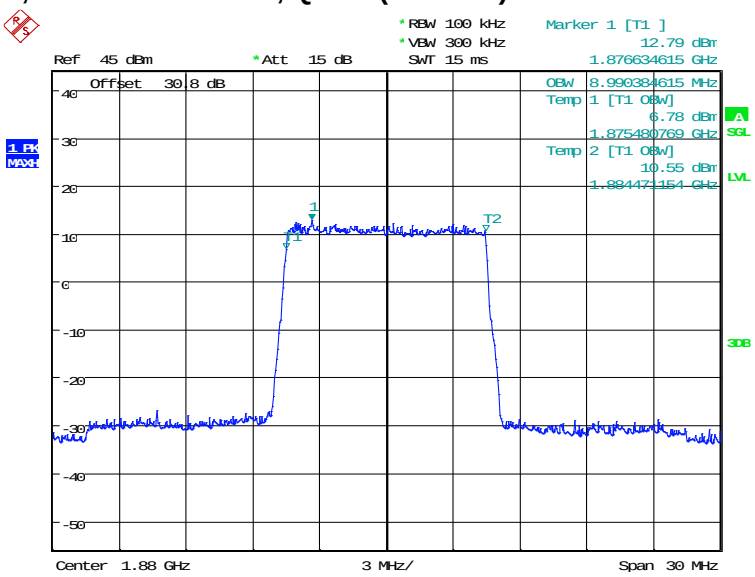
Date: 13.AUG.2024 14:53:37

©Copyright. All rights reserved by CTTL.

LTE band 2, 10MHz (99%)

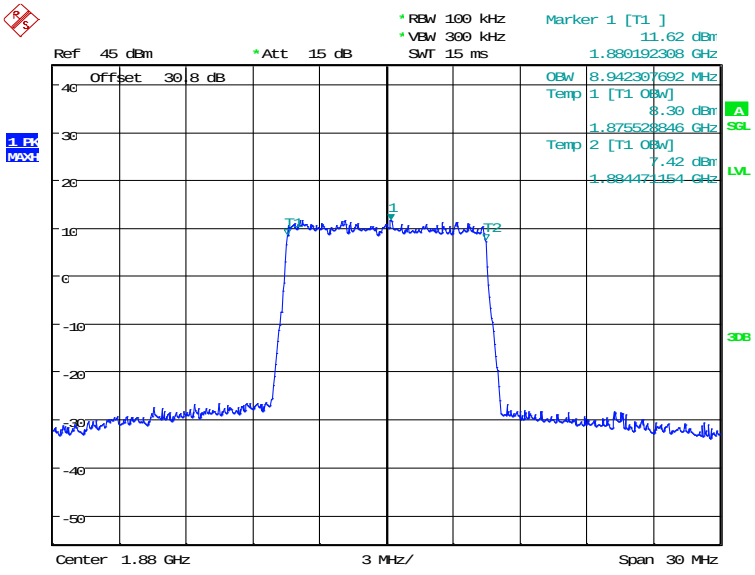
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	8990.38	8942.31

LTE band 2, 10MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:54:18

LTE band 2, 10MHz Bandwidth, 16QAM (99% BW)



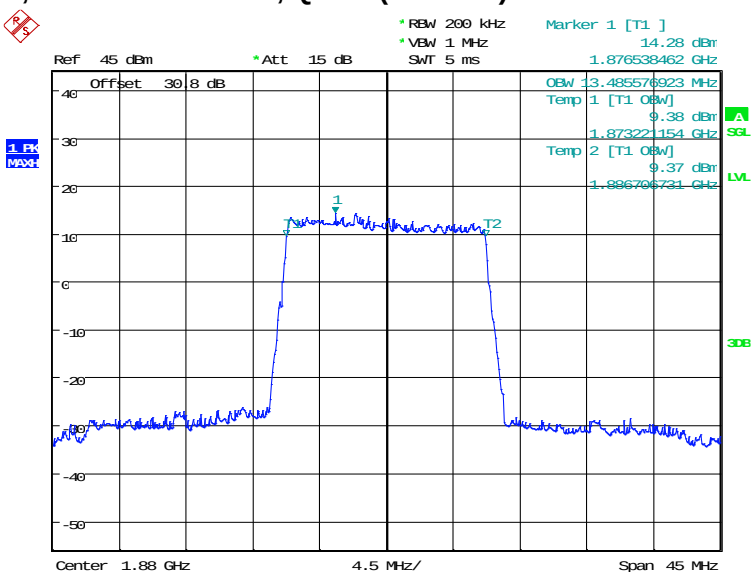
Date: 13.AUG.2024 14:54:58

©Copyright. All rights reserved by CTTL.

LTE band 2, 15MHz (99%)

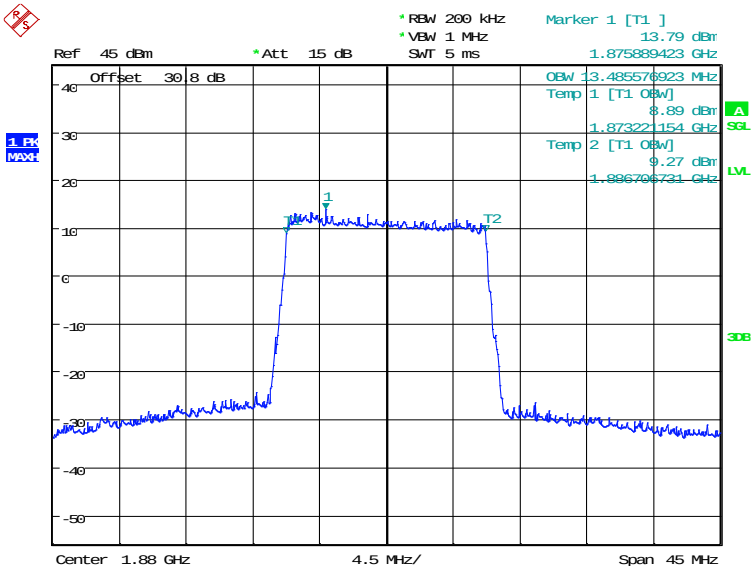
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	13485.58	13485.58

LTE band 2, 15MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:55:40

LTE band 2, 15MHz Bandwidth, 16QAM (99% BW)



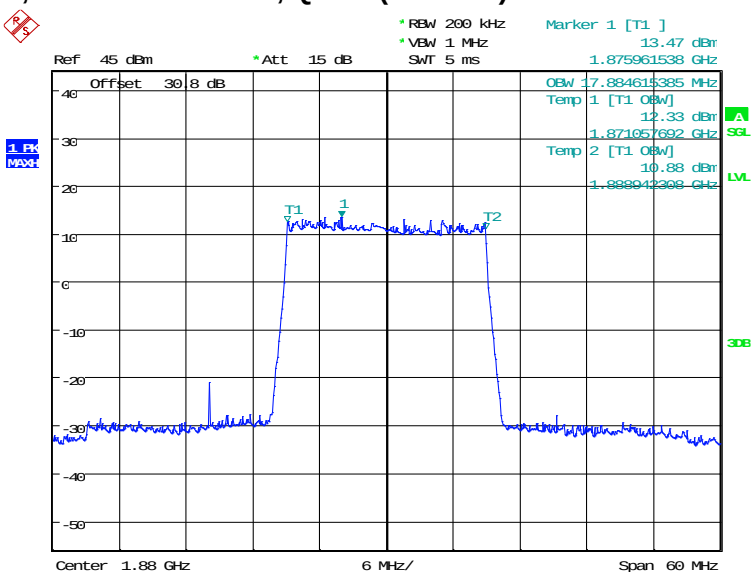
Date: 13.AUG.2024 14:56:20

©Copyright. All rights reserved by CTTL.

LTE band 2, 20MHz (99%)

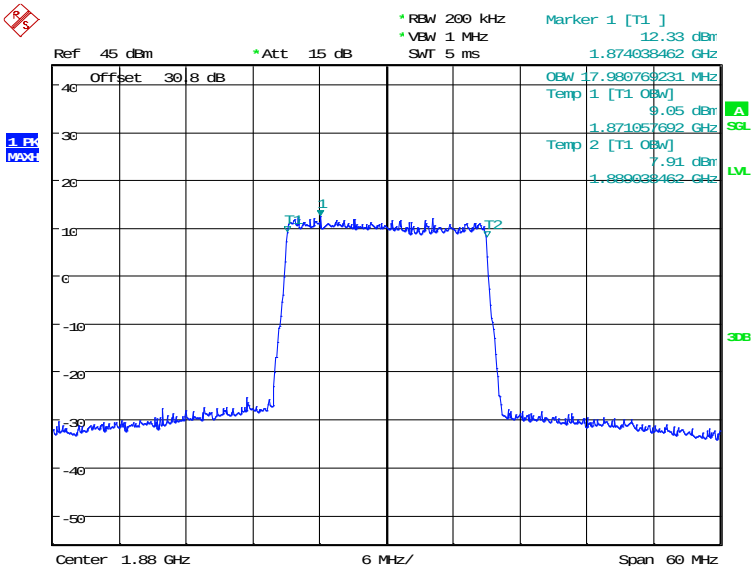
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	17884.62	17980.77

LTE band 2, 20MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 14:57:02

LTE band 2, 20MHz Bandwidth, 16QAM (99% BW)



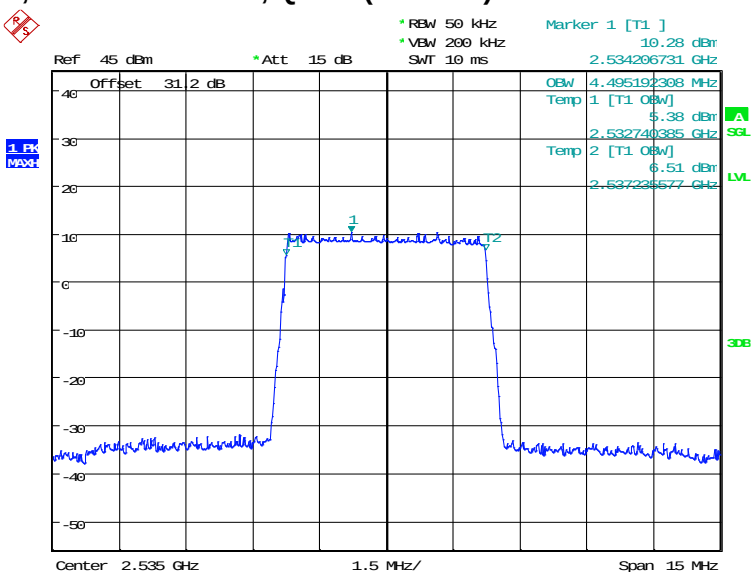
Date: 13.AUG.2024 14:57:42

©Copyright. All rights reserved by CTTL.

LTE band 7, 5MHz (99%)

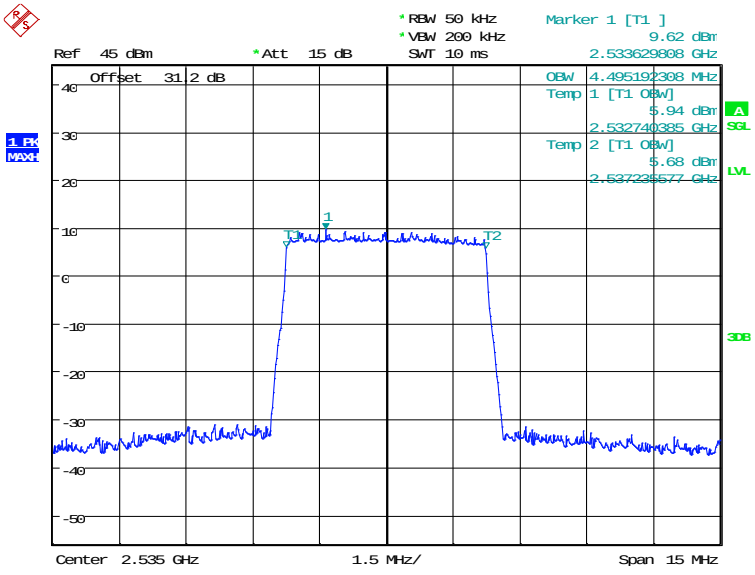
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 13.AUG.2024 14:58:25

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



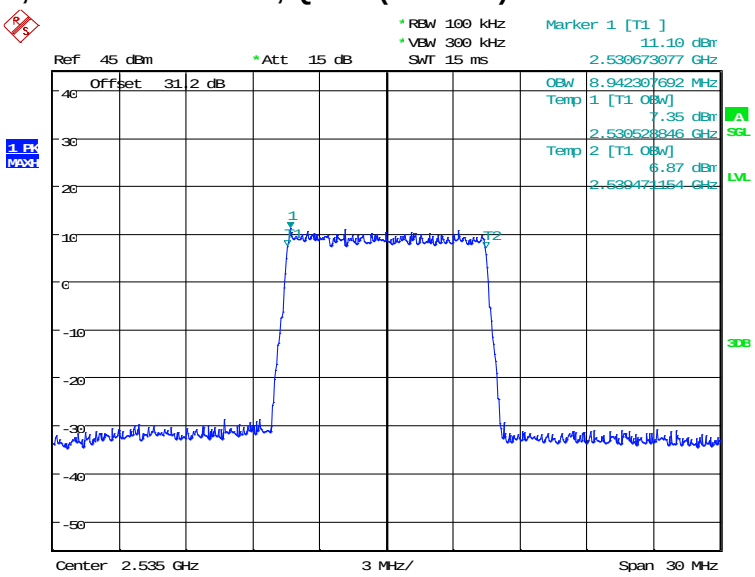
Date: 13.AUG.2024 14:59:05

©Copyright. All rights reserved by CTTL.

LTE band 7, 10MHz (99%)

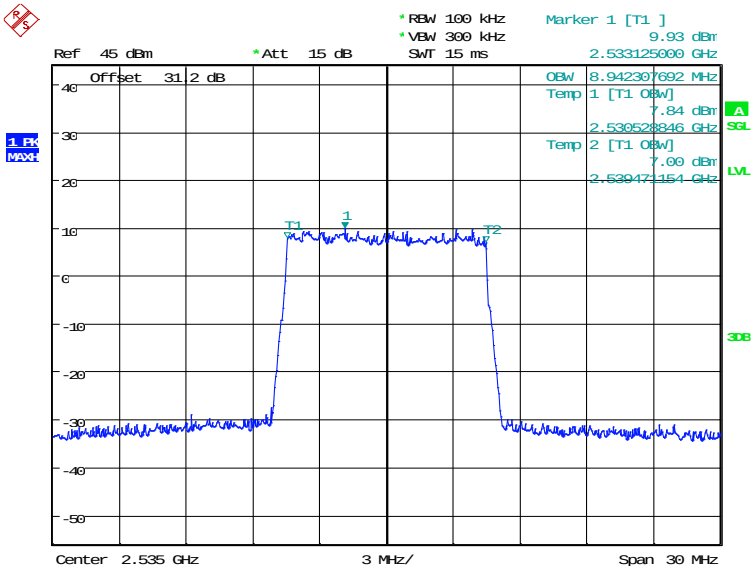
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 13.AUG.2024 14:59:47

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



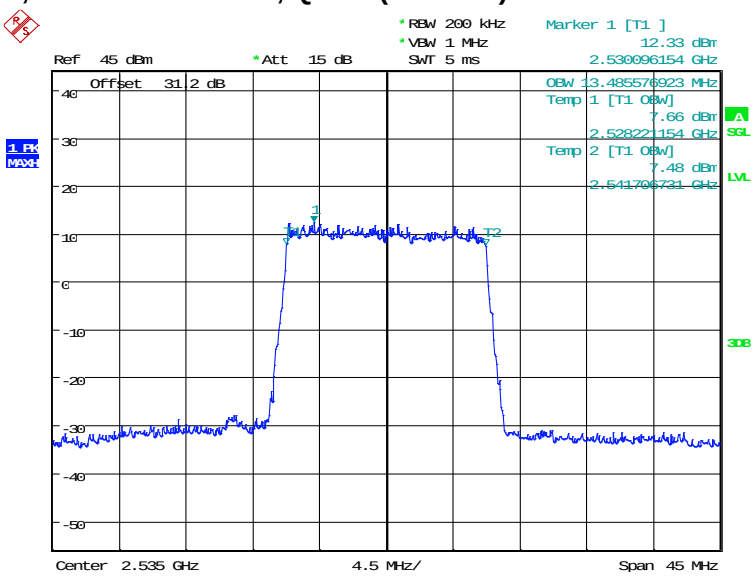
Date: 13.AUG.2024 15:00:27

©Copyright. All rights reserved by CTTL.

LTE band 7, 15MHz (99%)

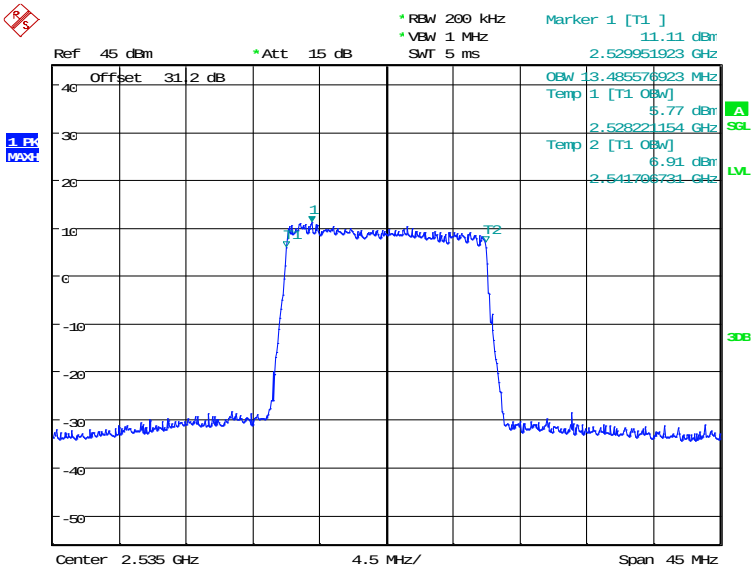
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 13.AUG.2024 15:01:09

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



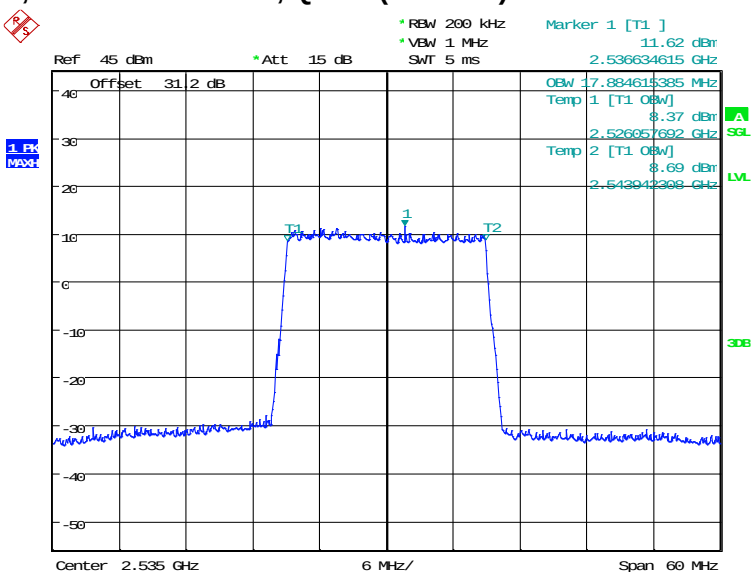
Date: 13.AUG.2024 15:01:49

©Copyright. All rights reserved by CTTL.

LTE band 7, 20MHz (99%)

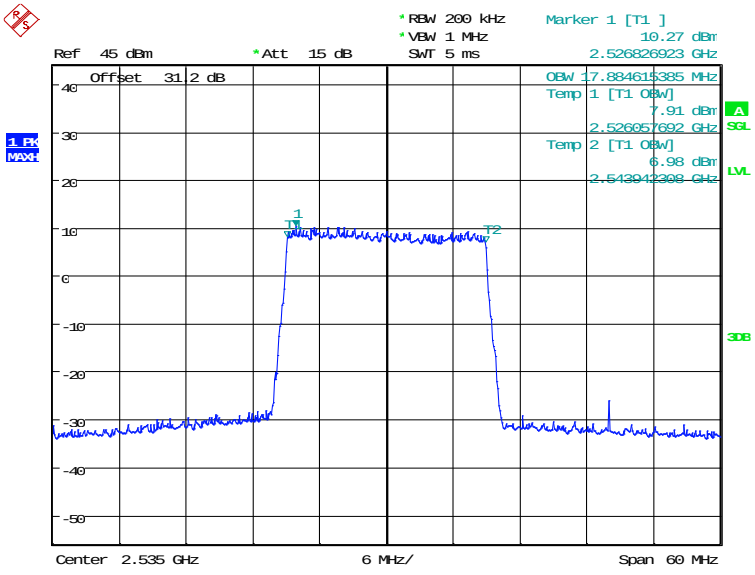
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	17884.62	17884.62

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



Date: 13.AUG.2024 15:02:31

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



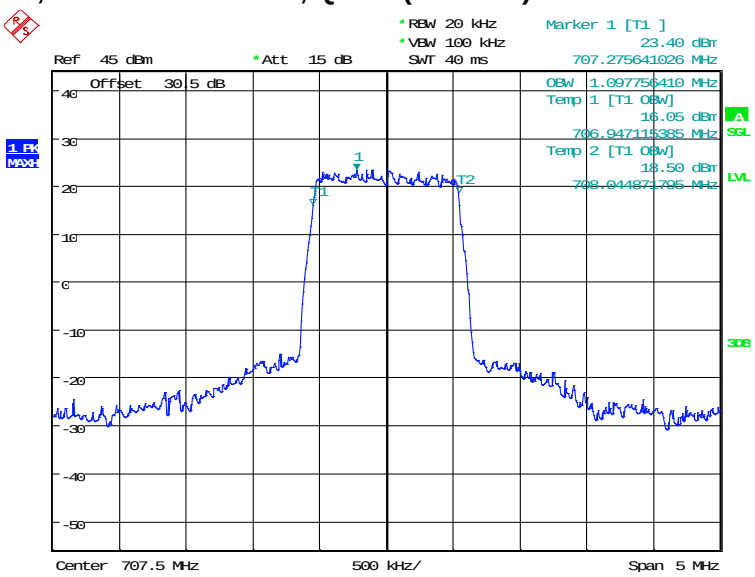
Date: 13.AUG.2024 15:03:11

©Copyright. All rights reserved by CTTL.

LTE band 12, 1.4MHz (99%)

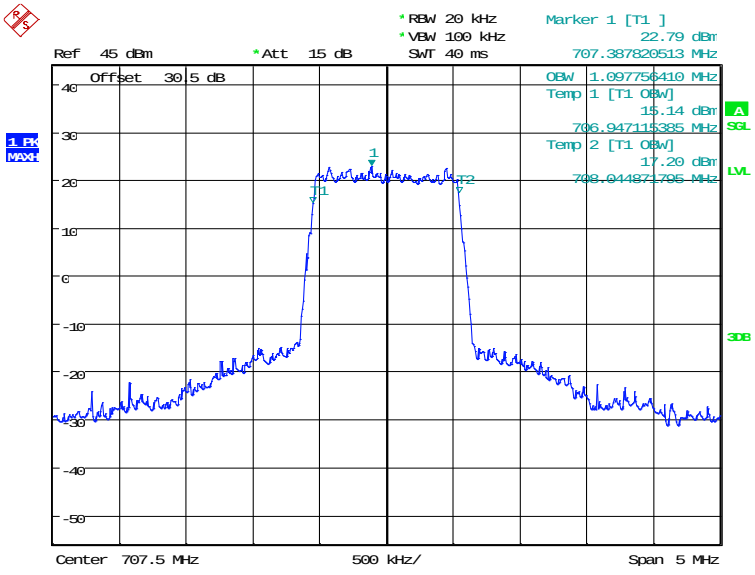
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	1097.76	1097.76

LTE band 12, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:49:39

LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)



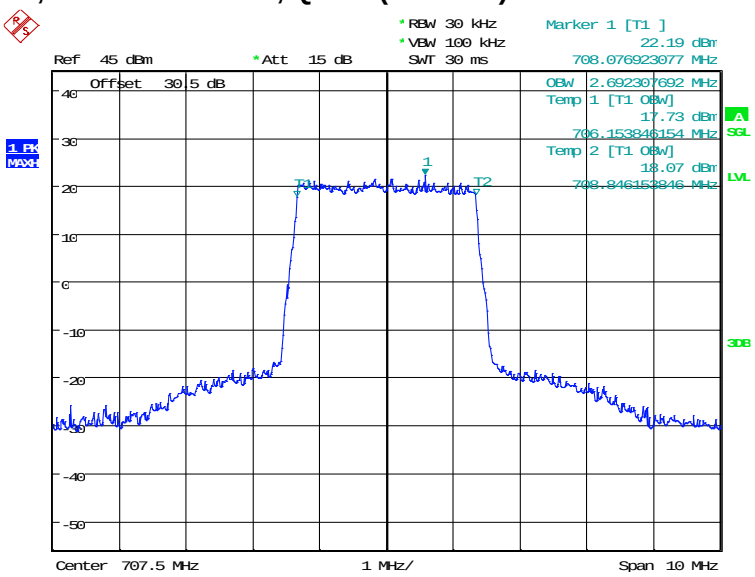
Date: 30.JUL.2024 10:50:19

©Copyright. All rights reserved by CTTL.

LTE band 12, 3MHz (99%)

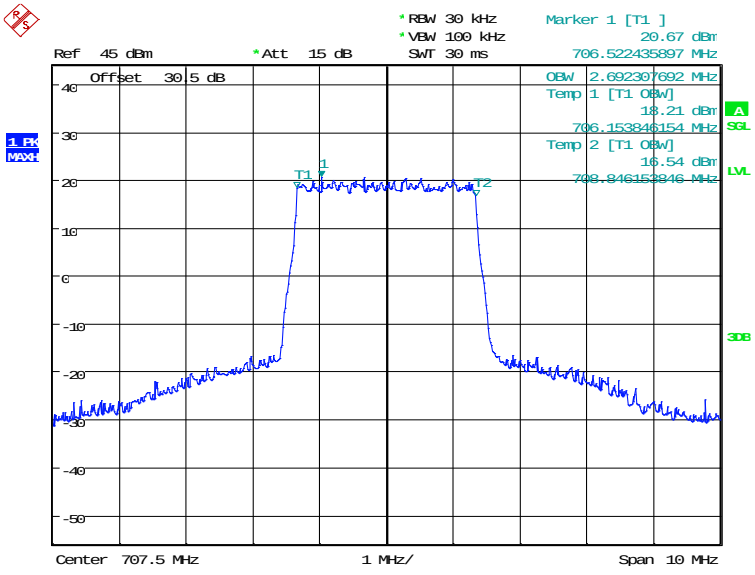
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

LTE band 12, 3MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:51:01

LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)



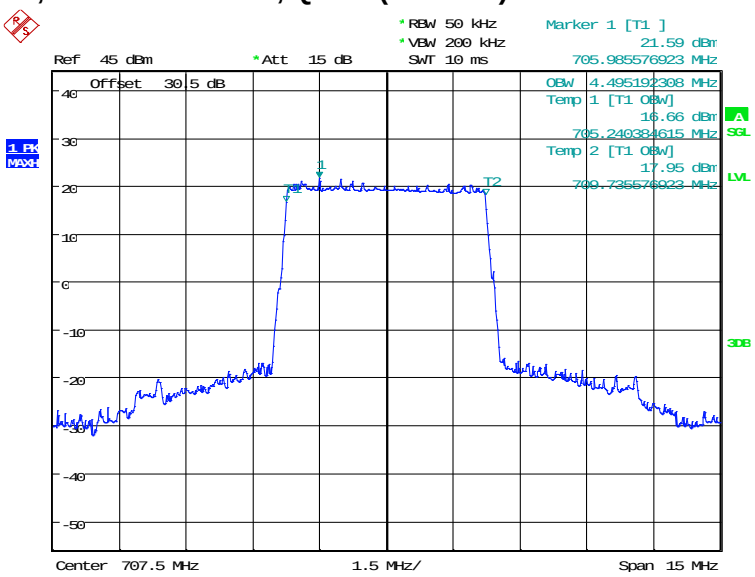
Date: 30.JUL.2024 10:51:42

©Copyright. All rights reserved by CTTL.

LTE band 12, 5MHz (99%)

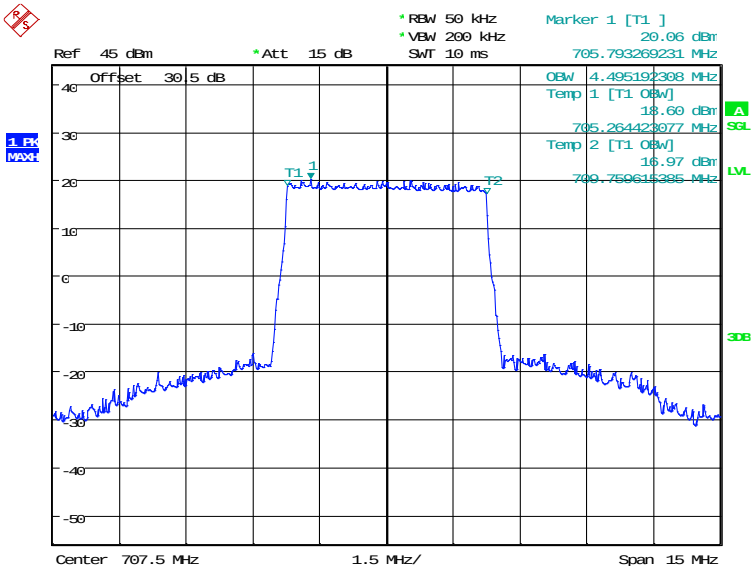
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	4495.19	4495.19

LTE band 12, 5MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:52:24

LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)



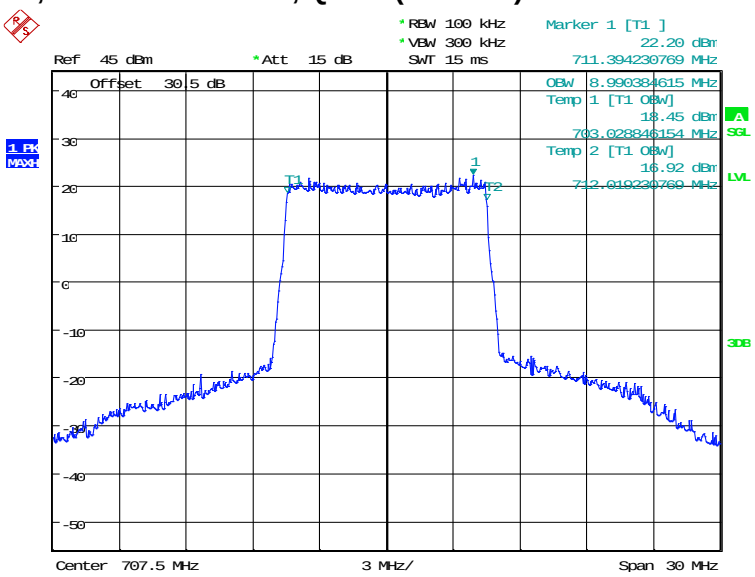
Date: 30.JUL.2024 10:53:04

©Copyright. All rights reserved by CTTL.

LTE band 12, 10MHz (99%)

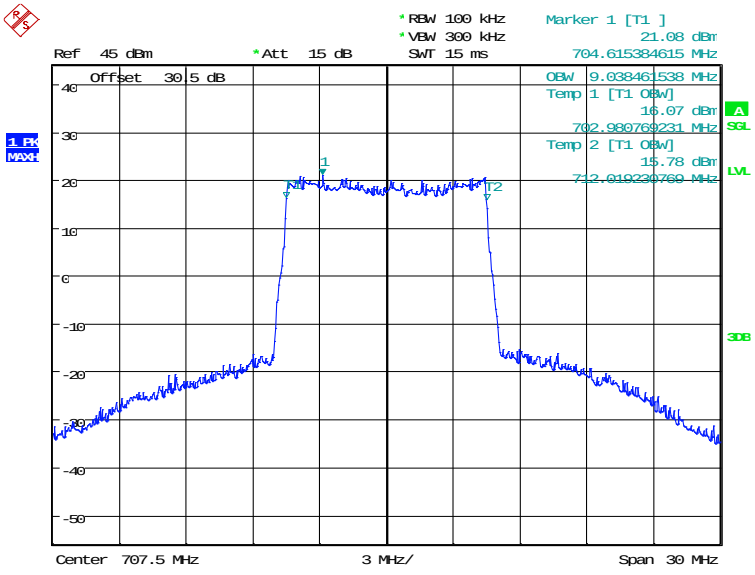
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8990.38	9038.46

LTE band 12, 10MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:53:46

LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)



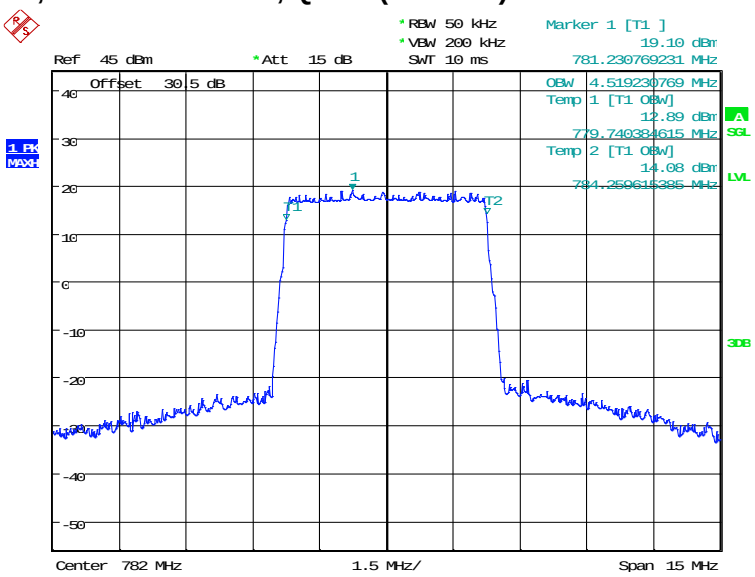
Date: 30.JUL.2024 10:54:26

©Copyright. All rights reserved by CTTL.

LTE band 13, 5MHz (99%)

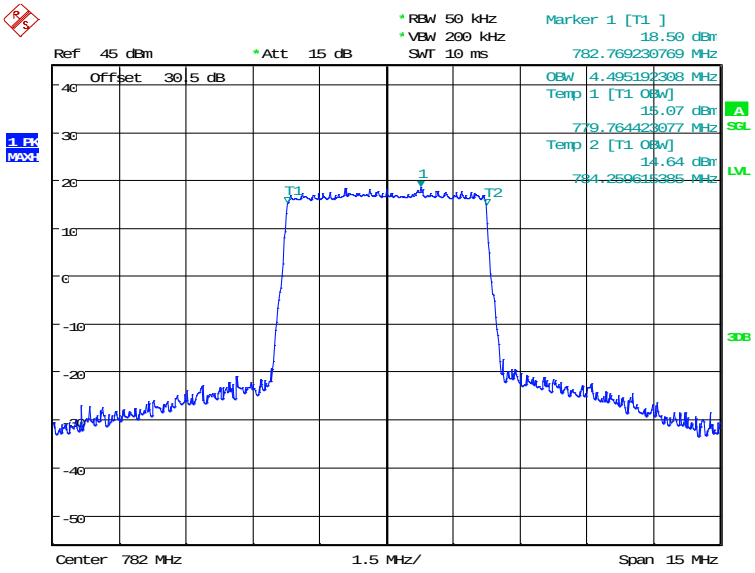
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4519.23	4495.19

LTE band 13, 5MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:55:10

LTE band 13, 5MHz Bandwidth,16QAM (99% BW)



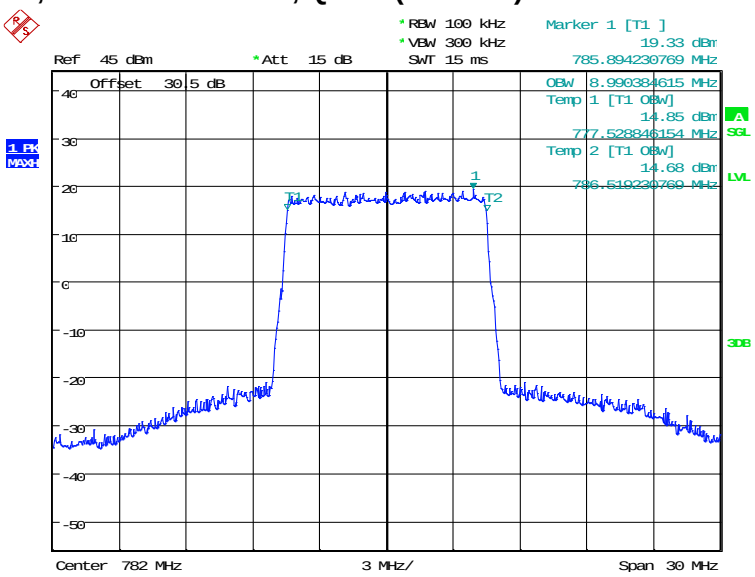
Date: 30.JUL.2024 10:55:50

©Copyright. All rights reserved by CTTL.

LTE band 13, 10MHz (99%)

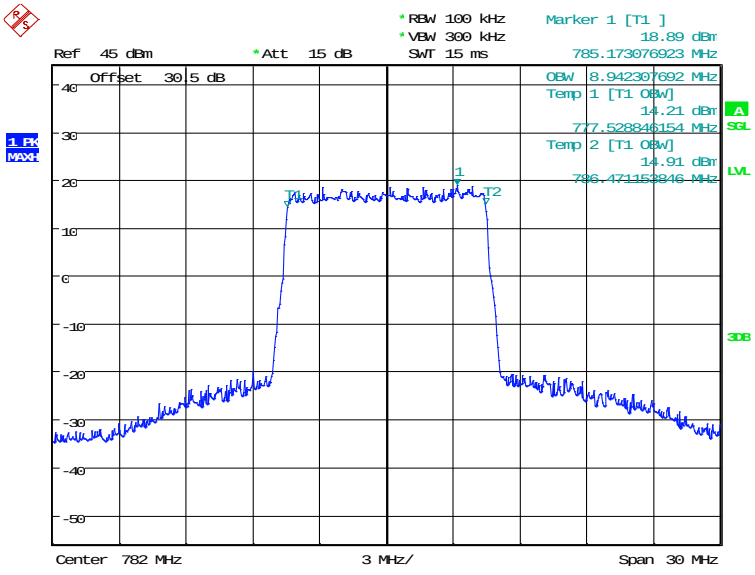
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	8990.38	8942.31

LTE band 13, 10MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:56:32

LTE band 13, 10MHz Bandwidth,16QAM (99% BW)



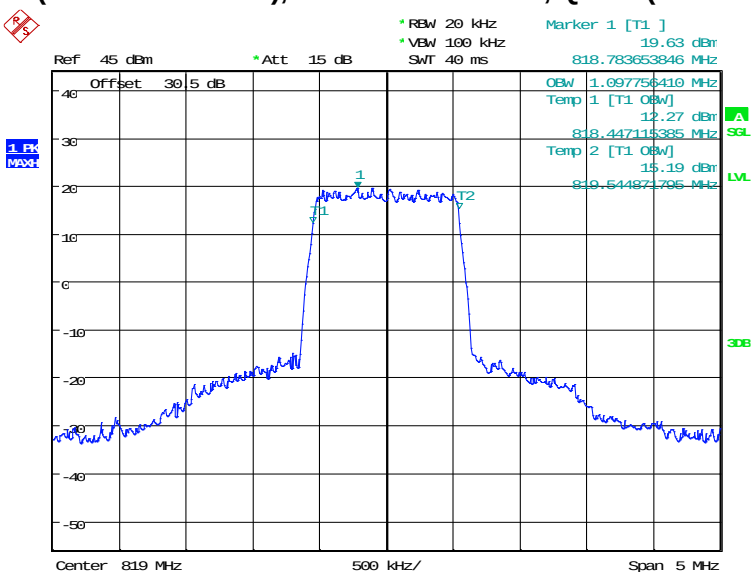
Date: 30.JUL.2024 10:57:12

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 1.4MHz (99%)

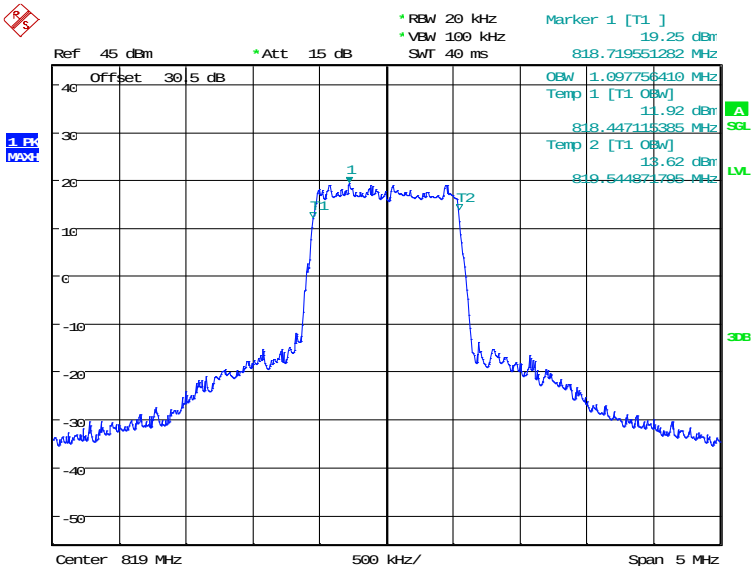
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	1097.76	1097.76

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:04:48

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)



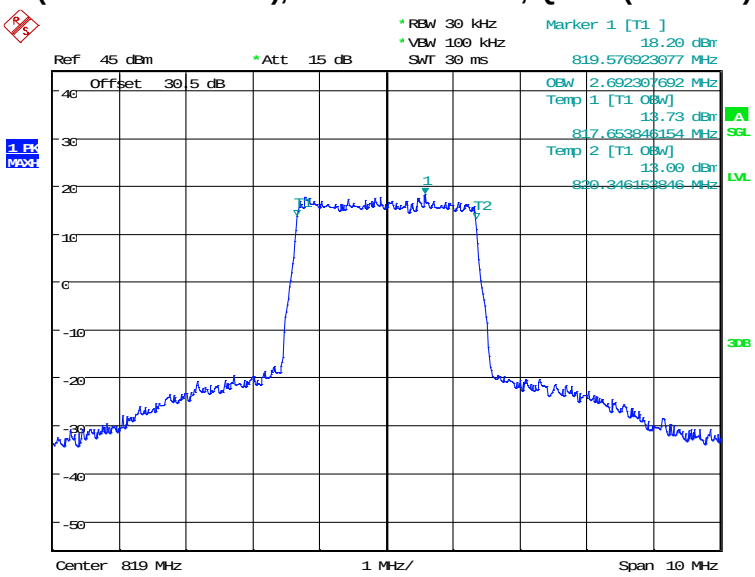
Date: 30.JUL.2024 11:05:28

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 3MHz (99%)

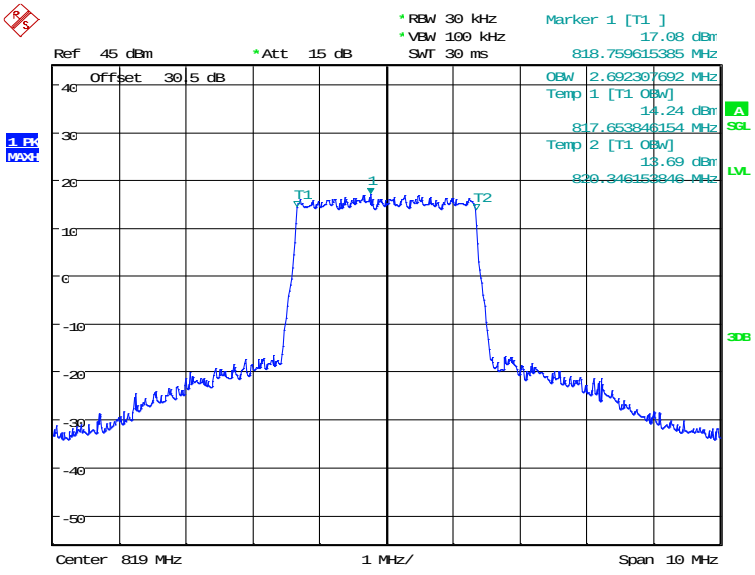
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:06:10

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)



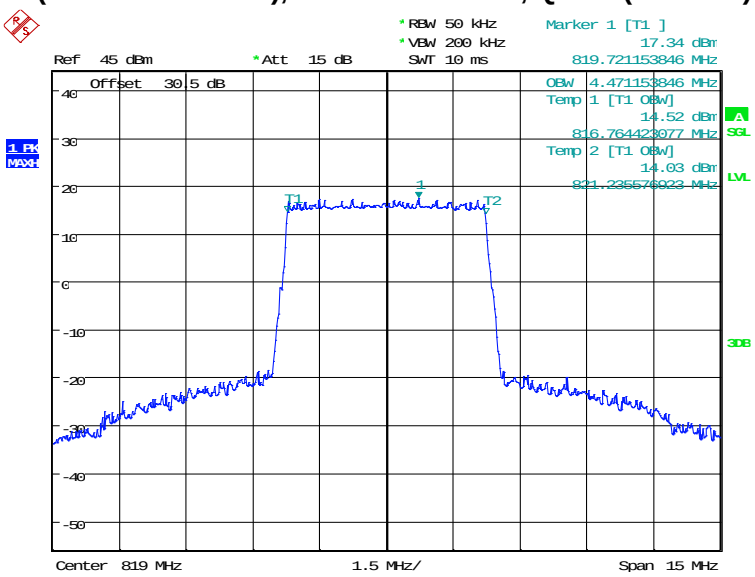
Date: 30.JUL.2024 11:06:51

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 5MHz (99%)

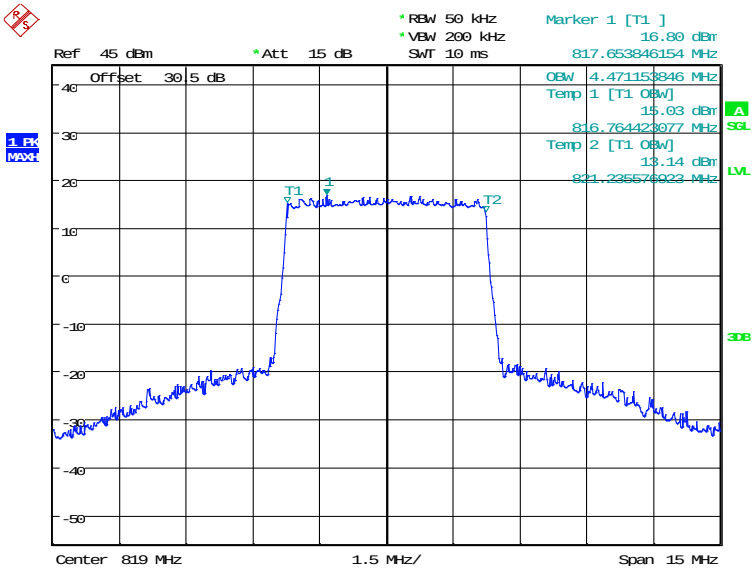
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	4471.15	4471.15

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:07:33

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)



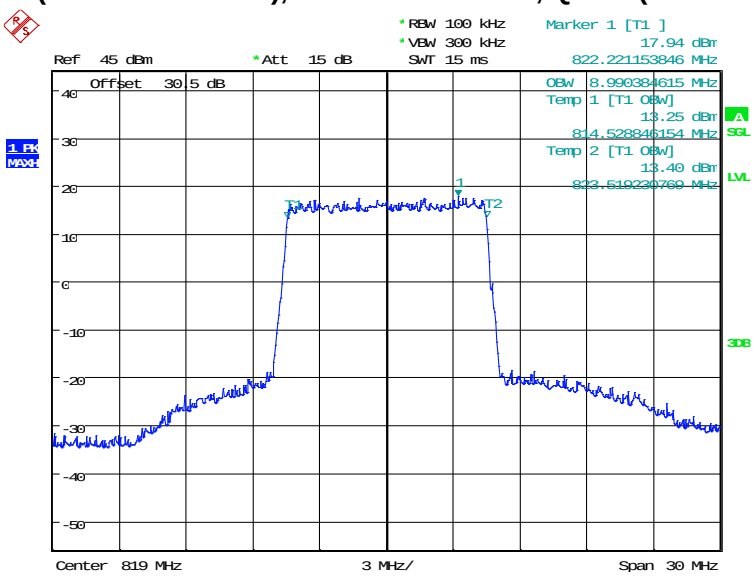
Date: 30.JUL.2024 11:08:13

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 10MHz (99%)

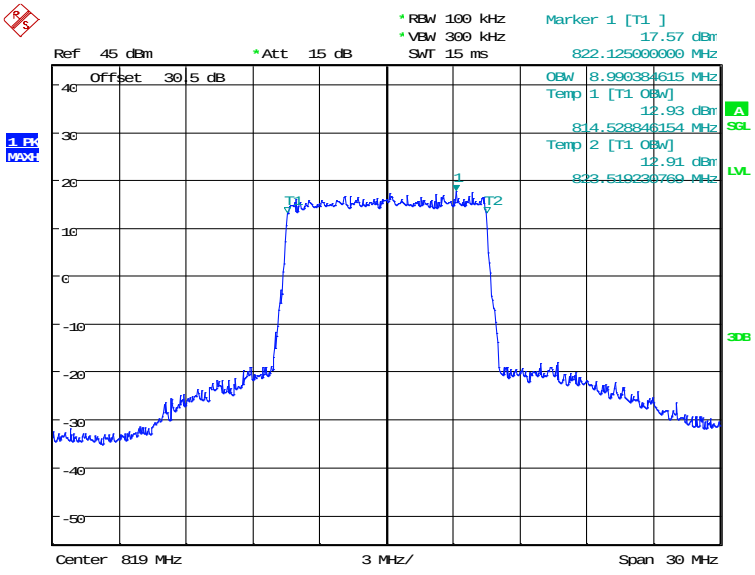
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8990.38	8990.38

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:08:56

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (99% BW)



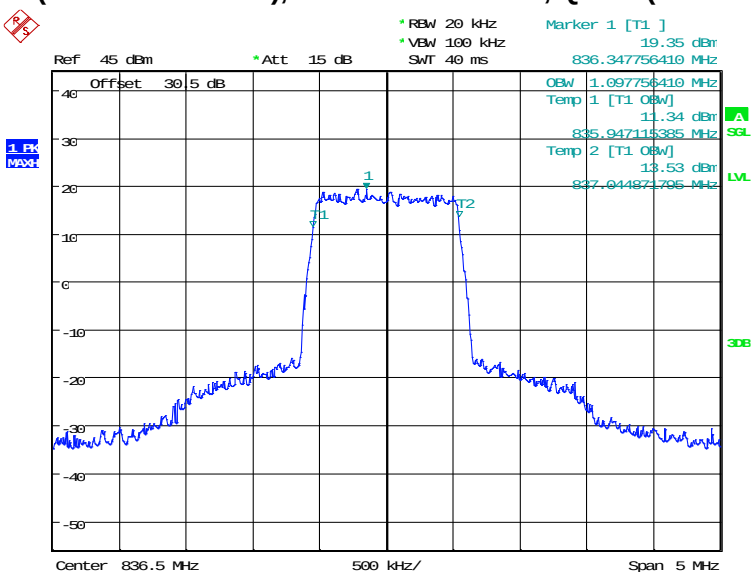
Date: 30.JUL.2024 11:09:36

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 1.4MHz (99%)

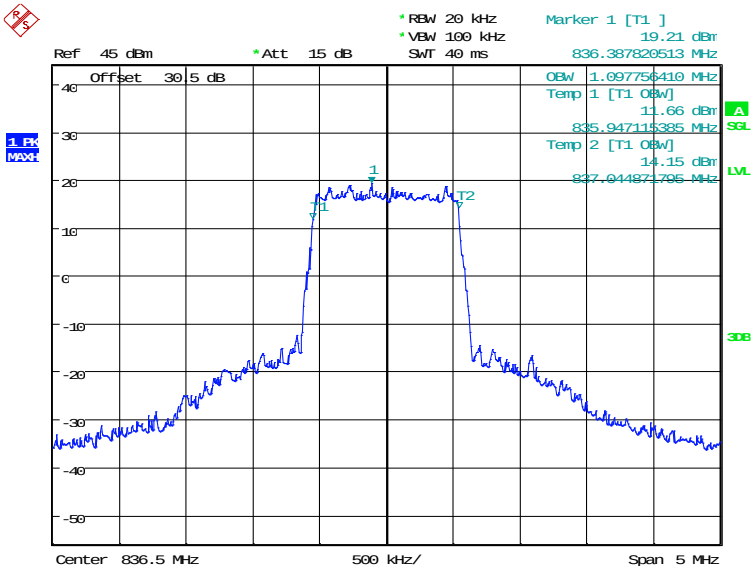
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1097.76	1097.76

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:57:56

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (99% BW)



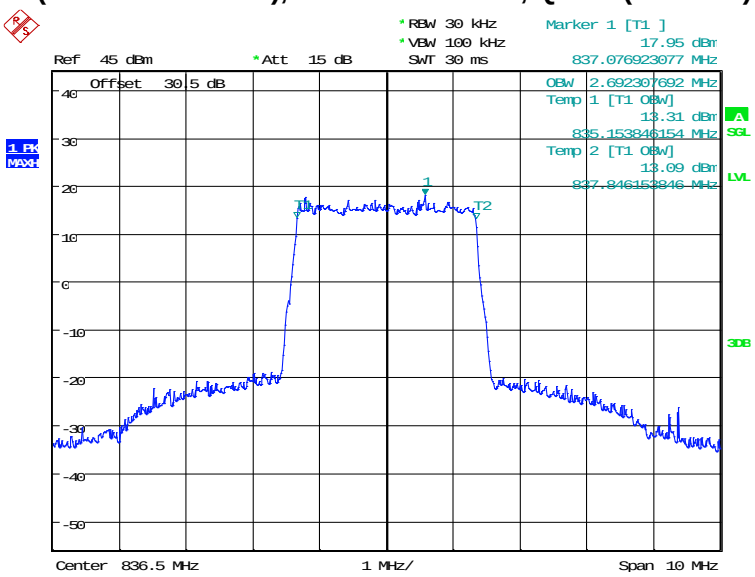
Date: 30.JUL.2024 10:58:36

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 3MHz (99%)

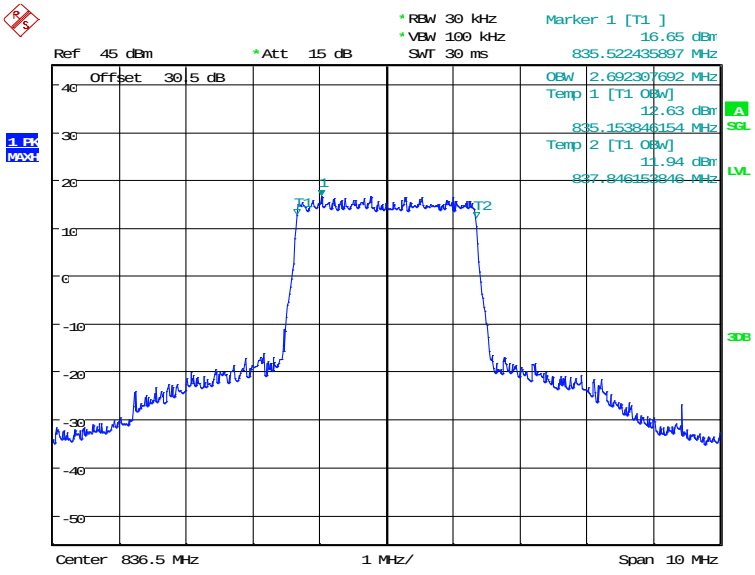
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 10:59:18

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (99% BW)



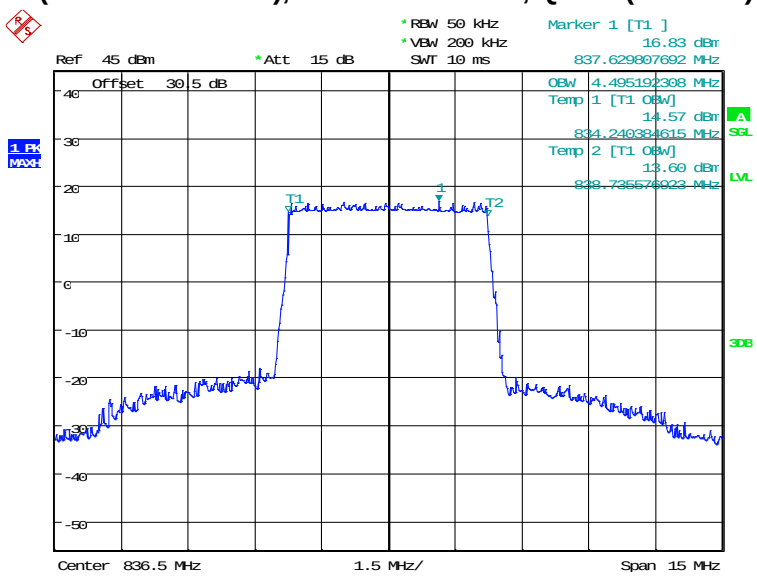
Date: 30.JUL.2024 10:59:59

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 5MHz (99%)

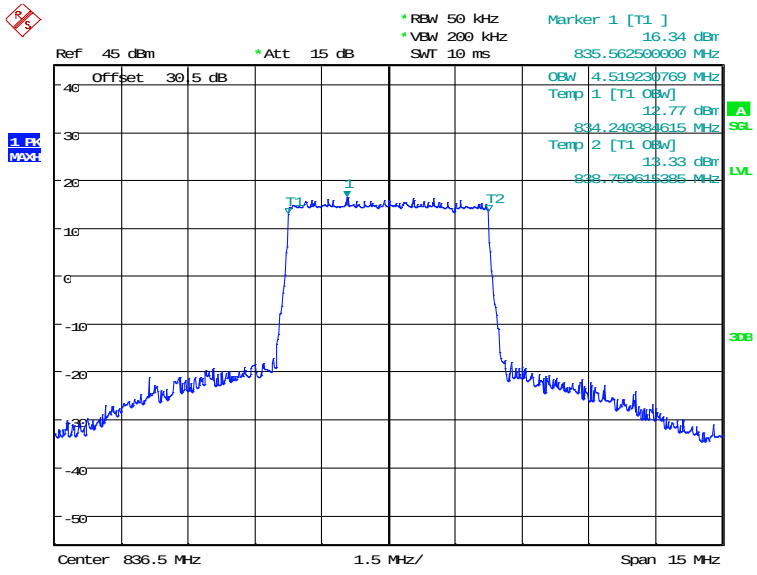
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4519.23

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:00:41

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (99% BW)



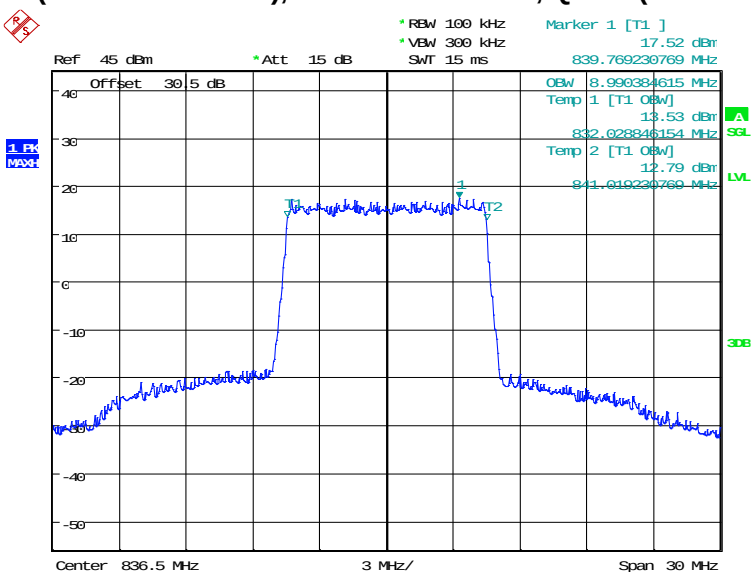
Date: 30.JUL.2024 11:01:21

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 10MHz (99%)

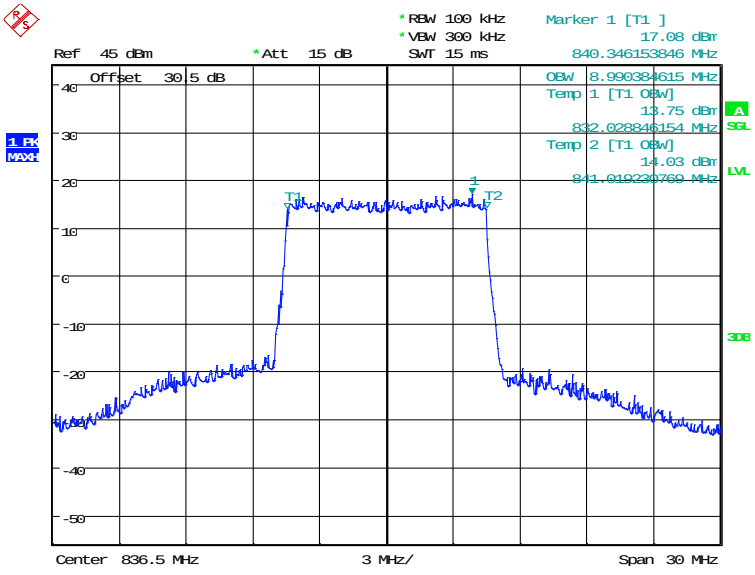
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8990.38	8990.38

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:02:03

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)



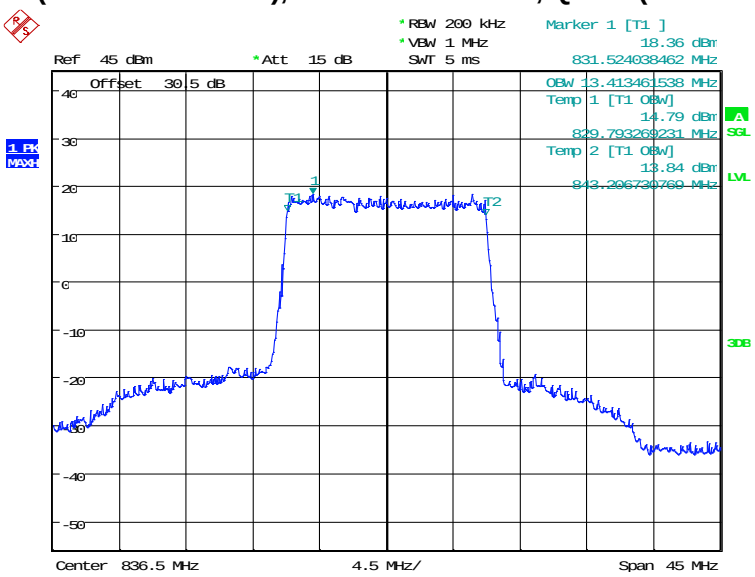
Date: 30.JUL.2024 11:02:43

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 15MHz (99%)

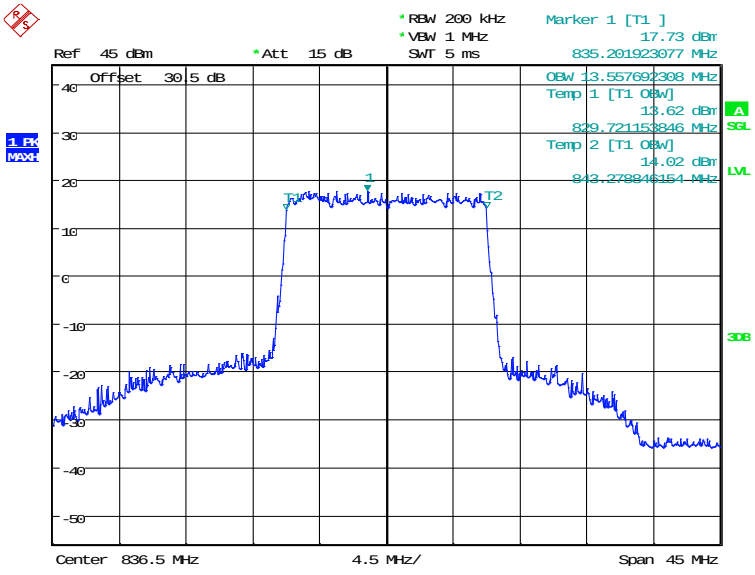
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	13413.46	13557.69

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)



Date: 30.JUL.2024 11:03:25

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)



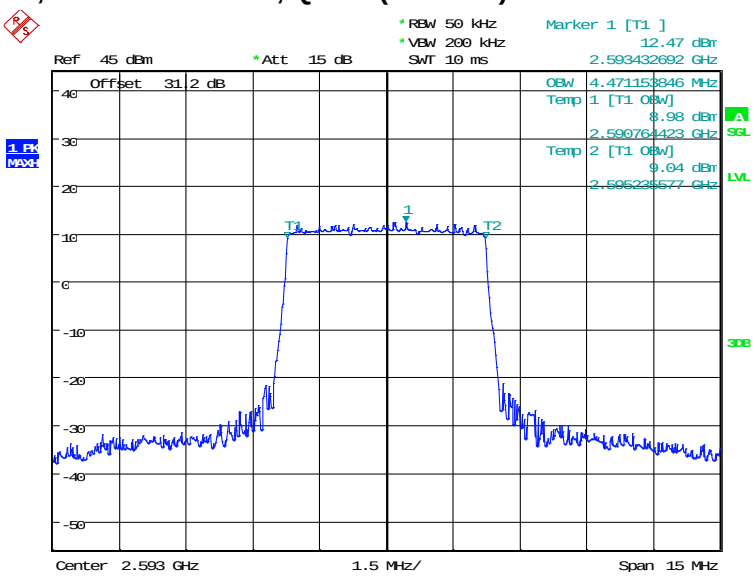
Date: 30.JUL.2024 11:04:05

©Copyright. All rights reserved by CTTL.

LTE band 41, 5MHz (99%)

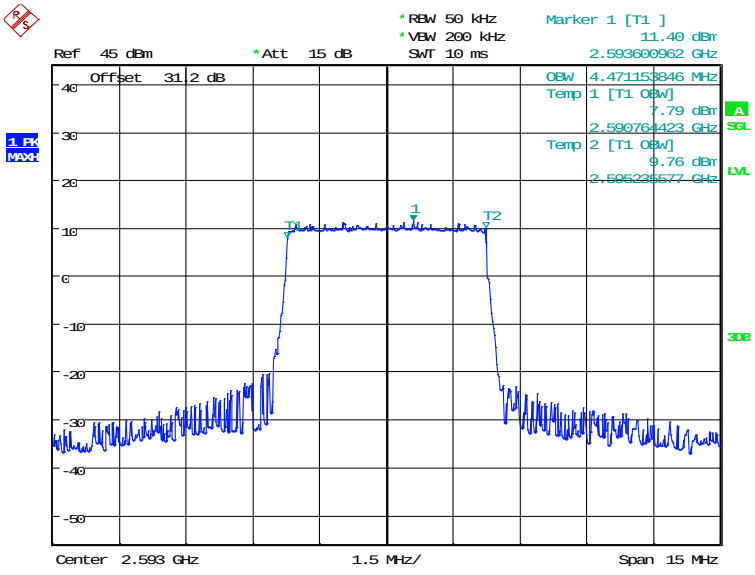
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	4471.15	4471.15

LTE band 41, 5MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:12:52

LTE band 41, 5MHz Bandwidth,16QAM (99% BW)



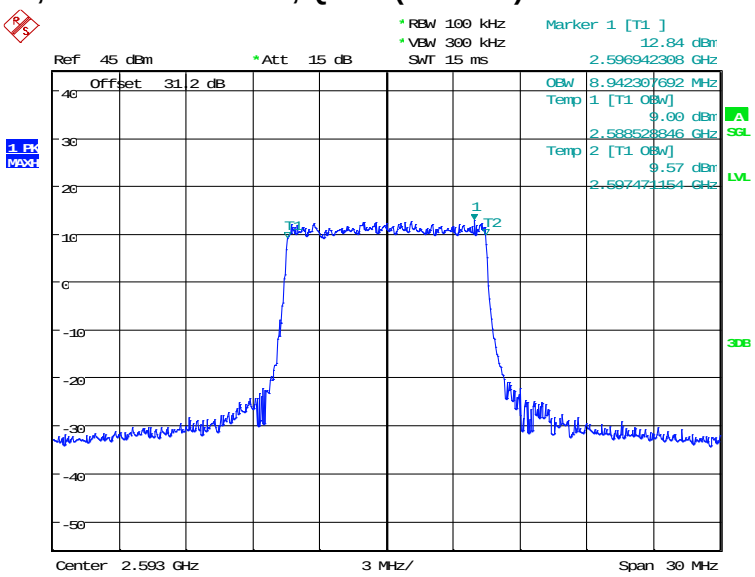
Date: 13.AUG.2024 15:13:32

©Copyright. All rights reserved by CTTL.

LTE band 41, 10MHz (99%)

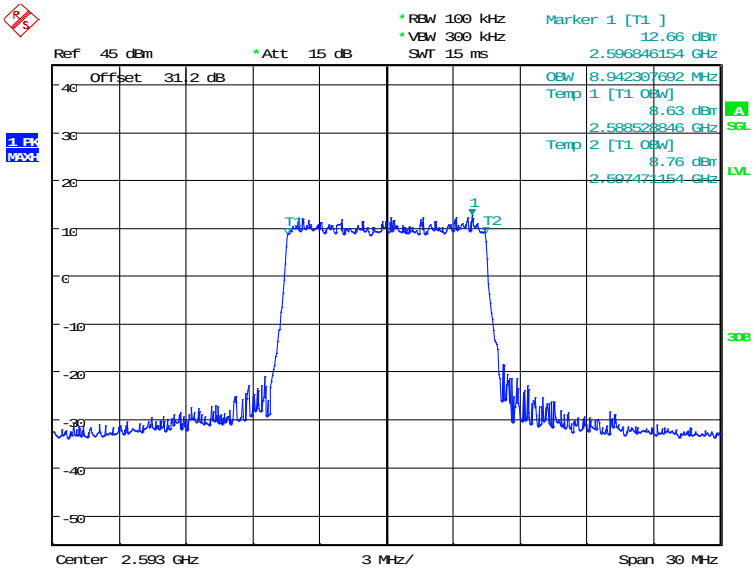
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

LTE band 41, 10MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:14:14

LTE band 41, 10MHz Bandwidth,16QAM (99% BW)



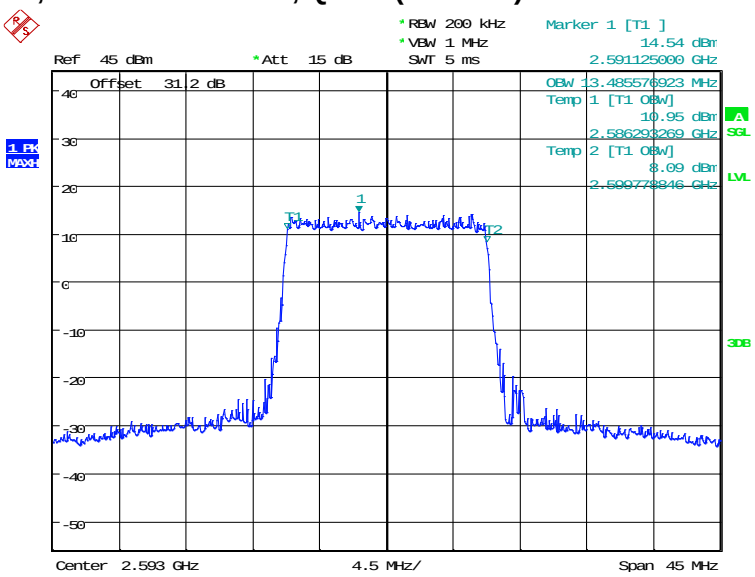
Date: 13.AUG.2024 15:14:54

©Copyright. All rights reserved by CTTL.

LTE band 41, 15MHz (99%)

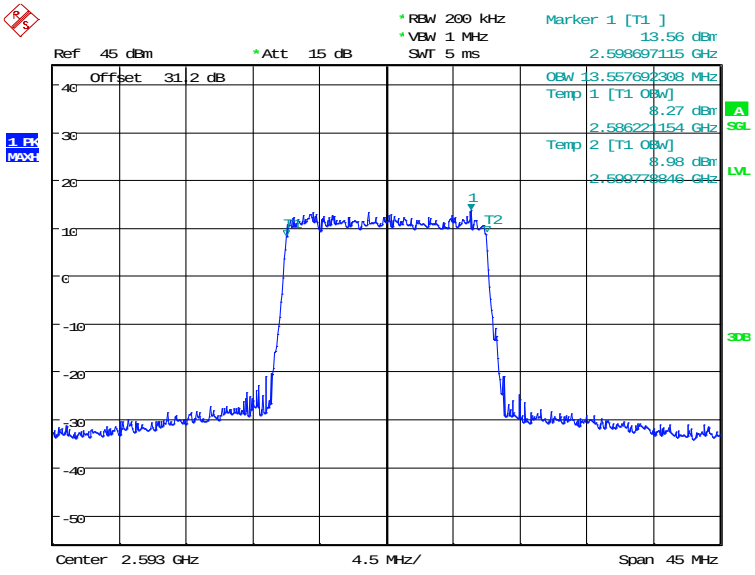
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	13485.58	13557.69

LTE band 41, 15MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:15:36

LTE band 41, 15MHz Bandwidth,16QAM (99% BW)



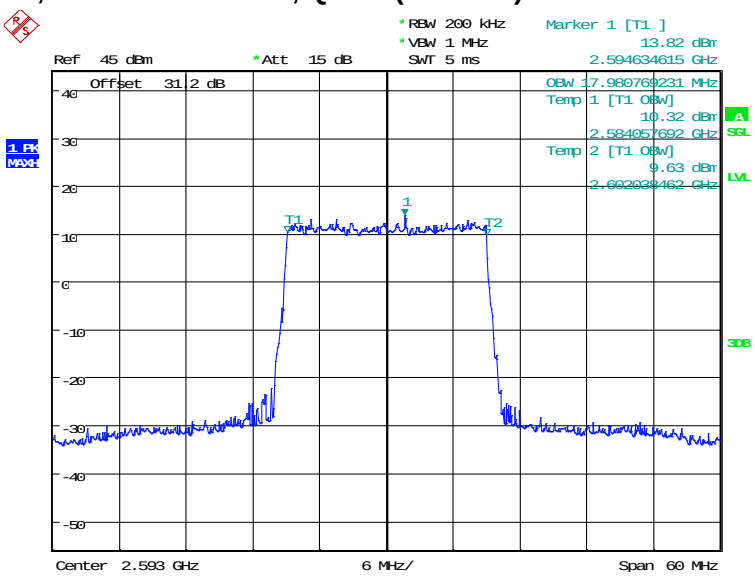
Date: 13.AUG.2024 15:16:16

©Copyright. All rights reserved by CTTL.

LTE band 41, 20MHz (99%)

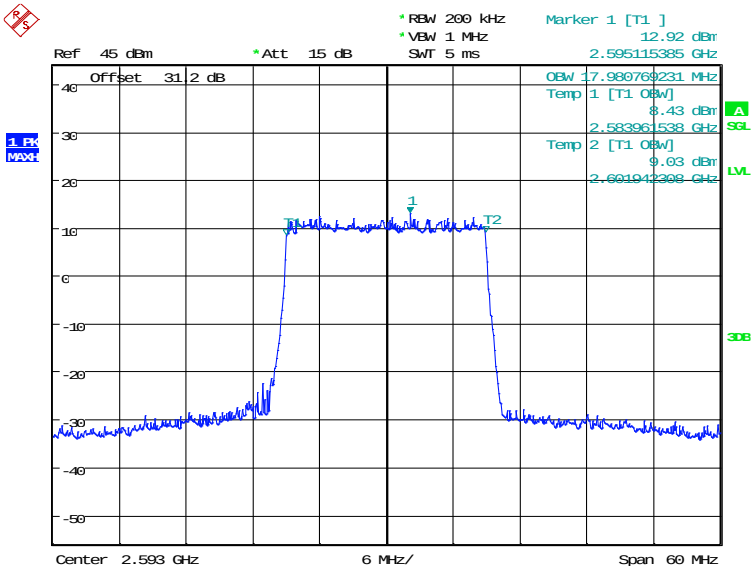
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	17980.77	17980.77

LTE band 41, 20MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:16:58

LTE band 41, 20MHz Bandwidth,16QAM (99% BW)



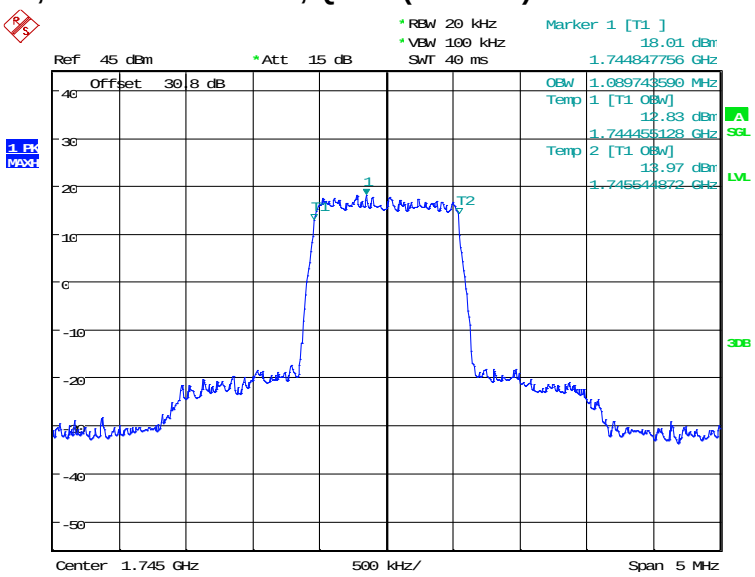
Date: 13.AUG.2024 15:17:38

©Copyright. All rights reserved by CTTL.

LTE band 66, 1.4MHz (99%)

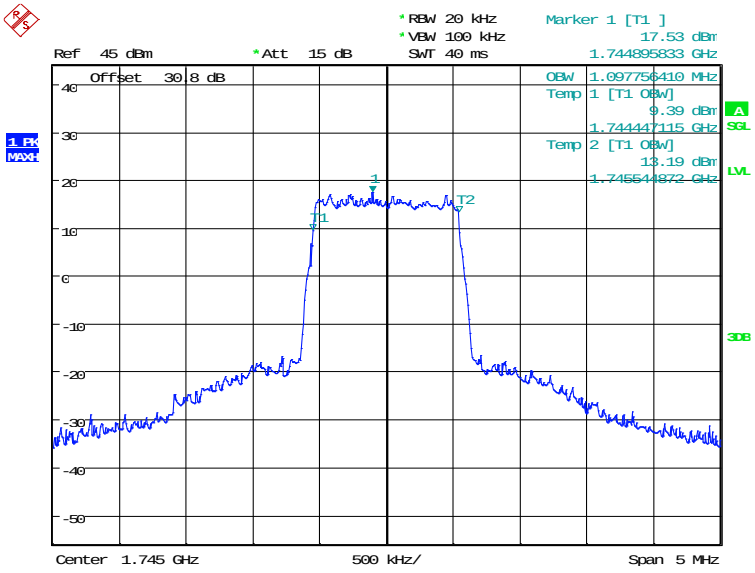
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	1089.74	1097.76

LTE band 66, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:03:54

LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)



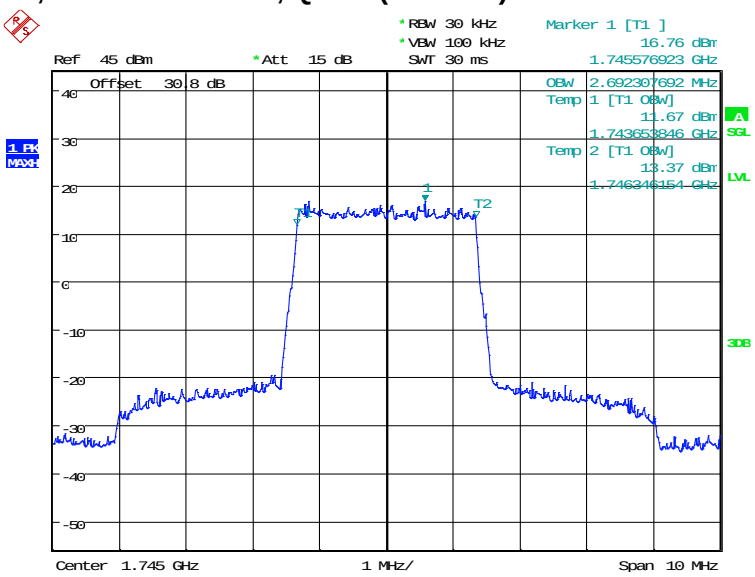
Date: 13.AUG.2024 15:04:35

©Copyright. All rights reserved by CTTL.

LTE band 66, 3MHz (99%)

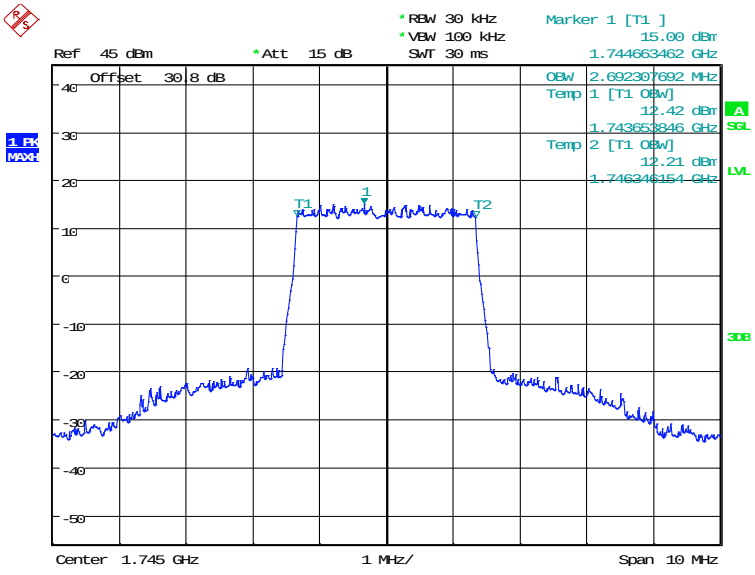
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	2692.31	2692.31

LTE band 66, 3MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:05:17

LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)



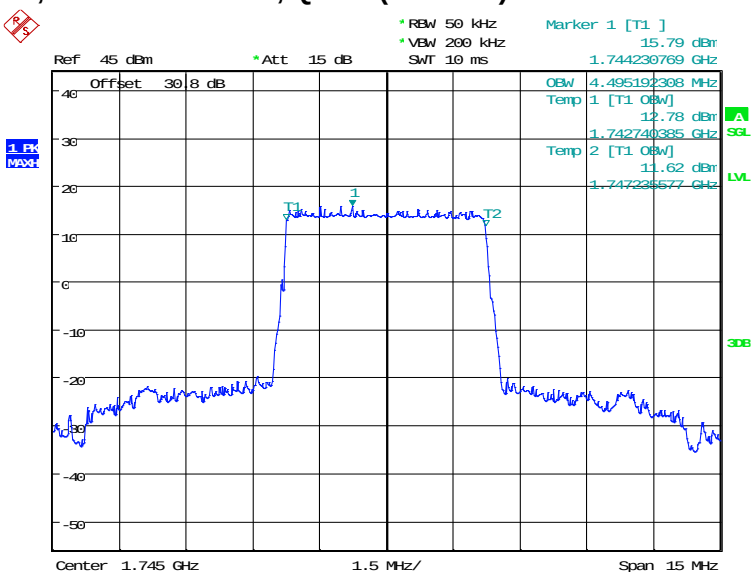
Date: 13.AUG.2024 15:05:57

©Copyright. All rights reserved by CTTL.

LTE band 66, 5MHz (99%)

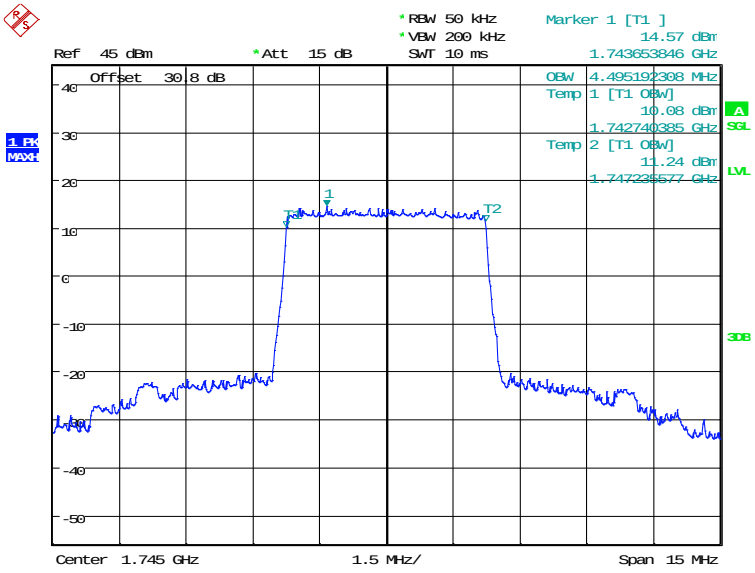
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	4495.19	4495.19

LTE band 66, 5MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:06:38

LTE band 66, 5MHz Bandwidth, 16QAM (99% BW)



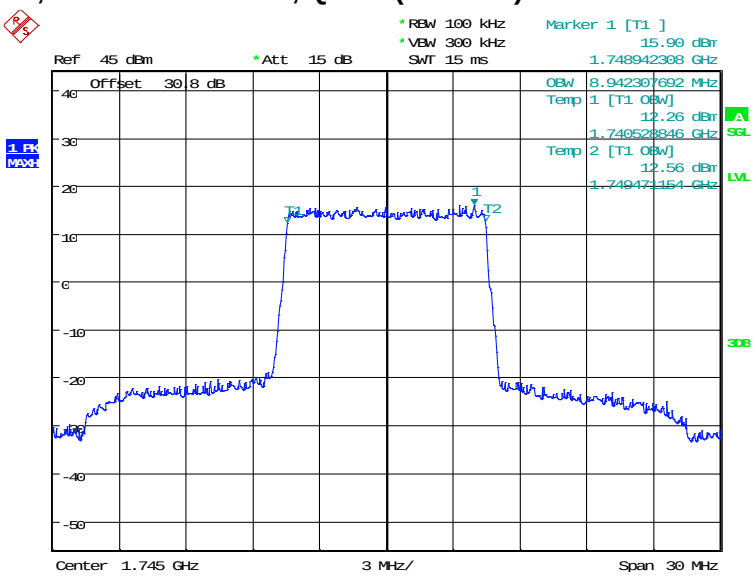
Date: 13.AUG.2024 15:07:18

©Copyright. All rights reserved by CTTL.

LTE band 66, 10MHz (99%)

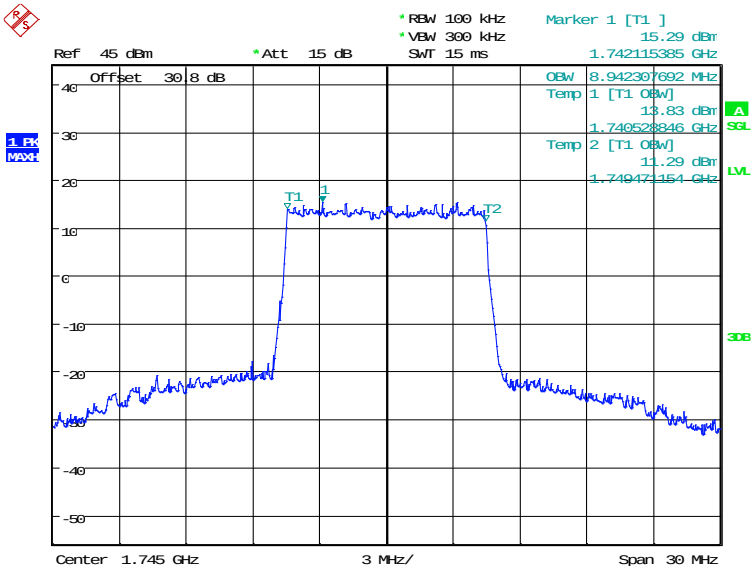
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	8942.31	8942.31

LTE band 66, 10MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:08:00

LTE band 66, 10MHz Bandwidth, 16QAM (99% BW)



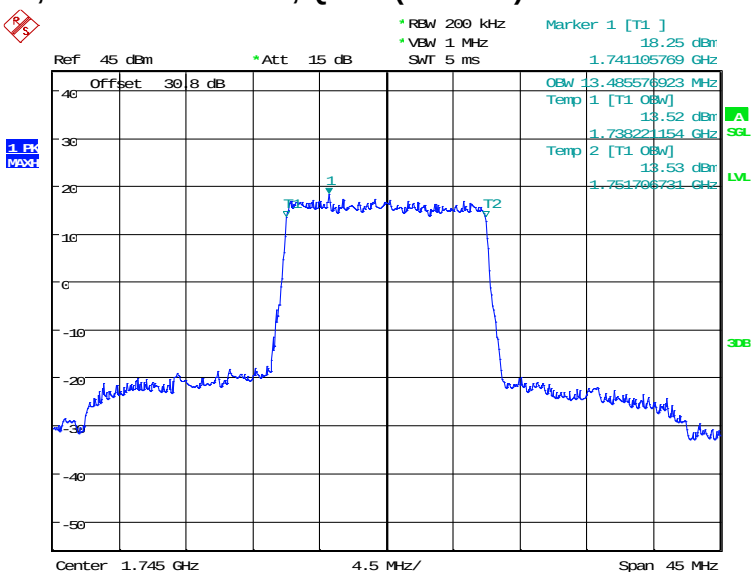
Date: 13.AUG.2024 15:08:41

©Copyright. All rights reserved by CTTL.

LTE band 66, 15MHz (99%)

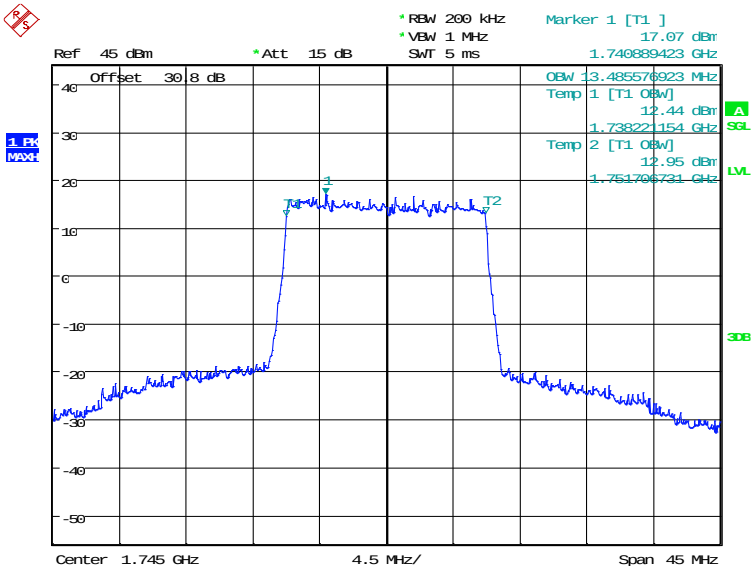
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	13485.58	13485.58

LTE band 66, 15MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:09:23

LTE band 66, 15MHz Bandwidth, 16QAM (99% BW)



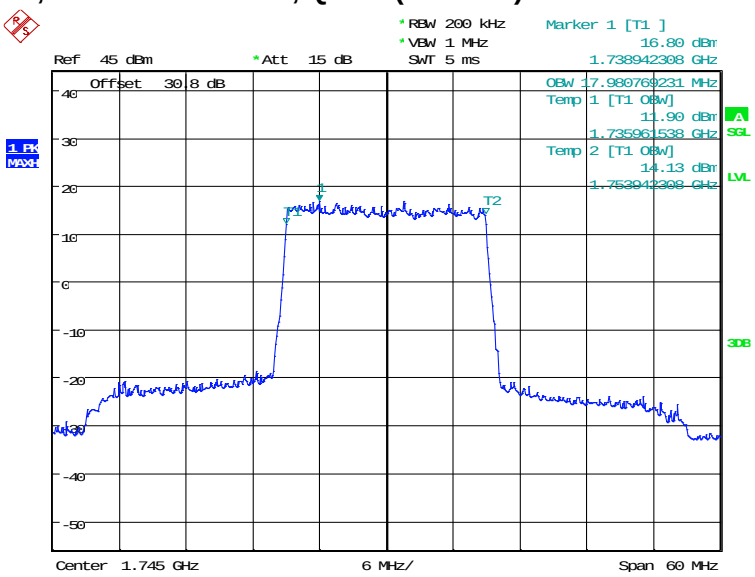
Date: 13.AUG.2024 15:10:03

©Copyright. All rights reserved by CTTL.

LTE band 66, 20MHz (99%)

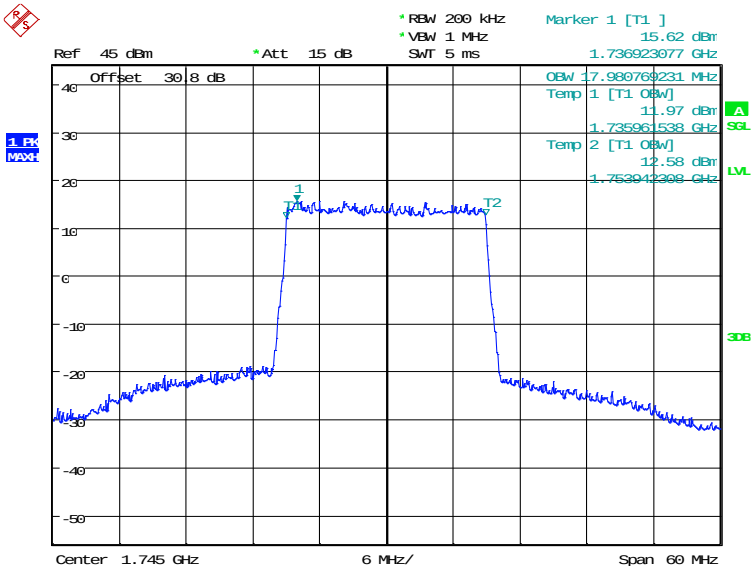
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	17980.77	17980.77

LTE band 66, 20MHz Bandwidth, QPSK (99% BW)



Date: 13.AUG.2024 15:10:45

LTE band 66, 20MHz Bandwidth, 16QAM (99% BW)



Date: 13.AUG.2024 15:11:25

Note: Expanded measurement uncertainty is U = 3428 Hz, *k* = 2.

©Copyright. All rights reserved by CTTL.

A.5 Emission Bandwidth

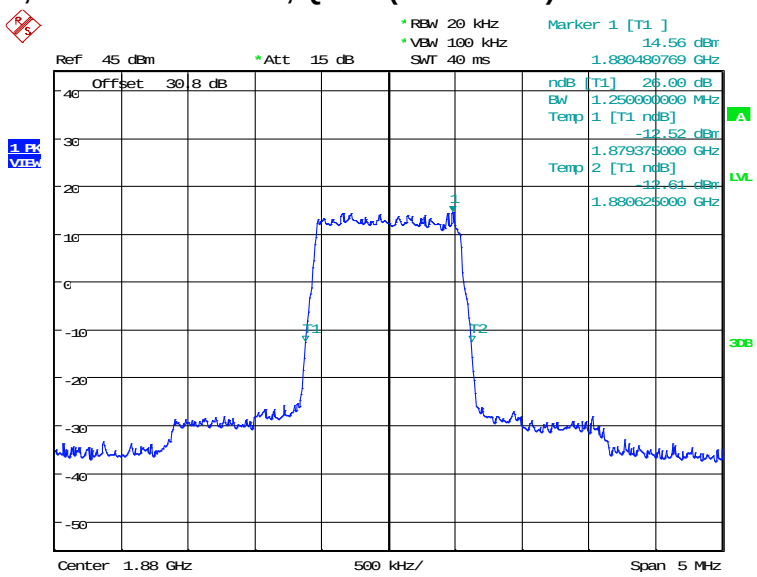
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.
The measurement method is from ANSI C63.26:
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × 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.
d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

©Copyright. All rights reserved by CTTL.

LTE band 2, 1.4MHz (-26dBc)

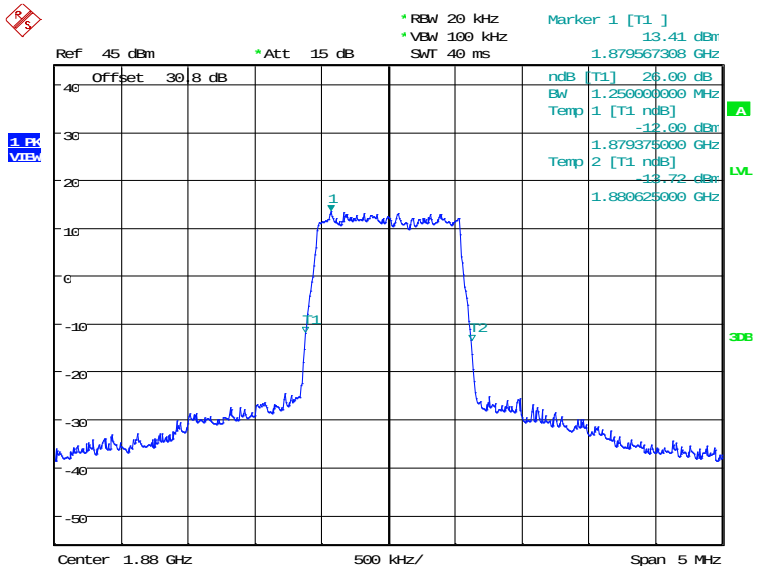
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	1250.00	1250.00

LTE band 2, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:18:57

LTE band 2, 1.4MHz Bandwidth, 16QAM (-26dBc BW)



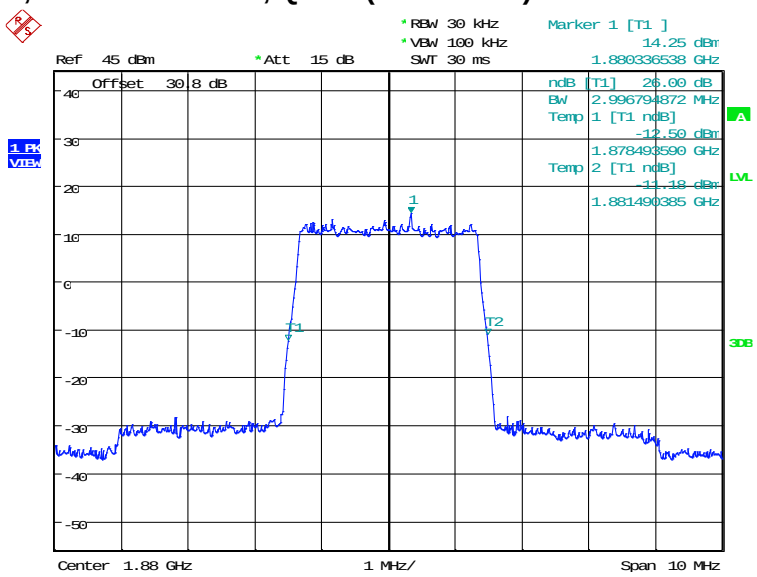
Date: 13.AUG.2024 15:19:38

©Copyright. All rights reserved by CTTL.

LTE band 2, 3MHz (-26dBc)

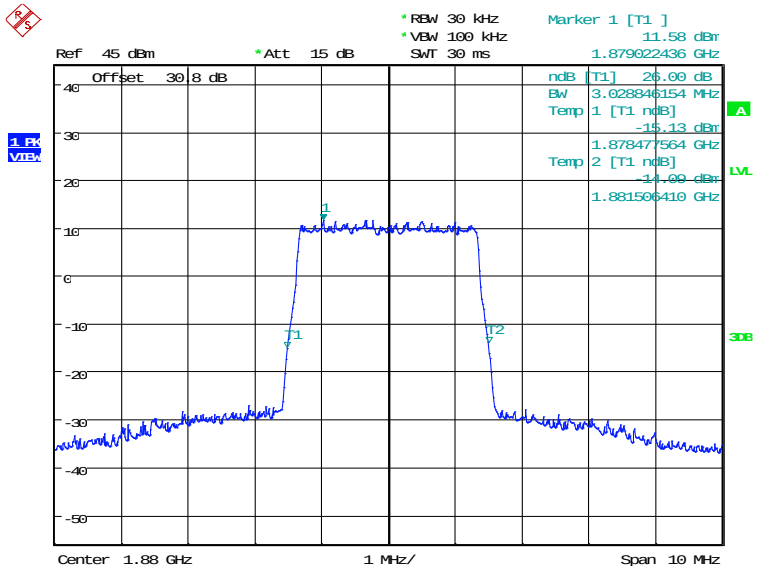
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	2996.79	3028.85

LTE band 2, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:20:20

LTE band 2, 3MHz Bandwidth, 16QAM (-26dBc BW)



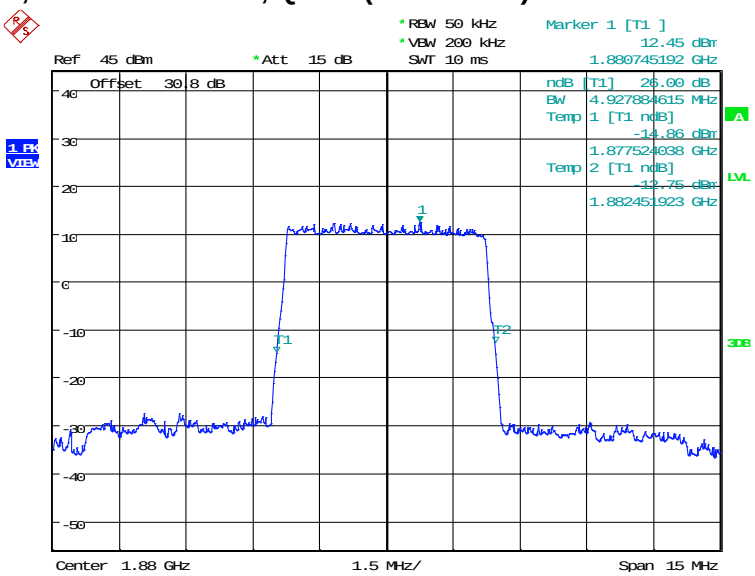
Date: 13.AUG.2024 15:21:01

©Copyright. All rights reserved by CTTL.

LTE band 2, 5MHz (-26dBc)

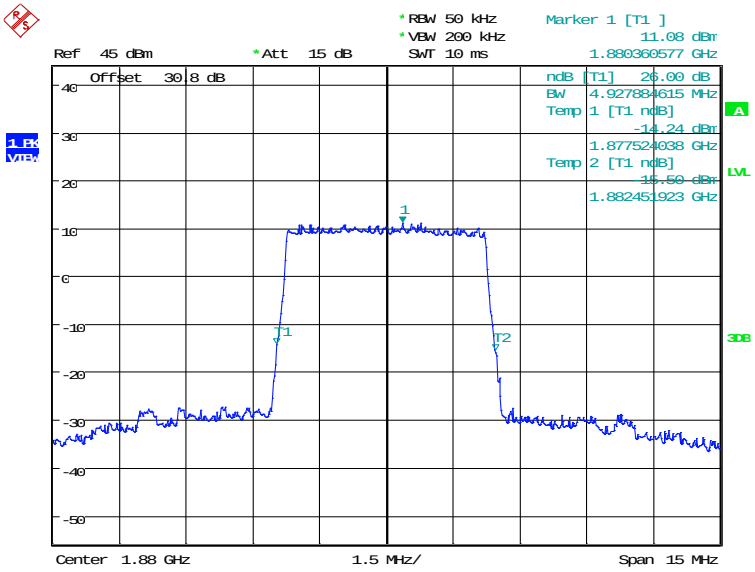
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	4927.88	4927.88

LTE band 2, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:21:43

LTE band 2, 5MHz Bandwidth, 16QAM (-26dBc BW)



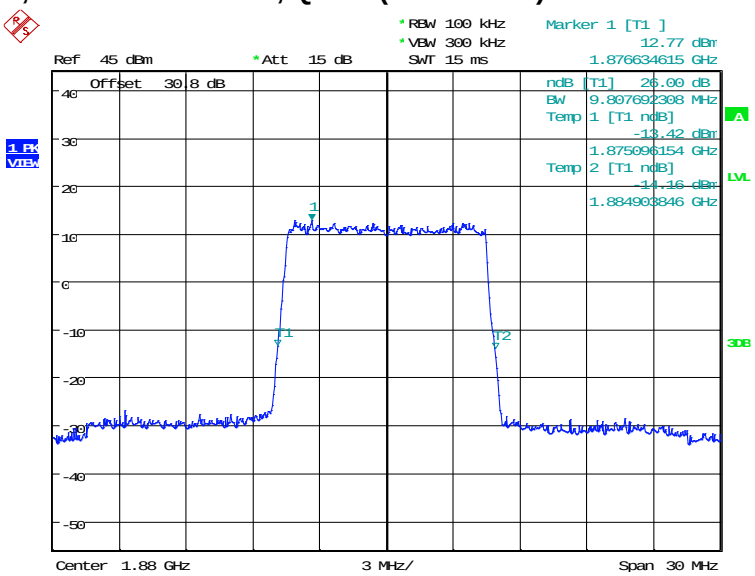
Date: 13.AUG.2024 15:22:23

©Copyright. All rights reserved by CTTL.

LTE band 2, 10MHz (-26dBc)

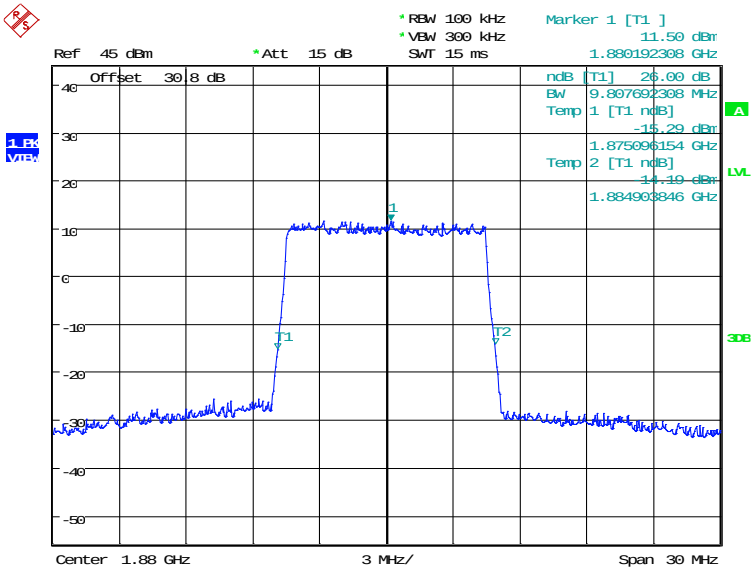
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	9807.69	9807.69

LTE band 2, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:23:06

LTE band 2, 10MHz Bandwidth, 16QAM (-26dBc BW)



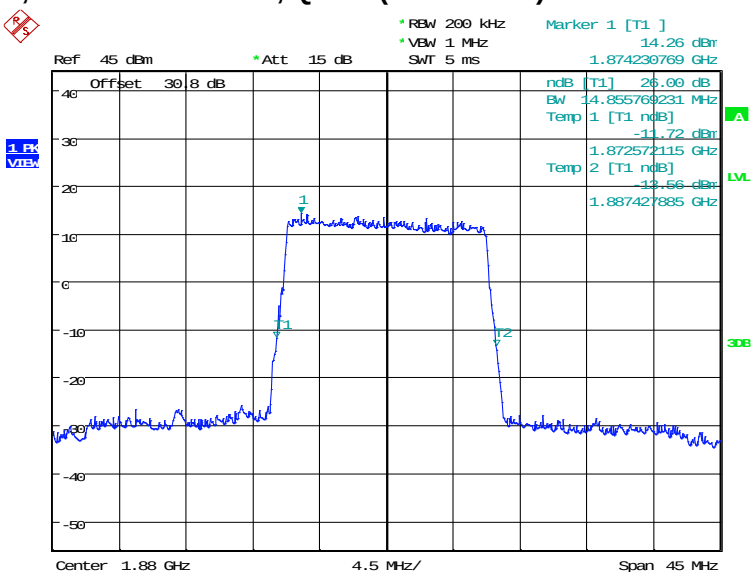
Date: 13.AUG.2024 15:23:46

©Copyright. All rights reserved by CTTL.

LTE band 2, 15MHz (-26dBc)

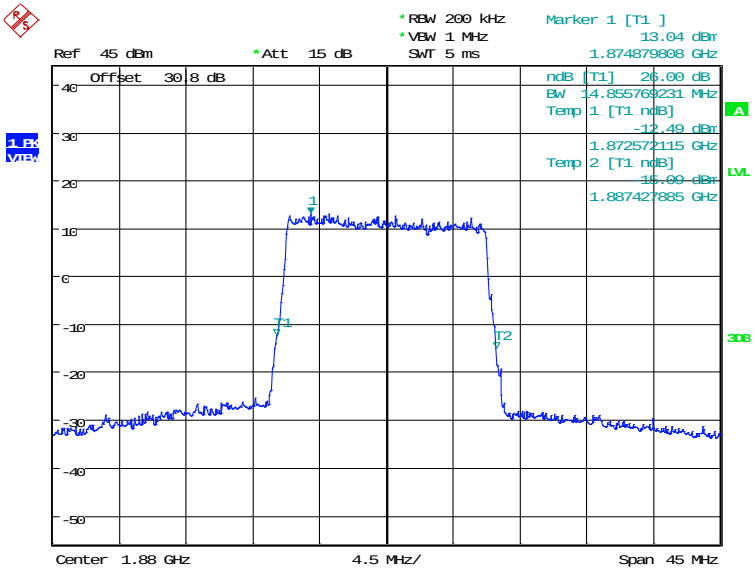
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	14855.77	14855.77

LTE band 2, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:24:28

LTE band 2, 15MHz Bandwidth, 16QAM (-26dBc BW)



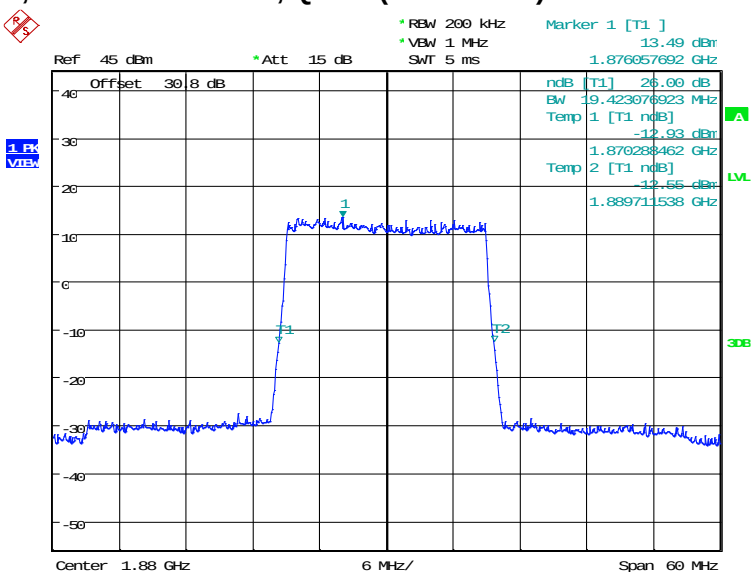
Date: 13.AUG.2024 15:25:09

©Copyright. All rights reserved by CTTL.

LTE band 2, 20MHz (-26dBc)

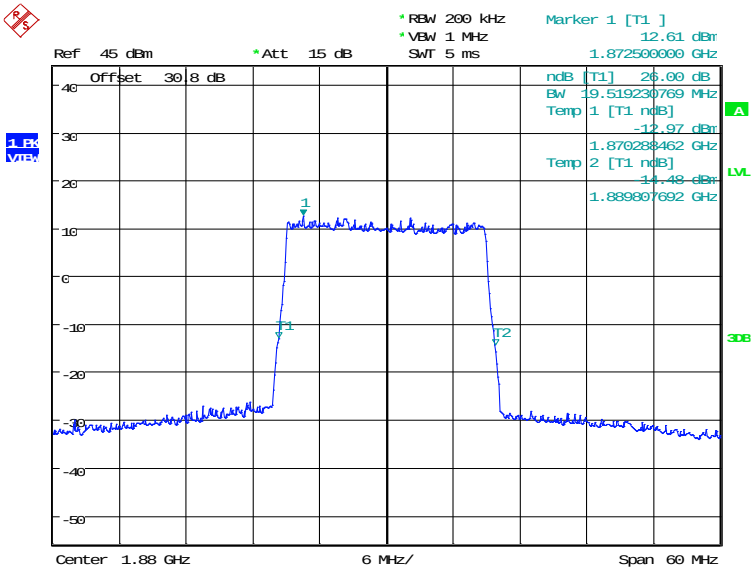
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	19423.08	19519.23

LTE band 2, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:25:51

LTE band 2, 20MHz Bandwidth, 16QAM (-26dBc BW)



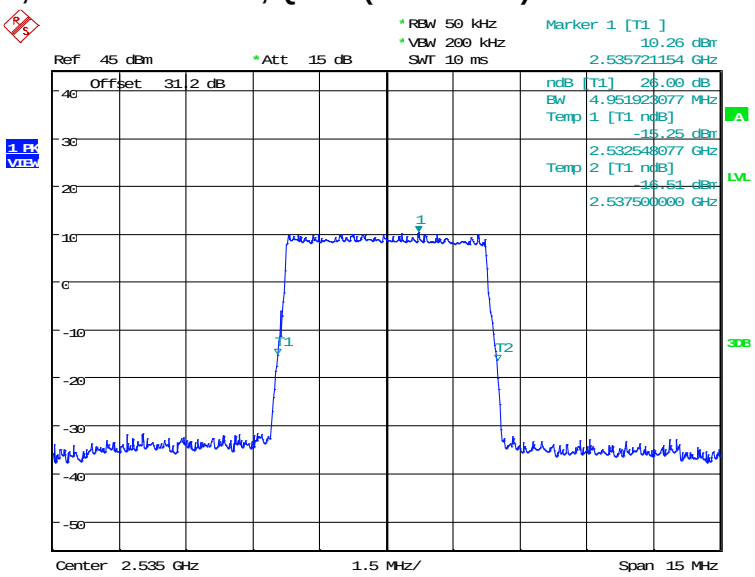
Date: 13.AUG.2024 15:26:31

©Copyright. All rights reserved by CTTL.

LTE band 7, 5MHz (-26dBc)

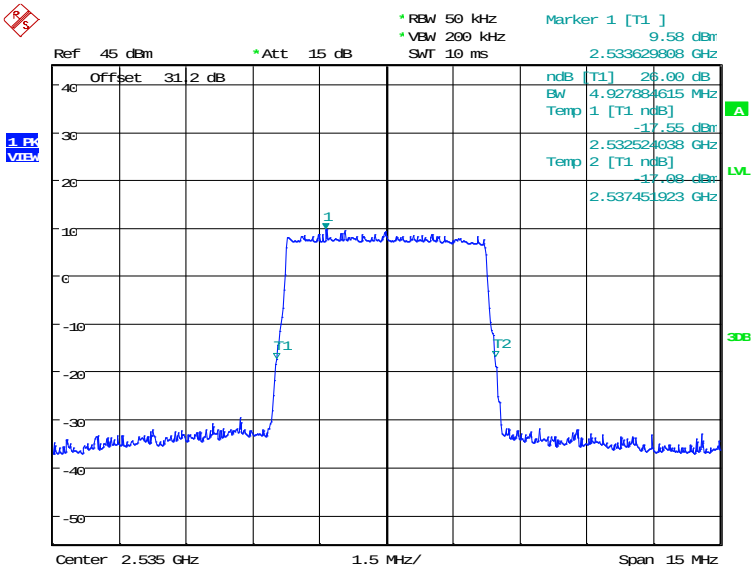
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2535.0	QPSK	16QAM
	4951.92	4927.88

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



Date: 13.AUG.2024 15:27:15

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



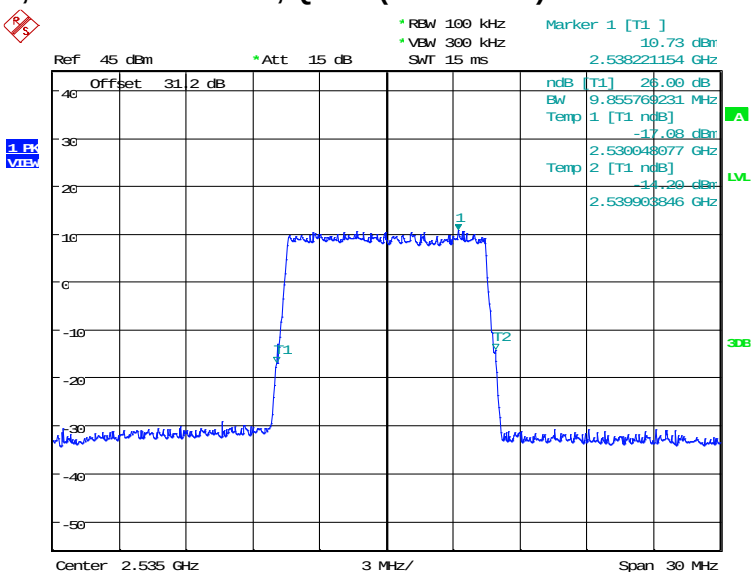
Date: 13.AUG.2024 15:27:55

©Copyright. All rights reserved by CTTL.

LTE band 7, 10MHz (-26dBc)

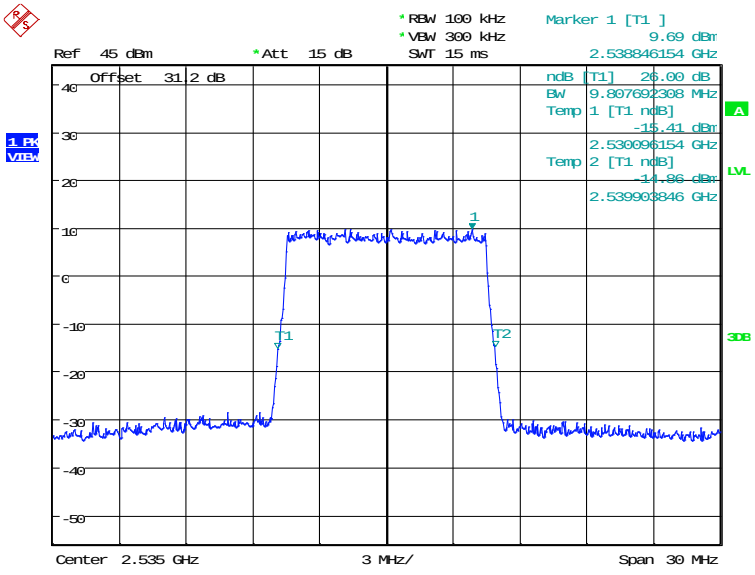
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2535.0	QPSK	16QAM
	9855.77	9807.69

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



Date: 13.AUG.2024 15:28:37

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



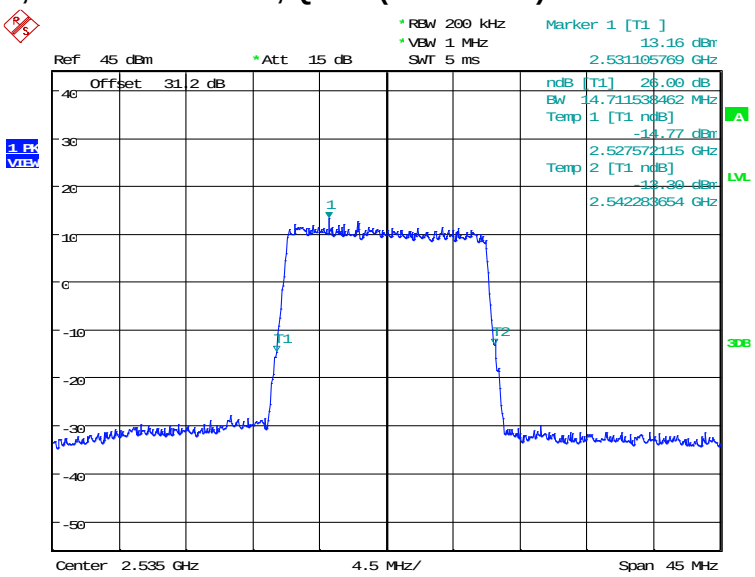
Date: 13.AUG.2024 15:29:18

©Copyright. All rights reserved by CTTL.

LTE band 7, 15MHz (-26dBc)

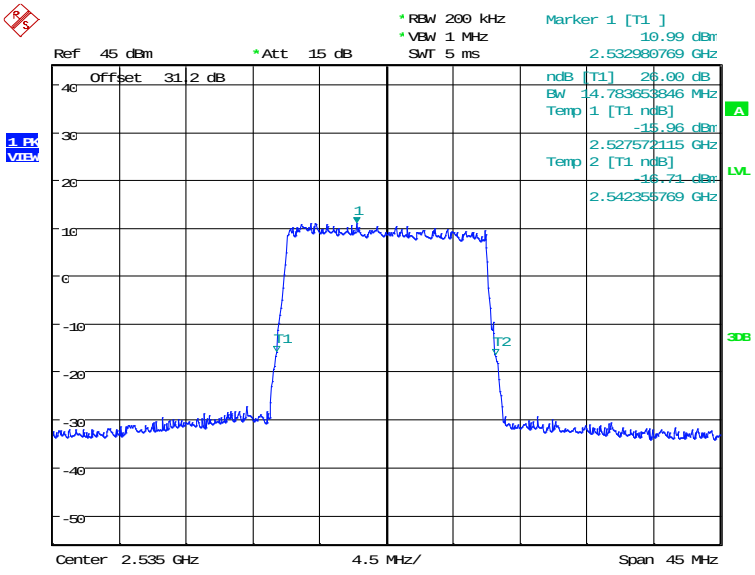
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2535.0	QPSK	16QAM
	14711.54	14783.65

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



Date: 13.AUG.2024 15:30:00

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



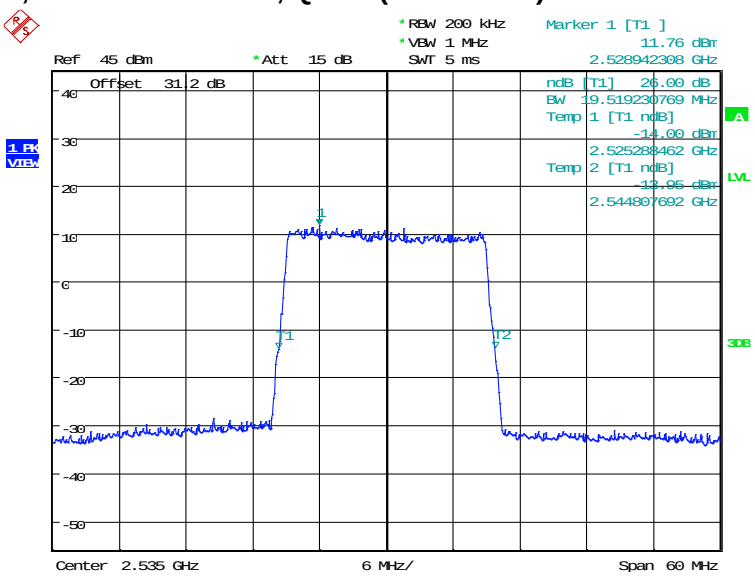
Date: 13.AUG.2024 15:30:40

©Copyright. All rights reserved by CTTL.

LTE band 7, 20MHz (-26dBc)

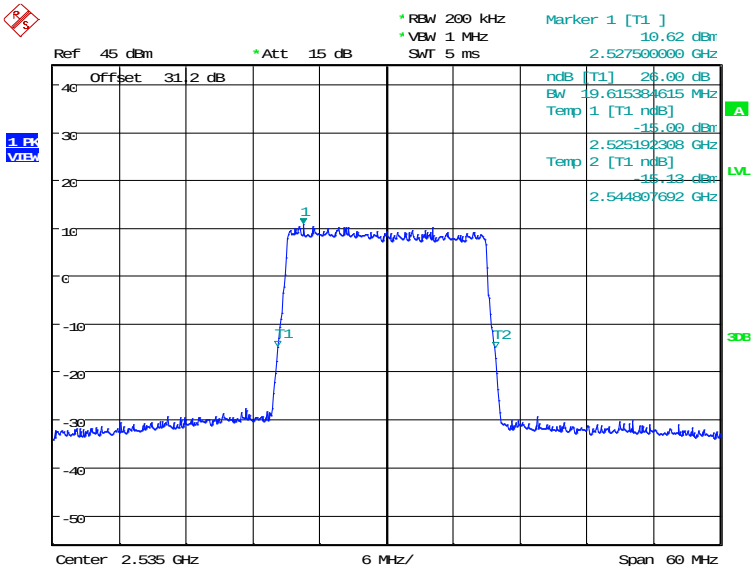
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2535.0	QPSK	16QAM
	19519.23	19615.38

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



Date: 13.AUG.2024 15:31:23

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



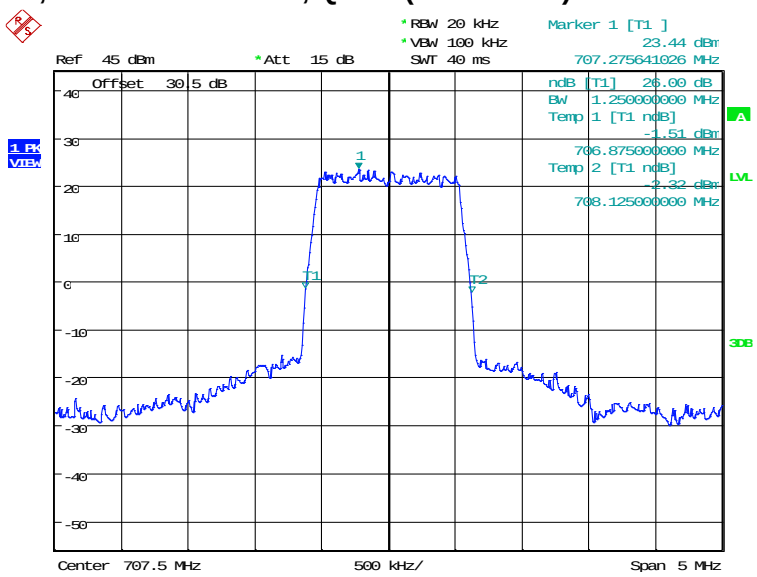
Date: 13.AUG.2024 15:32:03

©Copyright. All rights reserved by CTTL.

LTE band 12, 1.4MHz (-26dBc)

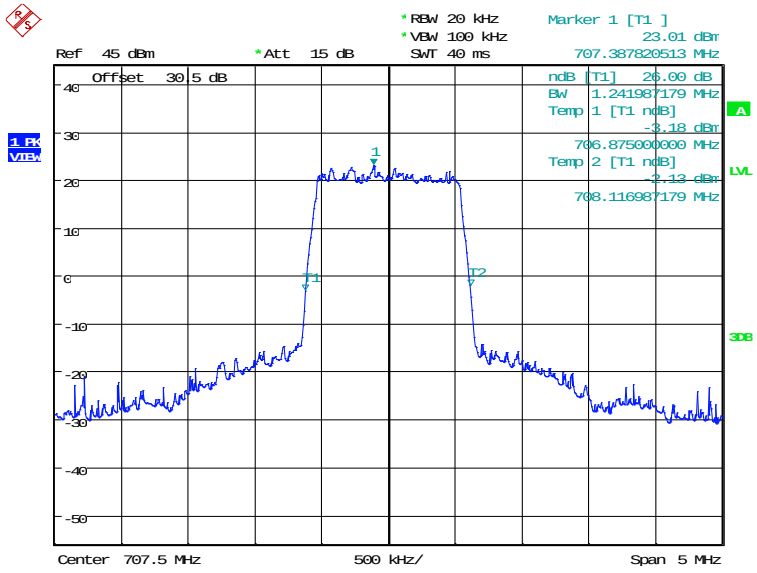
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
707.5	QPSK	16QAM
	1250.00	1241.99

LTE band 12, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:39:23

LTE band 12, 1.4MHz Bandwidth, 16QAM (-26dBc BW)



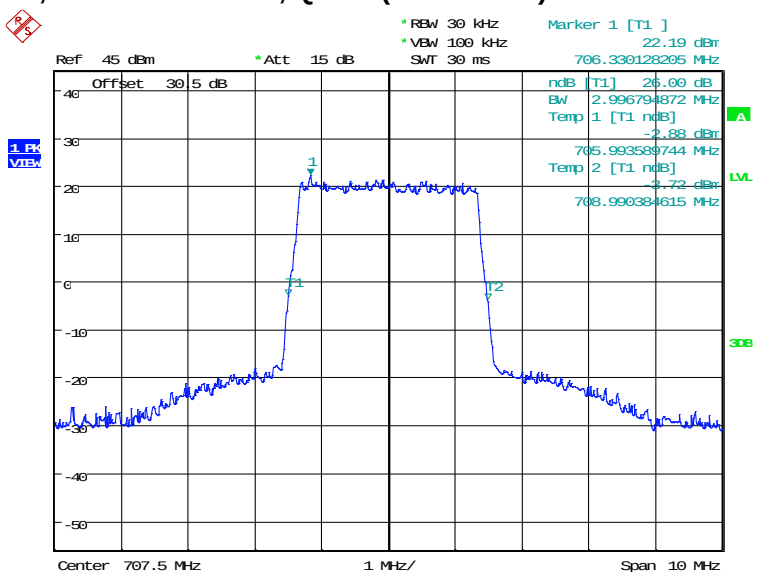
Date: 30.JUL.2024 11:40:03

©Copyright. All rights reserved by CTTL.

LTE band 12, 3MHz (-26dBc)

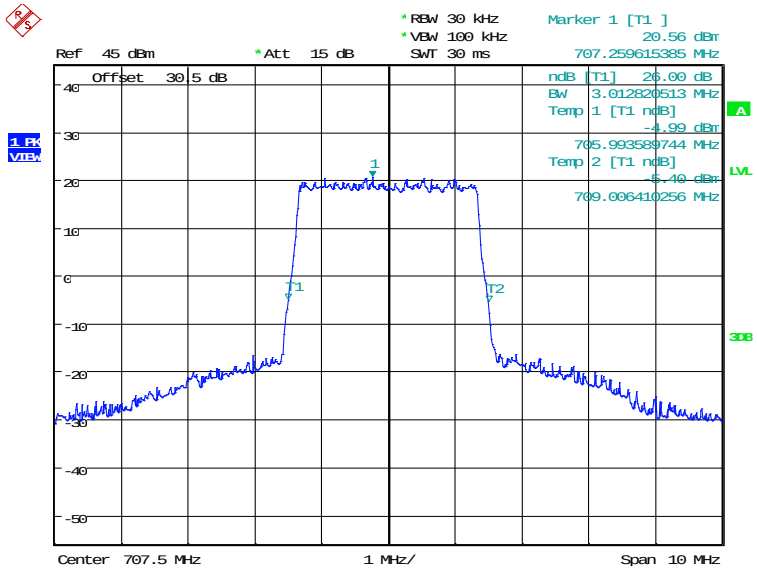
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
707.5	QPSK	16QAM
	2996.79	3012.82

LTE band 12, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:40:46

LTE band 12, 3MHz Bandwidth, 16QAM (-26dBc BW)



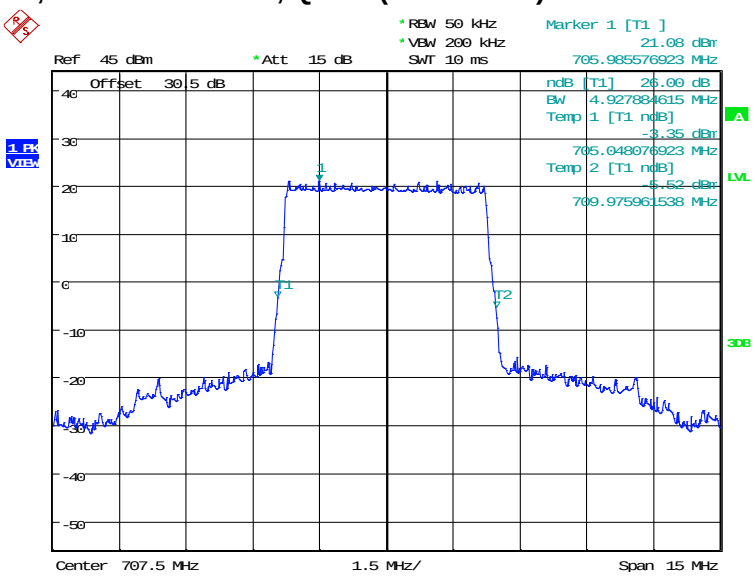
Date: 30.JUL.2024 11:41:26

©Copyright. All rights reserved by CTTL.

LTE band 12, 5MHz (-26dBc)

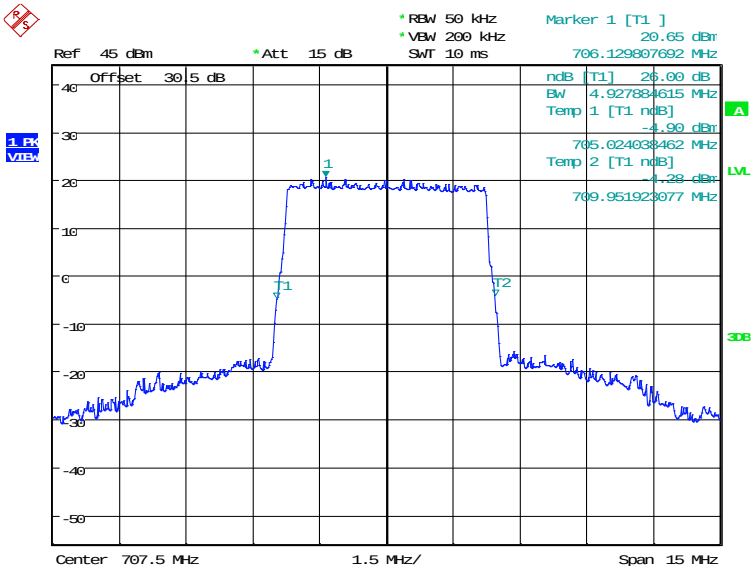
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
707.5	QPSK	16QAM
	4927.88	4927.88

LTE band 12, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:42:09

LTE band 12, 5MHz Bandwidth, 16QAM (-26dBc BW)



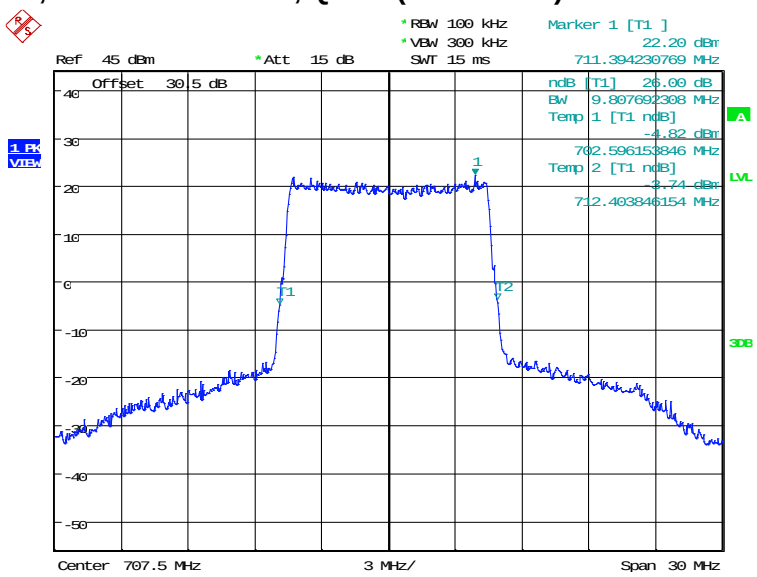
Date: 30.JUL.2024 11:42:49

©Copyright. All rights reserved by CTTL.

LTE band 12, 10MHz (-26dBc)

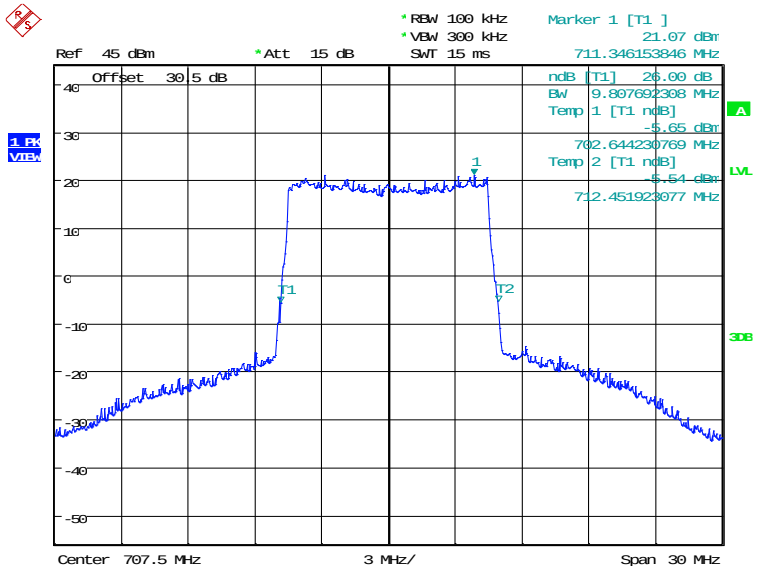
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
707.5	QPSK	16QAM
	9807.69	9807.69

LTE band 12, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:43:32

LTE band 12, 10MHz Bandwidth, 16QAM (-26dBc BW)



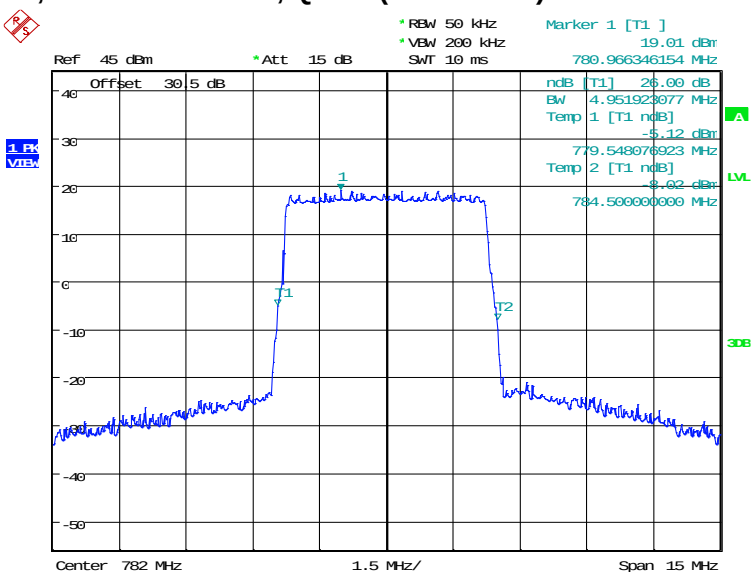
Date: 30.JUL.2024 11:44:13

©Copyright. All rights reserved by CTTL.

LTE band 13, 5MHz (-26dBc)

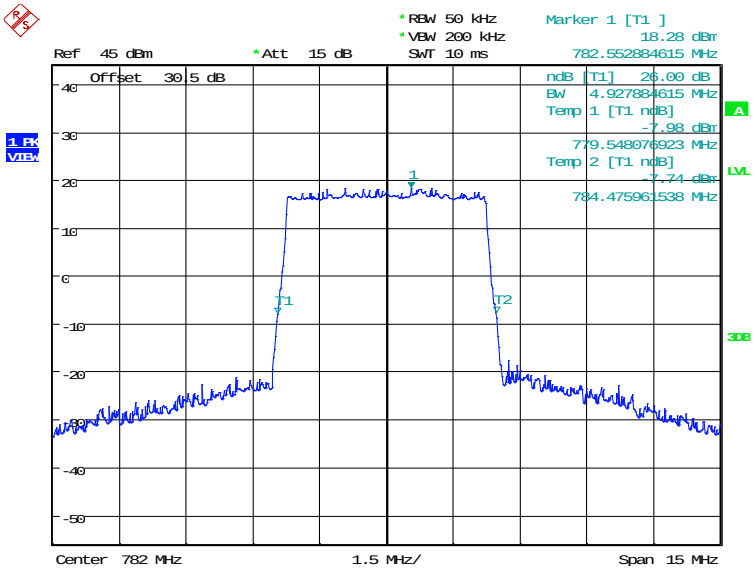
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
782.0	QPSK	16QAM
	4951.92	4927.88

LTE band 13, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:44:56

LTE band 13, 5MHz Bandwidth,16QAM (-26dBc BW)



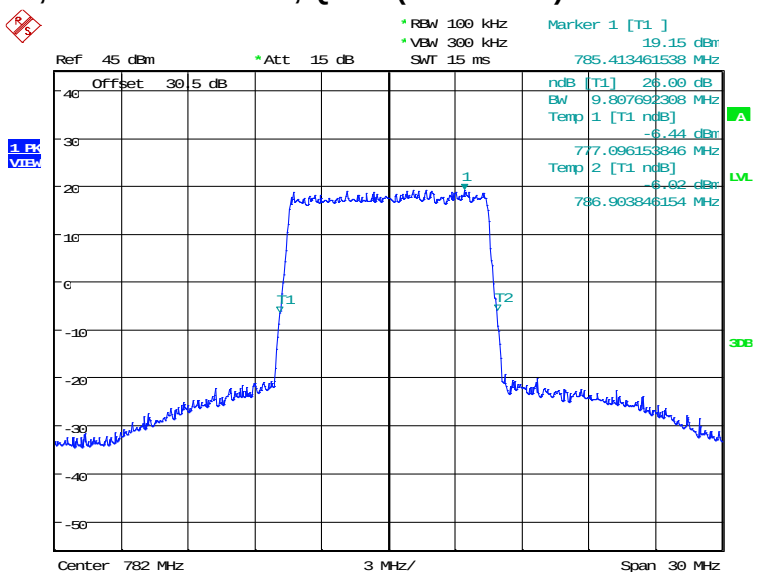
Date: 30.JUL.2024 11:45:37

©Copyright. All rights reserved by CTTL.

LTE band 13, 10MHz (-26dBc)

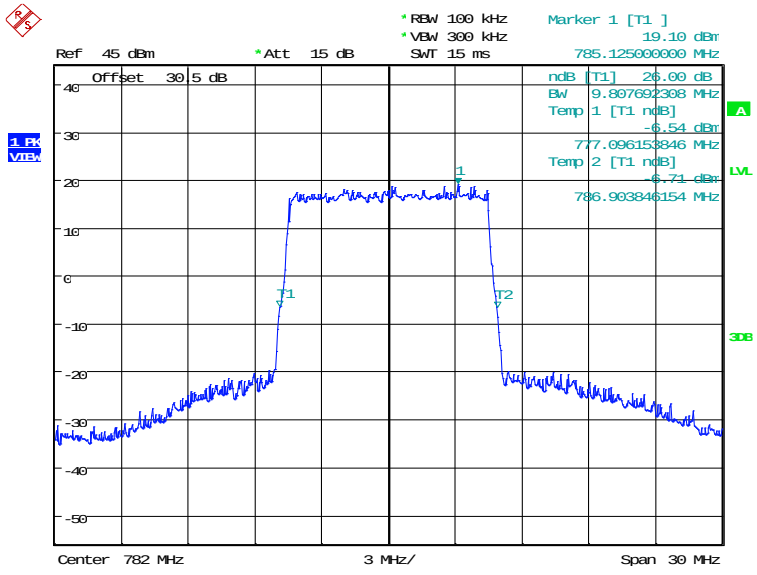
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
782.0	QPSK	16QAM
	9807.69	9807.69

LTE band 13, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:46:20

LTE band 13, 10MHz Bandwidth,16QAM (-26dBc BW)



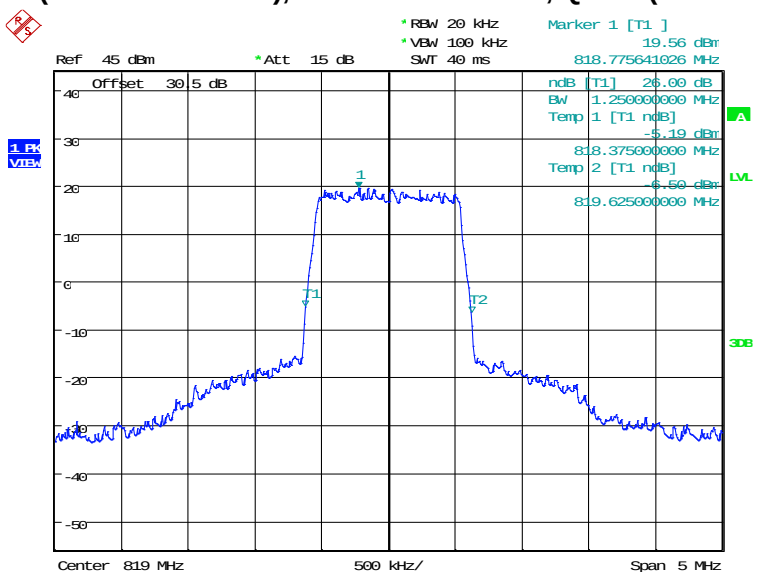
Date: 30.JUL.2024 11:47:00

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 1.4MHz (-26dBc)

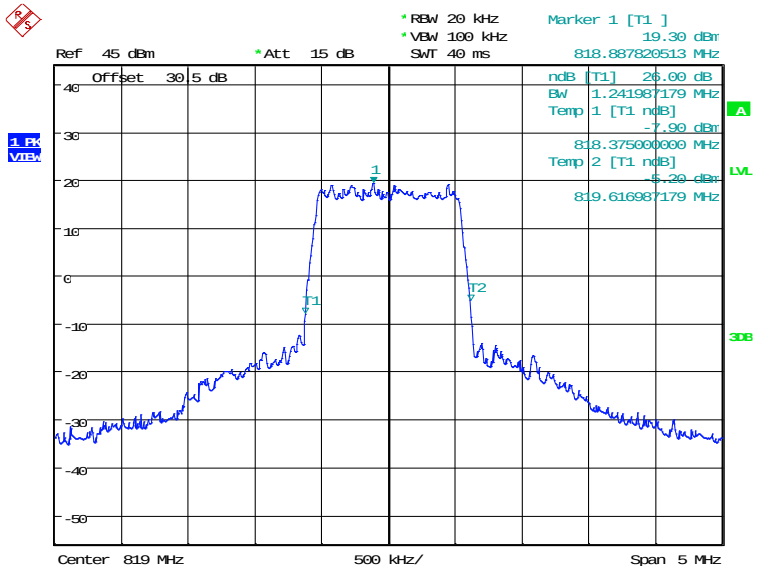
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
819.0	QPSK	16QAM
	1250.00	1241.99

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:54:44

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)



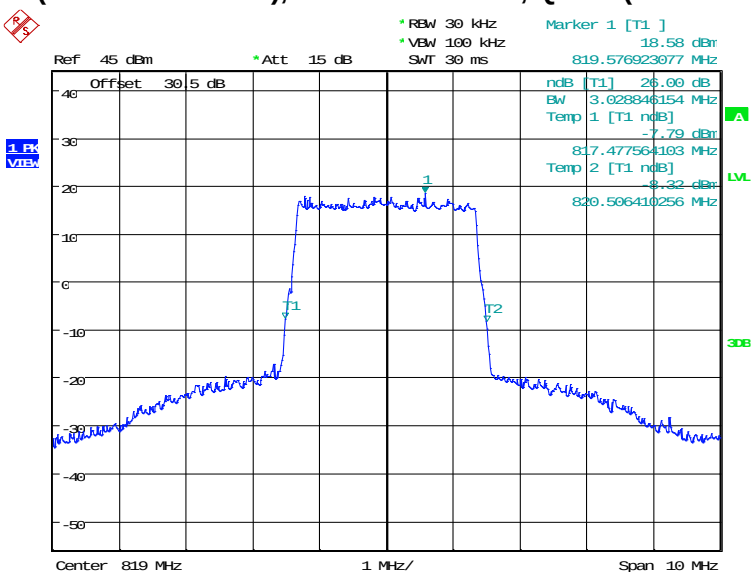
Date: 30.JUL.2024 11:55:25

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 3MHz (-26dBc)

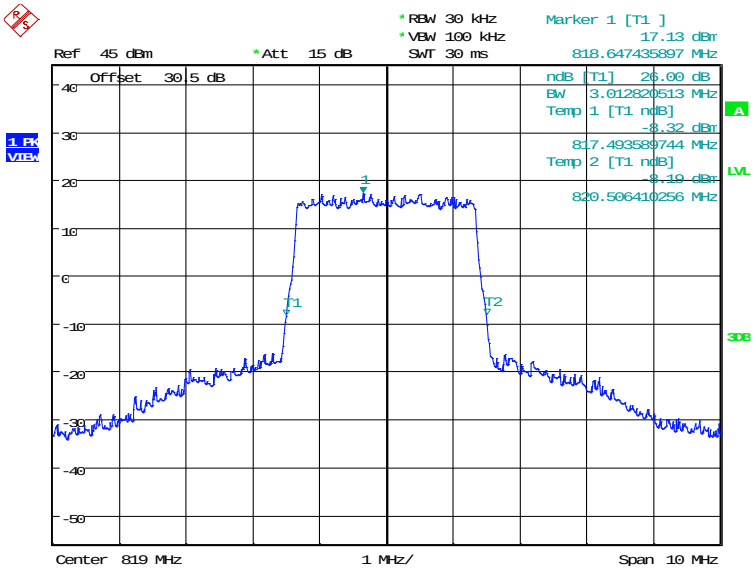
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
819.0	QPSK	16QAM
	3028.85	3012.82

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:56:08

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)



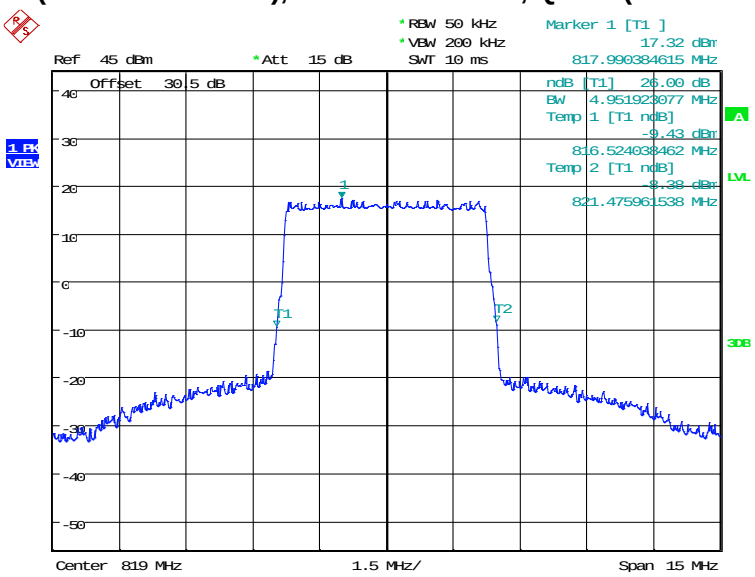
Date: 30.JUL.2024 11:56:48

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 5MHz (-26dBc)

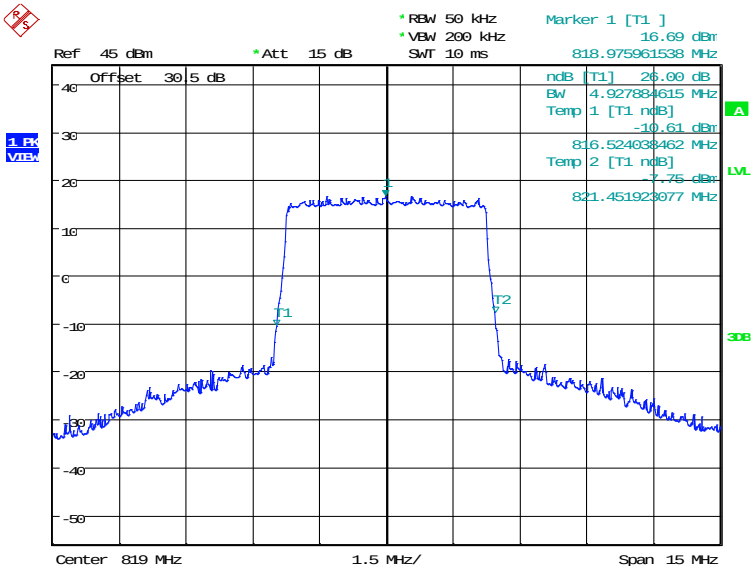
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
819.0	QPSK	16QAM
	4951.92	4927.88

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:57:31

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)



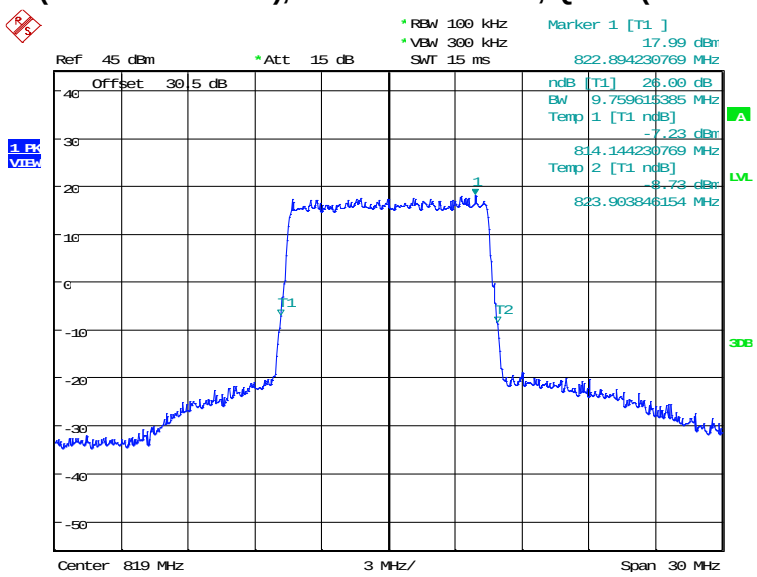
Date: 30.JUL.2024 11:58:12

©Copyright. All rights reserved by CTTL.

LTE band 26(814MHz~824MHz), 10MHz (-26dBc)

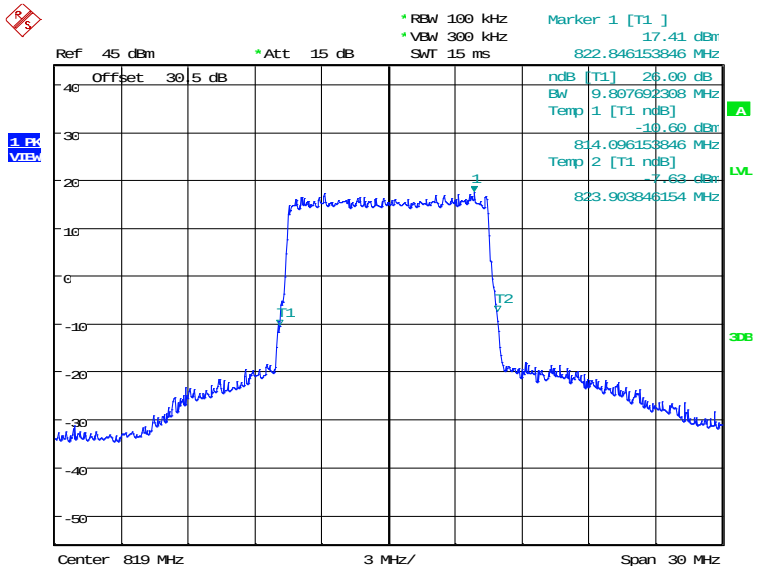
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
819.0	QPSK	16QAM
	9759.62	9807.69

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:58:55

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)



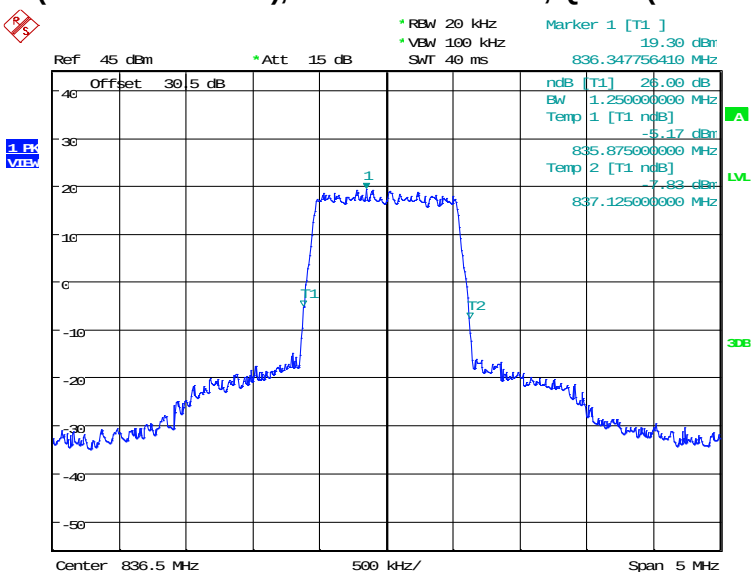
Date: 30.JUL.2024 11:59:35

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 1.4MHz (-26dBc)

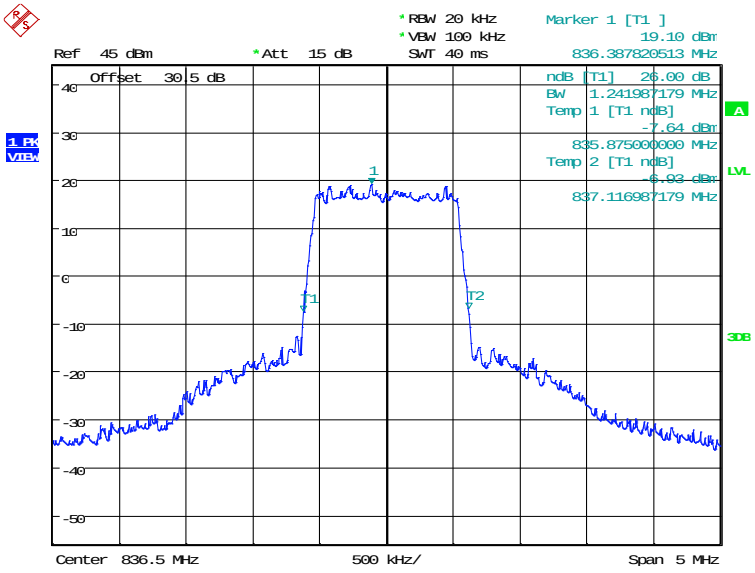
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	1250.00	1241.99

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:47:45

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (-26dBc BW)



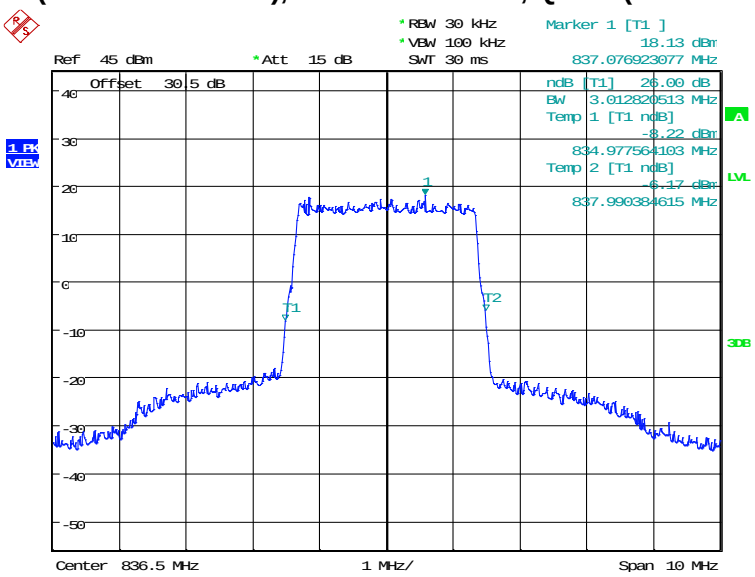
Date: 30.JUL.2024 11:48:26

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 3MHz (-26dBc)

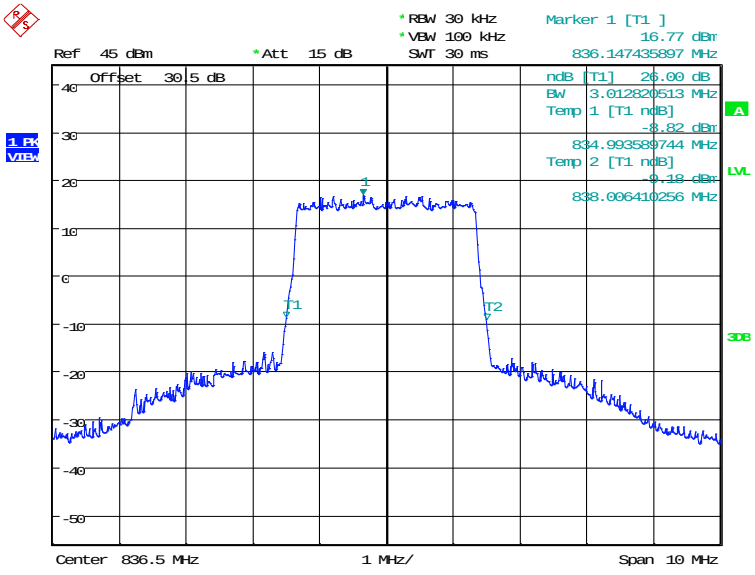
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	3012.82	3012.82

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:49:09

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (-26dBc BW)



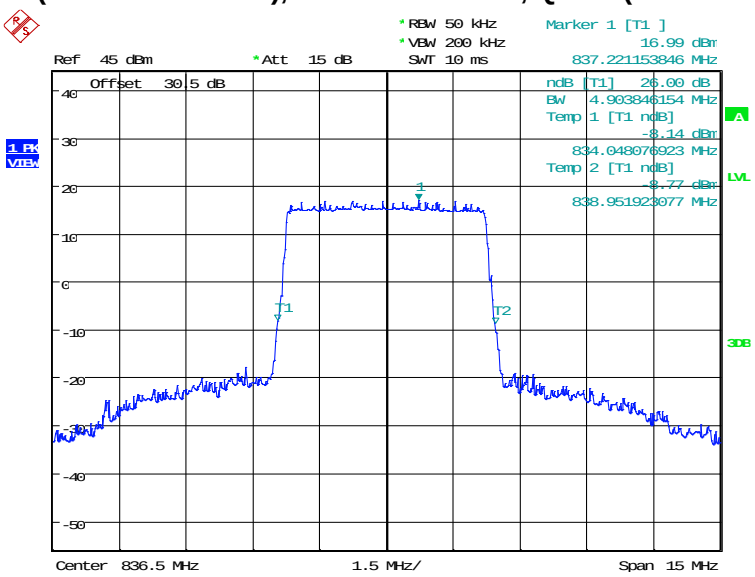
Date: 30.JUL.2024 11:49:49

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 5MHz (-26dBc)

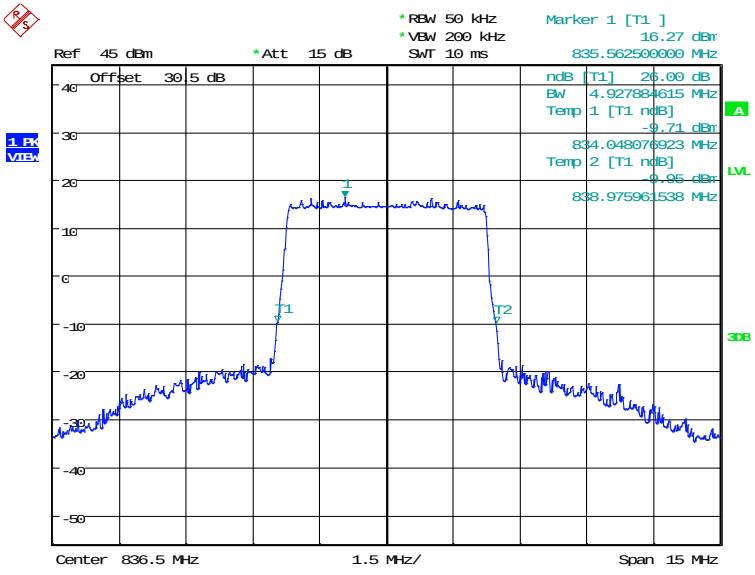
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	4903.85	4927.88

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:50:32

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (-26dBc BW)



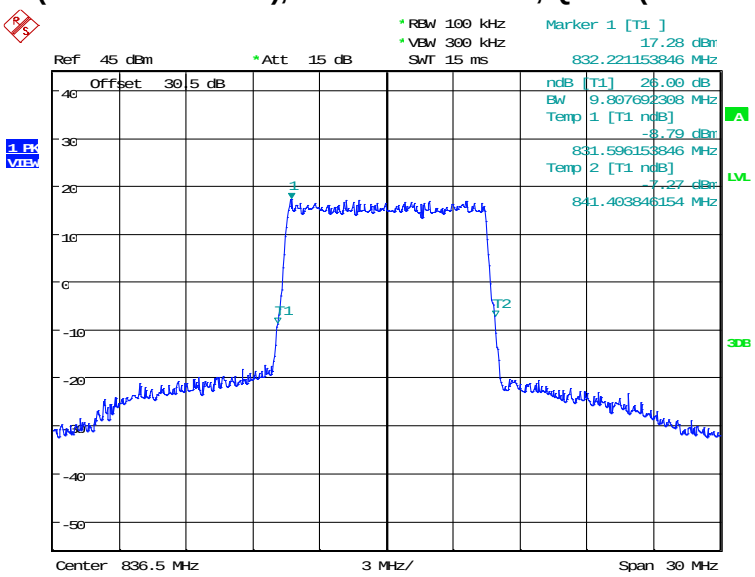
Date: 30.JUL.2024 11:51:13

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 10MHz (-26dBc)

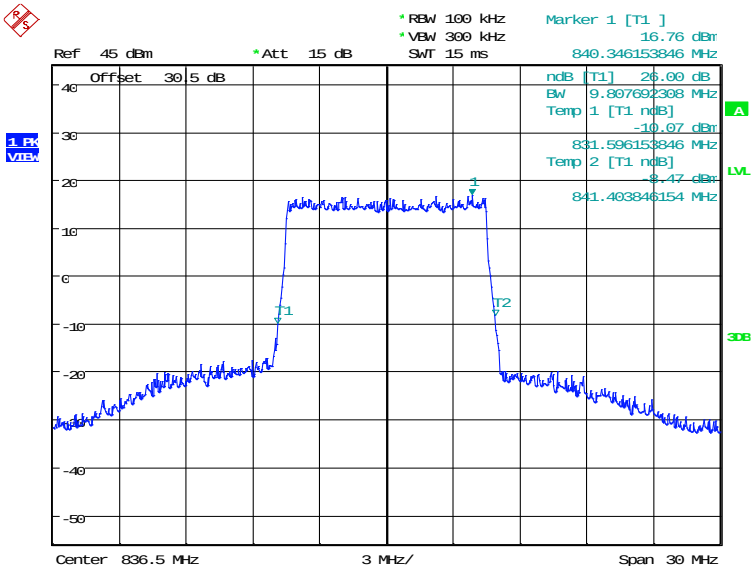
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	9807.69	9807.69

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:51:56

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (-26dBc BW)



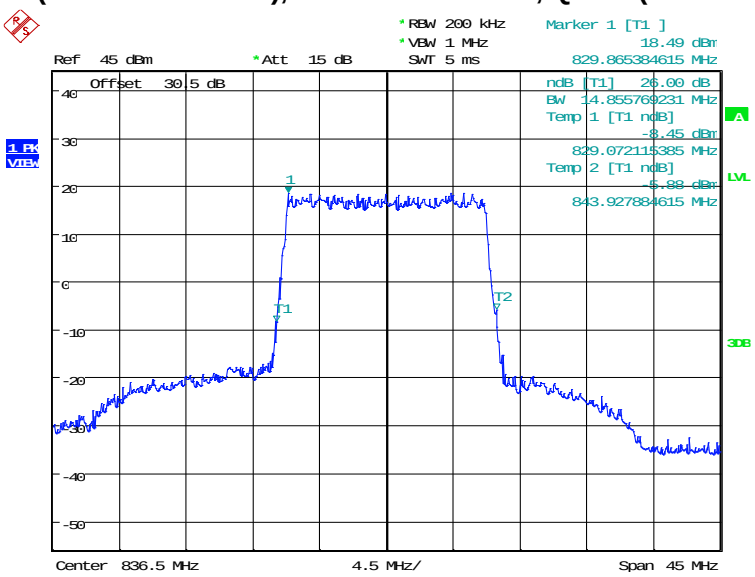
Date: 30.JUL.2024 11:52:37

©Copyright. All rights reserved by CTTL.

LTE band 26(824MHz~849MHz), 15MHz (-26dBc)

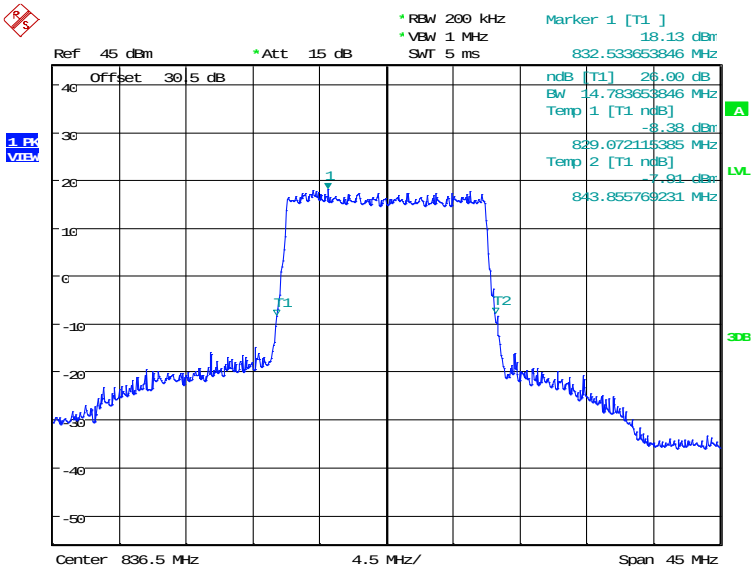
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
836.5	QPSK	16QAM
	14855.77	14783.65

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 30.JUL.2024 11:53:19

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (-26dBc BW)



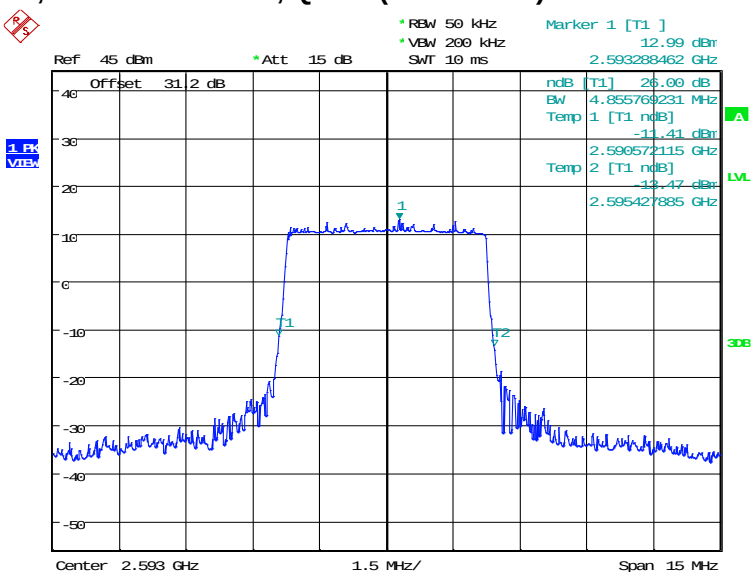
Date: 30.JUL.2024 11:54:00

©Copyright. All rights reserved by CTTL.

LTE band 41, 5MHz (-26dBc)

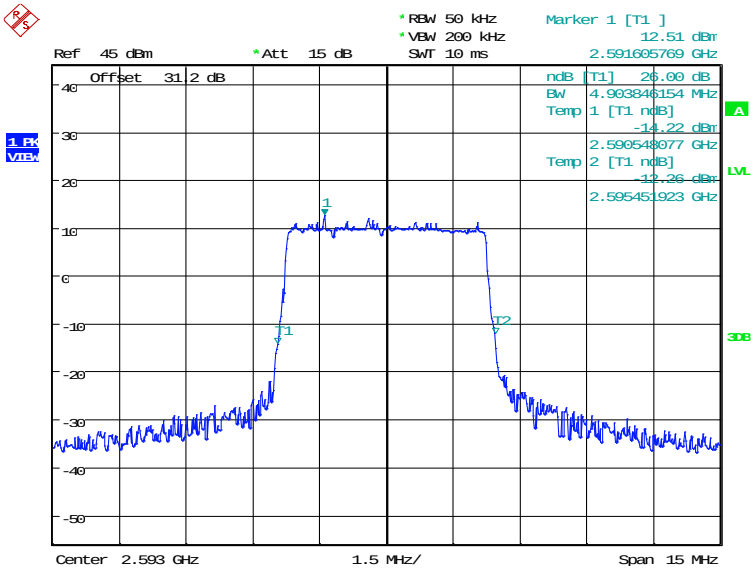
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2593.0	QPSK	16QAM
	4855.77	4903.85

LTE band 41, 5MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:41:49

LTE band 41, 5MHz Bandwidth,16QAM (-26dBc BW)



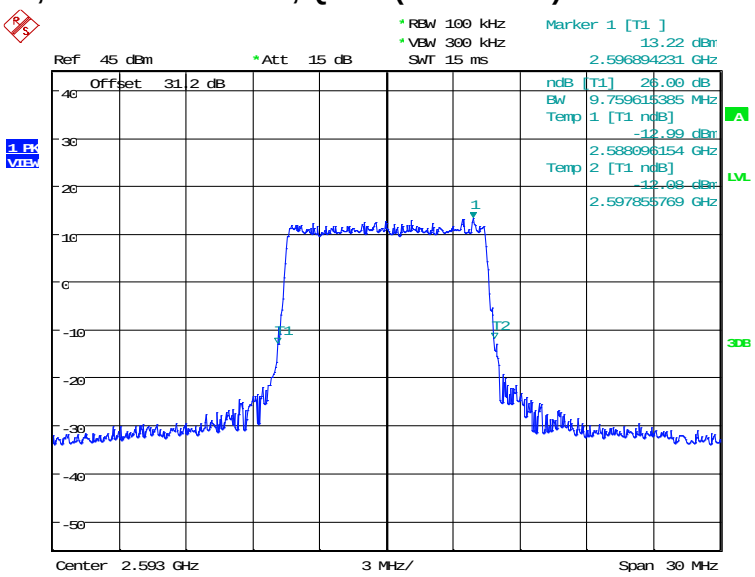
Date: 13.AUG.2024 15:42:30

©Copyright. All rights reserved by CTTL.

LTE band 41, 10MHz (-26dBc)

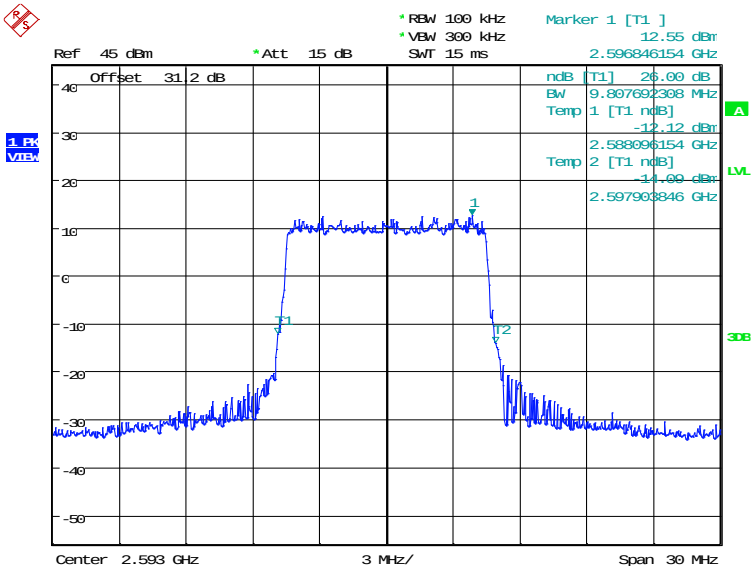
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2593.0	QPSK	16QAM
	9759.62	9807.69

LTE band 41, 10MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:43:12

LTE band 41, 10MHz Bandwidth,16QAM (-26dBc BW)



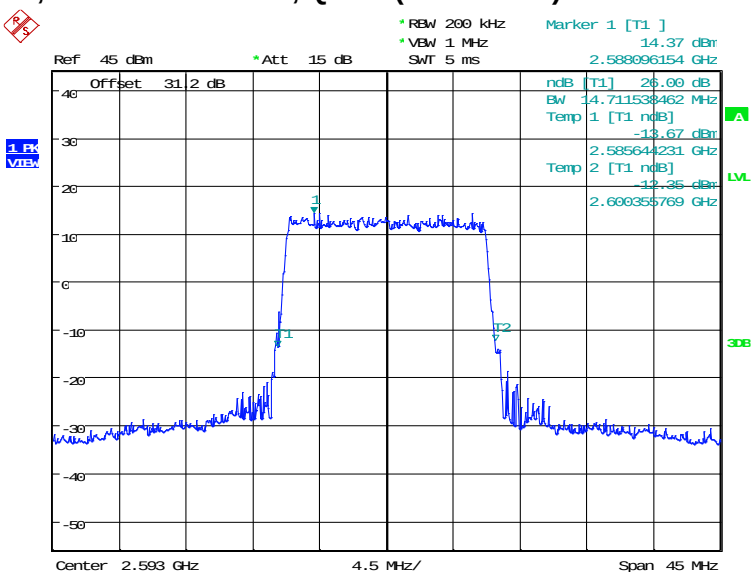
Date: 13.AUG.2024 15:43:52

©Copyright. All rights reserved by CTTL.

LTE band 41, 15MHz (-26dBc)

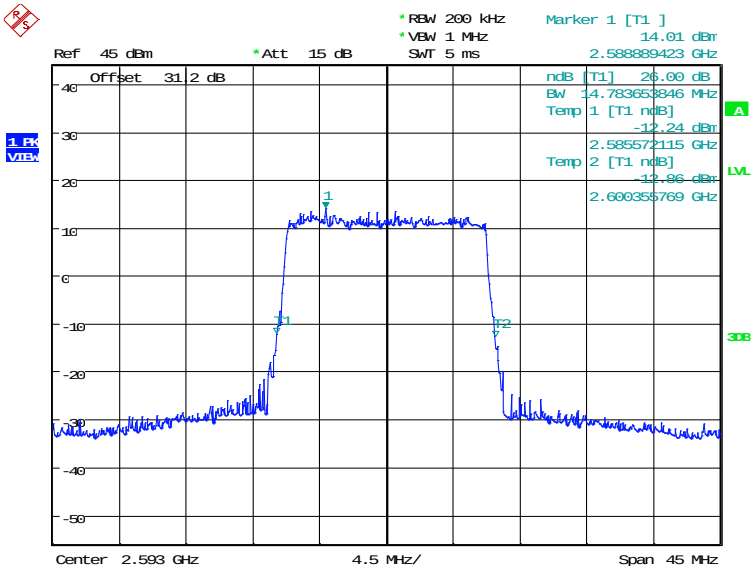
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2593.0	QPSK	16QAM
	14711.54	14783.65

LTE band 41, 15MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:44:34

LTE band 41, 15MHz Bandwidth,16QAM (-26dBc BW)



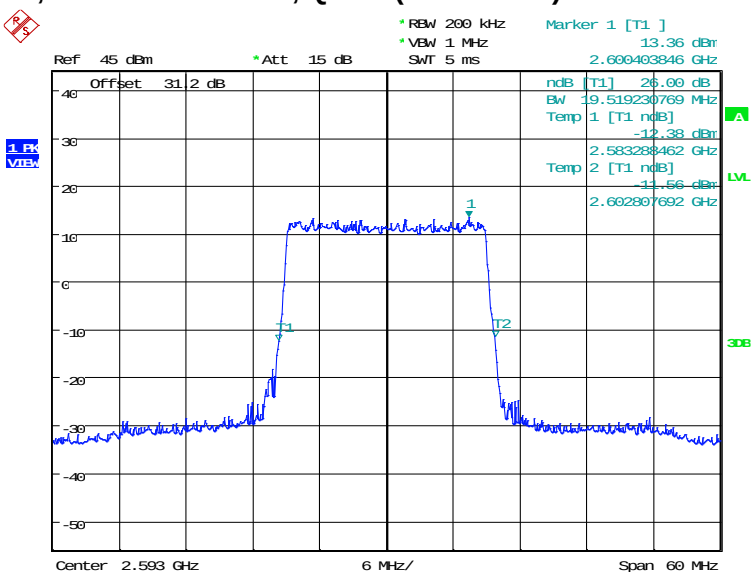
Date: 13.AUG.2024 15:45:15

©Copyright. All rights reserved by CTTL.

LTE band 41, 20MHz (-26dBc)

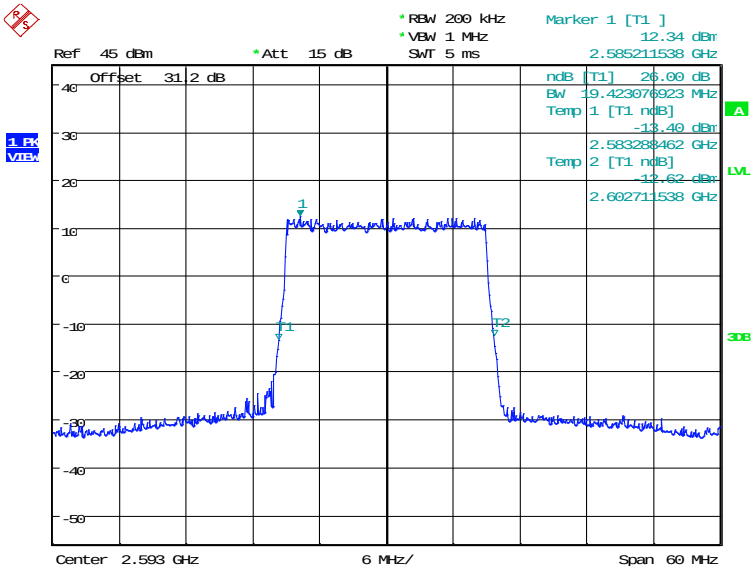
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
2593.0	QPSK	16QAM
	19519.23	19423.08

LTE band 41, 20MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:45:57

LTE band 41, 20MHz Bandwidth,16QAM (-26dBc BW)



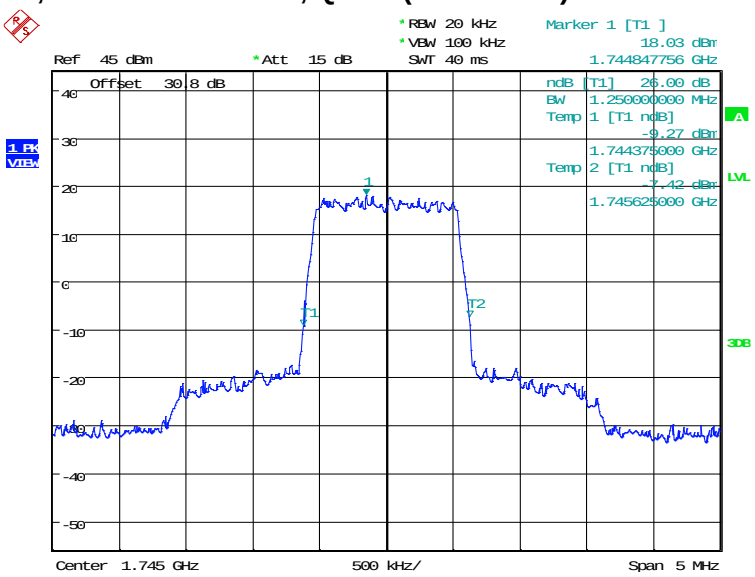
Date: 13.AUG.2024 15:46:37

©Copyright. All rights reserved by CTTL.

LTE band 66, 1.4MHz (-26dBc)

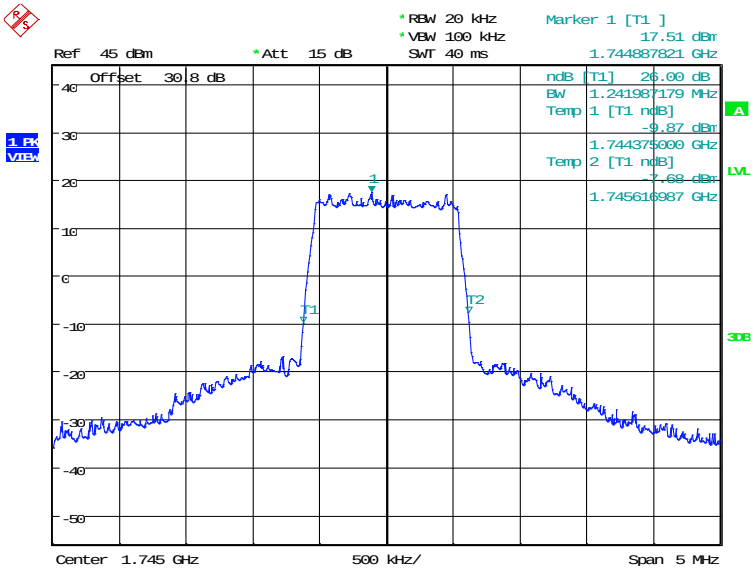
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1745.0	QPSK	16QAM
	1250.00	1241.99

LTE band 66, 1.4MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:32:47

LTE band 66, 1.4MHz Bandwidth, 16QAM (-26dBc BW)



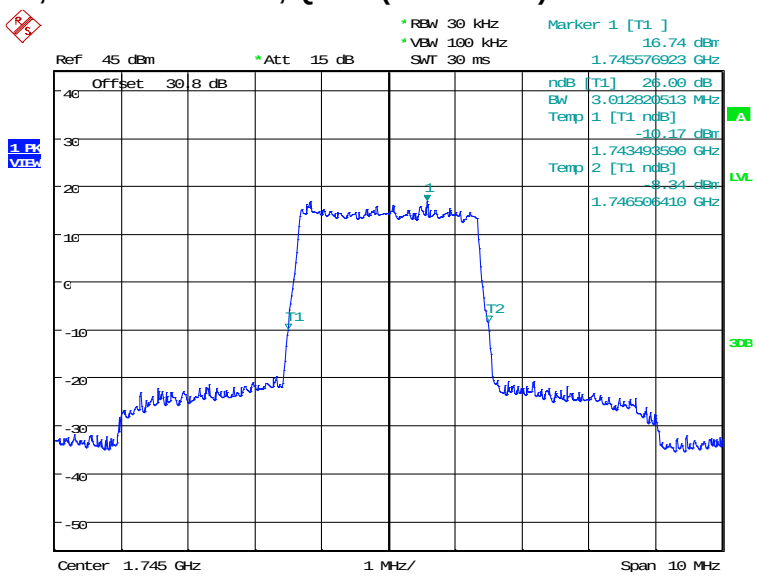
Date: 13.AUG.2024 15:33:27

©Copyright. All rights reserved by CTTL.

LTE band 66, 3MHz (-26dBc)

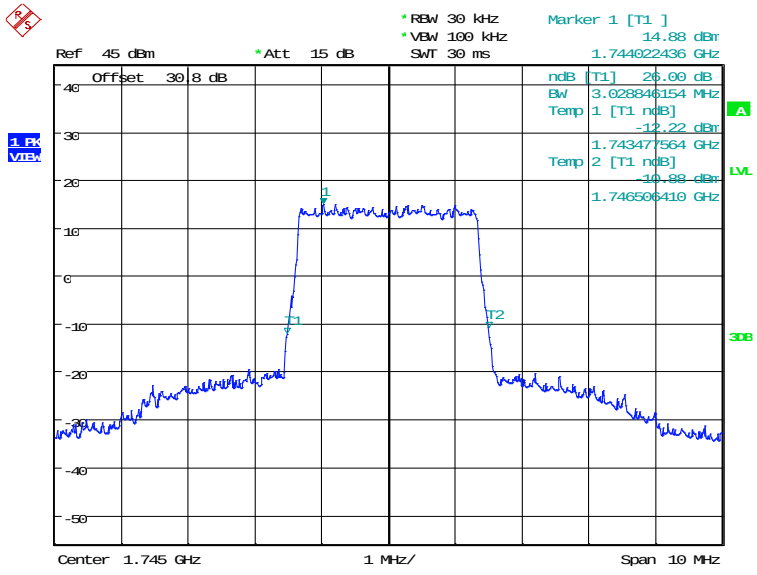
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1745.0	QPSK	16QAM
	3012.82	3028.85

LTE band 66, 3MHz Bandwidth, QPSK (-26dBc BW)



Date: 13.AUG.2024 15:34:10

LTE band 66, 3MHz Bandwidth, 16QAM (-26dBc BW)



Date: 13.AUG.2024 15:34:50

©Copyright. All rights reserved by CTTL.