TEST REPORT

REPORT NUMBER: I22W00079-LTE RF-Rev4

ON

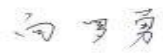
Type of Equipment:	Tracker
Type of Designation:	PA30B
Brand Name：	Prime
Manufacturer:	Micron Electronics LLC.
FCC ID:	ZKQ-PA30B

ACCORDING TO

FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS，e-CFR
PART 27,MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES，e-CFR
ANSI C63.26-2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

Chongqing Academy of Information and Communications Technology

Month date, year
Feb, 10, 2023
Signature



Xiang Luoyong
Director

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 Chongqing Academy of Information and Communications Technology.

Revision Version

Report Number	Revision	Date	Memo
I22W00079-LTE RF	00	2022-12-16	Initial creation of test report
I22W00079-LTE RF-Rev1	01	2023-01-04	The first change of test report
I22W00079-LTE RF-Rev2	02	2023-02-06	The second change of test report
I22W00079-LTE RF-Rev3	03	2023-02-08	The third change of test report
I22W00079-LTE RF-Rev4	04	2023-02-10	The fourth change of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
Designation Number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2022-11-21
Testing End Date:	2023-02-04

1.4. Signature

董俊鑫	2023-02-10
Dong Junxin **(Prepared this test report)**	**Date**
李旭	2023-02-10
Li Xu **(Reviewed this test report)**	**Date**
向罗勇	2023-02-10
Xiang Luoyong **Director of the laboratory** **(Approved this test report)**	**Date**

2. Client Information

2.1. Applicant Information

Company Name:	Micron Electronics LLC.
Address /Post:	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA
City:	Boca Raton
Country:	USA
Telephone:	+1 8885383489
Fax:	--
Email:	pcheng@micron-electronics.com
Contact Person:	Ping Cheng

2.2. Manufacturer Information

Company Name:	Micron Electronics LLC.
Address /Post:	1001 Yamato Road, Suite 400, Boca Raton, FL 33431, USA
City:	Boca Raton
Country:	USA
Telephone:	+1 8885383489
Fax:	--
Email:	pcheng@micron-electronics.com
Contact Person:	Ping Cheng

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

3.1. About EUT

EUT Description	Tracker
Model name	PA30B
Brand name	Prime
LTE Frequency Band	4/13
Type of modulation	QPSK/16QAM
Extreme Temperature	-20/+55℃
Nominal Voltage	DC 3.7V
Extreme High Voltage	DC 4.2V
Extreme Low Voltage	DC 3.6V
Adapter	Input：AC 100-240V 0.15A Output：DC 5V 1A

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: High and low voltage values in extreme condition test are given by manufacturer.

3.2. Internal Identification of EUT used during the test

EUT ID	SN or IMEI	HW Version	SW Version	Date of receipt
S7	IMEI:350807770292294	A103_V1	PA30_C_V01.01B03	2022-11-10
S1	SN:G4MA2902010004	A103_V1	PA30_C_V01.01B03	2022-11-10

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

3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
LTE	B4	1710-1755	2110-2155	16QAM only supports 1.4M, 3M and 5M bandwidth
	B13	777-787	746-756	16QAM only supports 5M bandwidth

3.4. Internal Identification of AE used during the test

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

AE ID	Instrument	Manufacturer	Model
AE1	Adapter	SHENZHEN TIANYIN	TPA-97H050100UW01

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4. Reference Documents

4.1. Documents supplied by applicant

PICS/PIXIT, referring to Annex B for detailed information, is supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC CFR Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS，e-CFR	--
PART 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES， e-CFR	--
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015

5. Test Equipments Utilized

5.1. RF Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Spectrum analyzer	FSQ 26	201137/026	--	--	R&S	2023-06-29
2	DC Power Supply	3303D	801128	--	--	Topward	2023-06-29
3	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2023-06-29

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Test Receiver	ESU26	100367	01	4.43 SP3	R&S	2023-06-29
2	Ultra-wideband Log Periodic Antenna	VULB 9163	01392	--	--	Schwarzbeck	2024-05-04
3	Double Ridged Guide Antenna	HF907	100357	--	--	Schwarzbeck	2023-02-10
4	Universal Radio Communication Tester	CMW500	102105	--	--	R&S	2023-06-29
5	Double Ridged Guide Antenna	HF907	100356	--	--	Schwarzbeck	2023-07-07
6	Generator	SMU 200A	104517	--	--	R&S	2023-06-29
7	Ultra-wideband Log Periodic Antenna	VULB 9163	00995	--	--	Schwarzbeck	2023-04-03
8	Fully-Anechoic Chamber	FACT3-2	--	--	--	ETS	2025-04-29
9	Amplifier1	150A	1429	--	--	Beehive	2023-06-18
10	Amplifier2	SCU 18	10141	--	--	R&S	--

5.3. Climate Chamber

No.	Name	Type	SN	Manufacture	Cal.Due Date
1	Climate chamber	SH-241	92010759	ESPEC	2023-06-29
2	Fully-Anechoic Chamber	FACT3-2	--	ETS	2025-04-29

Vibration table

No.	Name	Type	SN	Manufacture	Cal.Due Date
--	--	--	--	--	--

5.4. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 8.51.00	--	R&S
2	T-RFS500	V2.0	--	Manufacturer:Beijing Zhiwang Xince Technology Co., Ltd.

6. Test Results

6.1. Summary of Test Results

A brief summary of the tests carried out is shown as following.

FCC Rules	Name of Test	Result
2.1046,27.50	Conducted RF Power Output	Pass
2.1046,27.50	ERP and EIRP	Pass
2.1049	Occupied Bandwidth	*Note 1
2.1051,2.1053, 27.53	Conducted spurious emissions	Pass
2.1051,2.1053, 27.53	Radiated Spurious Emission	Pass
2.1051, 2.1053, 27.53	Band Edge	Pass
2.1055, 27.54	Frequency Stability	Pass
27.50	Peak to Average Ratio	Pass
Note 1: No applicable performance criteria. Note 2：Explanation of worst-case configuration The worst-case scenario for all measurements is based on the conducted output power. Output power was measured on QPSK,16QAM 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. Note 3：The prototype type is Cat1.		

6.2. Conducted RF Power Output

Specifications:	FCC Part 2.1046,27.50
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 27.50(b)(10): Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

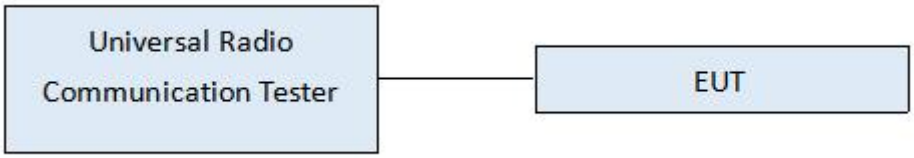
According to Part 27.50(d), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz Band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz Bands are limited to 1 watt EIRP.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.6 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Telecommunications Test Set to ensure max power transmission and proper modulation



Test Method:

The EUT is connected to the Universal Radio Communication Tester through the RF cable, and the average power and peak power are obtained through the Universal Radio Communication Tester

Note: --

6.2.1 Conducted RF Power Output Results

LTE band 4

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm)	Peak Power (dBm)
1.4MHz	1 RB low	1710.7	QPSK	20.65	24.46
1.4MHz	1 RB mid	1710.7	QPSK	20.67	24.44
1.4MHz	1 RB high	1710.7	QPSK	20.53	24.45
1.4MHz	50%,low	1710.7	QPSK	20.56	23.36
1.4MHz	50% RB mid	1710.7	QPSK	20.45	24.41
1.4MHz	50%,high	1710.7	QPSK	20.35	23.18
1.4MHz	100% RB	1710.7	QPSK	18.78	23.93
1.4MHz	1 RB low	1710.7	16QAM	19.11	24.04
1.4MHz	1 RB mid	1710.7	16QAM	19.12	23.99
1.4MHz	1 RB high	1710.7	16QAM	18.89	24.00
1.4MHz	50%,low	1710.7	16QAM	19.99	22.86
1.4MHz	50% RB mid	1710.7	16QAM	18.66	23.89
1.4MHz	50%,high	1710.7	16QAM	19.98	22.85
1.4MHz	100% RB	1710.7	16QAM	17.30	23.40
1.4MHz	1 RB low	1732.5	QPSK	20.66	24.30
1.4MHz	1 RB mid	1732.5	QPSK	20.82	24.31
1.4MHz	1 RB high	1732.5	QPSK	20.70	24.30
1.4MHz	50%,low	1732.5	QPSK	20.81	23.53
1.4MHz	50% RB mid	1732.5	QPSK	20.97	24.48
1.4MHz	50%,high	1732.5	QPSK	20.65	23.41
1.4MHz	100% RB	1732.5	QPSK	19.34	24.27
1.4MHz	1 RB low	1732.5	16QAM	19.40	24.18
1.4MHz	1 RB mid	1732.5	16QAM	19.59	24.20
1.4MHz	1 RB high	1732.5	16QAM	19.69	24.30
1.4MHz	50%,low	1732.5	16QAM	20.76	23.49
1.4MHz	50% RB mid	1732.5	16QAM	19.16	24.02
1.4MHz	50%,high	1732.5	16QAM	20.55	23.33
1.4MHz	100% RB	1732.5	16QAM	18.35	24.13
1.4MHz	1 RB low	1754.3	QPSK	19.93	23.80
1.4MHz	1 RB mid	1754.3	QPSK	19.88	23.78
1.4MHz	1 RB high	1754.3	QPSK	19.96	23.86
1.4MHz	50%,low	1754.3	QPSK	20.00	22.85
1.4MHz	50% RB mid	1754.3	QPSK	20.08	23.91
1.4MHz	50%,high	1754.3	QPSK	19.69	22.59

1.4MHz	100% RB	1754.3	QPSK	18.27	23.47
1.4MHz	1 RB low	1754.3	16QAM	18.17	23.30
1.4MHz	1 RB mid	1754.3	16QAM	18.75	23.55
1.4MHz	1 RB high	1754.3	16QAM	18.55	23.56
1.4MHz	50%,low	1754.3	16QAM	19.95	22.80
1.4MHz	50% RB mid	1754.3	16QAM	18.59	23.72
1.4MHz	50%,high	1754.3	16QAM	19.92	22.78
1.4MHz	100% RB	1754.3	16QAM	17.25	23.43
3MHz	1 RB low	1711.5	QPSK	19.95	24.02
3MHz	1 RB mid	1711.5	QPSK	19.96	24.06
3MHz	1 RB high	1711.5	QPSK	20.23	24.40
3MHz	50%,low	1711.5	QPSK	20.26	23.13
3MHz	50% RB mid	1711.5	QPSK	18.67	23.45
3MHz	50%,high	1711.5	QPSK	20.14	23.04
3MHz	100% RB	1711.5	QPSK	18.58	23.72
3MHz	1 RB low	1711.5	16QAM	18.51	23.60
3MHz	1 RB mid	1711.5	16QAM	18.50	23.60
3MHz	1 RB high	1711.5	16QAM	18.50	23.81
3MHz	50%,low	1711.5	16QAM	19.97	22.87
3MHz	50% RB mid	1711.5	16QAM	17.58	23.44
3MHz	50%,high	1711.5	16QAM	20.05	22.94
3MHz	100% RB	1711.5	16QAM	17.47	23.65
3MHz	1 RB low	1732.5	QPSK	20.92	24.46
3MHz	1 RB mid	1732.5	QPSK	20.69	24.21
3MHz	1 RB high	1732.5	QPSK	20.58	24.20
3MHz	50%,low	1732.5	QPSK	20.70	23.37
3MHz	50% RB mid	1732.5	QPSK	19.33	23.76
3MHz	50%,high	1732.5	QPSK	20.71	23.39
3MHz	100% RB	1732.5	QPSK	19.48	24.45
3MHz	1 RB low	1732.5	16QAM	19.49	24.10
3MHz	1 RB mid	1732.5	16QAM	19.37	23.92
3MHz	1 RB high	1732.5	16QAM	19.08	23.81
3MHz	50%,low	1732.5	16QAM	20.71	23.38
3MHz	50% RB mid	1732.5	16QAM	18.48	23.79
3MHz	50%,high	1732.5	16QAM	20.86	23.49
3MHz	100% RB	1732.5	16QAM	18.31	24.16
3MHz	1 RB low	1753.5	QPSK	19.51	23.56
3MHz	1 RB mid	1753.5	QPSK	19.74	23.64

3MHz	1 RB high	1753.5	QPSK	20.09	23.92
3MHz	50%,low	1753.5	QPSK	19.85	22.82
3MHz	50% RB mid	1753.5	QPSK	18.44	23.13
3MHz	50%,high	1753.5	QPSK	19.99	22.93
3MHz	100% RB	1753.5	QPSK	18.24	23.43
3MHz	1 RB low	1753.5	16QAM	18.30	23.51
3MHz	1 RB mid	1753.5	16QAM	18.58	23.59
3MHz	1 RB high	1753.5	16QAM	18.77	23.82
3MHz	50%,low	1753.5	16QAM	19.69	22.68
3MHz	50% RB mid	1753.5	16QAM	17.52	23.16
3MHz	50%,high	1753.5	16QAM	19.67	22.68
3MHz	100% RB	1753.5	16QAM	17.27	23.65
5MHz	1 RB low	1712.5	QPSK	19.87	23.93
5MHz	1 RB mid	1712.5	QPSK	20.01	24.11
5MHz	1 RB high	1712.5	QPSK	20.09	24.35
5MHz	50%,low	1712.5	QPSK	18.56	23.46
5MHz	50% RB mid	1712.5	QPSK	18.60	23.44
5MHz	50%,high	1712.5	QPSK	18.75	23.71
5MHz	100% RB	1712.5	QPSK	18.64	24.01
5MHz	1 RB low	1712.5	16QAM	18.69	23.79
5MHz	1 RB mid	1712.5	16QAM	18.93	24.00
5MHz	1 RB high	1712.5	16QAM	18.96	24.23
5MHz	50%,low	1712.5	16QAM	17.40	23.20
5MHz	50% RB mid	1712.5	16QAM	17.56	23.32
5MHz	50%,high	1712.5	16QAM	17.62	23.46
5MHz	100% RB	1712.5	16QAM	17.56	23.66
5MHz	1 RB low	1732.5	QPSK	21.09	24.52
5MHz	1 RB mid	1732.5	QPSK	20.91	24.27
5MHz	1 RB high	1732.5	QPSK	20.60	24.10
5MHz	50%,low	1732.5	QPSK	19.48	24.02
5MHz	50% RB mid	1732.5	QPSK	19.48	23.79
5MHz	50%,high	1732.5	QPSK	19.35	23.78
5MHz	100% RB	1732.5	QPSK	19.43	24.56
5MHz	1 RB low	1732.5	16QAM	19.80	24.21
5MHz	1 RB mid	1732.5	16QAM	19.59	23.95
5MHz	1 RB high	1732.5	16QAM	18.88	23.53
5MHz	50%,low	1732.5	16QAM	18.49	23.84
5MHz	50% RB mid	1732.5	16QAM	18.55	23.70

5MHz	50%,high	1732.5	16QAM	18.49	23.70
5MHz	100% RB	1732.5	16QAM	18.52	24.28
5MHz	1 RB low	1752.5	QPSK	19.55	23.52
5MHz	1 RB mid	1752.5	QPSK	19.69	23.53
5MHz	1 RB high	1752.5	QPSK	20.01	23.87
5MHz	50%,low	1752.5	QPSK	18.16	22.89
5MHz	50% RB mid	1752.5	QPSK	18.28	22.93
5MHz	50%,high	1752.5	QPSK	18.43	23.13
5MHz	100% RB	1752.5	QPSK	18.24	23.58
5MHz	1 RB low	1752.5	16QAM	17.86	23.05
5MHz	1 RB mid	1752.5	16QAM	17.81	23.00
5MHz	1 RB high	1752.5	16QAM	18.51	23.57
5MHz	50%,low	1752.5	16QAM	17.27	22.94
5MHz	50% RB mid	1752.5	16QAM	17.36	22.94
5MHz	50%,high	1752.5	16QAM	17.31	23.01
5MHz	100% RB	1752.5	16QAM	17.38	23.52
10MHz	1 RB low	1715	QPSK	19.94	24.14
10MHz	1 RB mid	1715	QPSK	20.53	24.65
10MHz	1 RB high	1715	QPSK	20.60	24.90
10MHz	50%,low	1715	QPSK	18.66	23.55
10MHz	50% RB mid	1715	QPSK	18.83	23.76
10MHz	50%,high	1715	QPSK	18.92	23.84
10MHz	100% RB	1715	QPSK	18.82	24.13
10MHz	1 RB low	1732.5	QPSK	21.04	24.76
10MHz	1 RB mid	1732.5	QPSK	21.06	24.37
10MHz	1 RB high	1732.5	QPSK	20.25	23.97
10MHz	50%,low	1732.5	QPSK	19.45	24.05
10MHz	50% RB mid	1732.5	QPSK	19.37	23.76
10MHz	50%,high	1732.5	QPSK	19.13	23.61
10MHz	100% RB	1732.5	QPSK	19.30	24.81
10MHz	1 RB low	1750	QPSK	19.36	23.44
10MHz	1 RB mid	1750	QPSK	19.49	23.39
10MHz	1 RB high	1750	QPSK	19.88	23.82
10MHz	50%,low	1750	QPSK	17.96	22.75
10MHz	50% RB mid	1750	QPSK	18.11	22.79
10MHz	50%,high	1750	QPSK	18.26	23.02
10MHz	100% RB	1750	QPSK	18.10	23.27
15MHz	1 RB low	1717.5	QPSK	20.02	24.21

15MHz	1 RB mid	1717.5	QPSK	20.67	24.86
15MHz	1 RB high	1717.5	QPSK	21.11	25.11
15MHz	50%,low	1717.5	QPSK	18.69	23.75
15MHz	50% RB mid	1717.5	QPSK	19.06	24.07
15MHz	50%,high	1717.5	QPSK	19.24	24.29
15MHz	100% RB	1717.5	QPSK	18.91	24.40
15MHz	1 RB low	1732.5	QPSK	20.78	24.72
15MHz	1 RB mid	1732.5	QPSK	20.81	24.21
15MHz	1 RB high	1732.5	QPSK	19.72	23.62
15MHz	50%,low	1732.5	QPSK	19.47	24.08
15MHz	50% RB mid	1732.5	QPSK	19.35	23.71
15MHz	50%,high	1732.5	QPSK	18.93	23.42
15MHz	100% RB	1732.5	QPSK	19.30	24.49
15MHz	1 RB low	1747.5	QPSK	19.66	23.53
15MHz	1 RB mid	1747.5	QPSK	19.48	23.35
15MHz	1 RB high	1747.5	QPSK	20.01	23.84
15MHz	50%,low	1747.5	QPSK	18.06	22.82
15MHz	50% RB mid	1747.5	QPSK	18.10	22.81
15MHz	50%,high	1747.5	QPSK	18.16	22.93
15MHz	100% RB	1747.5	QPSK	18.02	23.43
20MHz	1 RB low	1720	QPSK	19.95	24.25
20MHz	1 RB mid	1720	QPSK	20.95	25.16
20MHz	1 RB high	1720	QPSK	21.27	24.90
20MHz	50%,low	1720	QPSK	18.72	23.80
20MHz	50% RB mid	1720	QPSK	19.14	24.09
20MHz	50%,high	1720	QPSK	19.54	24.44
20MHz	100% RB	1720	QPSK	19.15	24.74
20MHz	1 RB low	1732.5	QPSK	20.94	24.90
20MHz	1 RB mid	1732.5	QPSK	21.06	24.27
20MHz	1 RB high	1732.5	QPSK	19.53	23.46
20MHz	50%,low	1732.5	QPSK	19.46	24.10
20MHz	50% RB mid	1732.5	QPSK	19.33	23.77
20MHz	50%,high	1732.5	QPSK	18.84	23.42
20MHz	100% RB	1732.5	QPSK	19.21	24.30
20MHz	1 RB low	1745	QPSK	20.46	23.96
20MHz	1 RB mid	1745	QPSK	19.58	23.37
20MHz	1 RB high	1745	QPSK	20.07	23.83
20MHz	50%,low	1745	QPSK	18.35	23.09

20MHz	50% RB mid	1745	QPSK	18.05	22.74
20MHz	50%,high	1745	QPSK	17.98	22.77
20MHz	100% RB	1745	QPSK	18.23	23.43

LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm)	Peak Power (dBm)
5MHz	1 RB low	779.5	QPSK	23.29	27.52
5MHz	1 RB mid	779.5	QPSK	23.02	27.43
5MHz	1 RB high	779.5	QPSK	23.29	27.82
5MHz	50%,low	779.5	QPSK	22.46	27.47
5MHz	50% RB mid	779.5	QPSK	22.47	27.38
5MHz	50%,high	779.5	QPSK	22.43	27.58
5MHz	100% RB	779.5	QPSK	22.38	27.85
5MHz	1 RB low	779.5	16QAM	22.76	27.80
5MHz	1 RB mid	779.5	16QAM	22.54	27.84
5MHz	1 RB high	779.5	16QAM	22.51	27.99
5MHz	50%,low	779.5	16QAM	21.07	27.12
5MHz	50% RB mid	779.5	16QAM	21.21	27.16
5MHz	50%,high	779.5	16QAM	21.19	27.31
5MHz	100% RB	779.5	16QAM	21.42	27.93
5MHz	1 RB low	782	QPSK	23.05	27.53
5MHz	1 RB mid	782	QPSK	23.17	27.60
5MHz	1 RB high	782	QPSK	23.04	27.61
5MHz	50%,low	782	QPSK	22.28	27.48
5MHz	50% RB mid	782	QPSK	22.42	27.42
5MHz	50%,high	782	QPSK	22.37	27.46
5MHz	100% RB	782	QPSK	22.32	27.99
5MHz	1 RB low	782	16QAM	22.02	27.25
5MHz	1 RB mid	782	16QAM	22.38	27.51
5MHz	1 RB high	782	16QAM	22.16	27.46
5MHz	50%,low	782	16QAM	21.53	27.35
5MHz	50% RB mid	782	16QAM	21.55	27.34
5MHz	50%,high	782	16QAM	21.17	27.00
5MHz	100% RB	782	16QAM	21.28	27.56
5MHz	1 RB low	784.5	QPSK	23.17	27.66
5MHz	1 RB mid	784.5	QPSK	23.37	27.78
5MHz	1 RB high	784.5	QPSK	23.02	27.51
5MHz	50%,low	784.5	QPSK	22.31	27.37
5MHz	50% RB mid	784.5	QPSK	22.23	27.14

5MHz	50%,high	784.5	QPSK	22.05	27.03
5MHz	100% RB	784.5	QPSK	22.21	27.72
5MHz	1 RB low	784.5	16QAM	22.16	27.67
5MHz	1 RB mid	784.5	16QAM	21.87	27.37
5MHz	1 RB high	784.5	16QAM	21.83	27.35
5MHz	50%,low	784.5	16QAM	21.36	27.32
5MHz	50% RB mid	784.5	16QAM	21.20	27.10
5MHz	50%,high	784.5	16QAM	21.09	26.99
5MHz	100% RB	784.5	16QAM	21.14	27.48
10MHz	1 RB low	782	QPSK	23.35	27.73
10MHz	1 RB mid	782	QPSK	23.56	28.03
10MHz	1 RB high	782	QPSK	22.98	27.54
10MHz	50%,low	782	QPSK	22.51	27.55
10MHz	50% RB mid	782	QPSK	22.39	27.38
10MHz	50%,high	782	QPSK	22.37	27.40
10MHz	100% RB	782	QPSK	22.42	27.55

6.3. ERP and EIRP

Limit Level Construction:

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

According to Part 27.50(d), fixed, mobile, and portable (hand-held) 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..

According to Part 27.50(b)(10)： Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

Conducted RF Power+Antenna Gain(dBi)=EIRP

Conducted RF Power+Antenna Gain(dBd)=ERP

Antenna Gain(dBd)= Antenna Gain(dBi)-2.15

Frequency Band	AntennaGain (dBi)
LTE Band 4	1
LTE Band 13	-1

Antenna Style：Metal antenna

6.3.1 LTE Band 4 result

LTE Band4

Limits 30dBm(1w)

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm)	EIRP(dBm) Max EIRP:22.27
1.4MHz	1 RB low	1710.7	QPSK	20.65	21.65
1.4MHz	1 RB mid	1710.7	QPSK	20.67	21.67
1.4MHz	1 RB high	1710.7	QPSK	20.53	21.53
1.4MHz	50%,low	1710.7	QPSK	20.56	21.56
1.4MHz	50% RB mid	1710.7	QPSK	20.45	21.45
1.4MHz	50%,high	1710.7	QPSK	20.35	21.35
1.4MHz	100% RB	1710.7	QPSK	18.78	19.78
1.4MHz	1 RB low	1710.7	16QAM	19.11	20.11
1.4MHz	1 RB mid	1710.7	16QAM	19.12	20.12
1.4MHz	1 RB high	1710.7	16QAM	18.89	19.89
1.4MHz	50%,low	1710.7	16QAM	19.99	20.99
1.4MHz	50% RB mid	1710.7	16QAM	18.66	19.66
1.4MHz	50%,high	1710.7	16QAM	19.98	20.98
1.4MHz	100% RB	1710.7	16QAM	17.30	18.30
1.4MHz	1 RB low	1732.5	QPSK	20.66	21.66
1.4MHz	1 RB mid	1732.5	QPSK	20.82	21.82
1.4MHz	1 RB high	1732.5	QPSK	20.70	21.70
1.4MHz	50%,low	1732.5	QPSK	20.81	21.81
1.4MHz	50% RB mid	1732.5	QPSK	20.97	21.97
1.4MHz	50%,high	1732.5	QPSK	20.65	21.65
1.4MHz	100% RB	1732.5	QPSK	19.34	20.34
1.4MHz	1 RB low	1732.5	16QAM	19.40	20.40
1.4MHz	1 RB mid	1732.5	16QAM	19.59	20.59
1.4MHz	1 RB high	1732.5	16QAM	19.69	20.69
1.4MHz	50%,low	1732.5	16QAM	20.76	21.76
1.4MHz	50% RB mid	1732.5	16QAM	19.16	20.16
1.4MHz	50%,high	1732.5	16QAM	20.55	21.55
1.4MHz	100% RB	1732.5	16QAM	18.35	19.35
1.4MHz	1 RB low	1754.3	QPSK	19.93	20.93
1.4MHz	1 RB mid	1754.3	QPSK	19.88	20.88
1.4MHz	1 RB high	1754.3	QPSK	19.96	20.96
1.4MHz	50%,low	1754.3	QPSK	20.00	21.00
1.4MHz	50% RB mid	1754.3	QPSK	20.08	21.08

1.4MHz	50%,high	1754.3	QPSK	19.69	20.69
1.4MHz	100% RB	1754.3	QPSK	18.27	19.27
1.4MHz	1 RB low	1754.3	16QAM	18.17	19.17
1.4MHz	1 RB mid	1754.3	16QAM	18.75	19.75
1.4MHz	1 RB high	1754.3	16QAM	18.55	19.55
1.4MHz	50%,low	1754.3	16QAM	19.95	20.95
1.4MHz	50% RB mid	1754.3	16QAM	18.59	19.59
1.4MHz	50%,high	1754.3	16QAM	19.92	20.92
1.4MHz	100% RB	1754.3	16QAM	17.25	18.25
3MHz	1 RB low	1711.5	QPSK	19.95	20.95
3MHz	1 RB mid	1711.5	QPSK	19.96	20.96
3MHz	1 RB high	1711.5	QPSK	20.23	21.23
3MHz	50%,low	1711.5	QPSK	20.26	21.26
3MHz	50% RB mid	1711.5	QPSK	18.67	19.67
3MHz	50%,high	1711.5	QPSK	20.14	21.14
3MHz	100% RB	1711.5	QPSK	18.58	19.58
3MHz	1 RB low	1711.5	16QAM	18.51	19.51
3MHz	1 RB mid	1711.5	16QAM	18.50	19.50
3MHz	1 RB high	1711.5	16QAM	18.50	19.50
3MHz	50%,low	1711.5	16QAM	19.97	20.97
3MHz	50% RB mid	1711.5	16QAM	17.58	18.58
3MHz	50%,high	1711.5	16QAM	20.05	21.05
3MHz	100% RB	1711.5	16QAM	17.47	18.47
3MHz	1 RB low	1732.5	QPSK	20.92	21.92
3MHz	1 RB mid	1732.5	QPSK	20.69	21.69
3MHz	1 RB high	1732.5	QPSK	20.58	21.58
3MHz	50%,low	1732.5	QPSK	20.70	21.70
3MHz	50% RB mid	1732.5	QPSK	19.33	20.33
3MHz	50%,high	1732.5	QPSK	20.71	21.71
3MHz	100% RB	1732.5	QPSK	19.48	20.48
3MHz	1 RB low	1732.5	16QAM	19.49	20.49
3MHz	1 RB mid	1732.5	16QAM	19.37	20.37
3MHz	1 RB high	1732.5	16QAM	19.08	20.08
3MHz	50%,low	1732.5	16QAM	20.71	21.71
3MHz	50% RB mid	1732.5	16QAM	18.48	19.48
3MHz	50%,high	1732.5	16QAM	20.86	21.86
3MHz	100% RB	1732.5	16QAM	18.31	19.31
3MHz	1 RB low	1753.5	QPSK	19.51	20.51

3MHz	1 RB mid	1753.5	QPSK	19.74	20.74
3MHz	1 RB high	1753.5	QPSK	20.09	21.09
3MHz	50%,low	1753.5	QPSK	19.85	20.85
3MHz	50% RB mid	1753.5	QPSK	18.44	19.44
3MHz	50%,high	1753.5	QPSK	19.99	20.99
3MHz	100% RB	1753.5	QPSK	18.24	19.24
3MHz	1 RB low	1753.5	16QAM	18.30	19.30
3MHz	1 RB mid	1753.5	16QAM	18.58	19.58
3MHz	1 RB high	1753.5	16QAM	18.77	19.77
3MHz	50%,low	1753.5	16QAM	19.69	20.69
3MHz	50% RB mid	1753.5	16QAM	17.52	18.52
3MHz	50%,high	1753.5	16QAM	19.67	20.67
3MHz	100% RB	1753.5	16QAM	17.27	18.27
5MHz	1 RB low	1712.5	QPSK	19.87	20.87
5MHz	1 RB mid	1712.5	QPSK	20.01	21.01
5MHz	1 RB high	1712.5	QPSK	20.09	21.09
5MHz	50%,low	1712.5	QPSK	18.56	19.56
5MHz	50% RB mid	1712.5	QPSK	18.60	19.60
5MHz	50%,high	1712.5	QPSK	18.75	19.75
5MHz	100% RB	1712.5	QPSK	18.64	19.64
5MHz	1 RB low	1712.5	16QAM	18.69	19.69
5MHz	1 RB mid	1712.5	16QAM	18.93	19.93
5MHz	1 RB high	1712.5	16QAM	18.96	19.96
5MHz	50%,low	1712.5	16QAM	17.40	18.40
5MHz	50% RB mid	1712.5	16QAM	17.56	18.56
5MHz	50%,high	1712.5	16QAM	17.62	18.62
5MHz	100% RB	1712.5	16QAM	17.56	18.56
5MHz	1 RB low	1732.5	QPSK	21.09	22.09
5MHz	1 RB mid	1732.5	QPSK	20.91	21.91
5MHz	1 RB high	1732.5	QPSK	20.60	21.60
5MHz	50%,low	1732.5	QPSK	19.48	20.48
5MHz	50% RB mid	1732.5	QPSK	19.48	20.48
5MHz	50%,high	1732.5	QPSK	19.35	20.35
5MHz	100% RB	1732.5	QPSK	19.43	20.43
5MHz	1 RB low	1732.5	16QAM	19.80	20.80
5MHz	1 RB mid	1732.5	16QAM	19.59	20.59
5MHz	1 RB high	1732.5	16QAM	18.88	19.88
5MHz	50%,low	1732.5	16QAM	18.49	19.49

5MHz	50% RB mid	1732.5	16QAM	18.55	19.55
5MHz	50%,high	1732.5	16QAM	18.49	19.49
5MHz	100% RB	1732.5	16QAM	18.52	19.52
5MHz	1 RB low	1752.5	QPSK	19.55	20.55
5MHz	1 RB mid	1752.5	QPSK	19.69	20.69
5MHz	1 RB high	1752.5	QPSK	20.01	21.01
5MHz	50%,low	1752.5	QPSK	18.16	19.16
5MHz	50% RB mid	1752.5	QPSK	18.28	19.28
5MHz	50%,high	1752.5	QPSK	18.43	19.43
5MHz	100% RB	1752.5	QPSK	18.24	19.24
5MHz	1 RB low	1752.5	16QAM	17.86	18.86
5MHz	1 RB mid	1752.5	16QAM	17.81	18.81
5MHz	1 RB high	1752.5	16QAM	18.51	19.51
5MHz	50%,low	1752.5	16QAM	17.27	18.27
5MHz	50% RB mid	1752.5	16QAM	17.36	18.36
5MHz	50%,high	1752.5	16QAM	17.31	18.31
5MHz	100% RB	1752.5	16QAM	17.38	18.38
10MHz	1 RB low	1715	QPSK	19.94	20.94
10MHz	1 RB mid	1715	QPSK	20.53	21.53
10MHz	1 RB high	1715	QPSK	20.60	21.60
10MHz	50%,low	1715	QPSK	18.66	19.66
10MHz	50% RB mid	1715	QPSK	18.83	19.83
10MHz	50%,high	1715	QPSK	18.92	19.92
10MHz	100% RB	1715	QPSK	18.82	19.82
10MHz	1 RB low	1732.5	QPSK	21.04	22.04
10MHz	1 RB mid	1732.5	QPSK	21.06	22.06
10MHz	1 RB high	1732.5	QPSK	20.25	21.25
10MHz	50%,low	1732.5	QPSK	19.45	20.45
10MHz	50% RB mid	1732.5	QPSK	19.37	20.37
10MHz	50%,high	1732.5	QPSK	19.13	20.13
10MHz	100% RB	1732.5	QPSK	19.30	20.30
10MHz	1 RB low	1750	QPSK	19.36	20.36
10MHz	1 RB mid	1750	QPSK	19.49	20.49
10MHz	1 RB high	1750	QPSK	19.88	20.88
10MHz	50%,low	1750	QPSK	17.96	18.96
10MHz	50% RB mid	1750	QPSK	18.11	19.11
10MHz	50%,high	1750	QPSK	18.26	19.26
10MHz	100% RB	1750	QPSK	18.10	19.10

15MHz	1 RB low	1717.5	QPSK	20.02	21.02
15MHz	1 RB mid	1717.5	QPSK	20.67	21.67
15MHz	1 RB high	1717.5	QPSK	21.11	22.11
15MHz	50%,low	1717.5	QPSK	18.69	19.69
15MHz	50% RB mid	1717.5	QPSK	19.06	20.06
15MHz	50%,high	1717.5	QPSK	19.24	20.24
15MHz	100% RB	1717.5	QPSK	18.91	19.91
15MHz	1 RB low	1732.5	QPSK	20.78	21.78
15MHz	1 RB mid	1732.5	QPSK	20.81	21.81
15MHz	1 RB high	1732.5	QPSK	19.72	20.72
15MHz	50%,low	1732.5	QPSK	19.47	20.47
15MHz	50% RB mid	1732.5	QPSK	19.35	20.35
15MHz	50%,high	1732.5	QPSK	18.93	19.93
15MHz	100% RB	1732.5	QPSK	19.30	20.30
15MHz	1 RB low	1747.5	QPSK	19.66	20.66
15MHz	1 RB mid	1747.5	QPSK	19.48	20.48
15MHz	1 RB high	1747.5	QPSK	20.01	21.01
15MHz	50%,low	1747.5	QPSK	18.06	19.06
15MHz	50% RB mid	1747.5	QPSK	18.10	19.10
15MHz	50%,high	1747.5	QPSK	18.16	19.16
15MHz	100% RB	1747.5	QPSK	18.02	19.02
20MHz	1 RB low	1720	QPSK	19.95	20.95
20MHz	1 RB mid	1720	QPSK	20.95	21.95
20MHz	1 RB high	1720	QPSK	21.27	22.27
20MHz	50%,low	1720	QPSK	18.72	19.72
20MHz	50% RB mid	1720	QPSK	19.14	20.14
20MHz	50%,high	1720	QPSK	19.54	20.54
20MHz	100% RB	1720	QPSK	19.15	20.15
20MHz	1 RB low	1732.5	QPSK	20.94	21.94
20MHz	1 RB mid	1732.5	QPSK	21.06	22.06
20MHz	1 RB high	1732.5	QPSK	19.53	20.53
20MHz	50%,low	1732.5	QPSK	19.46	20.46
20MHz	50% RB mid	1732.5	QPSK	19.33	20.33
20MHz	50%,high	1732.5	QPSK	18.84	19.84
20MHz	100% RB	1732.5	QPSK	19.21	20.21
20MHz	1 RB low	1745	QPSK	20.46	21.46
20MHz	1 RB mid	1745	QPSK	19.58	20.58
20MHz	1 RB high	1745	QPSK	20.07	21.07

20MHz	50%,low	1745	QPSK	18.35	19.35
20MHz	50% RB mid	1745	QPSK	18.05	19.05
20MHz	50%,high	1745	QPSK	17.98	18.98
20MHz	100% RB	1745	QPSK	18.23	19.23

6.3.2 LTE Band 13 result

LTE Band 13

Limits 34.8dBm(3w)

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm)	ERP (dBm) Max ERP:20.41
5MHz	1 RB low	779.5	QPSK	23.29	20.14
5MHz	1 RB mid	779.5	QPSK	23.02	19.87
5MHz	1 RB high	779.5	QPSK	23.29	20.14
5MHz	50%,low	779.5	QPSK	22.46	19.31
5MHz	50% RB mid	779.5	QPSK	22.47	19.32
5MHz	50%,high	779.5	QPSK	22.43	19.28
5MHz	100% RB	779.5	QPSK	22.38	19.23
5MHz	1 RB low	779.5	16QAM	22.76	19.61
5MHz	1 RB mid	779.5	16QAM	22.54	19.39
5MHz	1 RB high	779.5	16QAM	22.51	19.36
5MHz	50%,low	779.5	16QAM	21.07	17.92
5MHz	50% RB mid	779.5	16QAM	21.21	18.06
5MHz	50%,high	779.5	16QAM	21.19	18.04
5MHz	100% RB	779.5	16QAM	21.42	18.27
5MHz	1 RB low	782	QPSK	23.05	19.90
5MHz	1 RB mid	782	QPSK	23.17	20.02
5MHz	1 RB high	782	QPSK	23.04	19.89
5MHz	50%,low	782	QPSK	22.28	19.13
5MHz	50% RB mid	782	QPSK	22.42	19.27
5MHz	50%,high	782	QPSK	22.37	19.22
5MHz	100% RB	782	QPSK	22.32	19.17
5MHz	1 RB low	782	16QAM	22.02	18.87
5MHz	1 RB mid	782	16QAM	22.38	19.23
5MHz	1 RB high	782	16QAM	22.16	19.01
5MHz	50%,low	782	16QAM	21.53	18.38
5MHz	50% RB mid	782	16QAM	21.55	18.40
5MHz	50%,high	782	16QAM	21.17	18.02
5MHz	100% RB	782	16QAM	21.28	18.13
5MHz	1 RB low	784.5	QPSK	23.17	20.02
5MHz	1 RB mid	784.5	QPSK	23.37	20.22
5MHz	1 RB high	784.5	QPSK	23.02	19.87
5MHz	50%,low	784.5	QPSK	22.31	19.16
5MHz	50% RB mid	784.5	QPSK	22.23	19.08

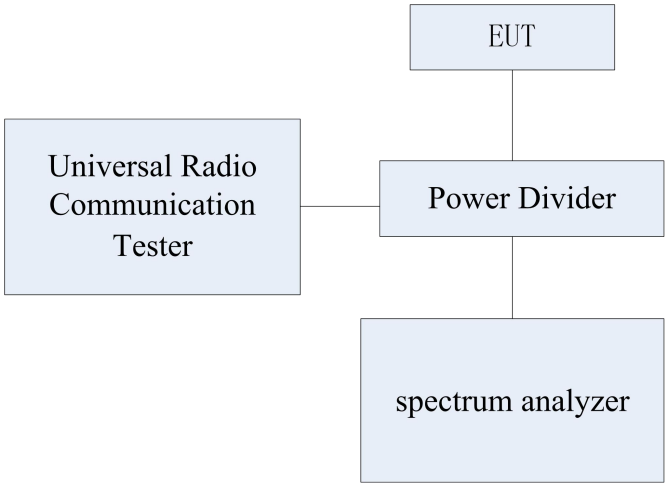
5MHz	50%,high	784.5	QPSK	22.05	18.90
5MHz	100% RB	784.5	QPSK	22.21	19.06
5MHz	1 RB low	784.5	16QAM	22.16	19.01
5MHz	1 RB mid	784.5	16QAM	21.87	18.72
5MHz	1 RB high	784.5	16QAM	21.83	18.68
5MHz	50%,low	784.5	16QAM	21.36	18.21
5MHz	50% RB mid	784.5	16QAM	21.20	18.05
5MHz	50%,high	784.5	16QAM	21.09	17.94
5MHz	100% RB	784.5	16QAM	21.14	17.99
10MHz	1 RB low	782	QPSK	23.35	20.20
10MHz	1 RB mid	782	QPSK	23.56	20.41
10MHz	1 RB high	782	QPSK	22.98	19.83
10MHz	50%,low	782	QPSK	22.51	19.36
10MHz	50% RB mid	782	QPSK	22.39	19.24
10MHz	50%,high	782	QPSK	22.37	19.22
10MHz	100% RB	782	QPSK	22.42	19.27

6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	70.04 Hz (k=2)

Test Method

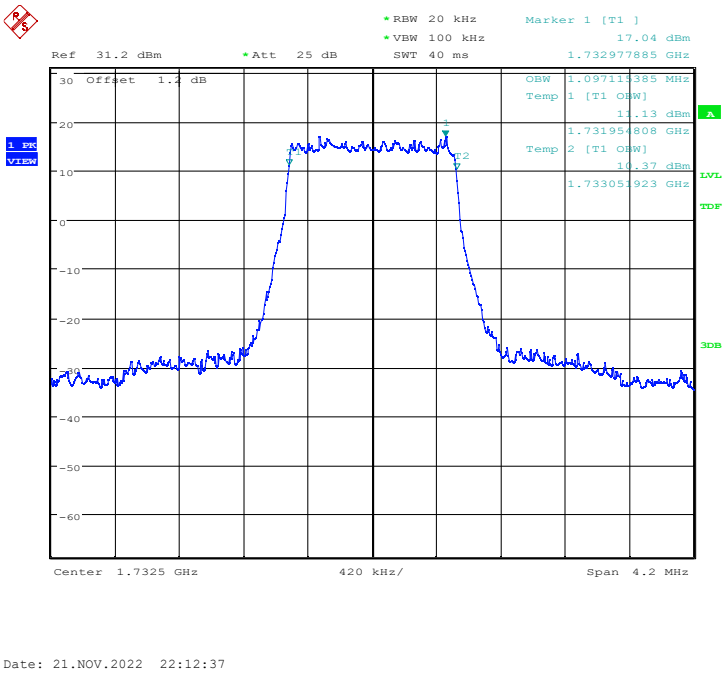
The 99% occupied Bandwidth was calculated from the spectrum analyzer. Markers in the spectrum analyzer were then placed between the calculated frequencies to show the calculated 99% power Band. The 26dB Bandwidth was also measured and recorded.

Note: --

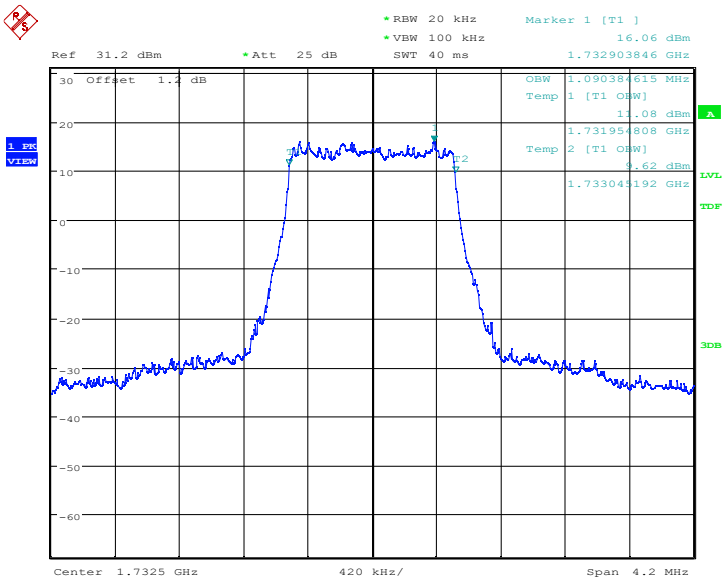
LTE band 4,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1732.5	1.097	1.090
1710.7	1.090	1.090
1754.3	1.090	1.097

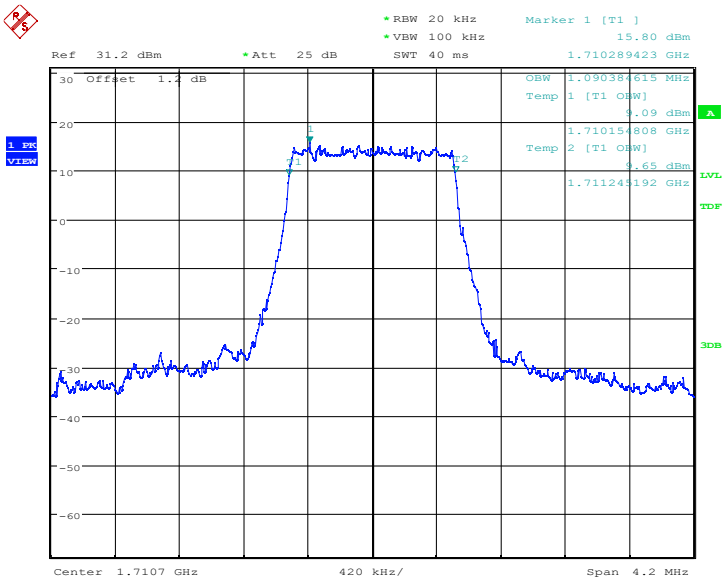
LTE band 4 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



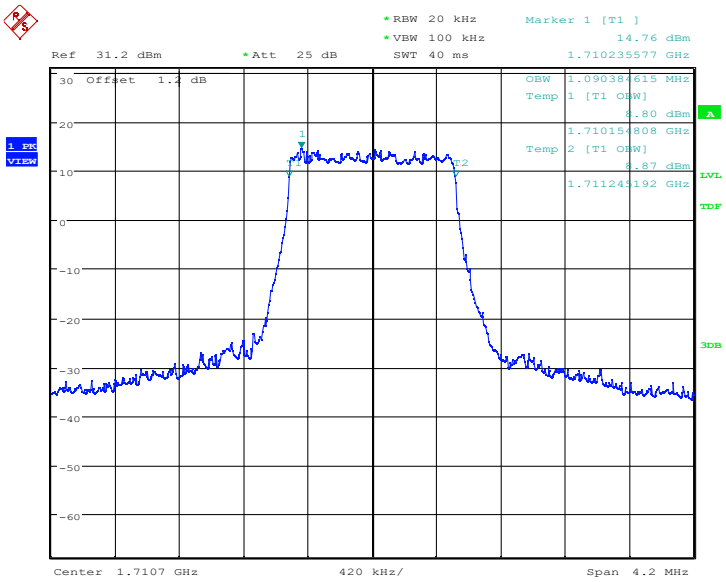
LTE band 4 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



LTE band 4 , 1.4MHz Bandwidth,LOW,QPSK (99% BW)

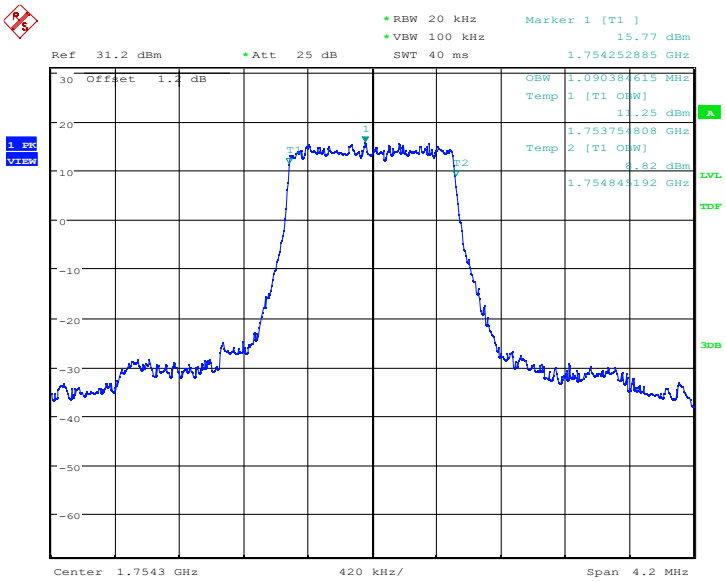


LTE band 4 , 1.4MHz Bandwidth,LOW,16QAM (99% BW)



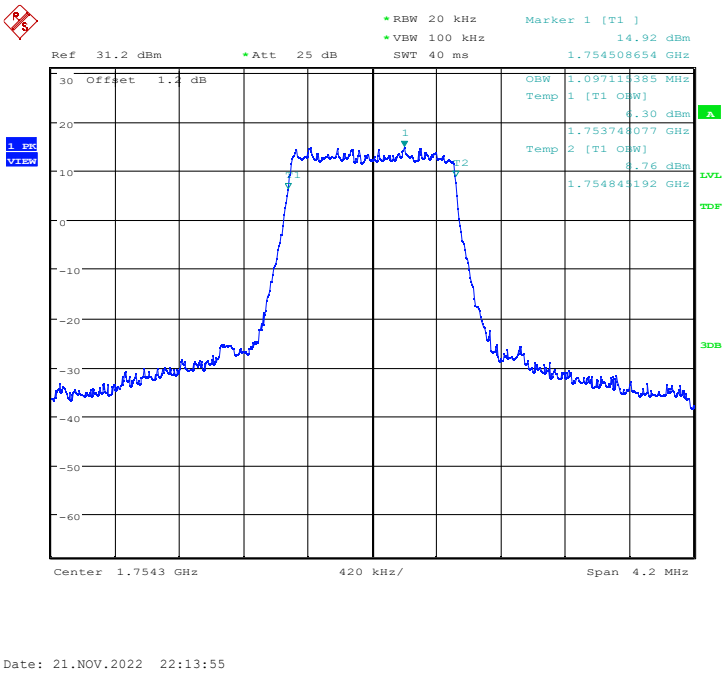
Date: 21.NOV.2022 22:12:11

LTE band 4 , 1.4MHz Bandwidth,HIGH,QPSK (99% BW)



Date: 21.NOV.2022 22:13:29

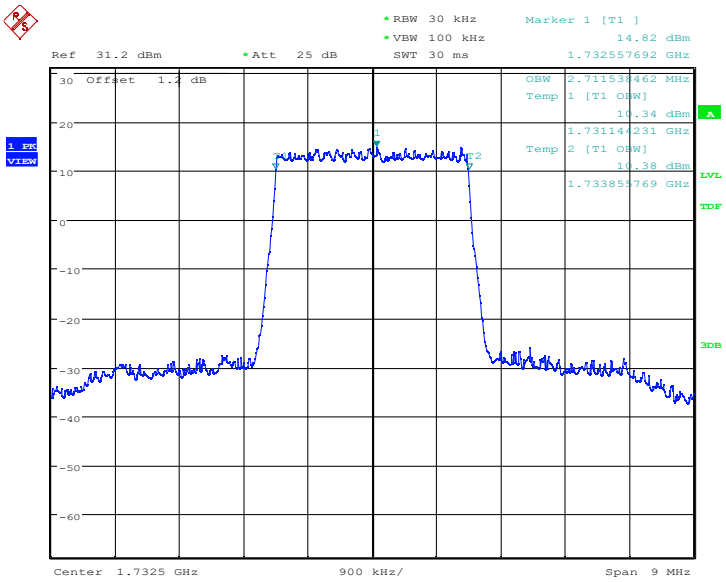
LTE band 4 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



LTE band 4,3MHz(99%)

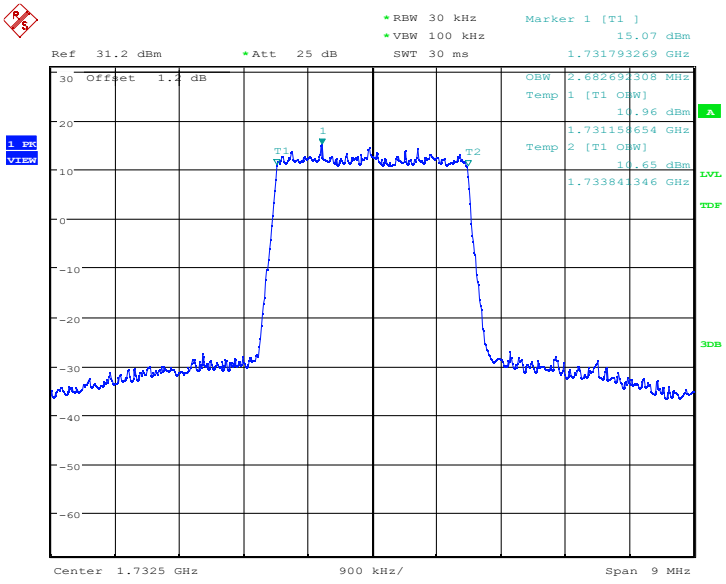
Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1732.5	2.712	2.683
1711.5	2.697	2.683
1753.5	2.683	2.697

LTE band 4 , 3MHz Bandwidth,MID,QPSK (99% BW)



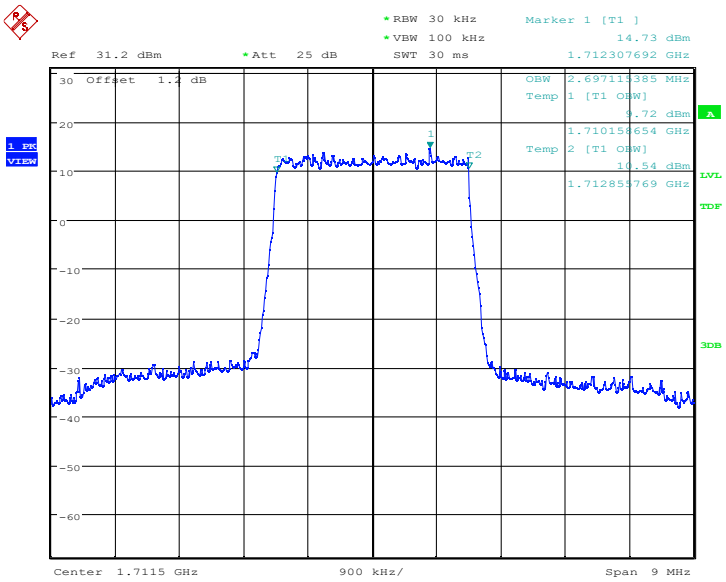
Date: 21.NOV.2022 22:16:09

LTE band 4 , 3MHz Bandwidth,MID,16QAM (99% BW)



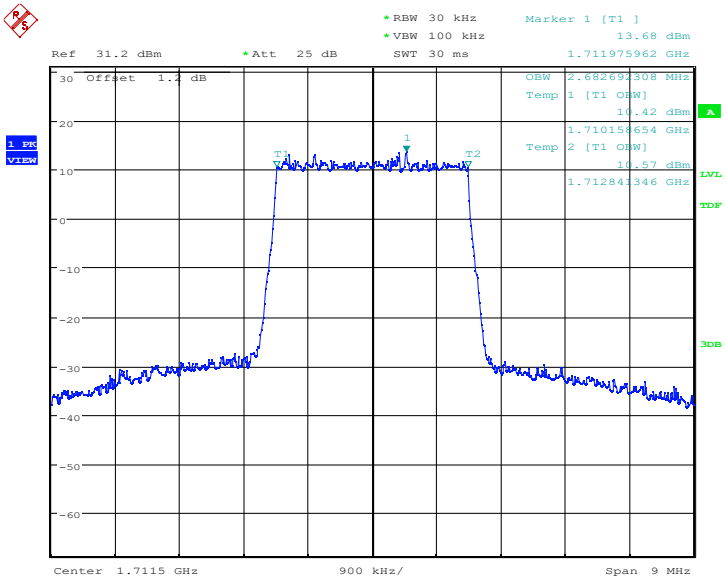
Date: 21.NOV.2022 22:16:33

LTE band 4 , 3MHz Bandwidth,LOW,QPSK (99% BW)



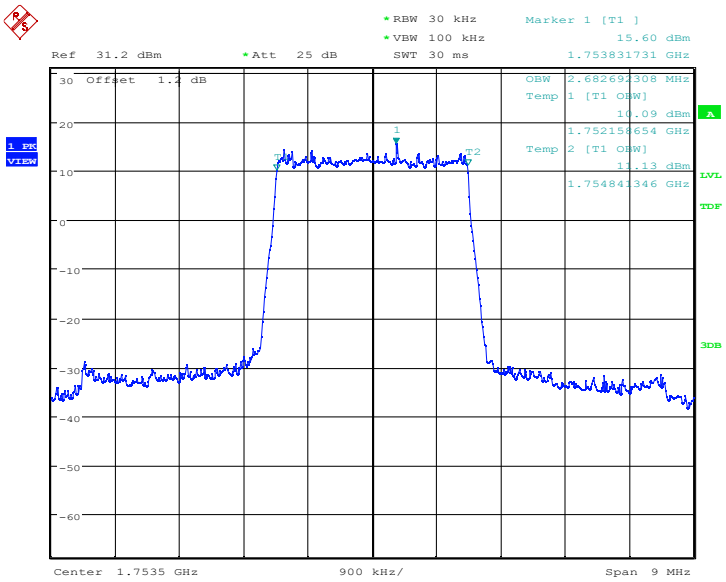
Date: 21.NOV.2022 22:15:13

LTE band 4 , 3MHz Bandwidth,LOW,16QAM (99% BW)



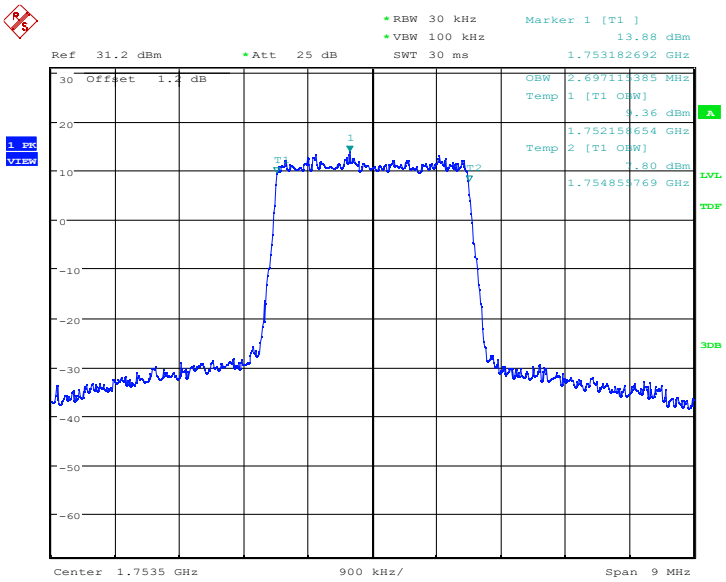
Date: 21.NOV.2022 22:15:41

LTE band 4 , 3MHz Bandwidth,HIGH,QPSK (99% BW)



Date: 21.NOV.2022 22:17:05

LTE band 4 , 3MHz Bandwidth,HIGH,16QAM (99% BW)



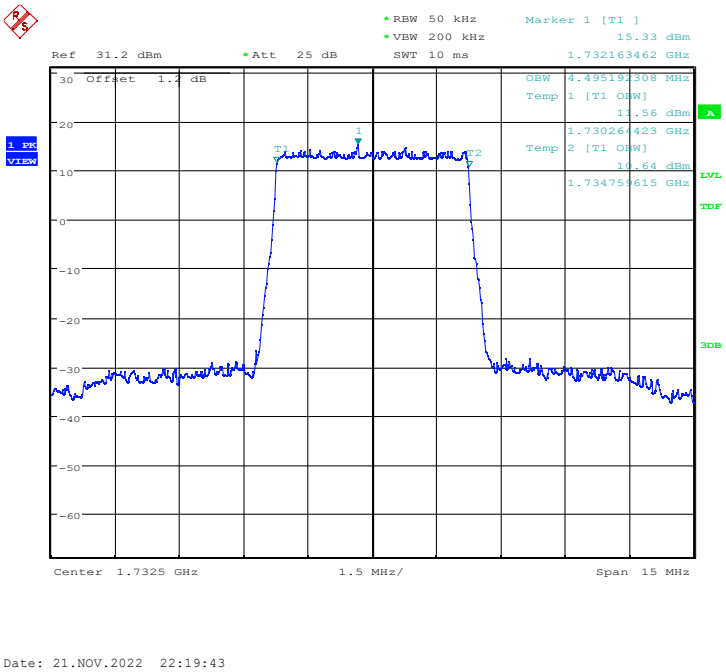
Date: 21.NOV.2022 22:17:33

LTE band 4,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM

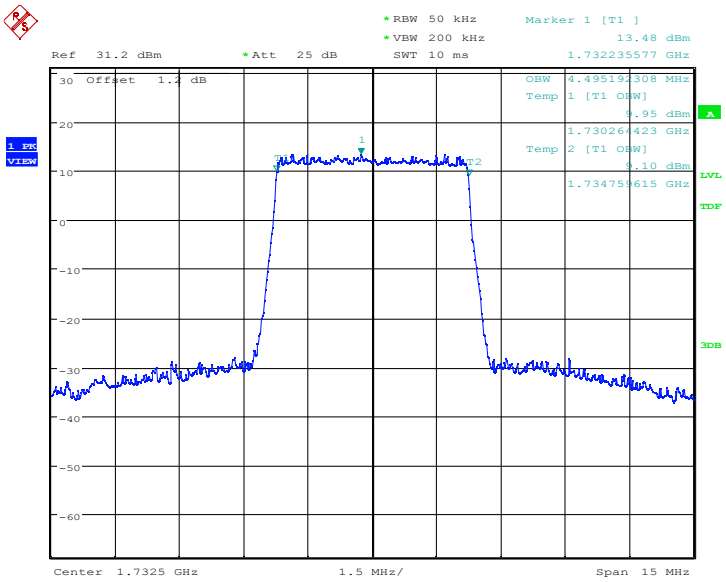
1732.5	4.495	4.495
1712.5	4.495	4.495
1752.5	4.495	4.495

LTE band 4 , 5MHz Bandwidth,MID,QPSK (99% BW)

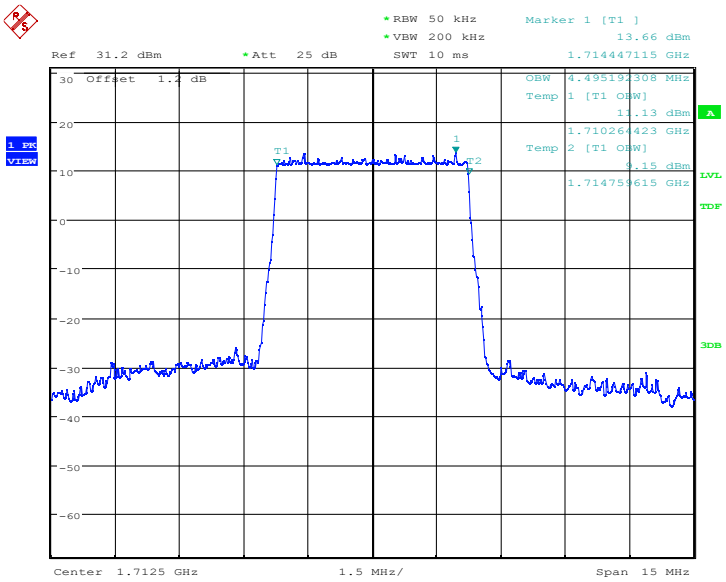


Date: 21.NOV.2022 22:19:43

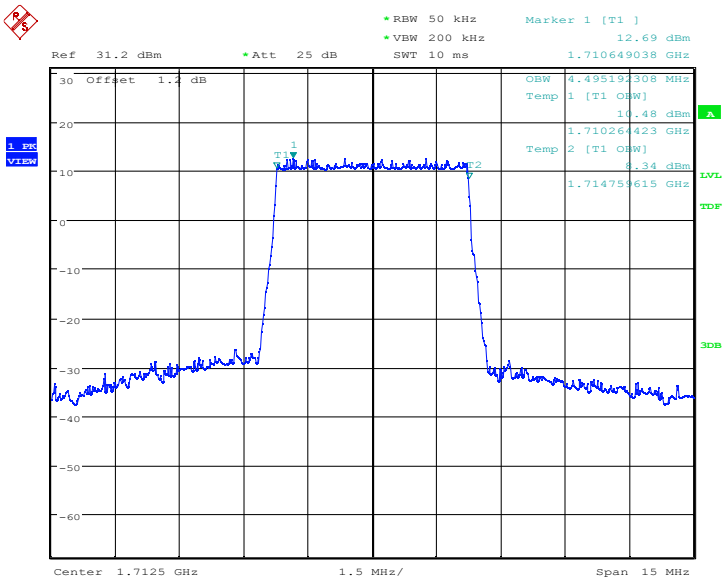
LTE band 4 , 5MHz Bandwidth,MID,16QAM (99% BW)



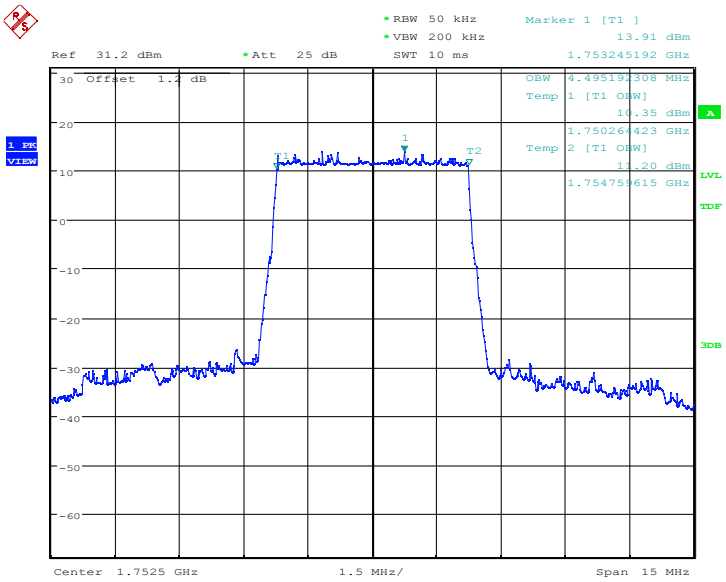
LTE band 4 , 5MHz Bandwidth,LOW,QPSK (99% BW)



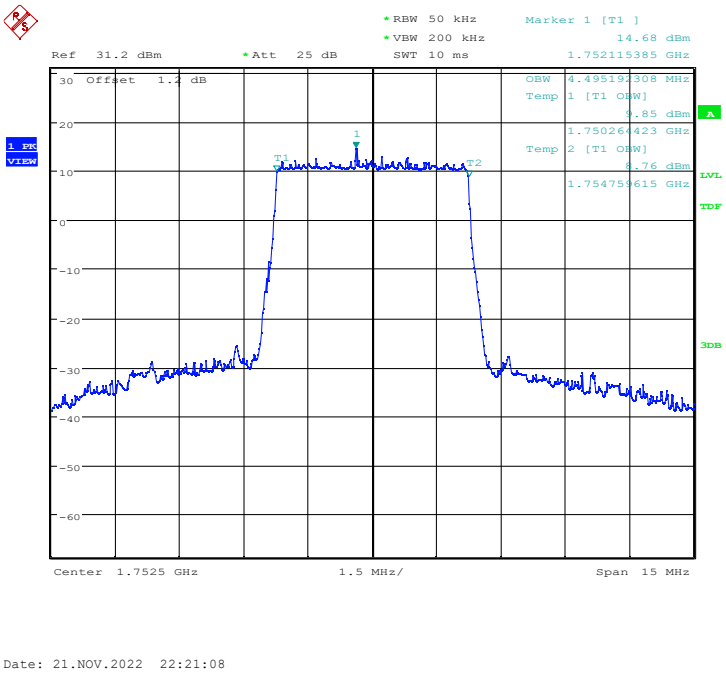
LTE band 4 , 5MHz Bandwidth,LOW,16QAM (99% BW)



LTE band 4 , 5MHz Bandwidth,HIGH,QPSK (99% BW)



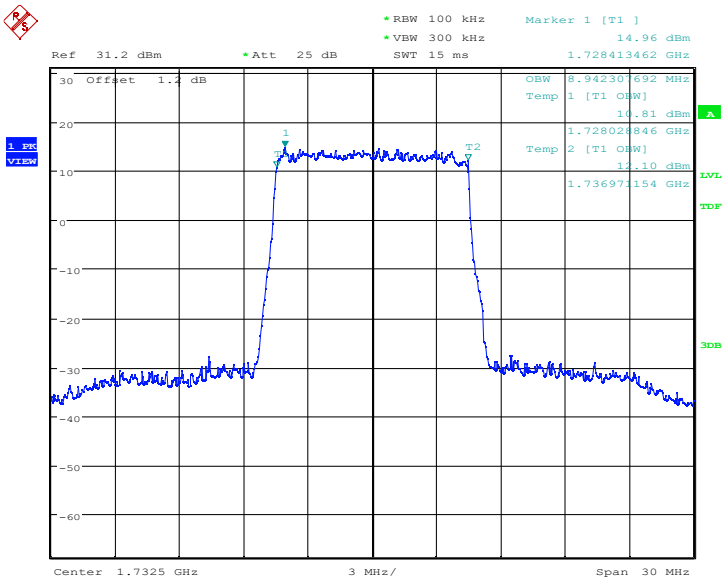
LTE band 4 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



LTE band 4,10MHz(99%)

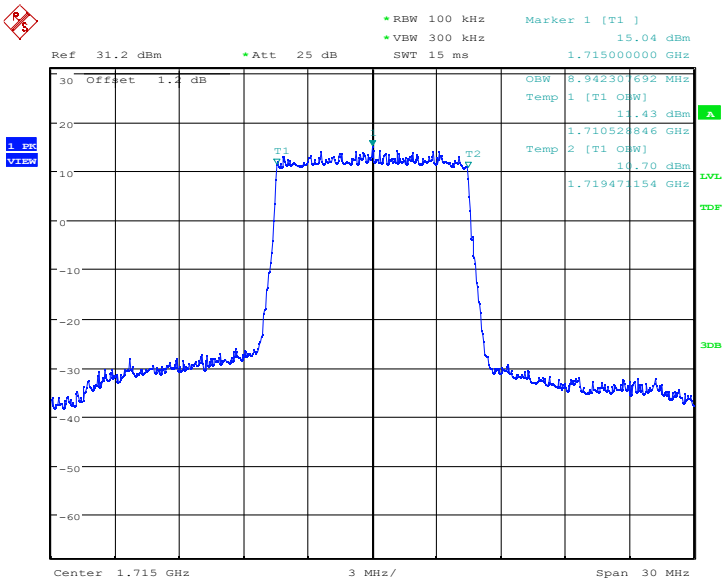
Frequency (MHz)	Occupied Bandwidth (99%)(MHz)
	QPSK
1732.5	8.942
1715	8.942
1750	8.942

LTE band 4 , 10MHz Bandwidth,MID,QPSK (99% BW)



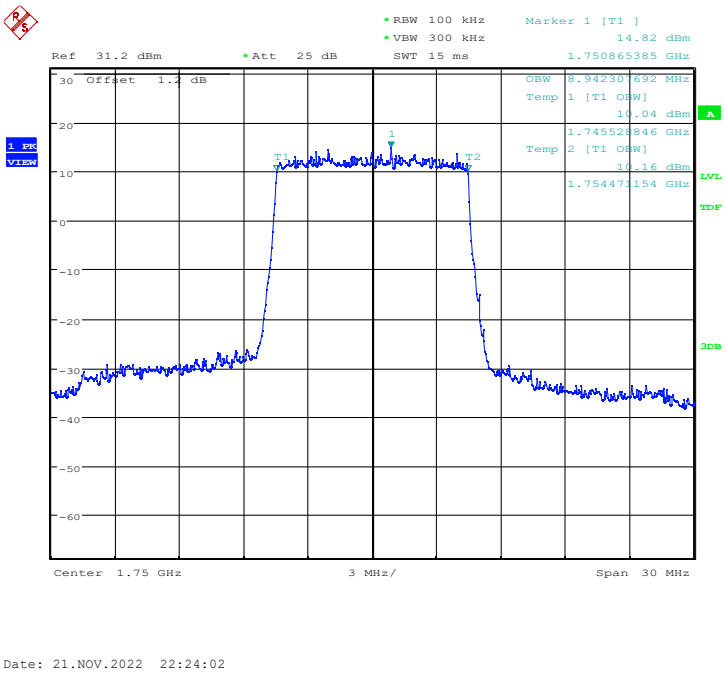
Date: 21.NOV.2022 22:23:15

LTE band 4 , 10MHz Bandwidth,LOW,QPSK (99% BW)



Date: 21.NOV.2022 22:22:24

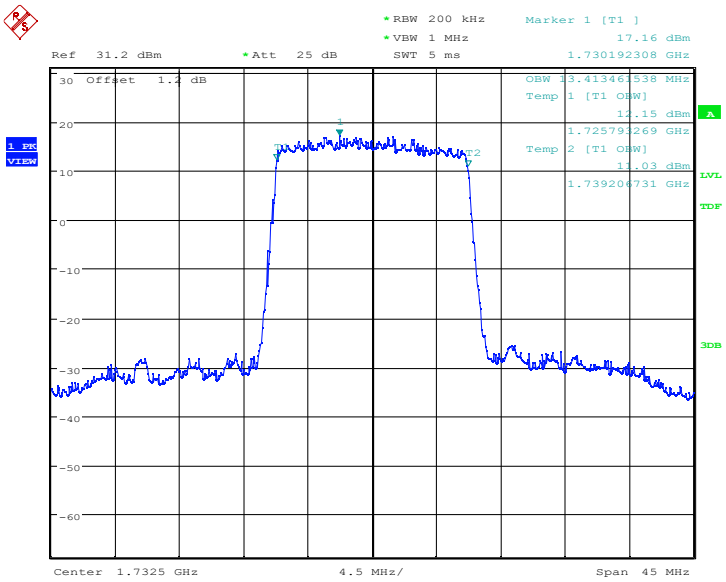
LTE band 4 , 10MHz Bandwidth,HIGH,QPSK (99% BW)



LTE band 4,15MHz(99%)

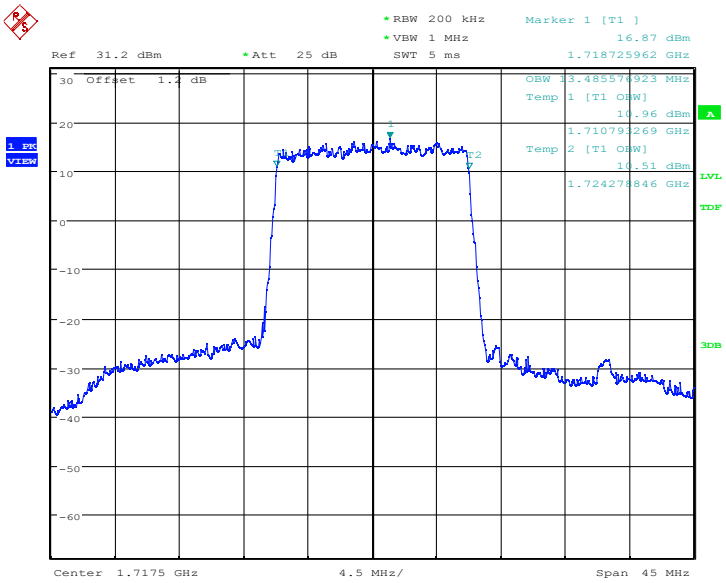
Frequency (MHz)	Occupied Bandwidth (99%)(MHz)
	QPSK
1732.5	13.413
1717.5	13.486
1747.5	13.486

LTE band 4 , 15MHz Bandwidth,MID,QPSK (99% BW)



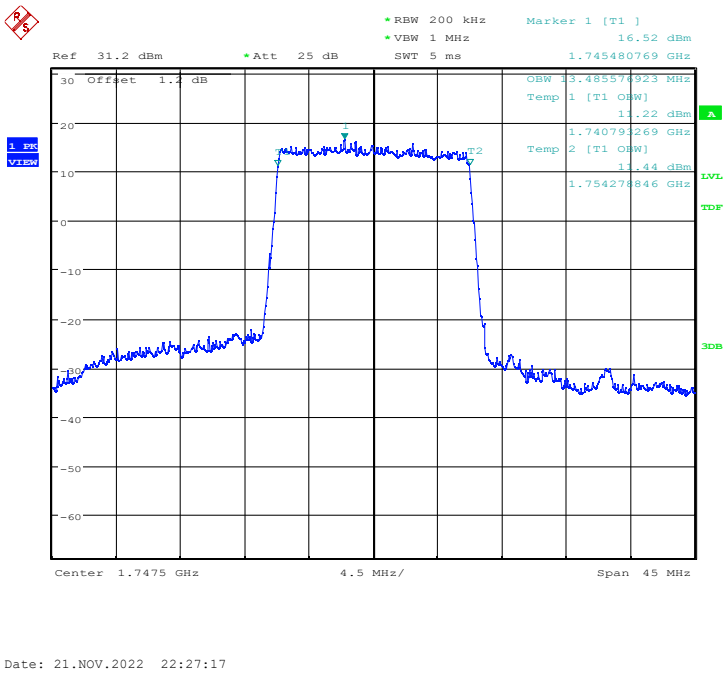
Date: 21.NOV.2022 22:26:26

LTE band 4 , 15MHz Bandwidth,LOW,QPSK (99% BW)



Date: 21.NOV.2022 22:25:38

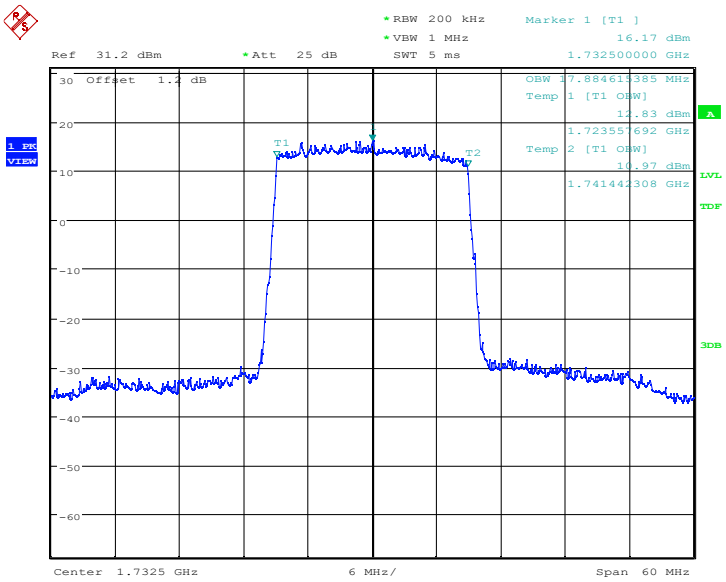
LTE band 4 , 15MHz Bandwidth,HIGH,QPSK (99% BW)



LTE band 4,20MHz(99%)

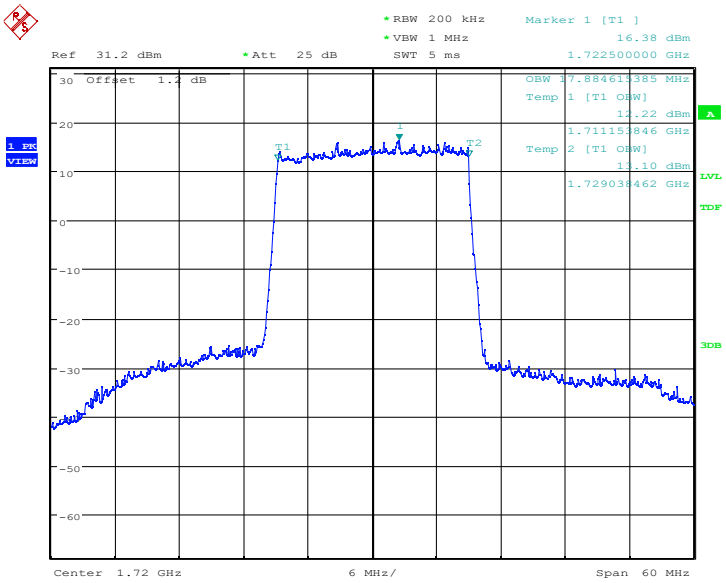
Frequency (MHz)	Occupied Bandwidth (99%)(MHz)
	QPSK
1732.5	17.885
1720	17.885
1745	17.885

LTE band 4 , 20MHz Bandwidth,MID,QPSK (99% BW)



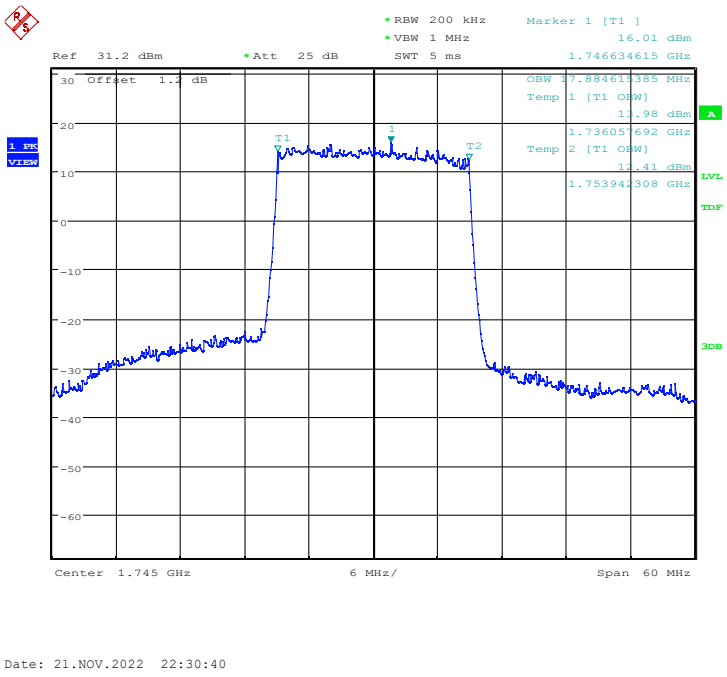
Date: 21.NOV.2022 22:29:46

LTE band 4 , 20MHz Bandwidth,LOW,QPSK (99% BW)



Date: 21.NOV.2022 22:28:55

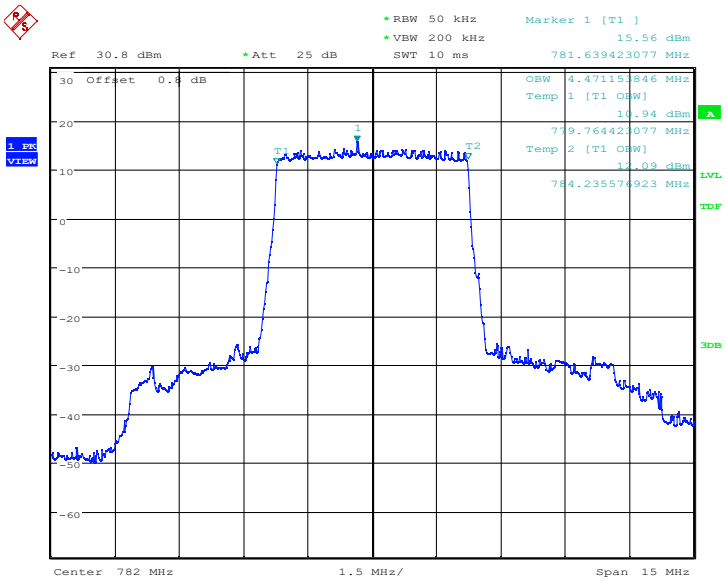
LTE band 4 , 20MHz Bandwidth,HIGH,QPSK (99% BW)



LTE band 13,5MHz(99%)

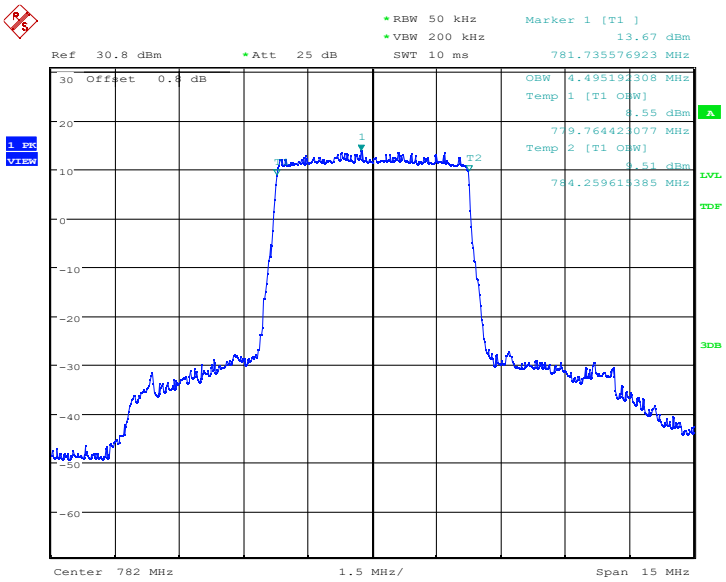
Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
782	4.471	4.495
779.5	4.495	4.471
784.5	4.495	4.495

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



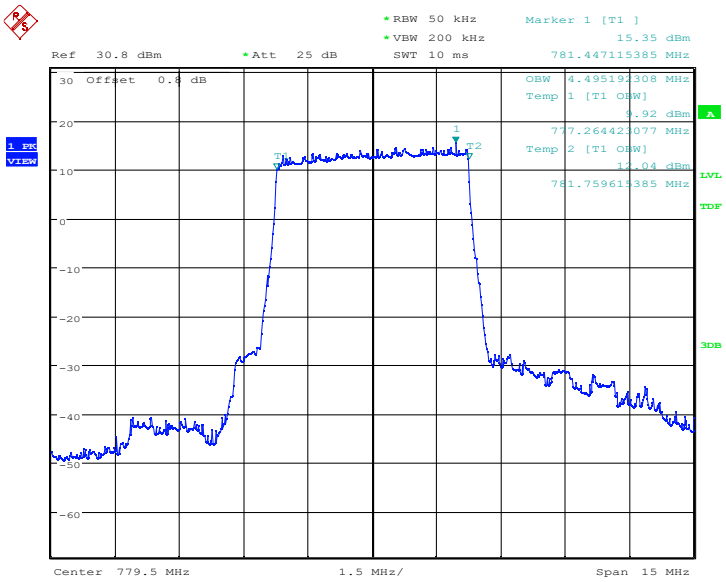
Date: 21.NOV.2022 22:51:39

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

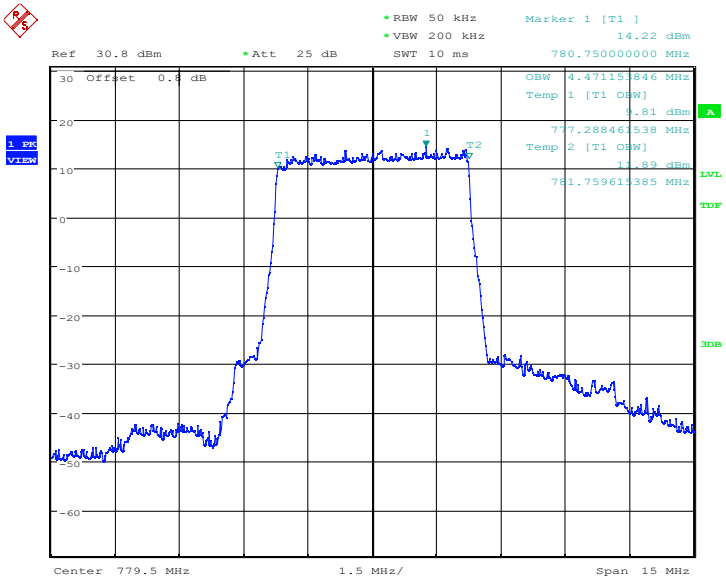


Date: 21.NOV.2022 22:52:03

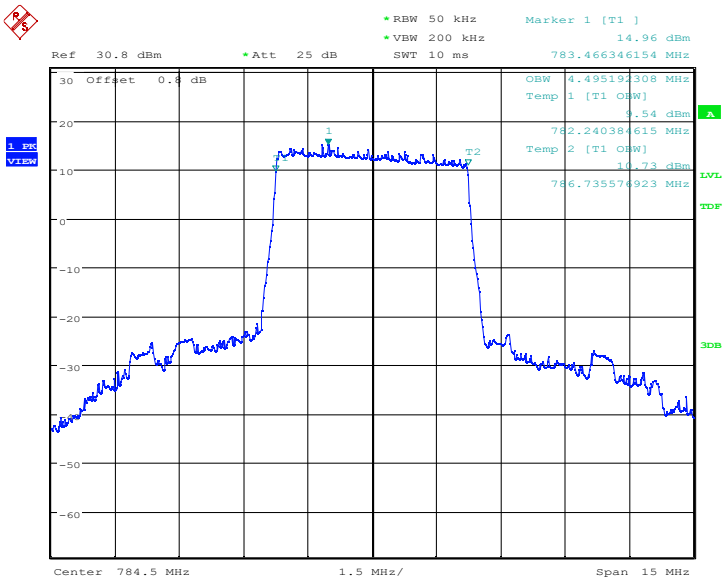
LTE band 13 , 5MHz Bandwidth,LOW,QPSK (99% BW)



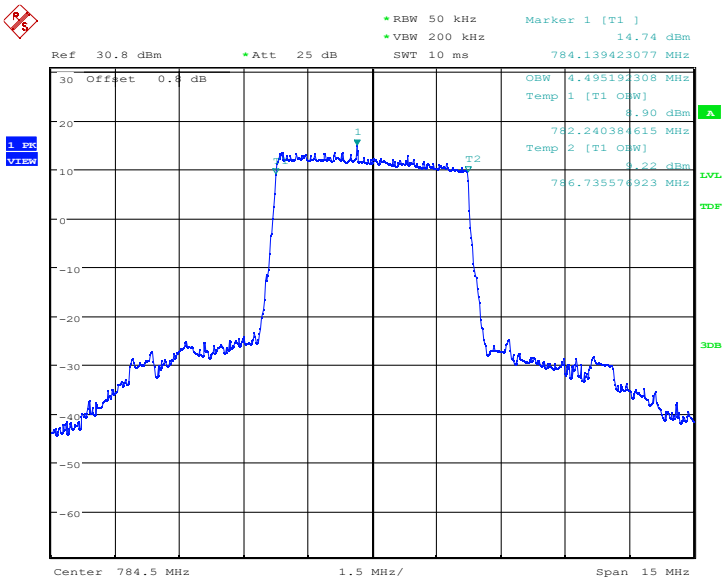
LTE band 13 , 5MHz Bandwidth,LOW,16QAM (99% BW)



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



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

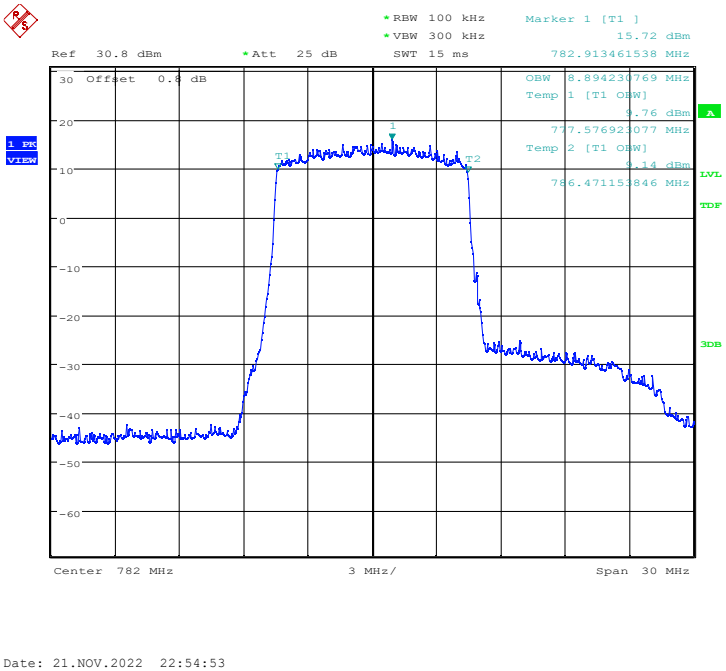


LTE band 13,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)
	QPSK

782	8.894

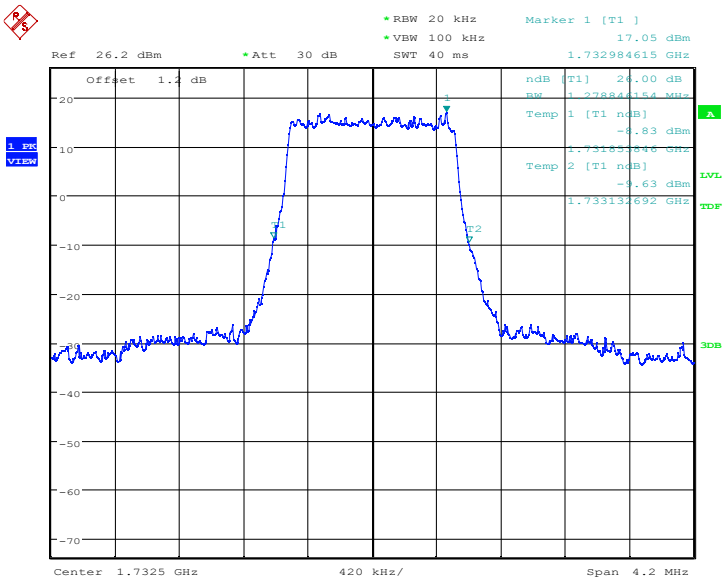
LTE band 13 , 10MHz Bandwidth,MID,QPSK (99% BW)



LTE band 4,1.4MHz(-26dBc)

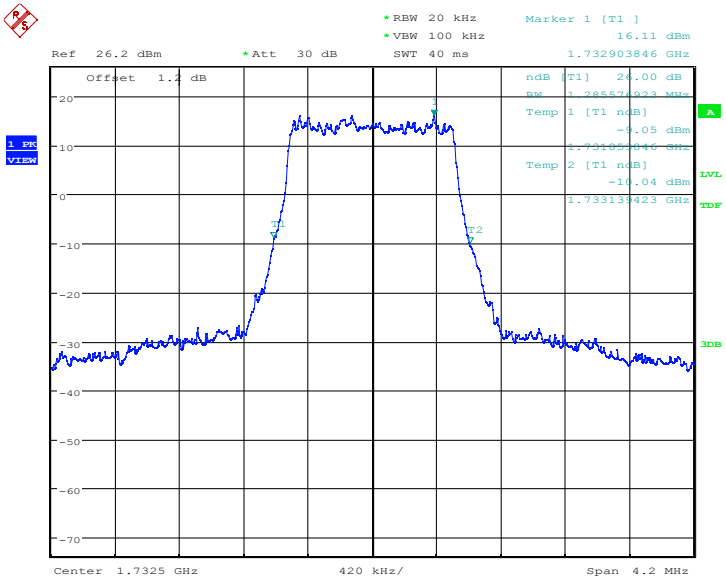
Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1732.5	1.279	1.286
1710.7	1.286	1.272
1754.3	1.286	1.299

LTE band 4 , 1.4MHz Bandwidth,MID,QPSK



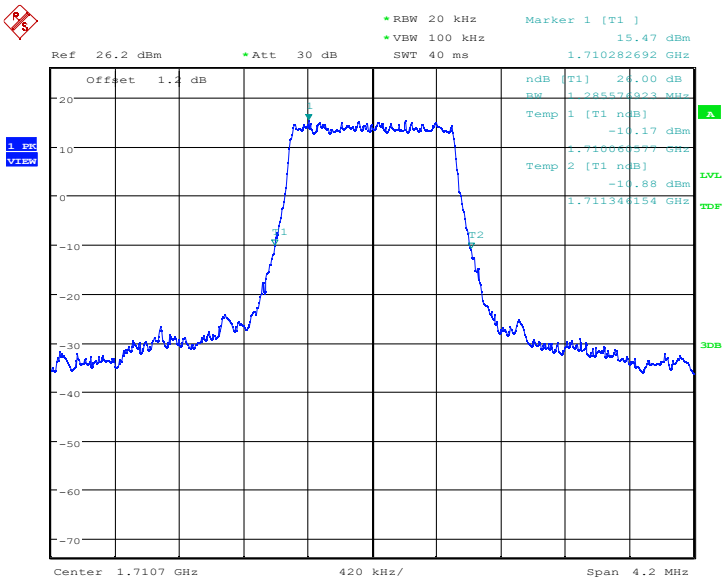
Date: 21.NOV.2022 22:57:43

LTE band 4 , 1.4MHz Bandwidth,MID,16QAM



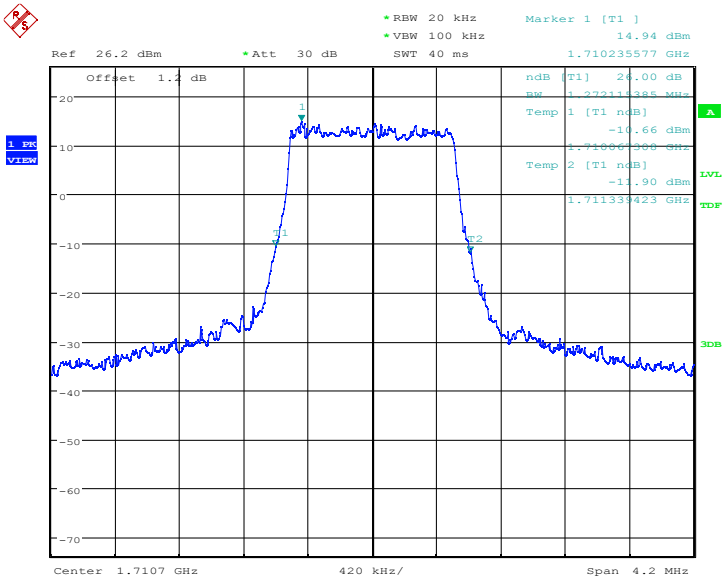
Date: 21.NOV.2022 22:58:07

LTE band 4 , 1.4MHz Bandwidth,LOW,QPSK



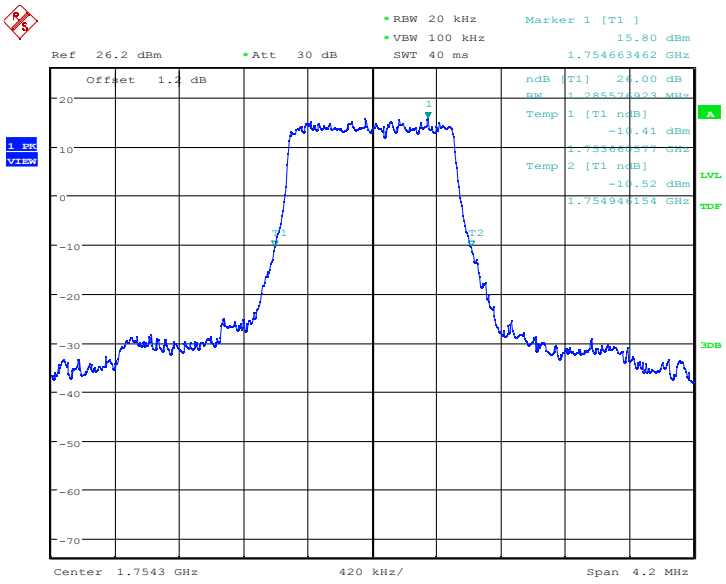
Date: 21.NOV.2022 22:56:46

LTE band 4 , 1.4MHz Bandwidth,LOW,16QAM

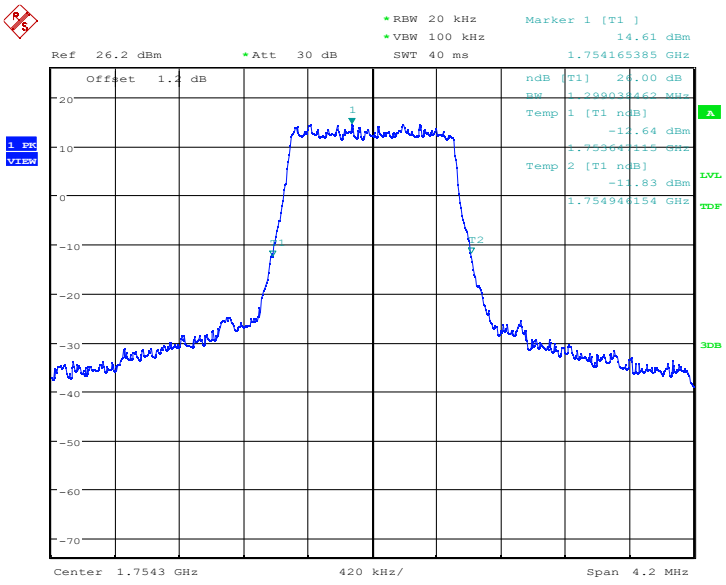


Date: 21.NOV.2022 22:57:16

LTE band 4 , 1.4MHz Bandwidth,HIGH,QPSK



LTE band 4 , 1.4MHz Bandwidth,HIGH,16QAM

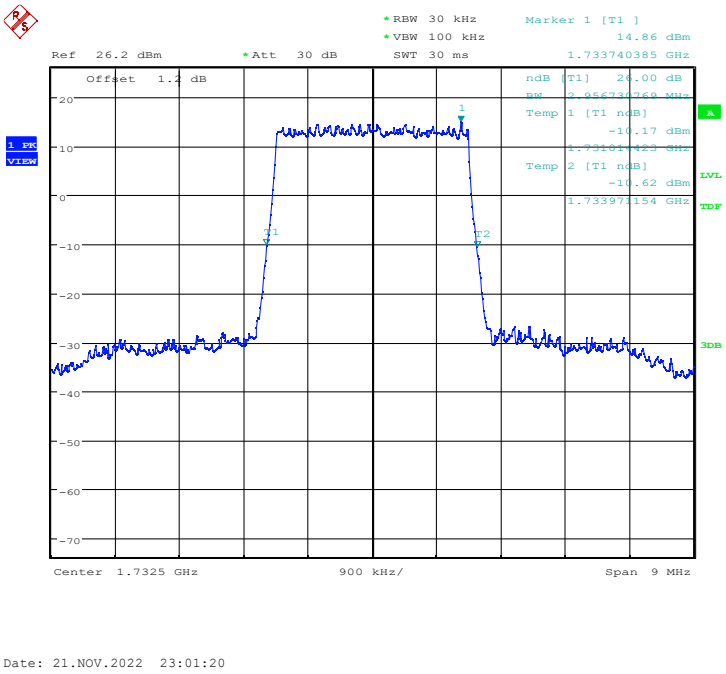


LTE band 4,3MHz(-26dBc)

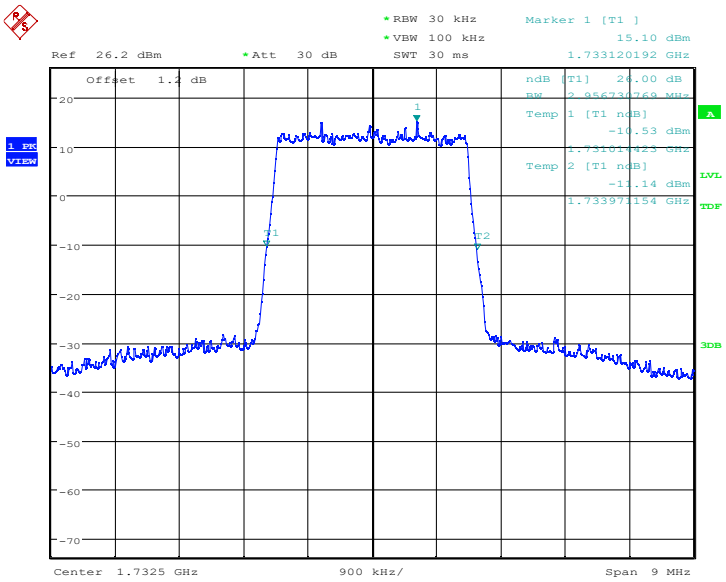
Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM

1732.5	2.957	2.957
1711.5	2.942	2.957
1753.5	2.957	2.971

LTE band 4 , 3MHz Bandwidth,MID,QPSK

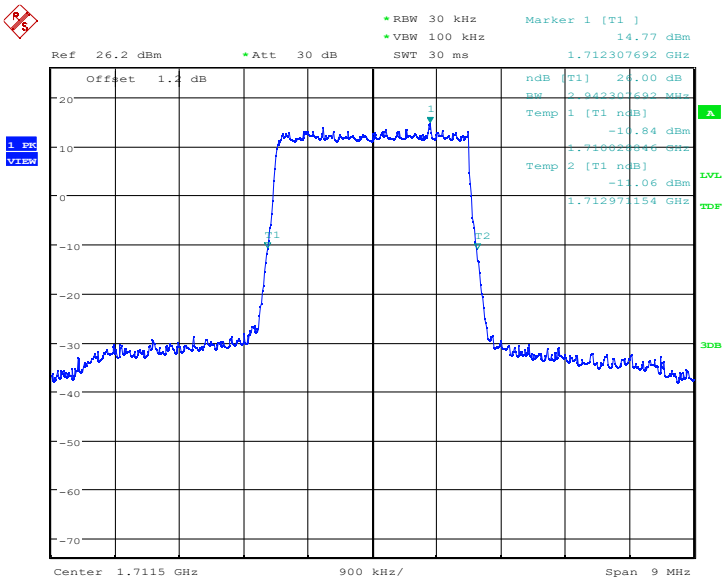


LTE band 4 , 3MHz Bandwidth,MID,16QAM



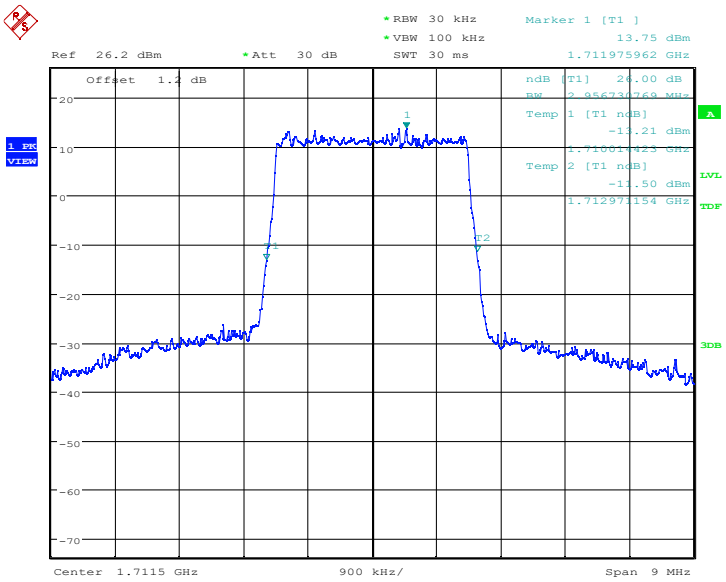
Date: 21.NOV.2022 23:01:42

LTE band 4 , 3MHz Bandwidth,LOW,QPSK

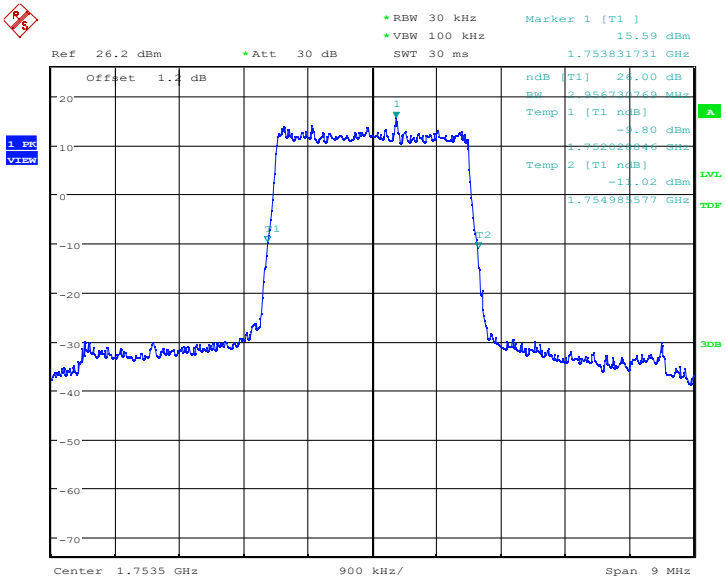


Date: 21.NOV.2022 23:00:16

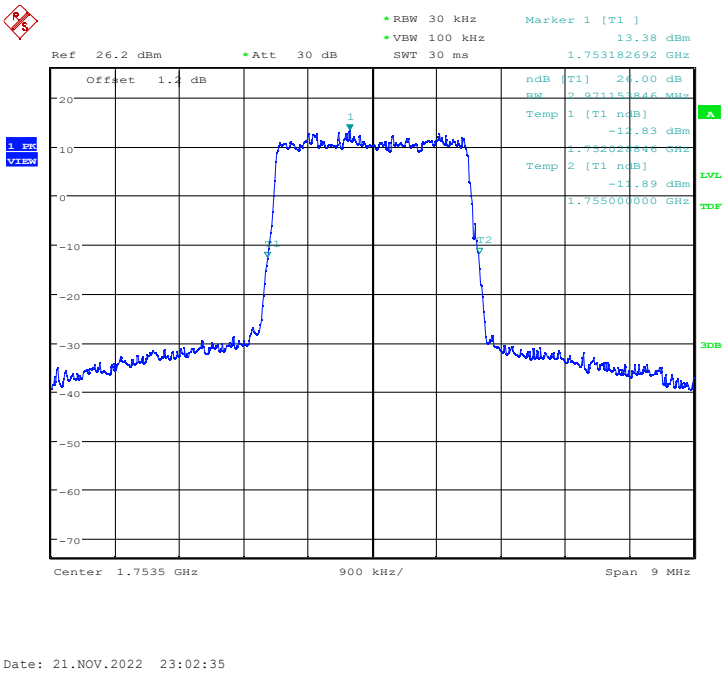
LTE band 4 , 3MHz Bandwidth,LOW,16QAM



LTE band 4 , 3MHz Bandwidth,HIGH,QPSK



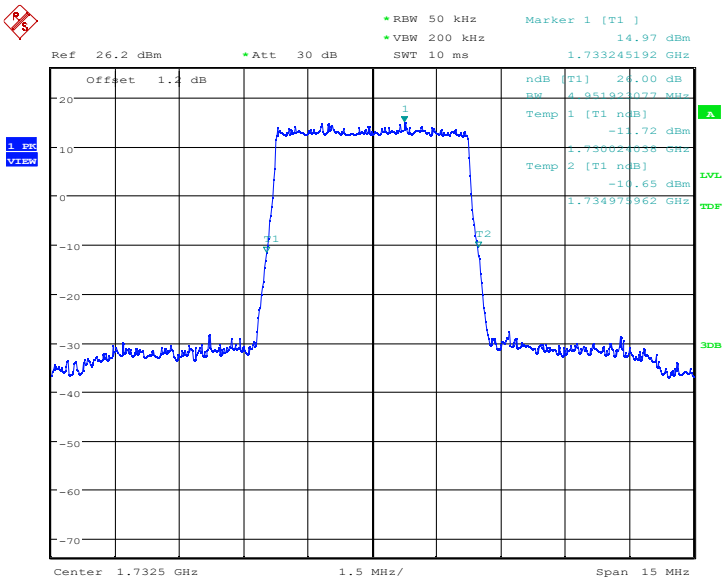
LTE band 4 , 3MHz Bandwidth,HIGH,16QAM



LTE band 4,5MHz(-26dBc)

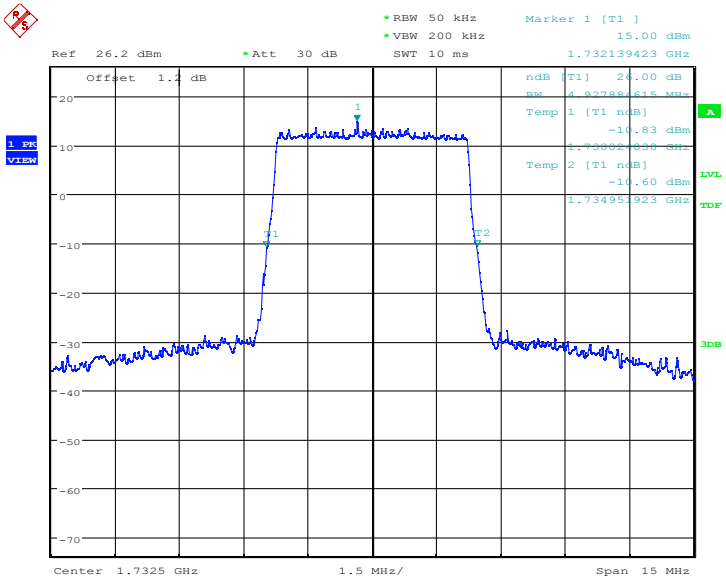
Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1732.5	4.952	4.928
1712.5	4.904	4.976
1752.5	4.952	4.952

LTE band 4 , 5MHz Bandwidth,MID,QPSK



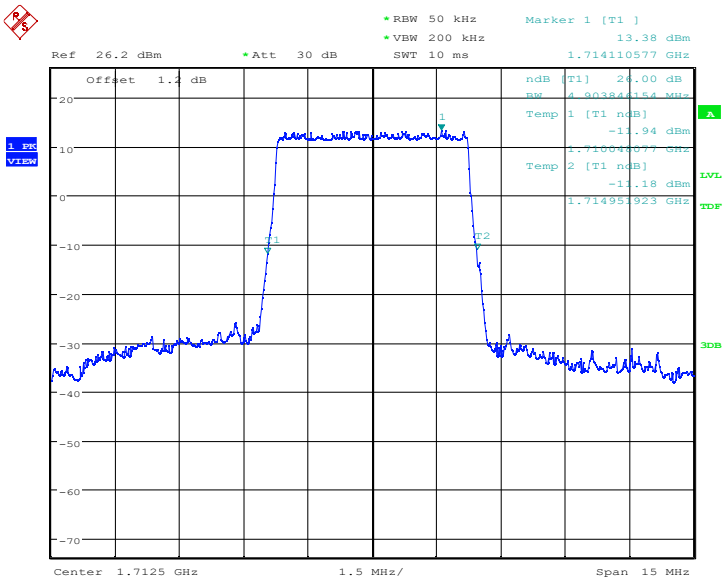
Date: 21.NOV.2022 23:04:49

LTE band 4 , 5MHz Bandwidth,MID,16QAM



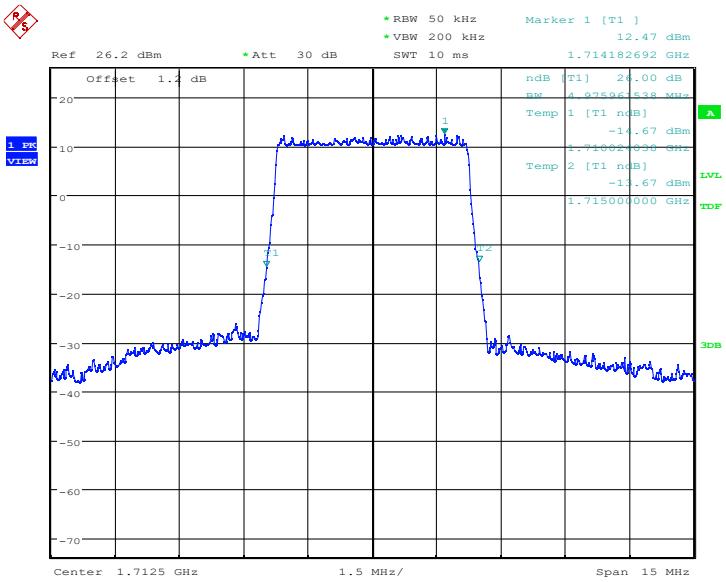
Date: 21.NOV.2022 23:05:17

LTE band 4 , 5MHz Bandwidth,LOW,QPSK



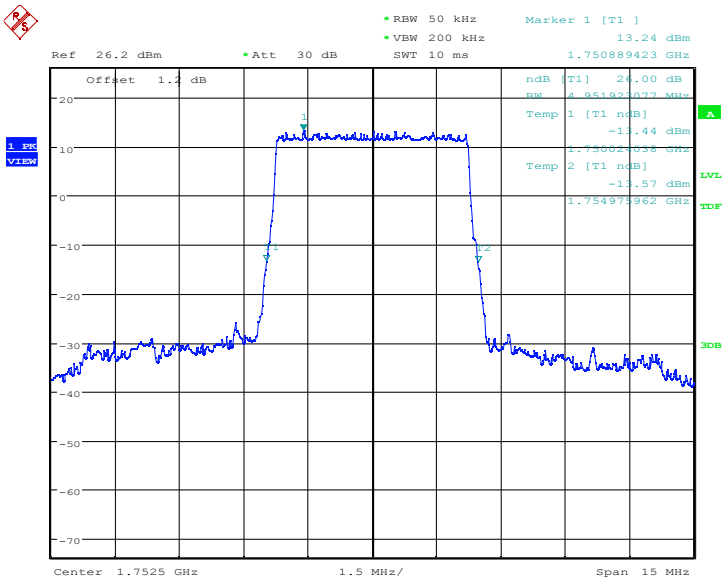
Date: 21.NOV.2022 23:03:49

LTE band 4 , 5MHz Bandwidth,LOW,16QAM



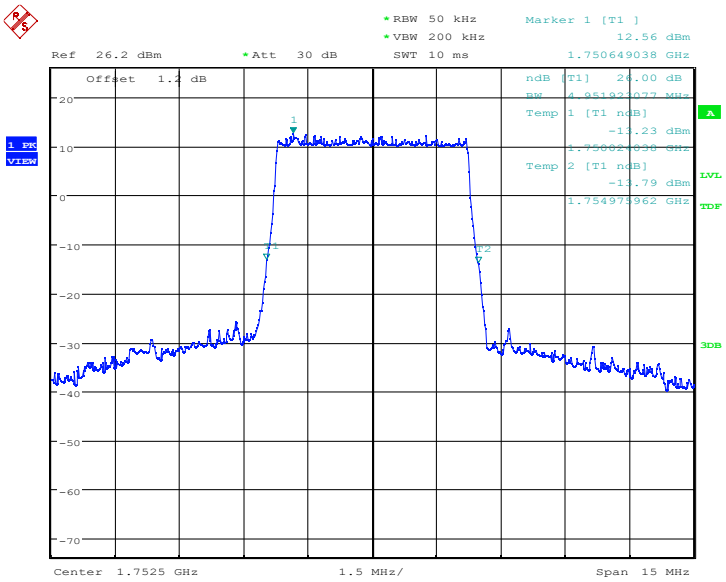
Date: 21.NOV.2022 23:04:11

LTE band 4 , 5MHz Bandwidth,HIGH,QPSK



Date: 21.NOV.2022 23:05:45

LTE band 4 , 5MHz Bandwidth,HIGH,16QAM



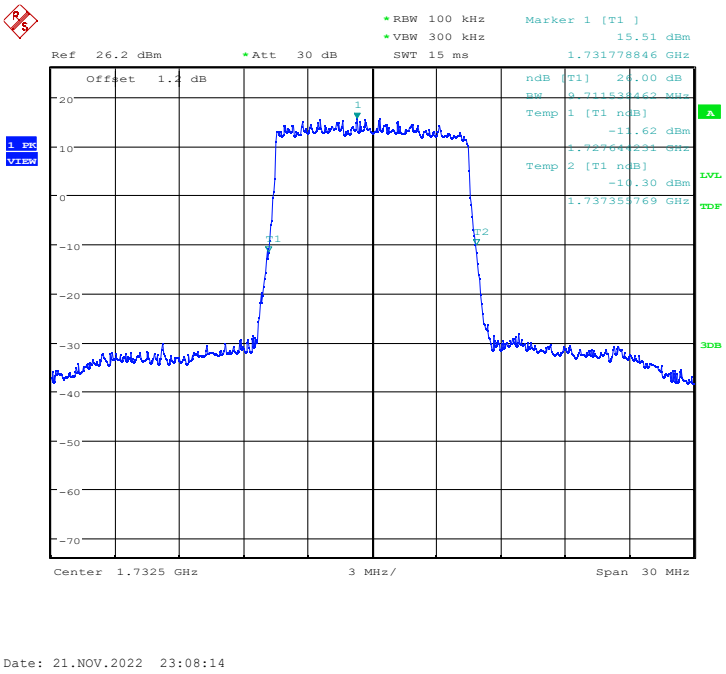
Date: 21.NOV.2022 23:06:08

LTE band 4,10MHz(-26dBc)

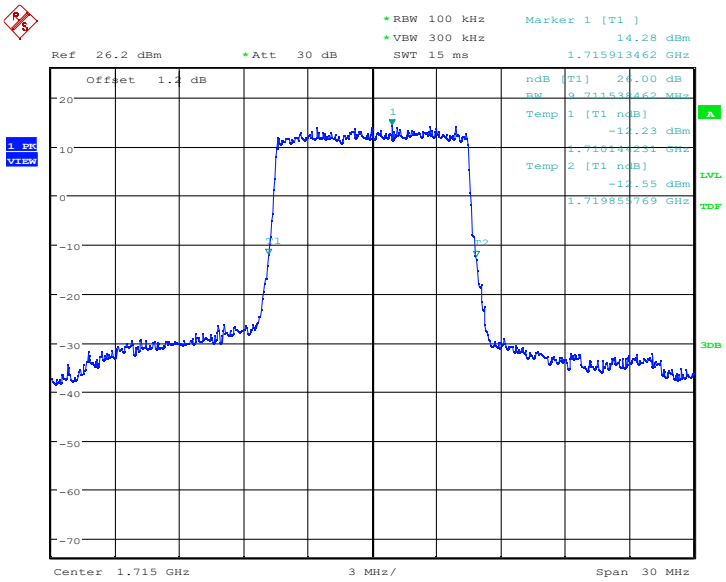
Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
	QPSK

1732.5	9.712
1715	9.712
1750	9.760

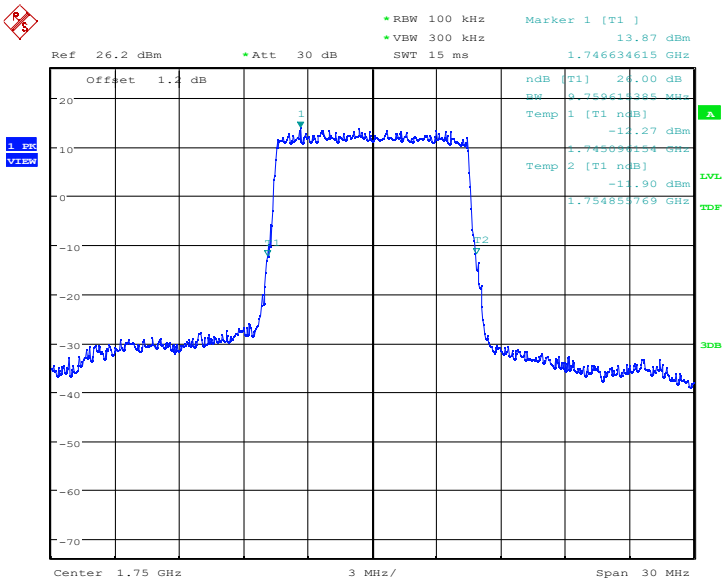
LTE band 4 , 10MHz Bandwidth,MID,QPSK



LTE band 4 , 10MHz Bandwidth,LOW,QPSK



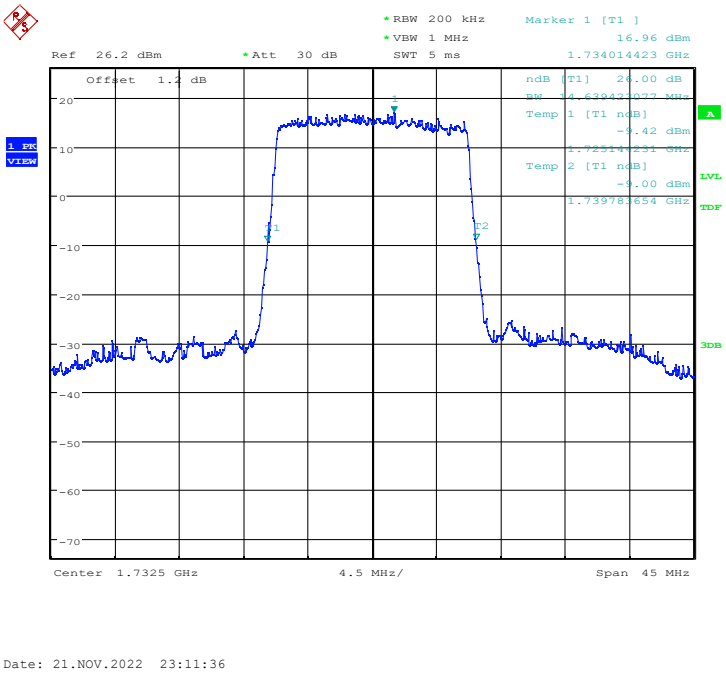
LTE band 4 , 10MHz Bandwidth,HIGH,QPSK



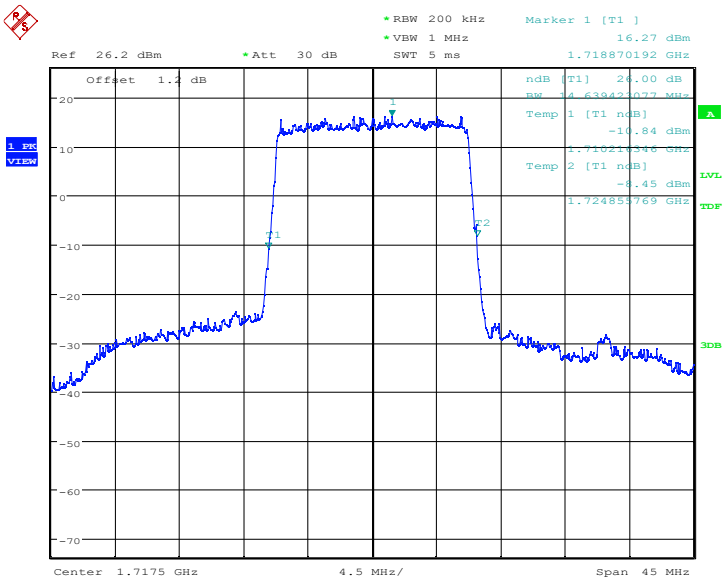
LTE band 4,15MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
	QPSK
1732.5	14.639
1717.5	14.639
1747.5	14.712

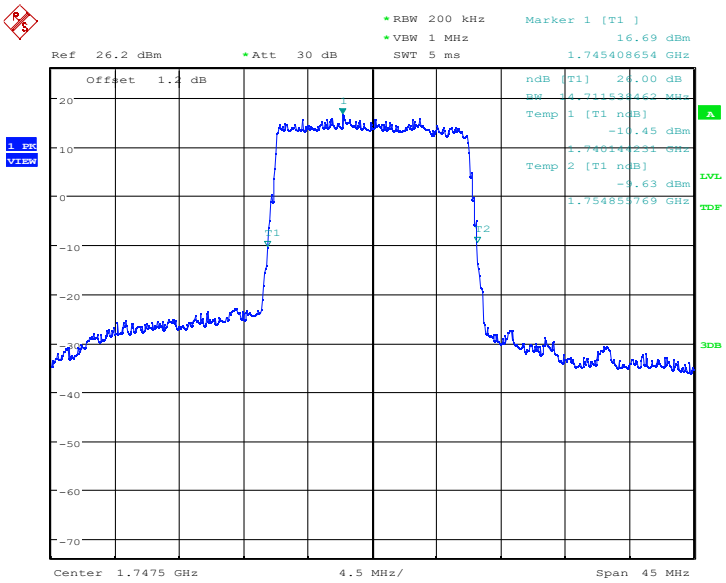
LTE band 4 , 15MHz Bandwidth,MID,QPSK



LTE band 4 , 15MHz Bandwidth,LOW,QPSK



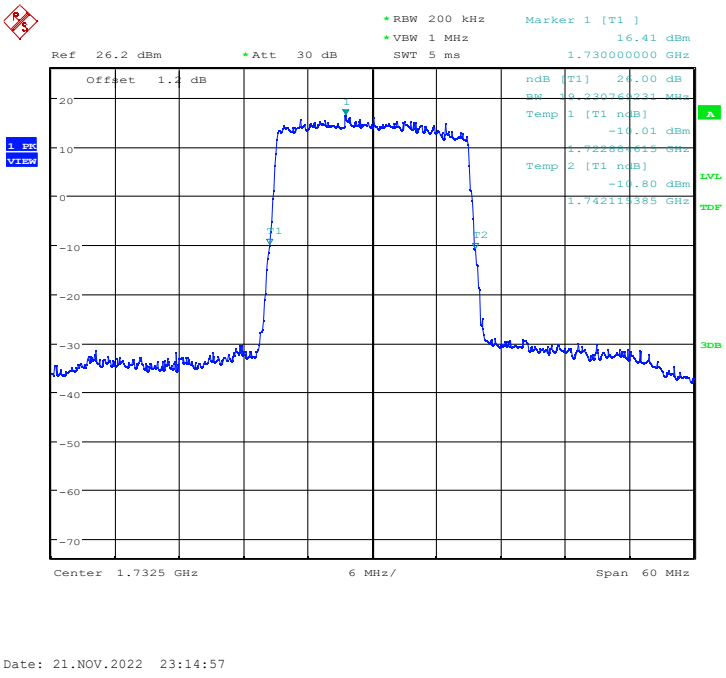
LTE band 4 , 15MHz Bandwidth,HIGH,QPSK



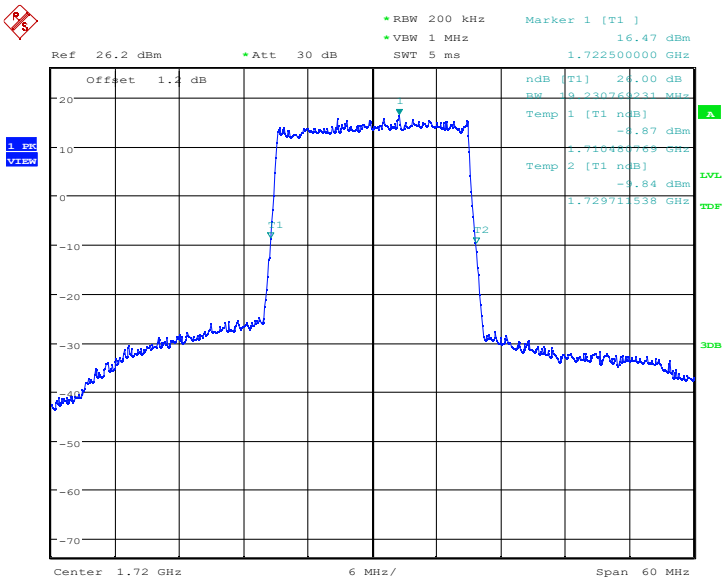
LTE band 4,20MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
	QPSK
1732.5	19.231
1720	19.231
1745	19.231

LTE band 4 , 20MHz Bandwidth,MID,QPSK

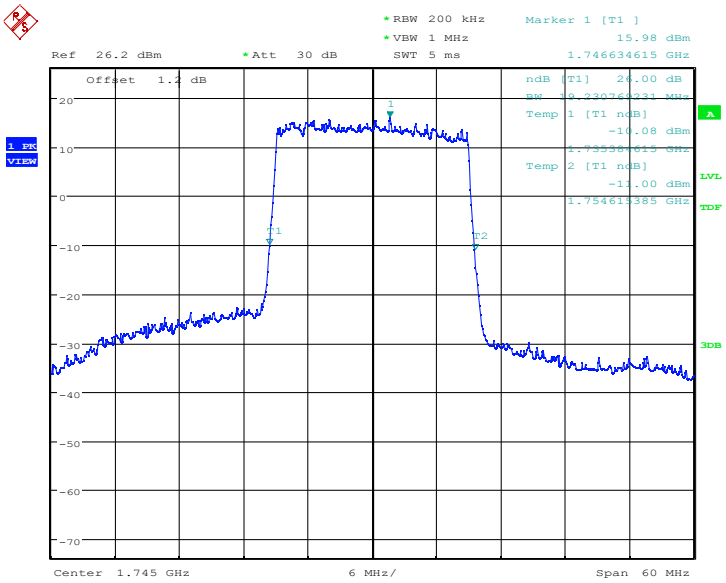


LTE band 4 , 20MHz Bandwidth,LOW,QPSK



Date: 21.NOV.2022 23:14:04

LTE band 4 , 20MHz Bandwidth,HIGH,QPSK

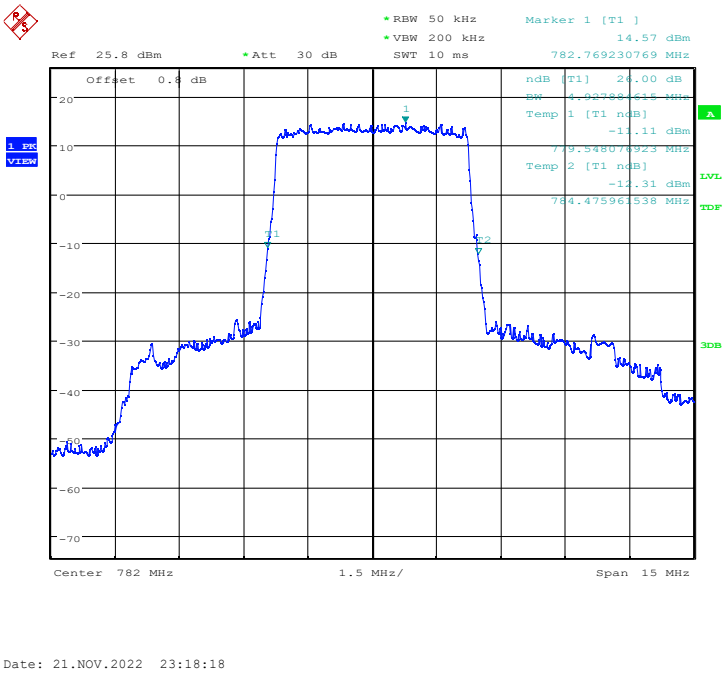


Date: 21.NOV.2022 23:15:49

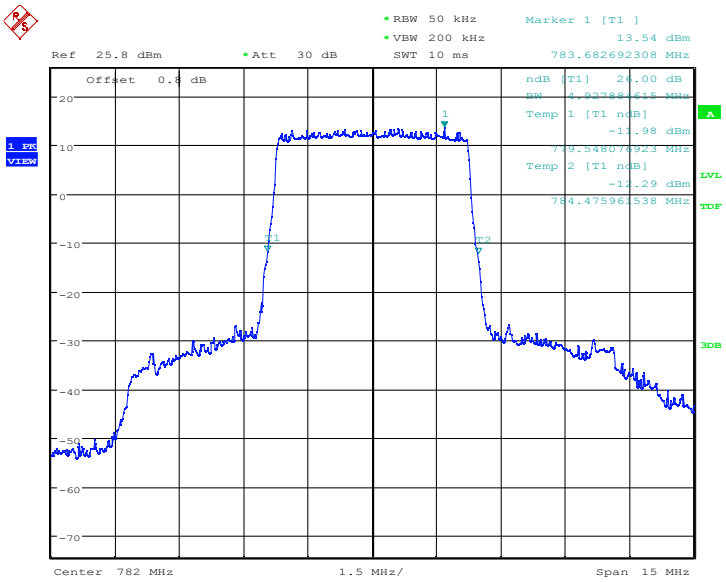
LTE band 13,5MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
782	4.928	4.928
779.5	4.904	4.904
784.5	4.928	4.880

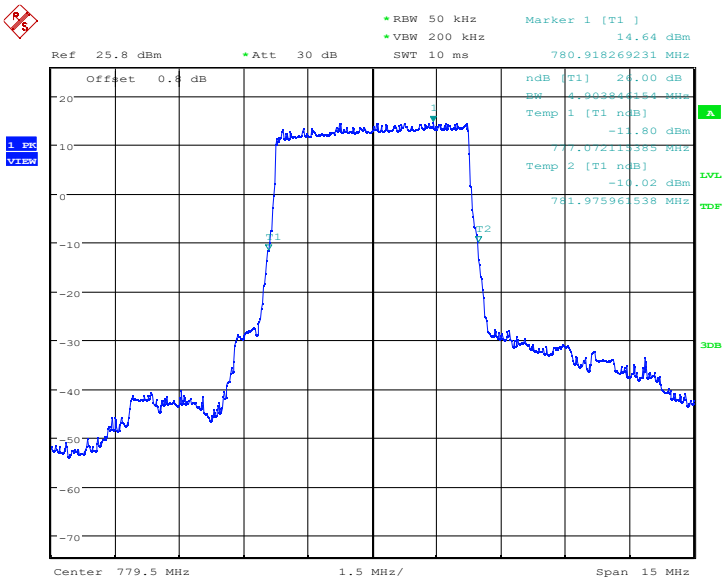
LTE band 13 , 5MHz Bandwidth,MID,QPSK



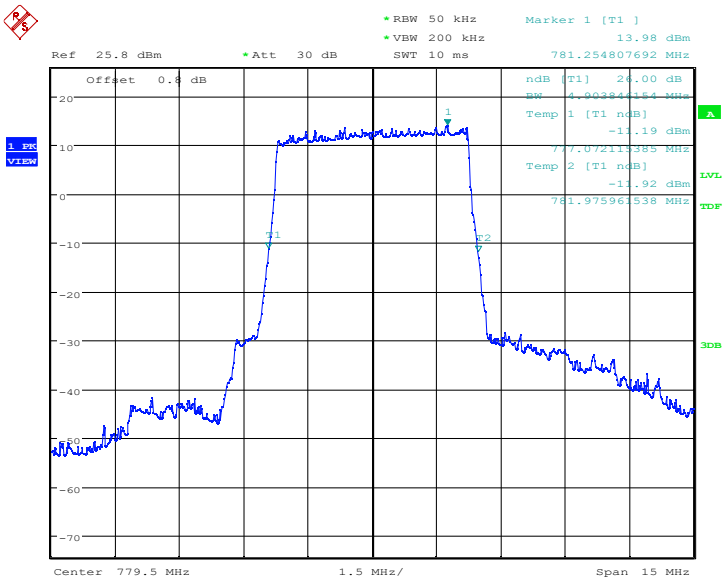
LTE band 13 , 5MHz Bandwidth,MID,16QAM



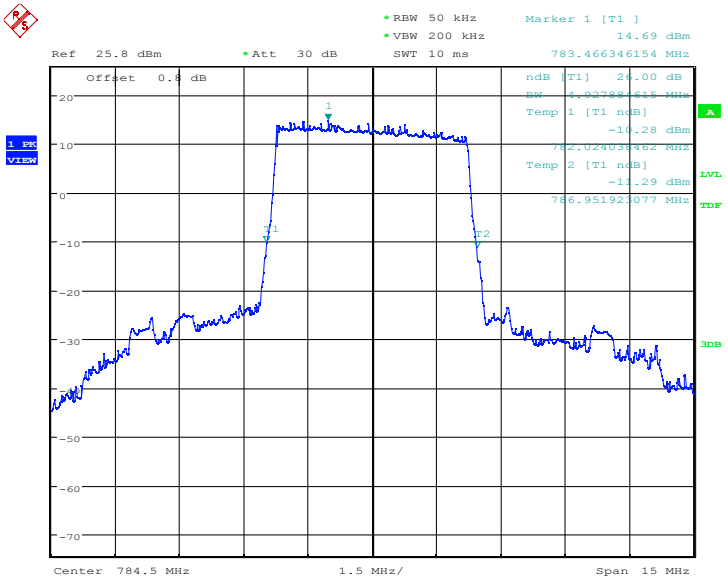
LTE band 13 , 5MHz Bandwidth,LOW,QPSK



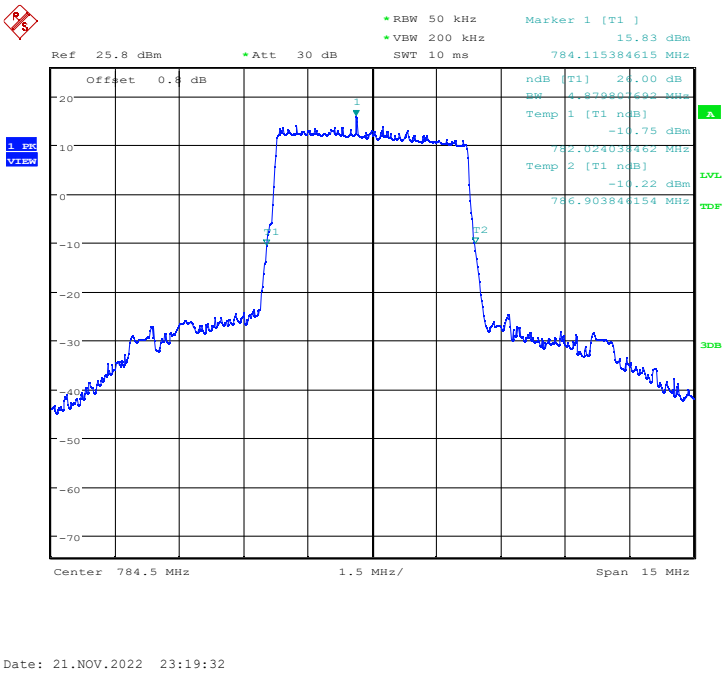
LTE band 13 , 5MHz Bandwidth,LOW,16QAM



LTE band 13 , 5MHz Bandwidth,HIGH,QPSK



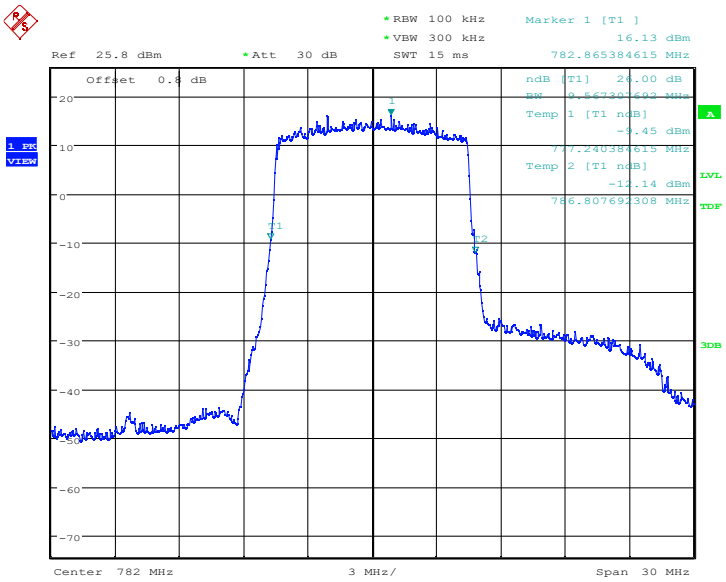
LTE band 13 , 5MHz Bandwidth,HIGH,16QAM



LTE band 13,10MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)
	QPSK
782	9.567

LTE band 13 , 10MHz Bandwidth,MID,QPSK



Date: 21.NOV.2022 23:21:33

6.5. Conducted spurious emissions

Specifications:	FCC Part 2.1051,2.1053, 27.53
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

According to Part 27.53(c): For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

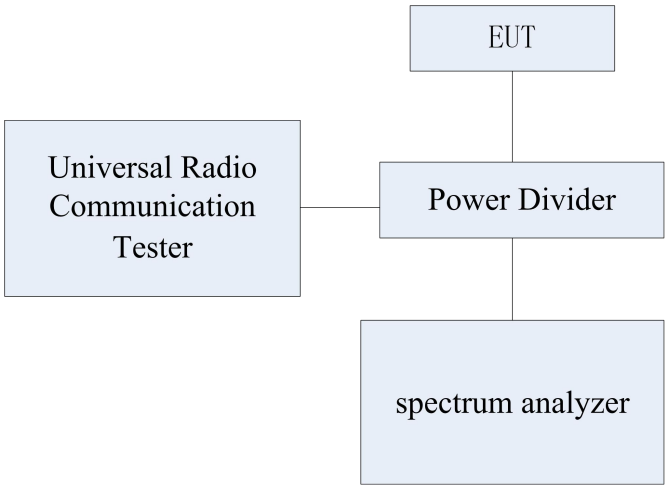
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.74 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

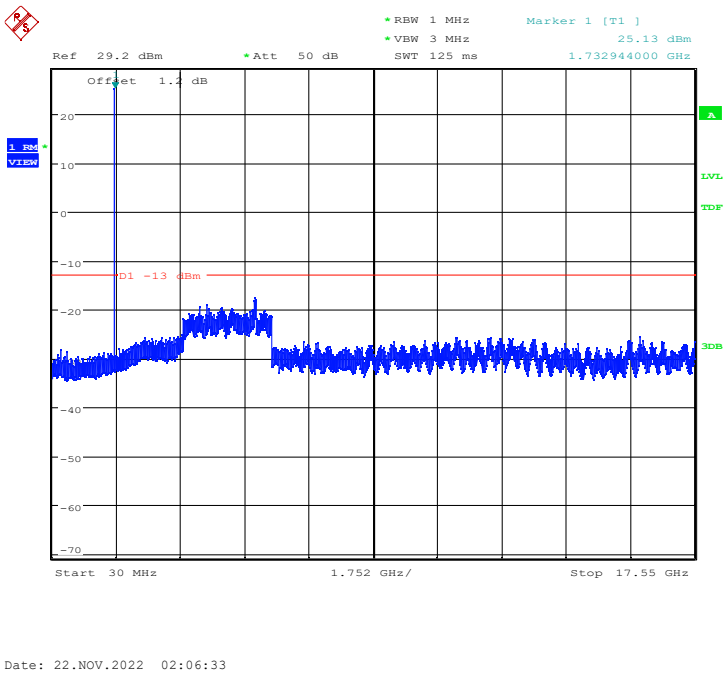
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-Band emissions, if any, up to 10th harmonic. The EUT was scanned for spurious emissions from 30MHz to 20GHz with sufficient Bandwidth and video resolution. The spectrum analyzer was set to Maximum hold mode to ensure that the worst-case emissions were captured.

Note: The following test results are the worst case selected in each bandwidth of each frequency band.

6.5.1 Conducted Spurious Emission Results

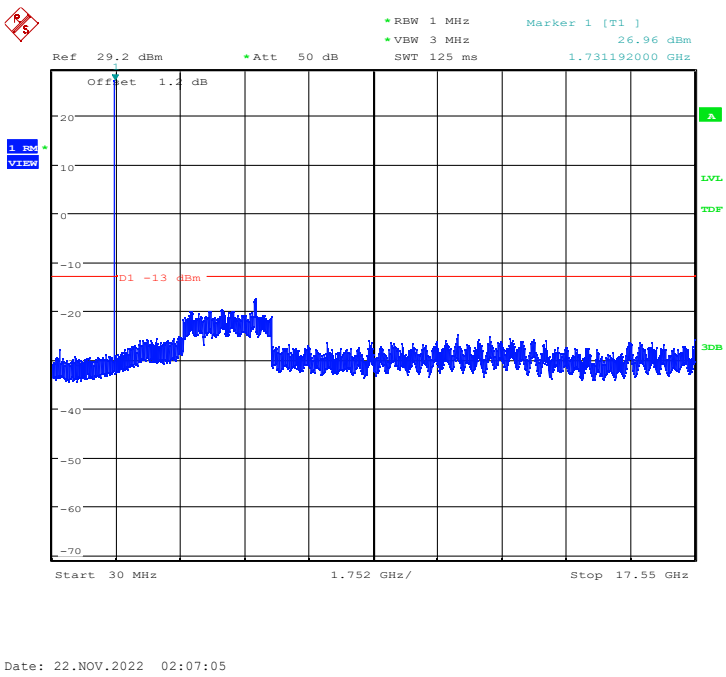
LTE band 4-1.4MHz-QPSK-MID-1RB

NOTE: peak above the limit line is the carrier frequency.



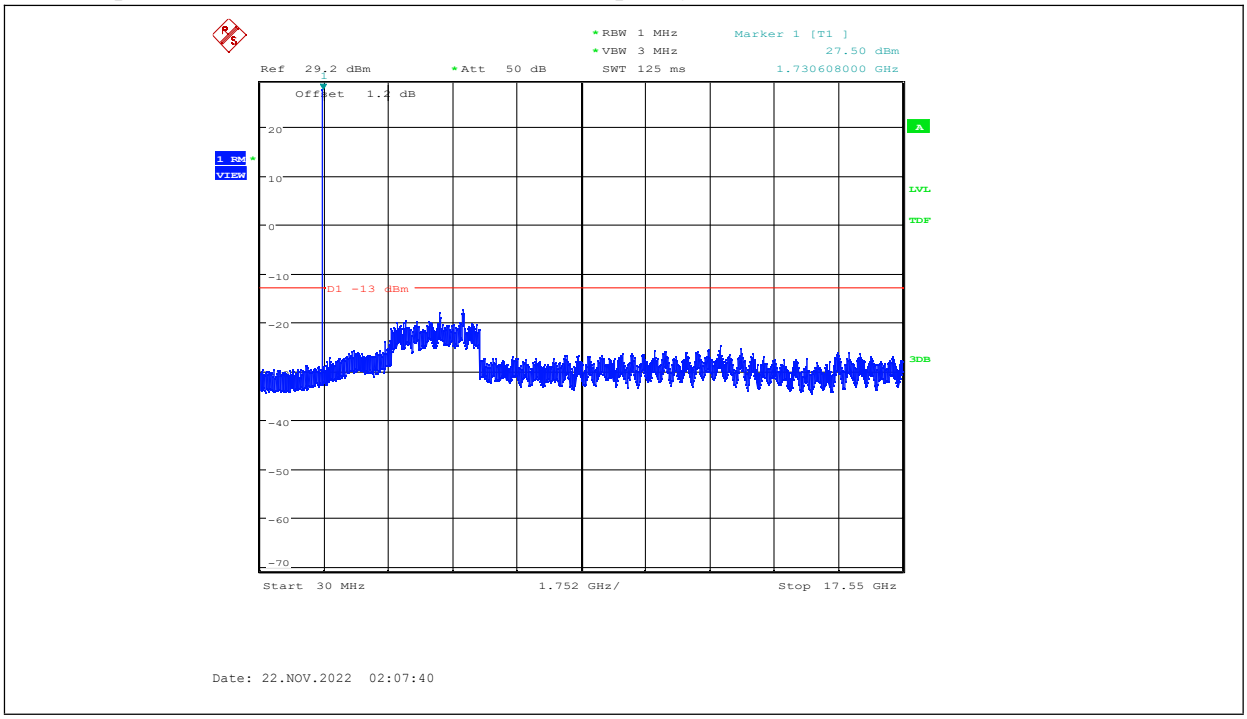
LTE band 4-3MHz-QPSK-MID-1RB

NOTE: peak above the limit line is the carrier frequency.



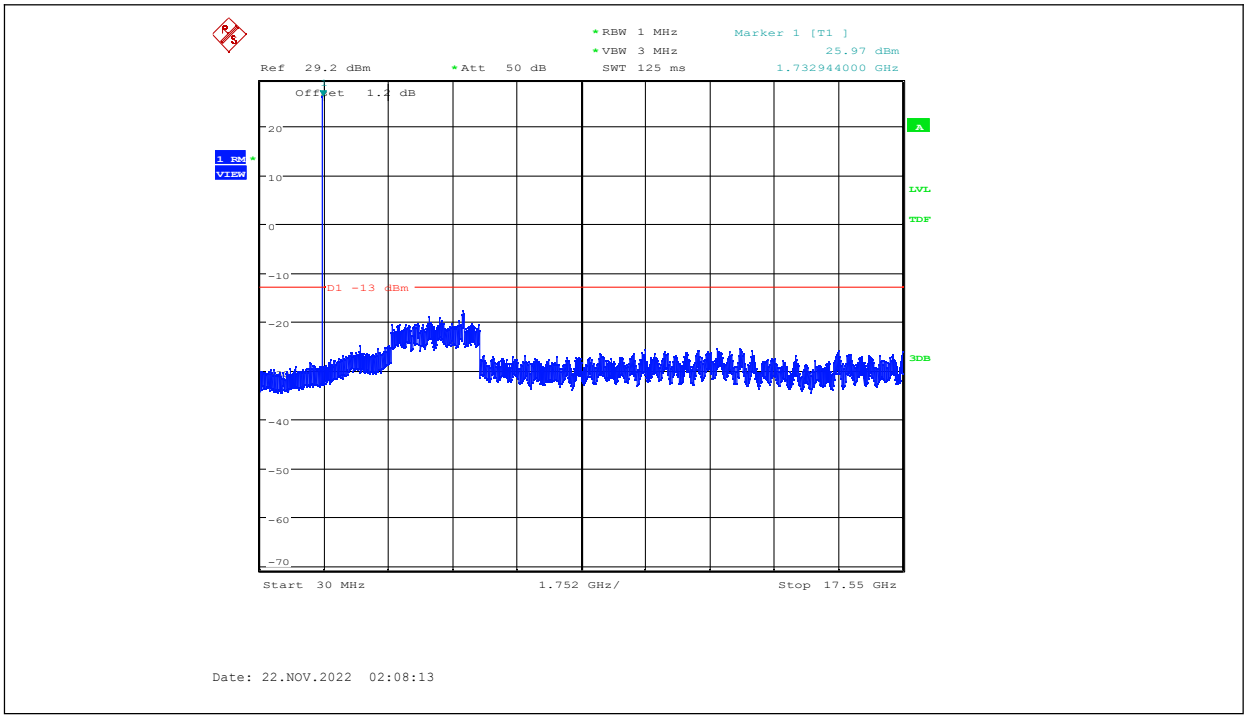
LTE band 4-5MHz-QPSK-MID-1RB

NOTE: peak above the limit line is the carrier frequency.



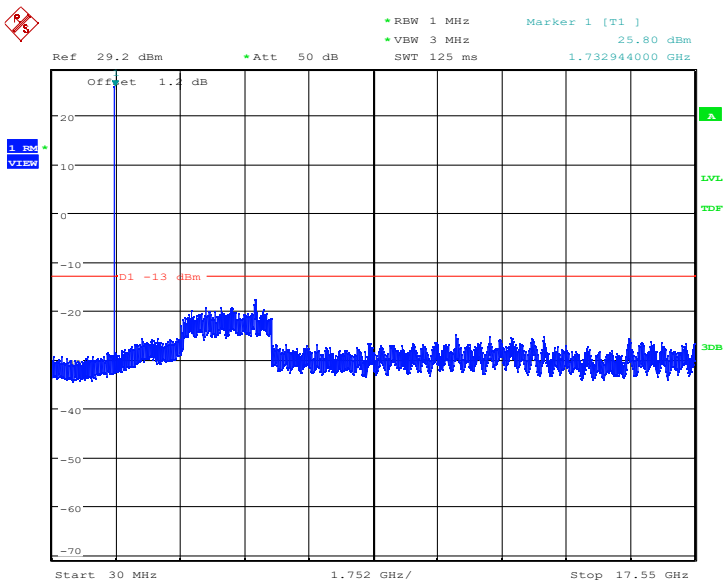
LTE band 4-10MHz-QPSK-MID-1RB

NOTE: peak above the limit line is the carrier frequency.



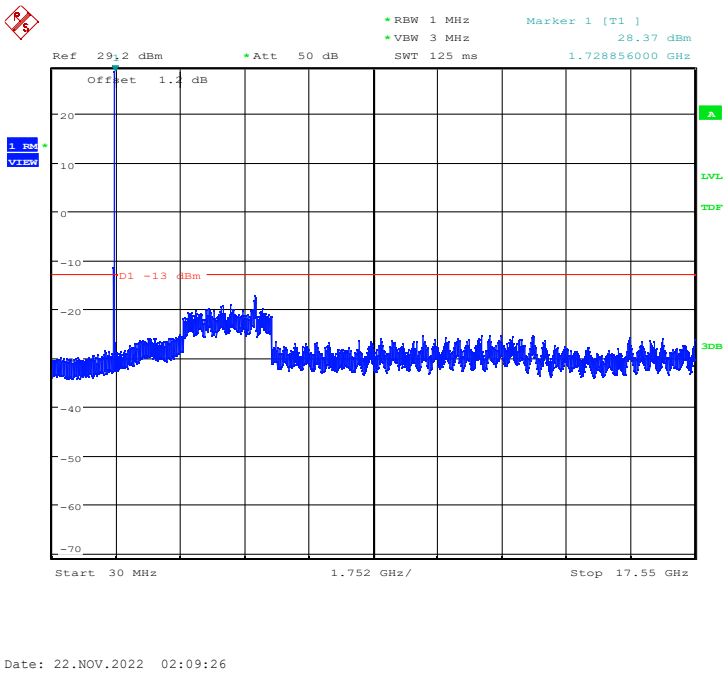
LTE band 4-15MHz-QPSK-LOW-1RB

NOTE: peak above the limit line is the carrier frequency.



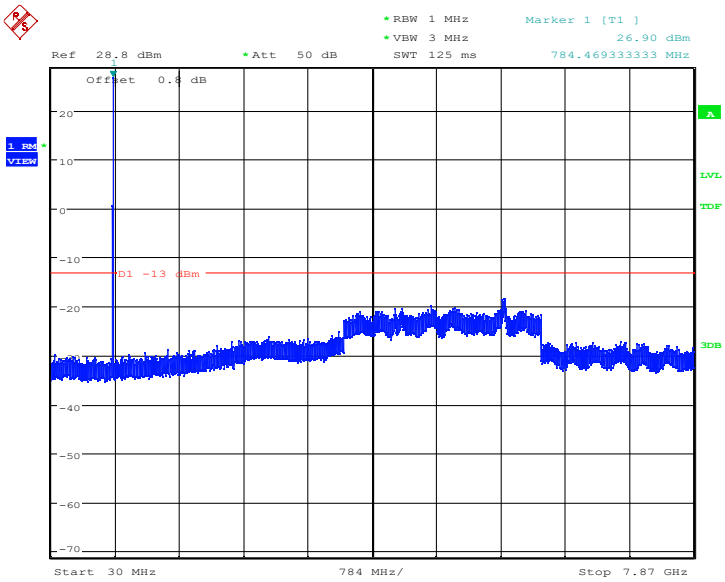
LTE band 4-20MHz-QPSK-LOW-1RB

NOTE: peak above the limit line is the carrier frequency.

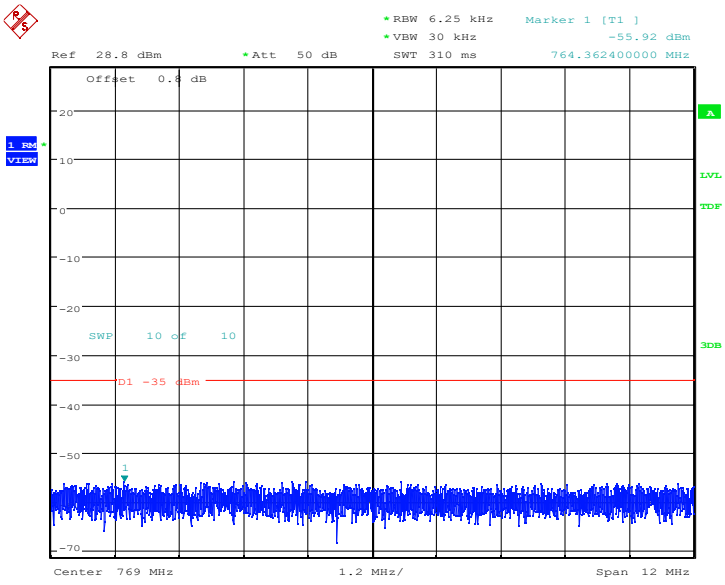


LTE band 13-5MHz-QPSK-MID-FULL RB

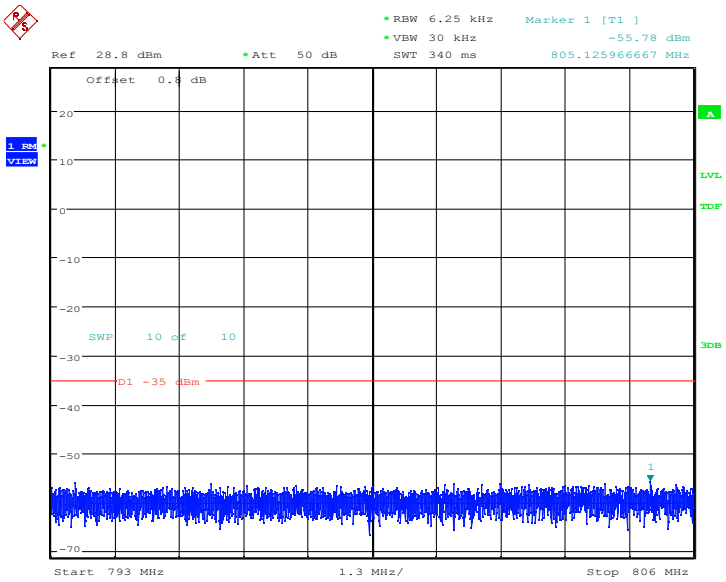
NOTE: peak above the limit line is the carrier frequency.



Date: 22.NOV.2022 04:04:22



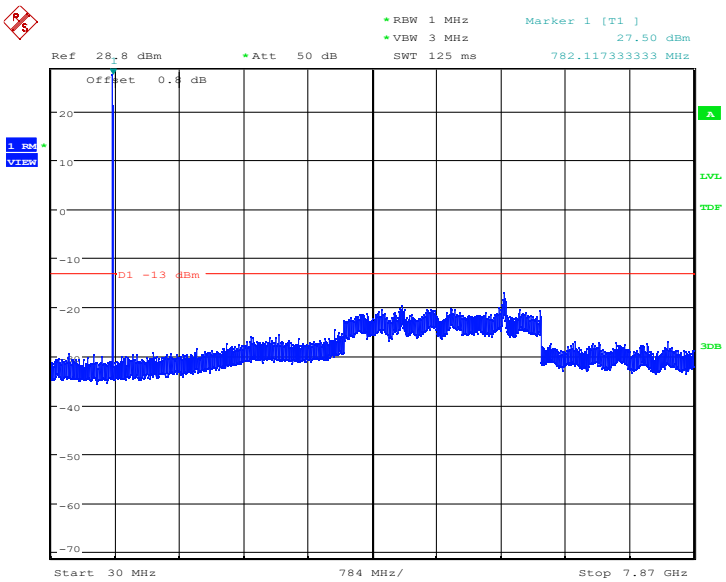
Date: 22.NOV.2022 04:05:39



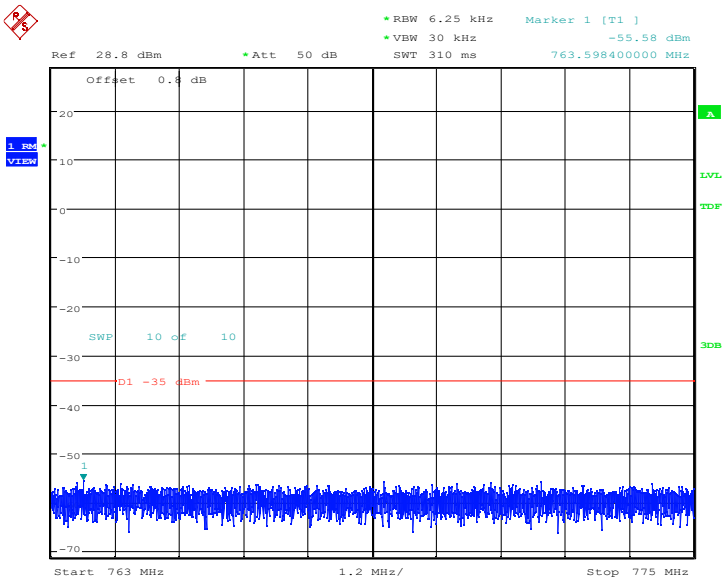
Date: 22.NOV.2022 04:06:15

LTE band 13-10MHz-QPSK-MID-1RB

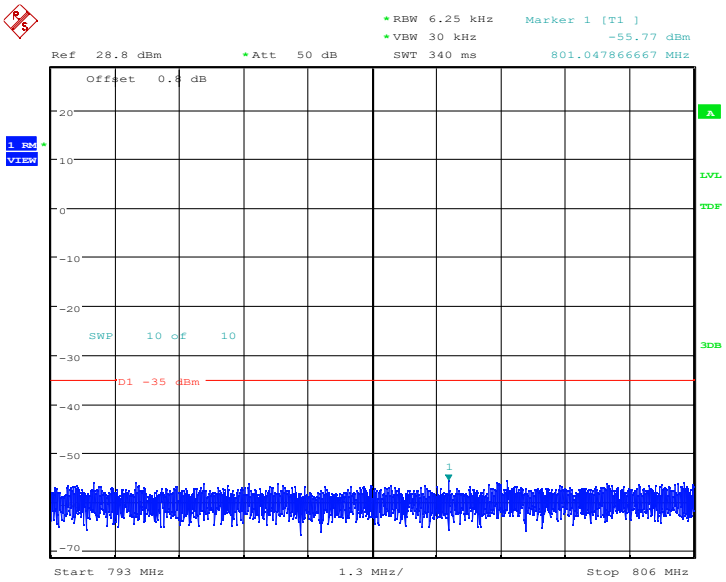
NOTE: peak above the limit line is the carrier frequency.



Date: 22.NOV.2022 04:10:41



Date: 22.NOV.2022 04:11:16



Date: 22.NOV.2022 04:11:52

6.6. Radiated Spurious Emission

Specifications:	FCC Part 2.1051,2.1053, 27.53
DUT Serial Number:	SN:G4MA2902010004
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

According to Part 27.53(c): For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

According to Part 27.53(f): For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Limits for Radiated spurious emissions(UE)	
Frequency range	**Limit Level /Resolution Bandwidth**
30 MHz to 20000 MHz	-13dBm/1MHz

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty（30MHz-150MHz）	5.15 dB (k=2)
Expanded Uncertainty（150MHz-1GHz）	4.09dB (k=2)
Expanded Uncertainty（1GHz-3GHz）	2.92dB (k=2)
Expanded Uncertainty（3GHz-6GHz）	2.93dB (k=2)
Expanded Uncertainty（3GHz-20GHz）	2.69dB (k=2)

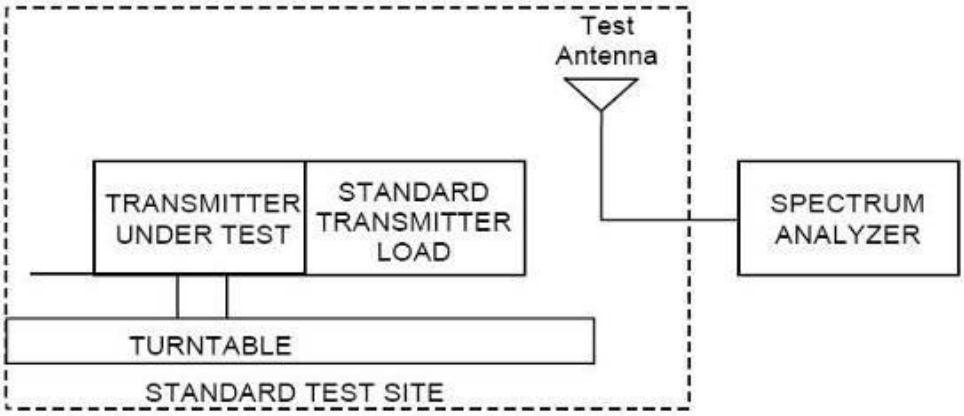
Test Setup:

The EUT was placed in an anechoic chamber. The Wireless Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

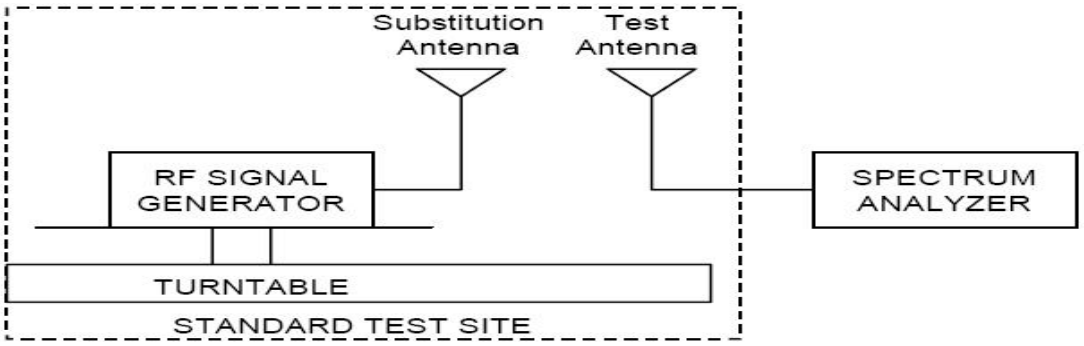
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-E: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above. The distance from the device to the antenna is 3 m .



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

P_d(dBm) = P_g(dBm) – cable loss (dB) + Antenna Gain (dB)

where:

Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.

Note：All modes of Radiated Spurious Emission were tested,only the worst case was reported.

6.6.1 LTE Radiated Spurious Emission Results

Test frequency：30MHz-20GHz

All modes were tested,only the worst case of each band was reported.

LTE B4 Radiated Spurious Emission Results

Test Data （10M bandwidth QPSK Mode CH20000）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
294.550	-78.18	0.41	6.13	-72.46	H
1115.600	-68.84	0.83	6.76	-62.91	V
2461.000	-63.83	1.30	6.31	-58.82	H
4740.800	-72.51	1.93	9.90	-64.54	V
6487.600	-70.38	2.36	11.16	-61.58	V
9785.200	-68.75	3.28	12.75	-59.28	V

LTE B4 Radiated Spurious Emission Results

Test Data （10M bandwidth QPSK Mode CH20175）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
83.946	-75.53	0.20	1.02	-74.71	V
289.962	-75.04	0.40	6.08	-69.36	H
1528.200	-69.90	0.98	6.24	-64.64	V
4935.200	-71.22	1.92	9.46	-63.68	V
6482.800	-71.07	2.36	11.16	-62.27	V
9372.800	-68.04	3.22	12.27	-58.99	V

LTE B4 Radiated Spurious Emission Results

Test Data （10M bandwidth QPSK Mode CH20350）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
90.236	-72.45	0.22	-0.59	-73.26	V
291.590	-75.64	0.41	6.08	-69.97	H
1185.600	-72.25	0.86	7.71	-65.40	V
4946.400	-71.42	1.93	9.46	-63.89	V
6459.200	-70.69	2.34	11.16	-61.87	V
10188.800	-68.37	3.45	13.07	-58.75	V

LTE B13 Radiated Spurious Emission Results

Test Data （10M bandwidth QPSK Mode CH23230）

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
82.466	-76.54	0.20	1.41	-75.33	V
575.520	-80.53	0.59	7.12	-74.00	V
2213.200	-65.26	1.22	5.98	-60.50	V
4946.400	-71.10	1.93	9.46	-63.57	V
6474.400	-70.42	2.36	11.16	-61.62	V
8636.000	-69.22	3.06	12.15	-60.13	V

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
1592.4	-79.98	1.00	6.30	-75.68	V

The max radiated power of 1559-1610 MHz is -79.98dBm＜-40dBm（-70dBW/MHz）.

There is no signal that bandwidth is less than 700 Hz bandwidth

6.7. Band Edge

Specifications:	FCC Part 2.1051,2.1053, 27.53
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 27.53(h):

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 Bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10(P) dB.

According to Part 27.53(c): For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

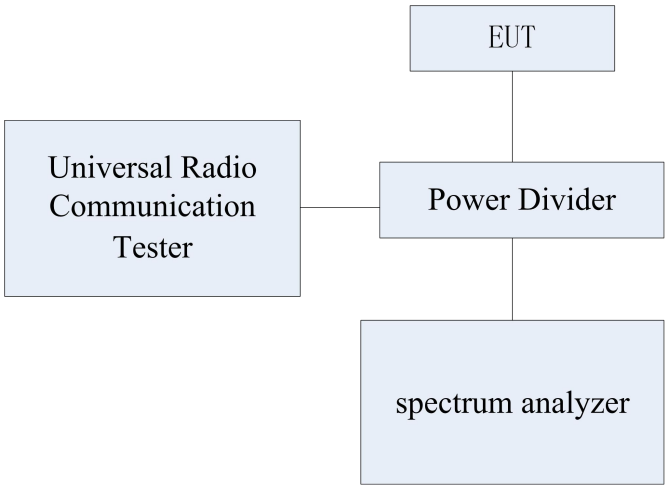
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.28 dB (k=2)

Test Setup:

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method:

1) The EUT was coupled to the EMI test receiver analyzer mode and the base station simulator through a power divider. The lost of the cables the test system is calibrated to correct the readings.

2) The spectrum analyzer was set to Average Detector function and Maximum hold mode.

3) The resolution Bandwidth of the spectrum analyzer was a little greater than 1% of the 26dB emission Bandwidth.

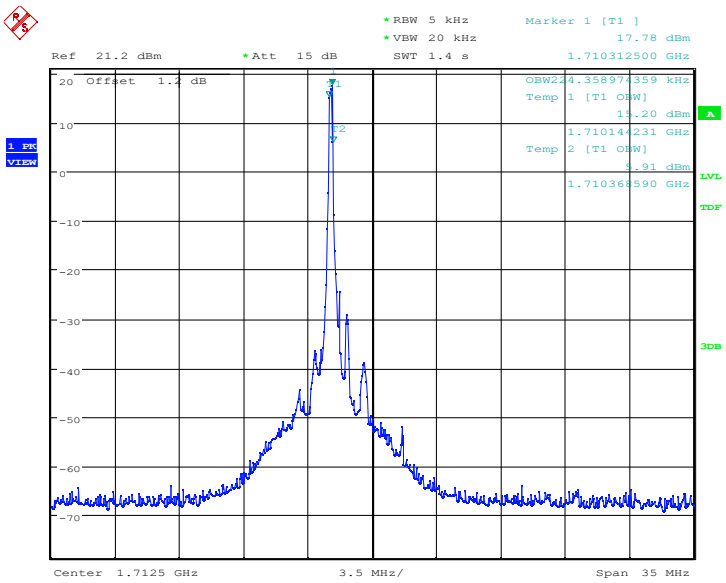
Note1: The Band Edge test data include QPSK and 16QAM. The following test results only reflect the date of the worse mode QPSK.

Note2： In this test item, the OBW test data do only use the OBW values to calculate RBW setting for the 1RB band edge test .

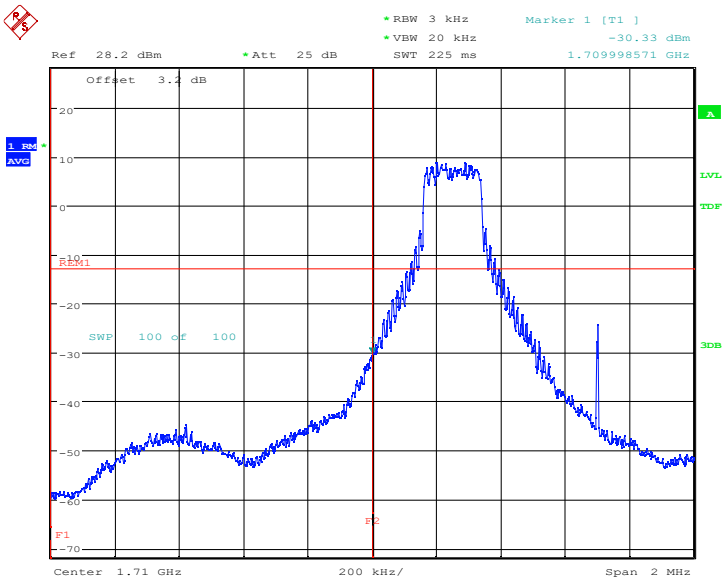
6.7.1 Band Edge Results

LTE band 4-1.4MHz

OBW: 1RB-LOW_offset

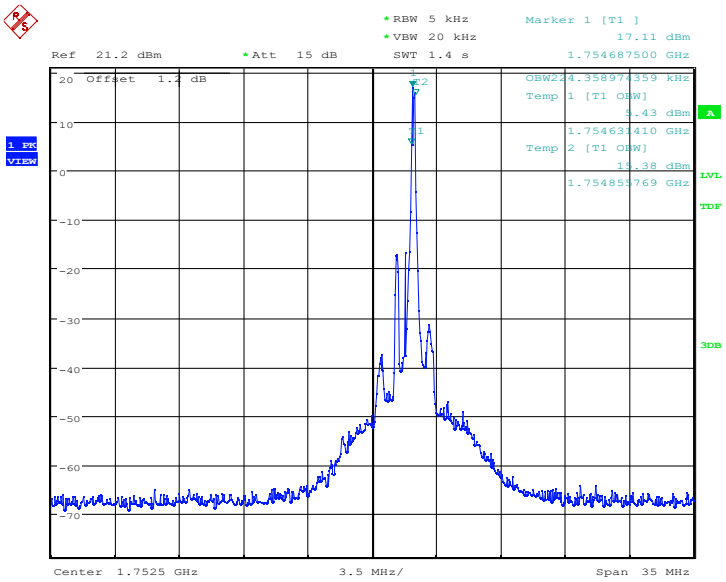


LOW BAND EDGE BLOCK-1RB-LOW_offset



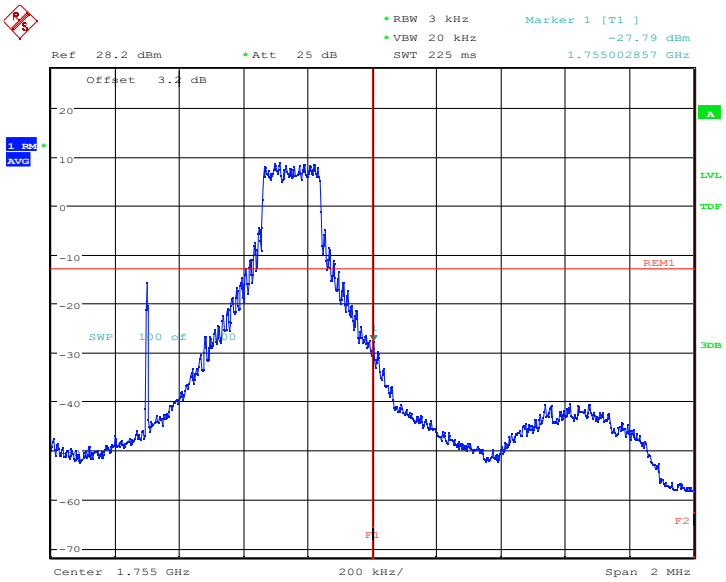
Date: 21.NOV.2022 23:24:25

OBW: 1RB-HIGH_offset



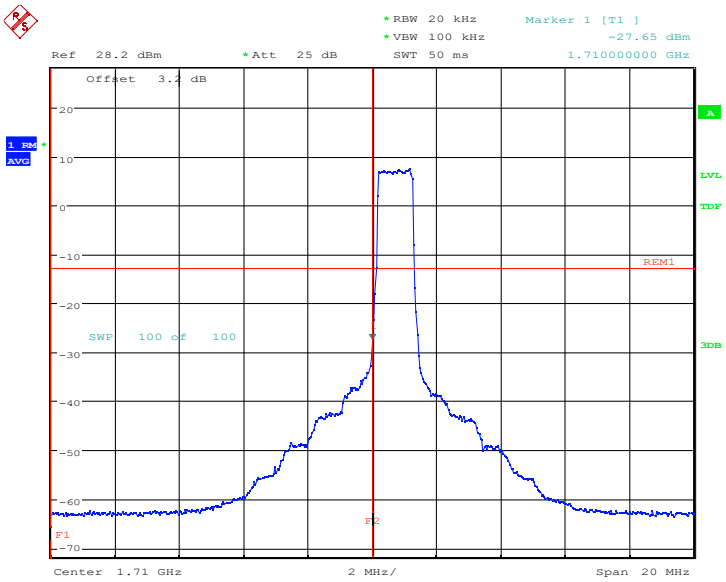
Date: 21.NOV.2022 23:25:45

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



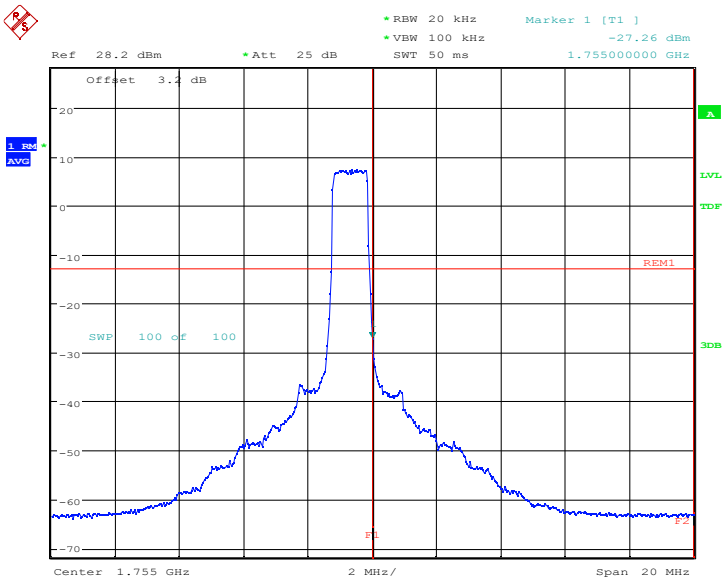
Date: 21.NOV.2022 23:26:54

LOW BAND EDGE BLOCK-1.4M-100%RB



Date: 21.NOV.2022 23:25:19

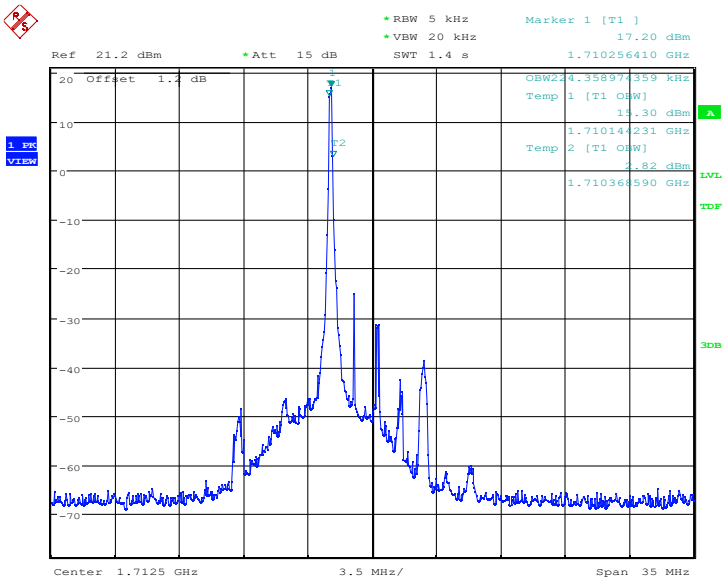
HIGH BAND EDGE BLOCK-1.4M-100%RB



Date: 21.NOV.2022 23:27:42

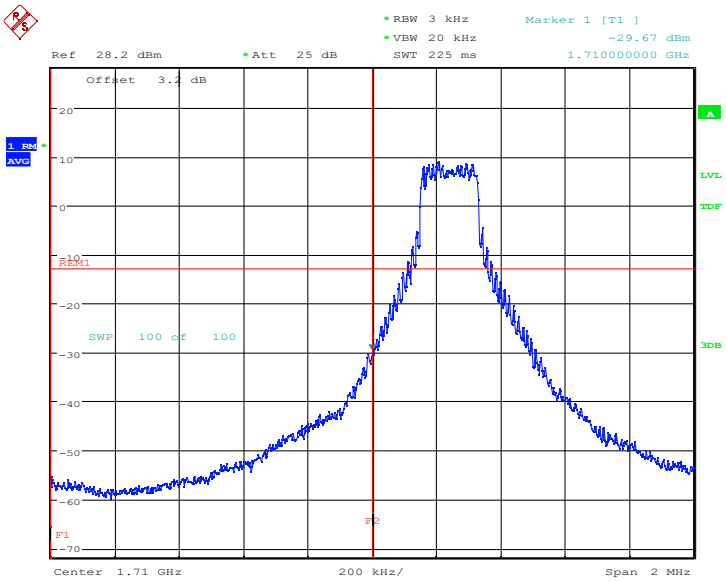
LTE band 4-3MHz

OBW: 1RB-LOW_offset



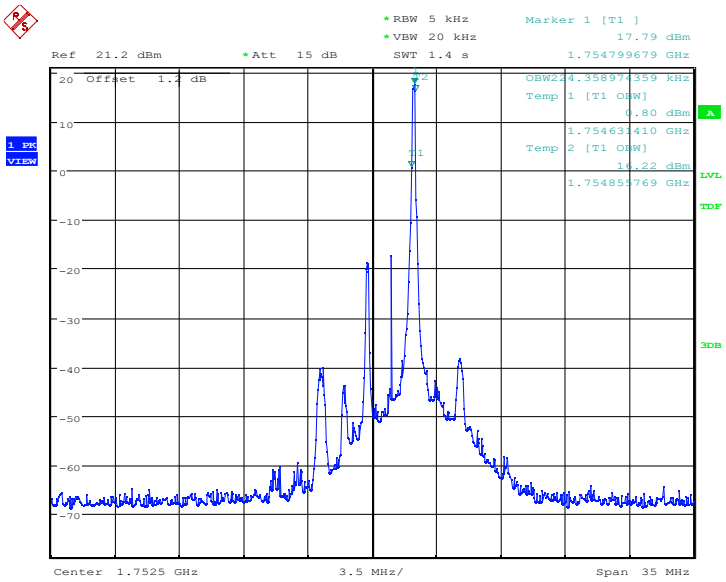
Date: 21.NOV.2022 23:28:57

LOW BAND EDGE BLOCK-1RB-LOW_offset



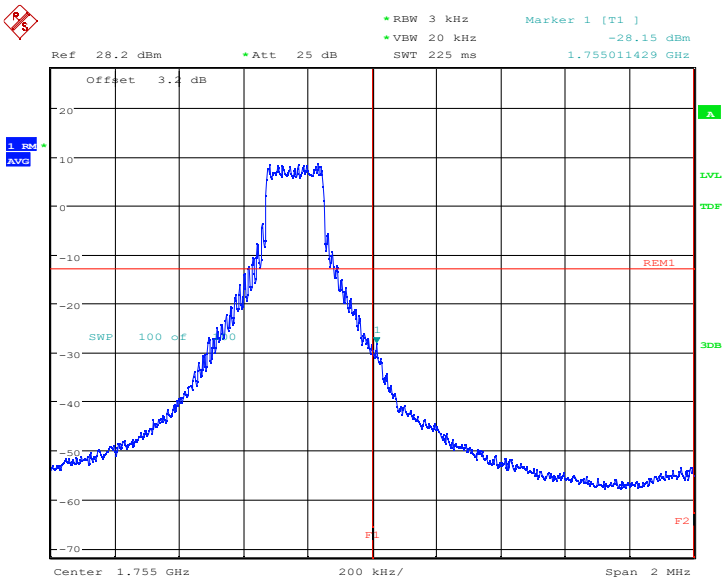
Date: 21.NOV.2022 23:30:01

OBW: 1RB-HIGH_offset



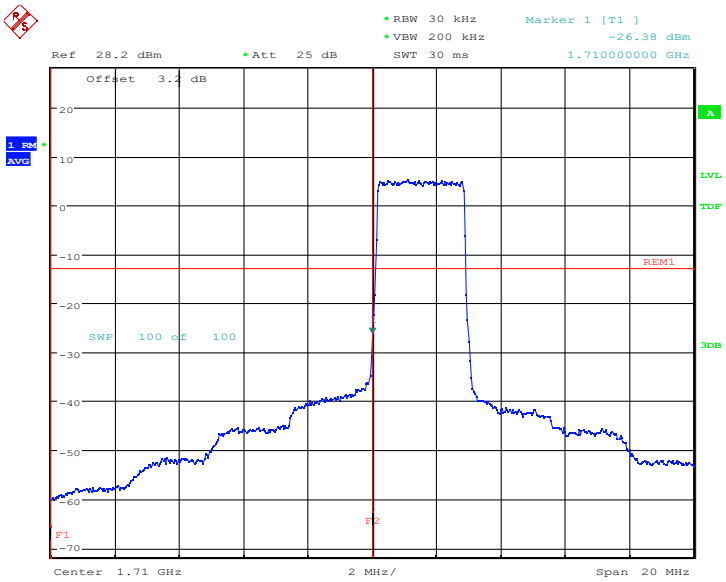
Date: 21.NOV.2022 23:31:15

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



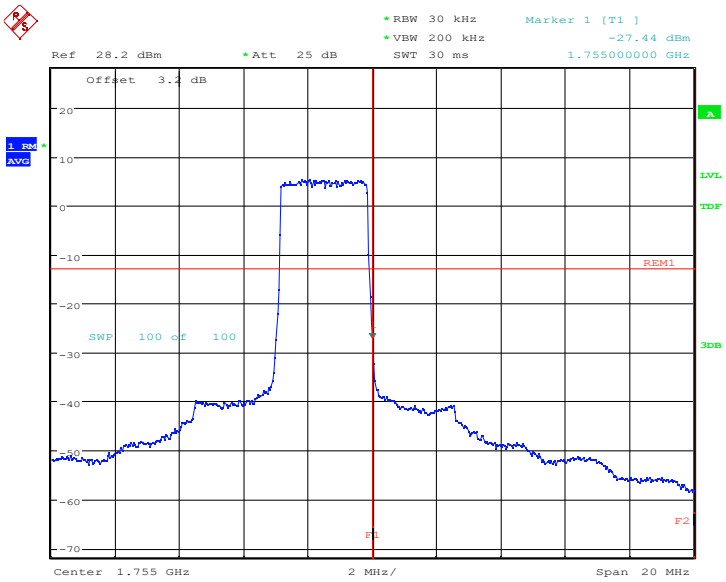
Date: 21.NOV.2022 23:32:17

LOW BAND EDGE BLOCK-3M-100%RB



Date: 21.NOV.2022 23:30:49

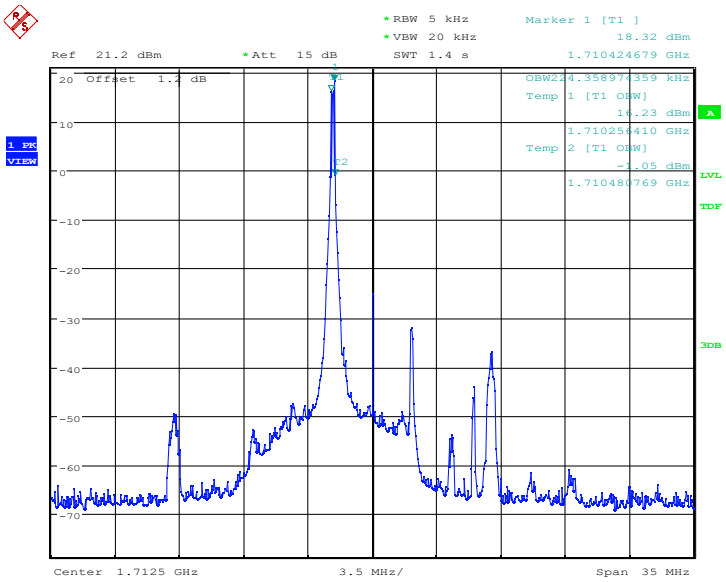
HIGH BAND EDGE BLOCK-3M-100%RB



Date: 21.NOV.2022 23:33:03

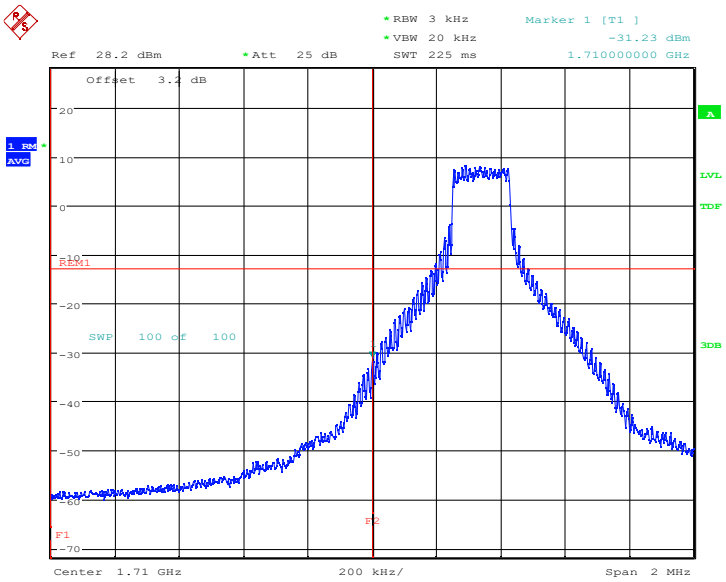
LTE band 4-5MHz

OBW: 1RB-LOW_offset



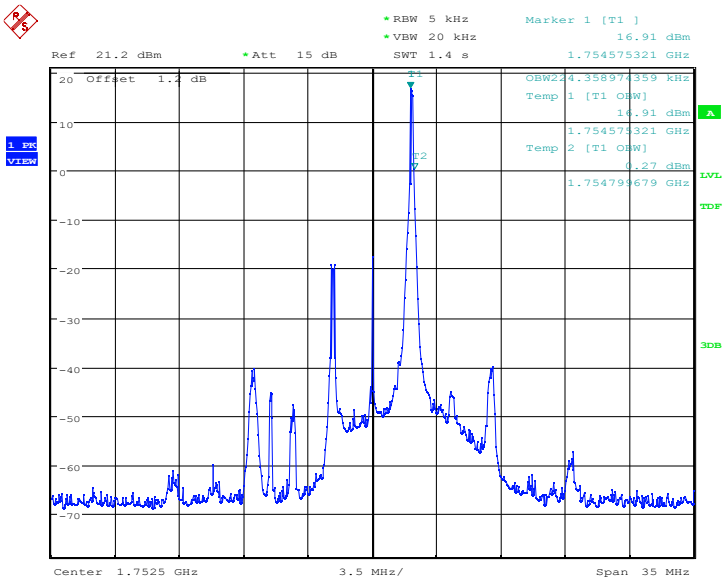
Date: 21.NOV.2022 23:34:18

LOW BAND EDGE BLOCK-1RB-LOW_offset



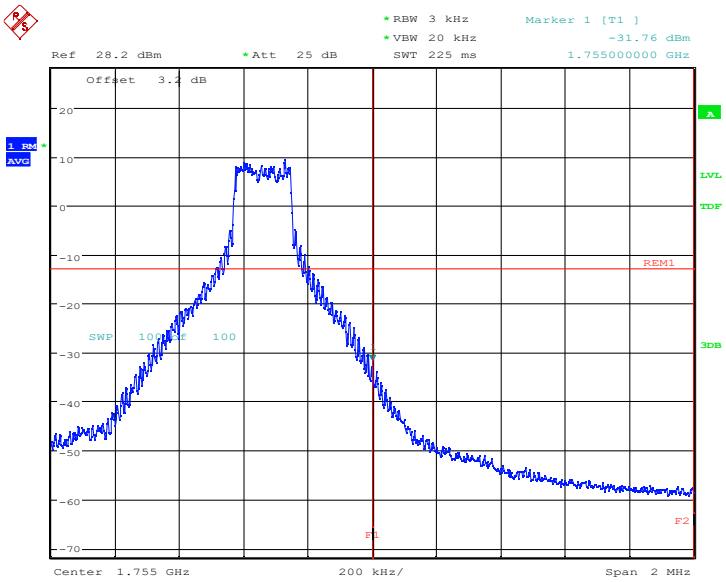
Date: 21.NOV.2022 23:35:22

OBW: 1RB-HIGH_offset



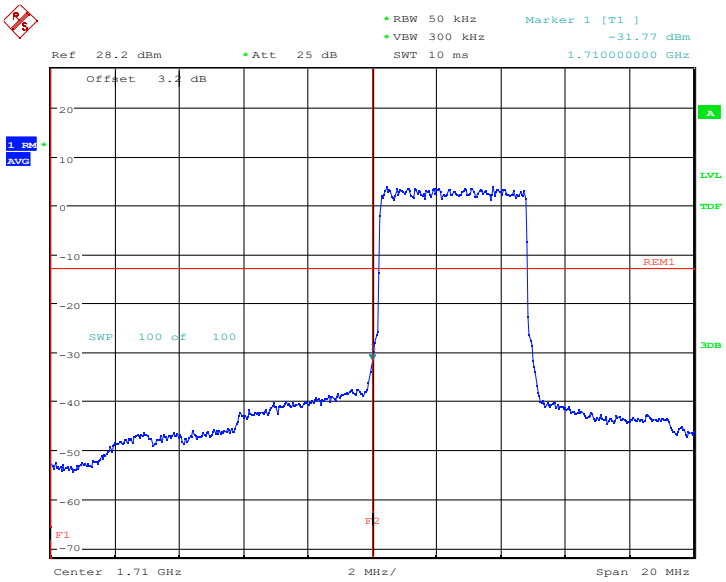
Date: 21.NOV.2022 23:36:34

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



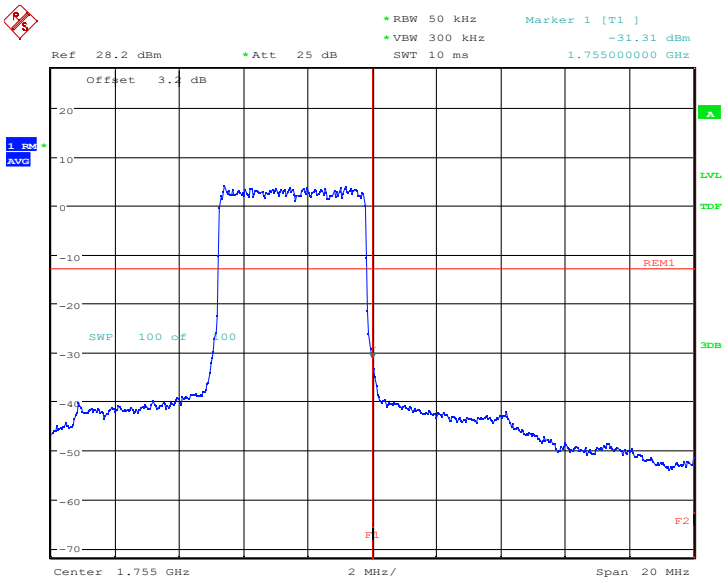
Date: 21.NOV.2022 23:37:36

LOW BAND EDGE BLOCK-5M-100%RB



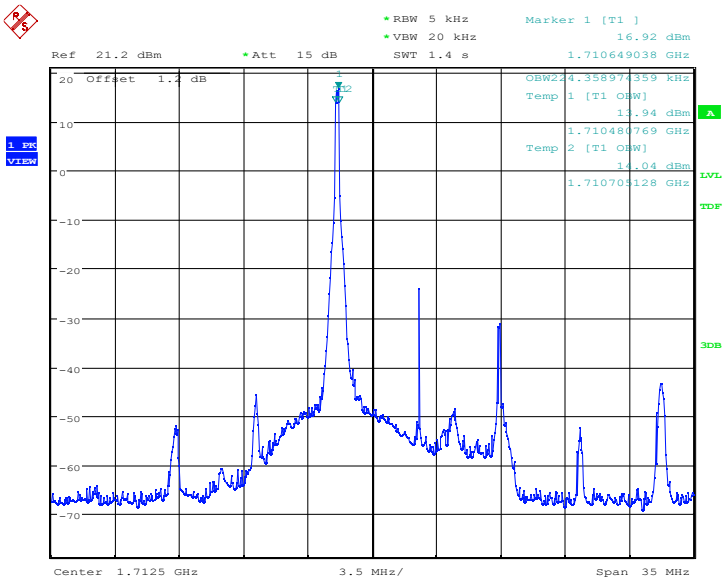
Date: 21.NOV.2022 23:36:08

HIGH BAND EDGE BLOCK-5M-100%RB

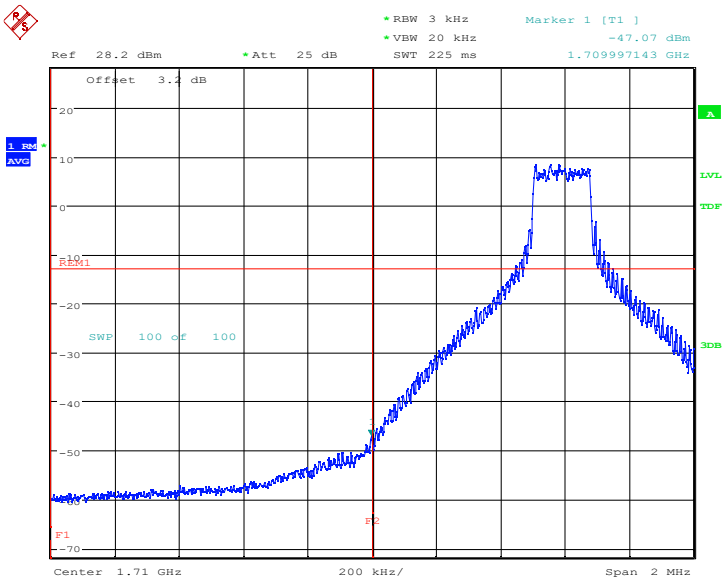


LTE band 4-10MHz

OBW: 1RB-LOW_offset

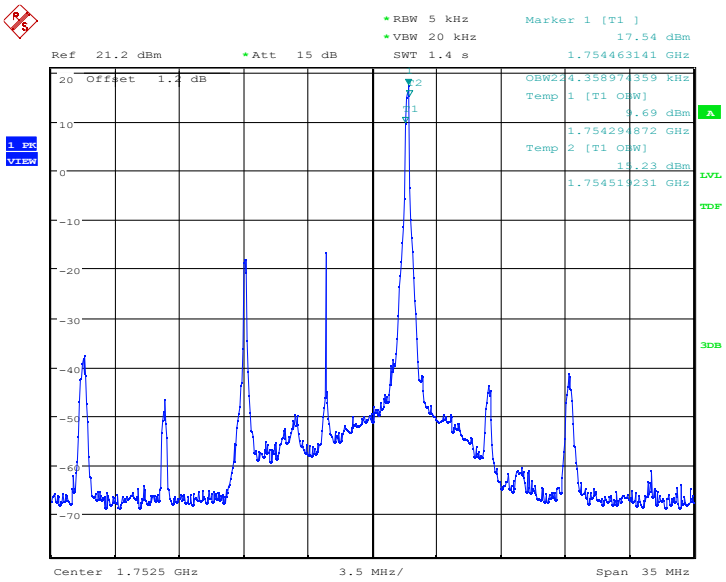


LOW BAND EDGE BLOCK-1RB-LOW_offset



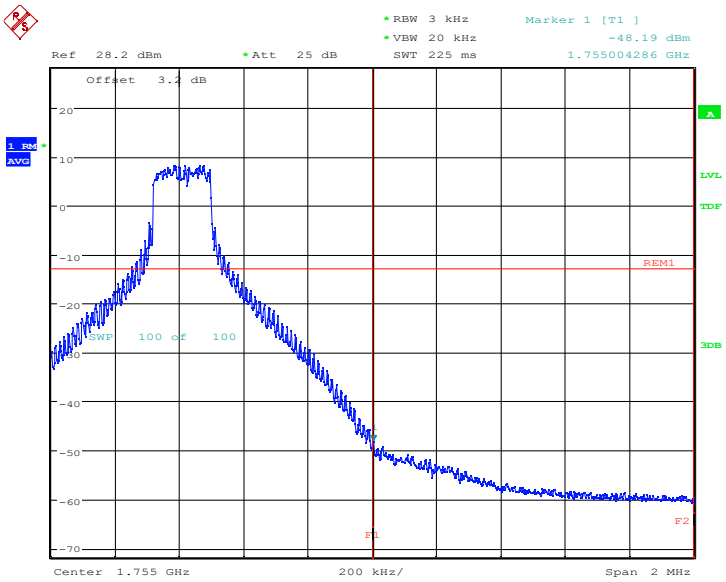
Date: 22.NOV.2022 01:43:10

OBW: 1RB-HIGH_offset



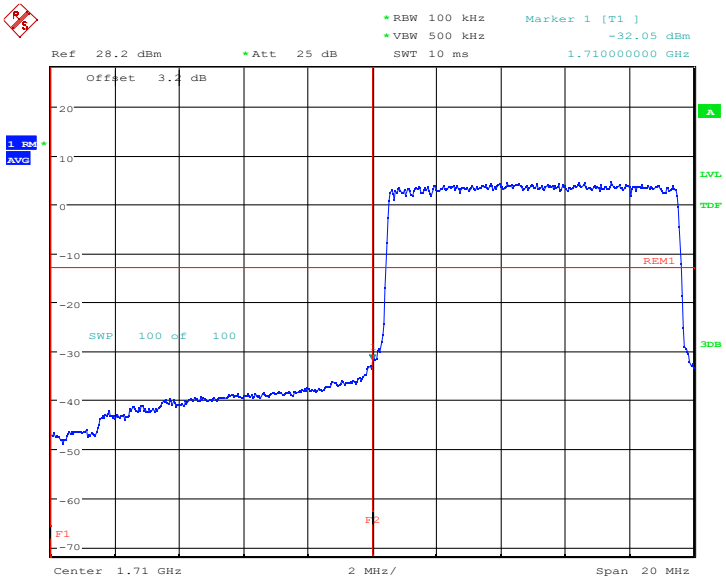
Date: 22.NOV.2022 01:44:22

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



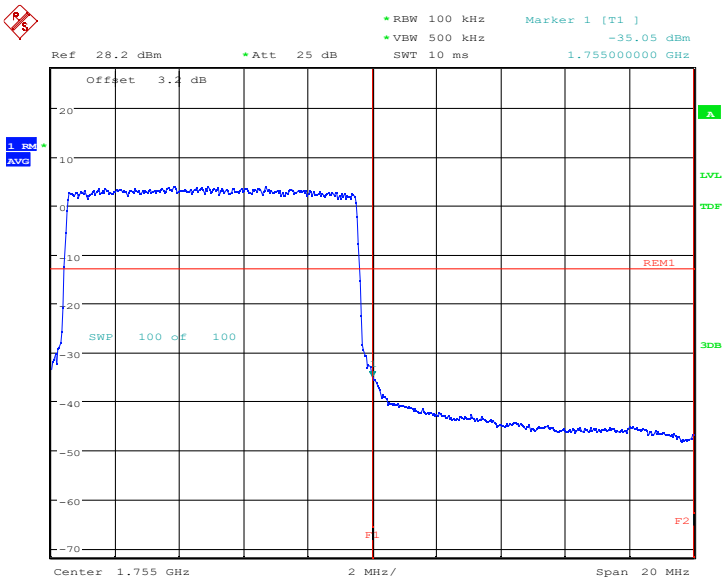
Date: 22.NOV.2022 01:45:24

LOW BAND EDGE BLOCK-10M-100%RB



Date: 22.NOV.2022 01:43:56

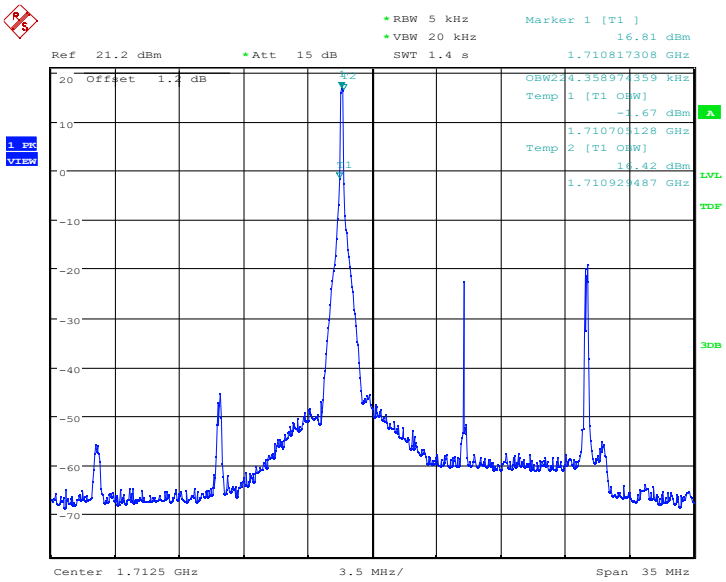
HIGH BAND EDGE BLOCK-10M-100%RB



Date: 22.NOV.2022 01:46:10

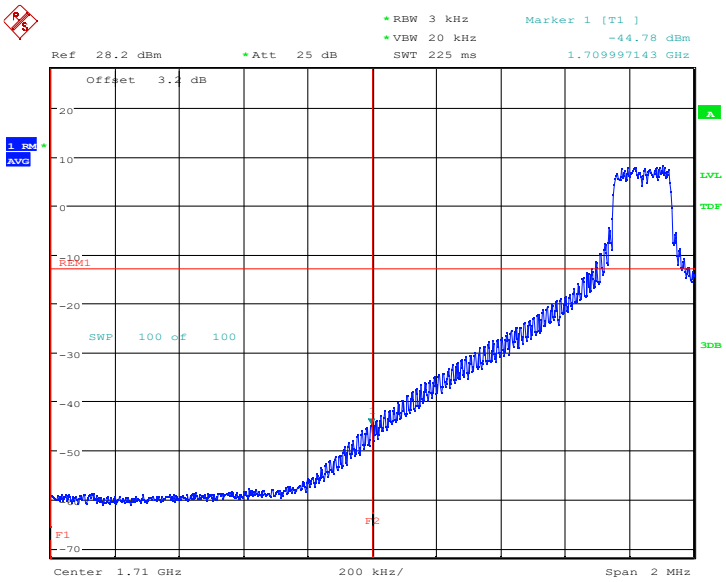
LTE band 4-15MHz

OBW: 1RB-LOW_offset



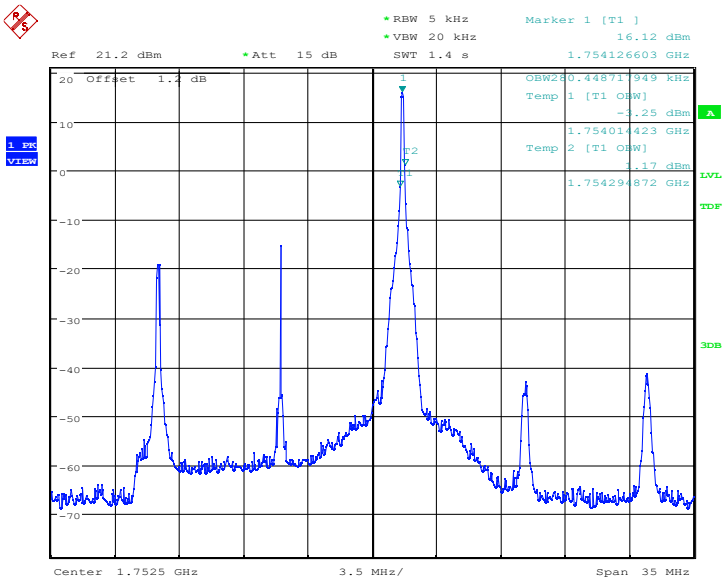
Date: 22.NOV.2022 01:47:25

LOW BAND EDGE BLOCK-1RB-LOW_offset



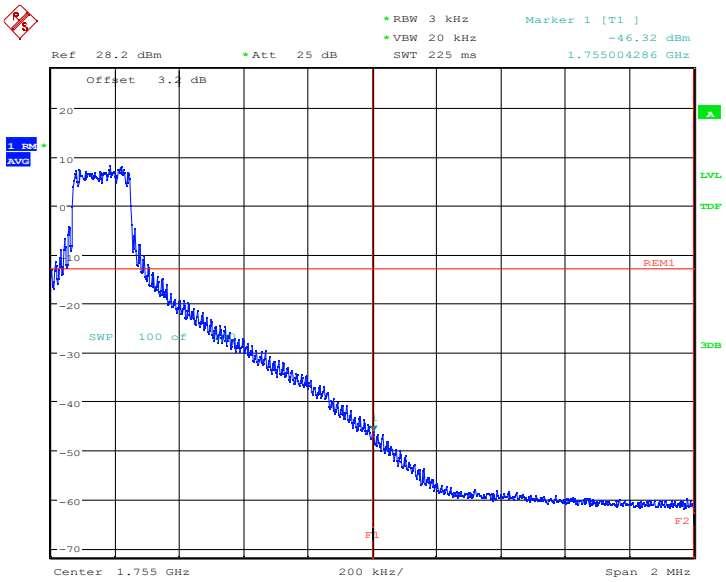
Date: 22.NOV.2022 01:48:29

OBW: 1RB-HIGH_offset



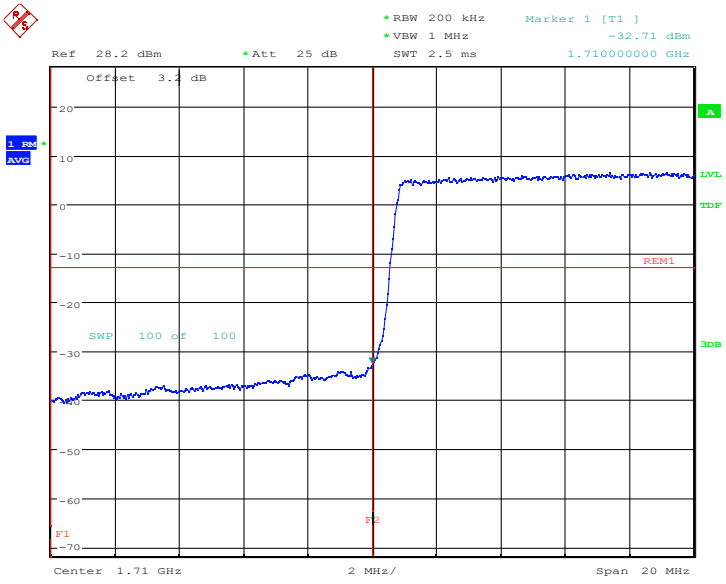
Date: 22.NOV.2022 01:49:40

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



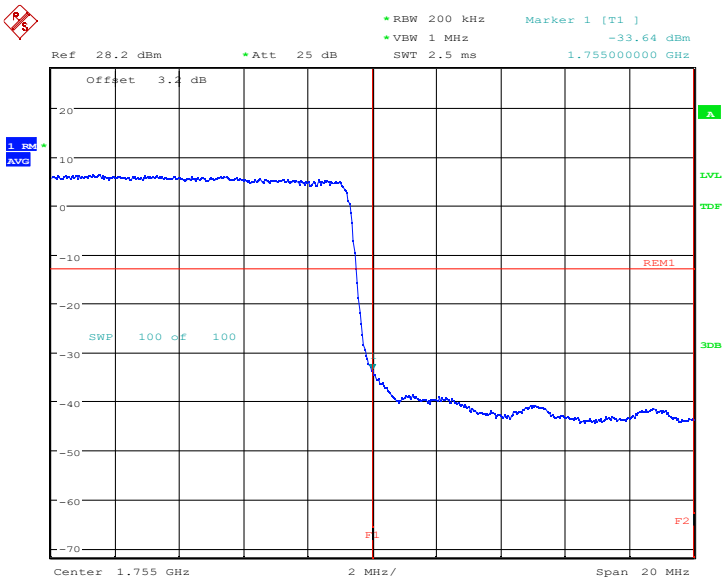
Date: 22.NOV.2022 01:50:42

LOW BAND EDGE BLOCK-15M-100%RB



Date: 22.NOV.2022 01:49:14

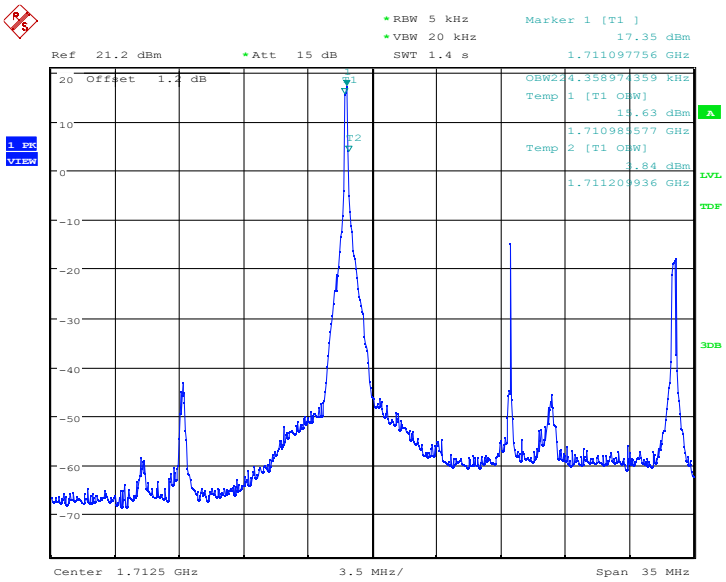
HIGH BAND EDGE BLOCK-15M-100%RB



Date: 22.NOV.2022 01:51:27

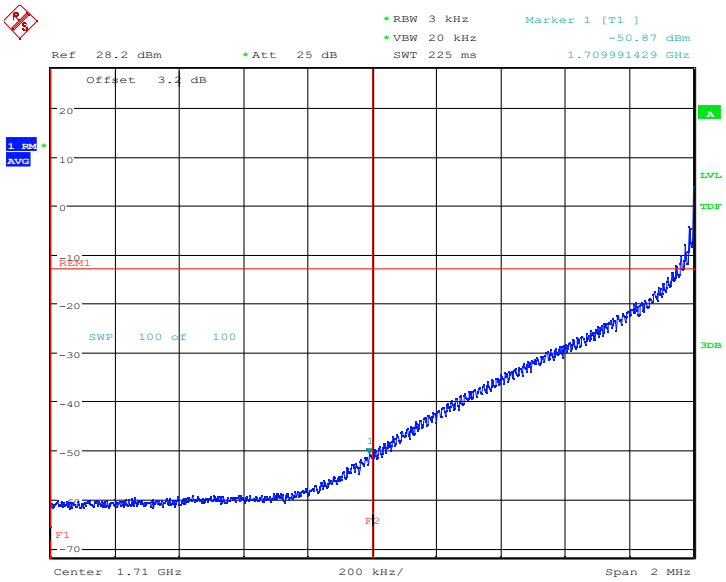
LTE band 4-20MHz

OBW: 1RB-LOW_offset



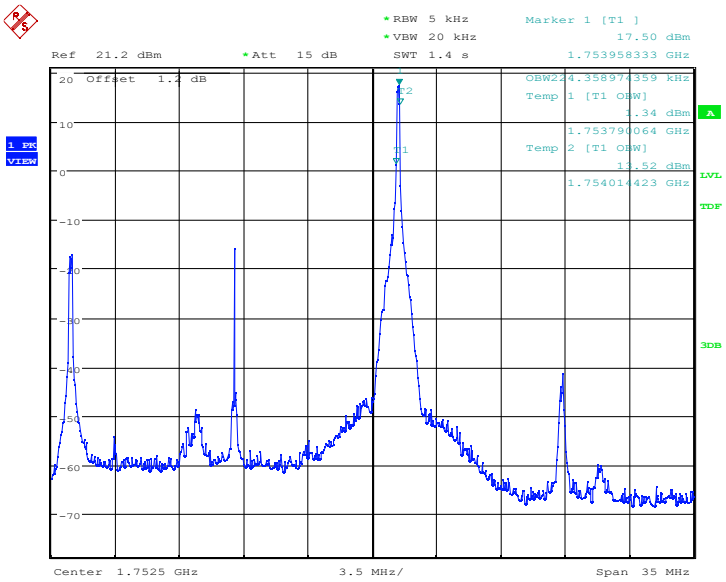
Date: 22.NOV.2022 01:52:42

LOW BAND EDGE BLOCK-1RB-LOW_offset



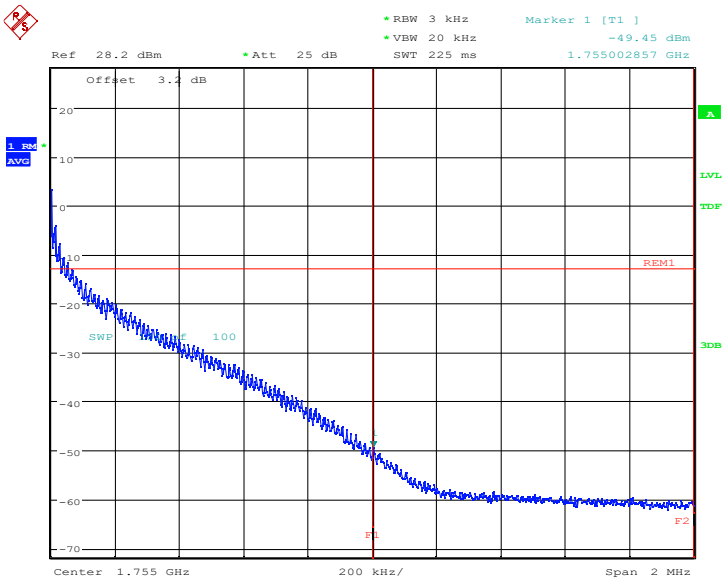
Date: 22.NOV.2022 01:53:48

OBW: 1RB-HIGH_offset



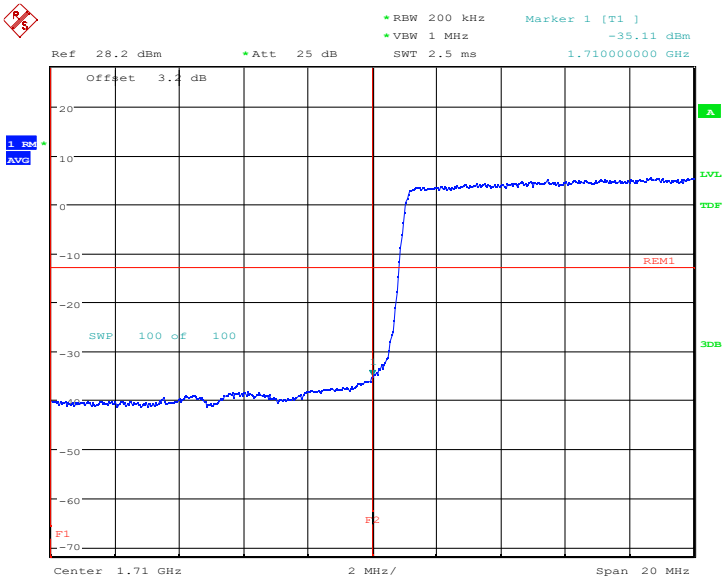
Date: 22.NOV.2022 01:54:59

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



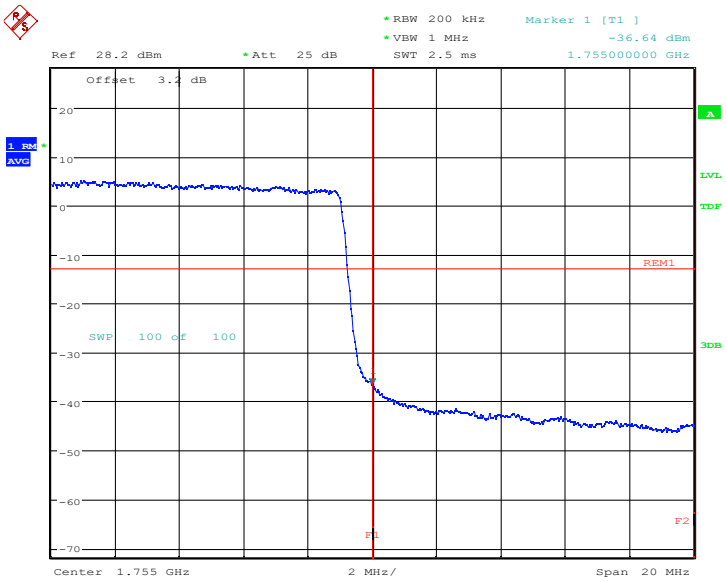
Date: 22.NOV.2022 01:56:01

LOW BAND EDGE BLOCK-20M-100%RB



Date: 22.NOV.2022 01:54:33

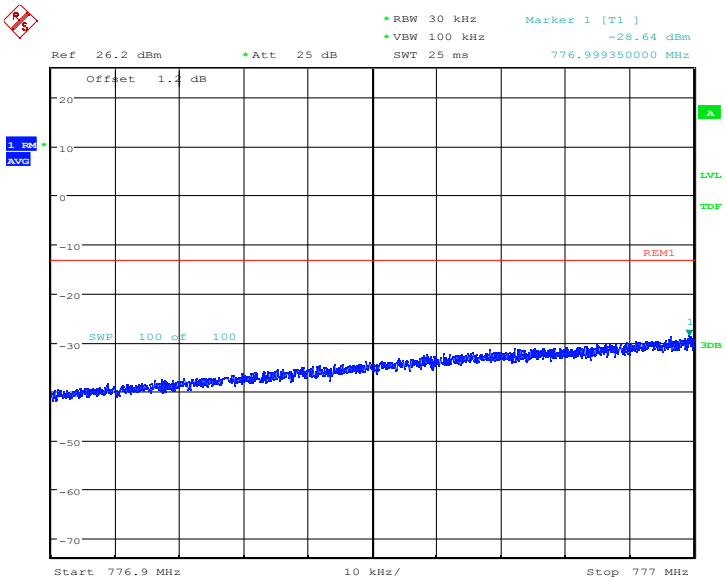
HIGH BAND EDGE BLOCK-20M-100%RB



Date: 22.NOV.2022 01:56:45

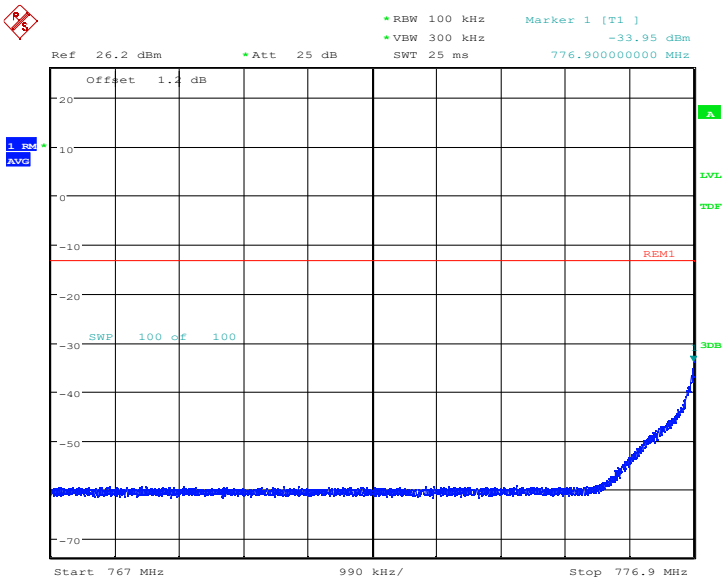
LTE band 13-5MHz

LOW BAND EDGE BLOCK-1RB-LOW_offset



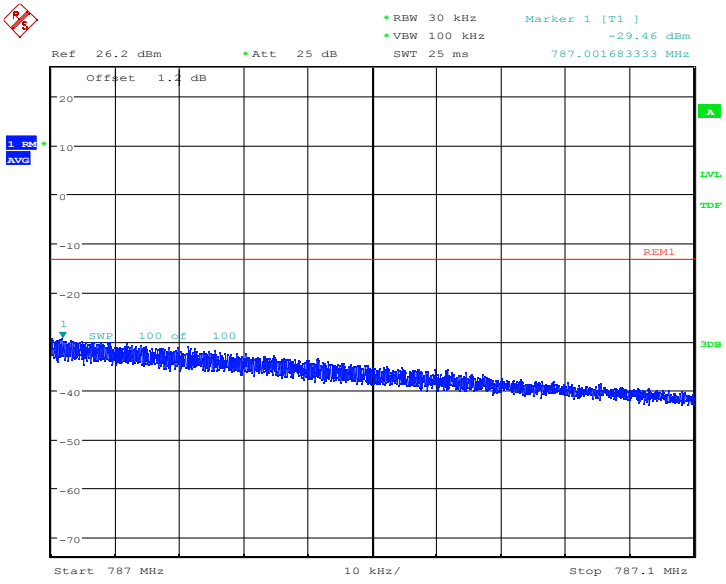
Date: 2.JAN.2023 23:31:48

LOW BAND EDGE BLOCK-1RB-LOW_offset



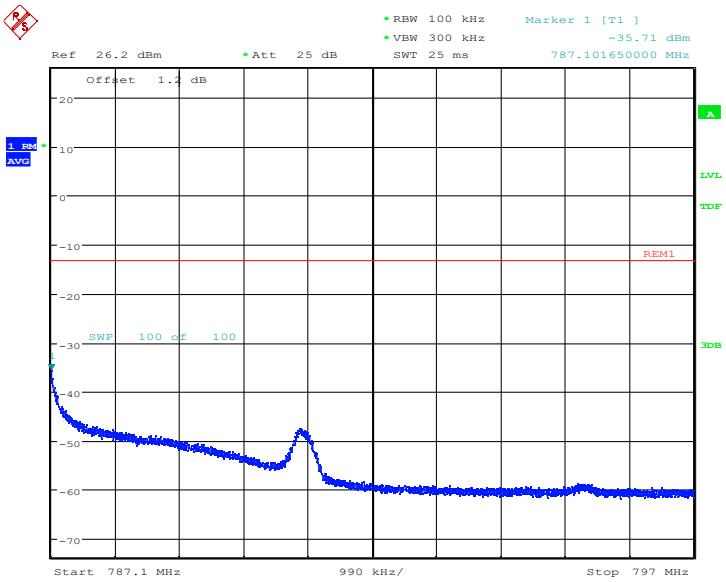
Date: 2.JAN.2023 23:32:39

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



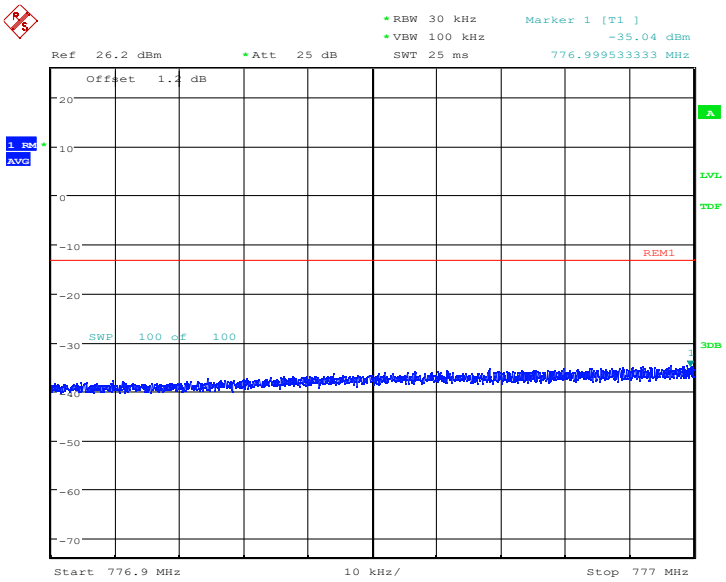
Date: 2.JAN.2023 23:35:19

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



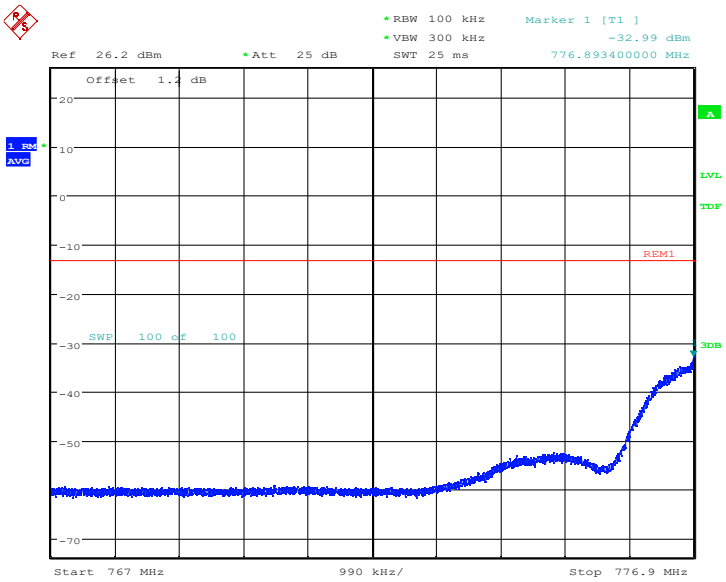
Date: 2.JAN.2023 23:36:10

LOW BAND EDGE BLOCK-5M-100%RB



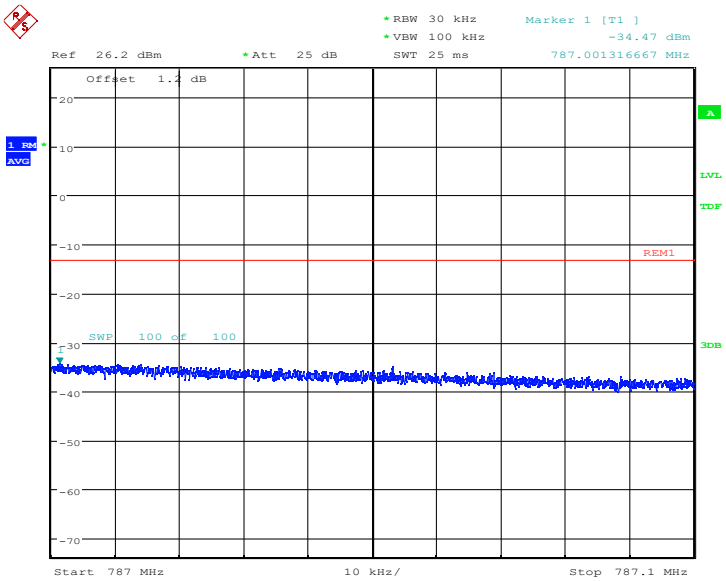
Date: 2.JAN.2023 23:33:31

LOW BAND EDGE BLOCK-5M-100%RB



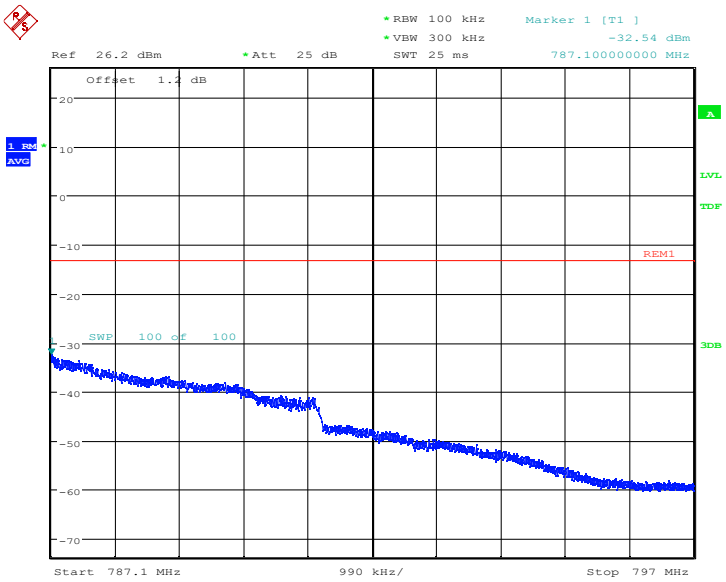
Date: 2.JAN.2023 23:34:22

HIGH BAND EDGE BLOCK-5M-100%RB



Date: 2.JAN.2023 23:37:06

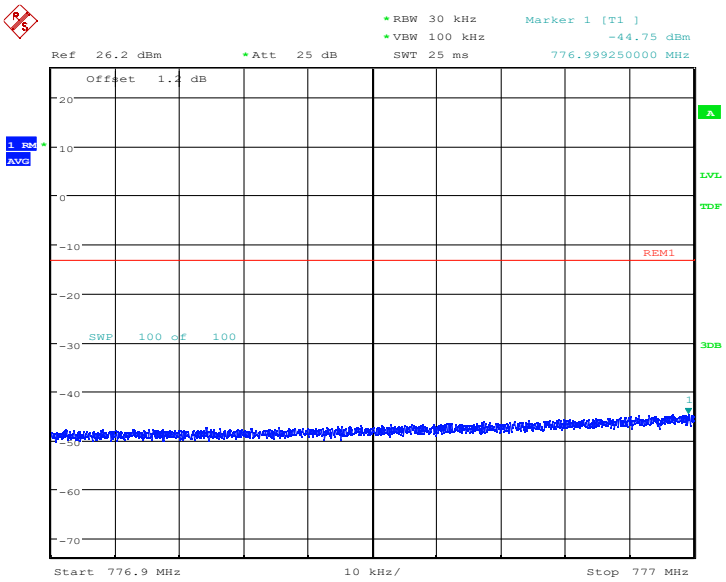
HIGH BAND EDGE BLOCK-5M-100%RB



Date: 2.JAN.2023 23:37:57

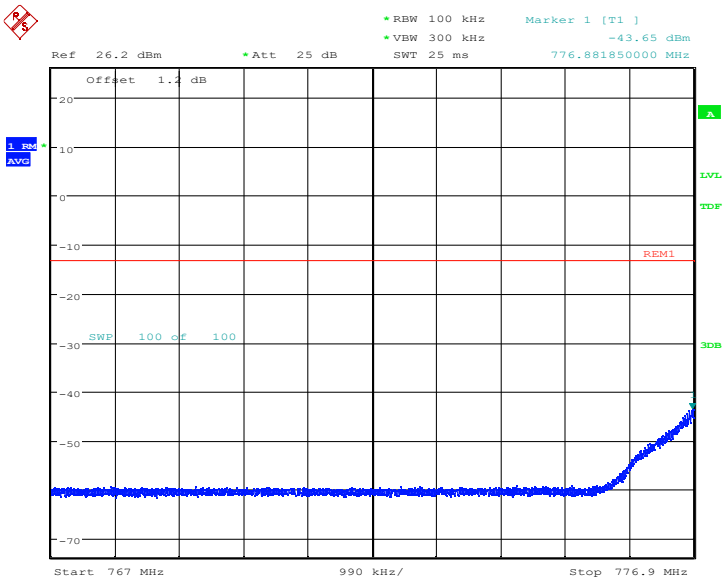
LTE band 13-10MHz

LOW BAND EDGE BLOCK-1RB-LOW_offset



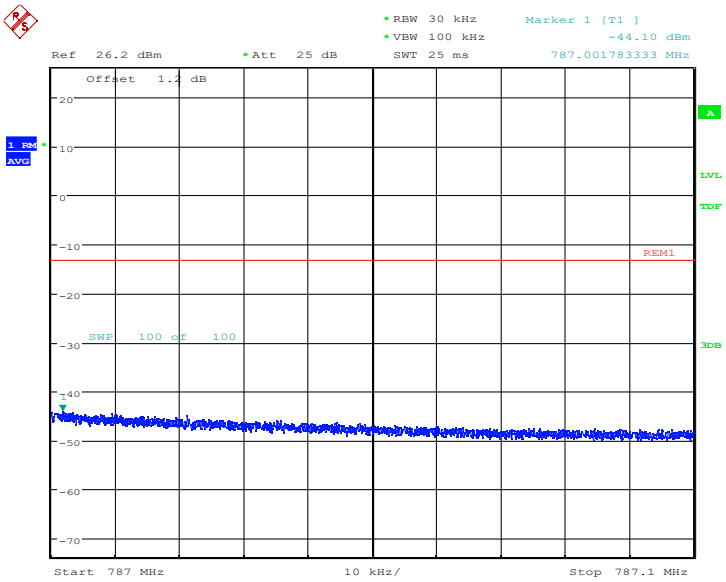
Date: 2.JAN.2023 23:39:43

LOW BAND EDGE BLOCK-1RB-LOW_offset



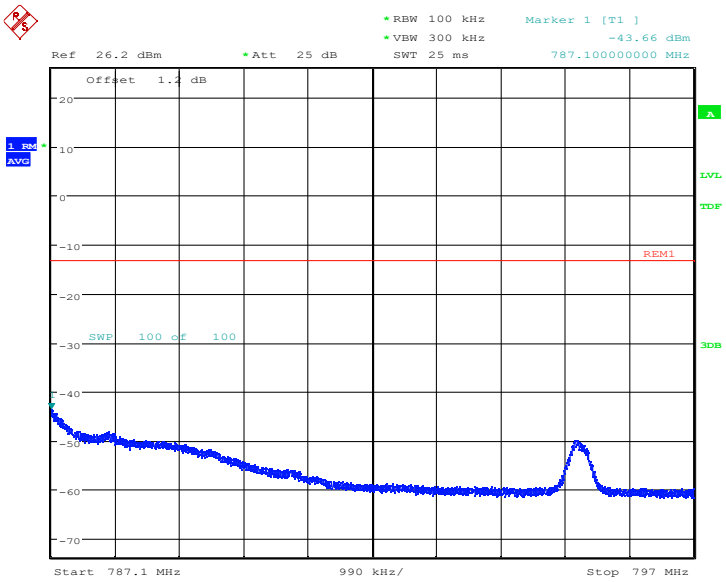
Date: 2.JAN.2023 23:40:34

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



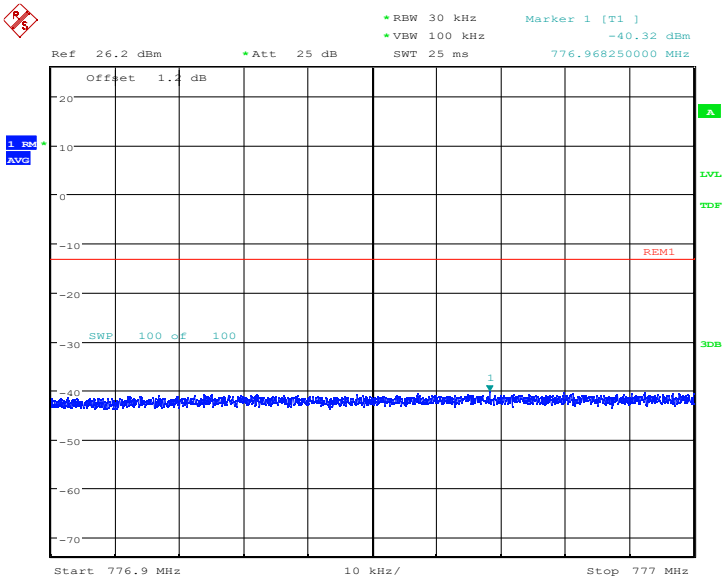
Date: 2.JAN.2023 23:43:10

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



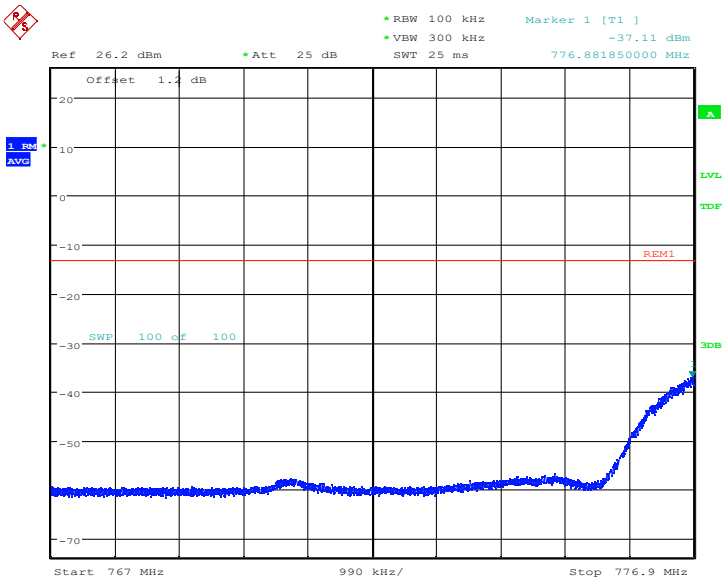
Date: 2.JAN.2023 23:44:00

LOW BAND EDGE BLOCK-10M-100%RB



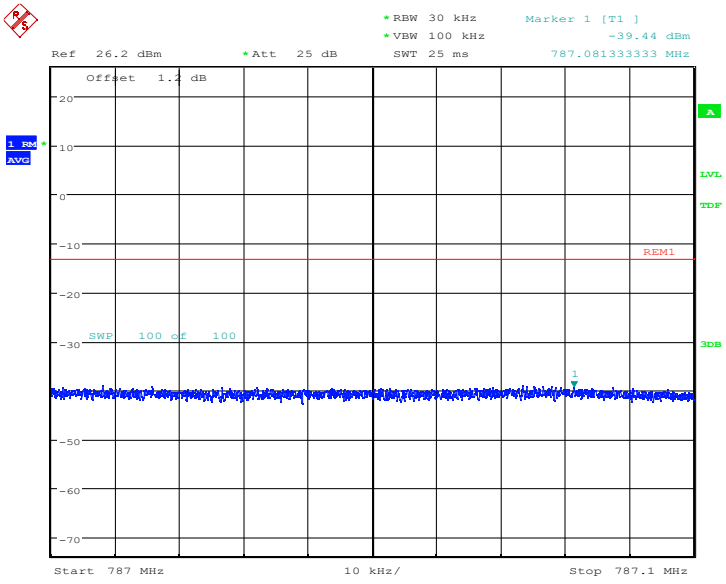
Date: 2.JAN.2023 23:41:26

LOW BAND EDGE BLOCK-10M-100%RB



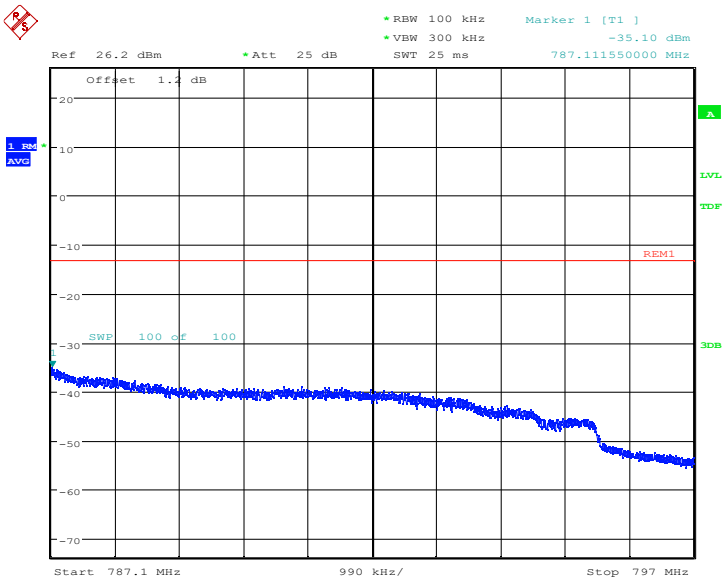
Date: 2.JAN.2023 23:42:17

HIGH BAND EDGE BLOCK-10M-100%RB



Date: 2.JAN.2023 23:44:52

HIGH BAND EDGE BLOCK-10M-100%RB



Date: 2.JAN.2023 23:45:44

6.8. Frequency Stability

Specifications:	FCC Part 2.1055, 27.54
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.54 Hz (k=2)

Test Method

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 FL and FH 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 ℃increments 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.

6.8.1 Frequency Stability over Temperature Variation Results

LTE band 4, 20MHz bandwidth MID,QPSK(worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.7	1732.5	0.22	0.0001
50			0.00	0.0000
40			0.34	0.0002
30			0.24	0.0001
10			0.00	0.0000
0			0.42	0.0002
-10			0.66	0.0004
-20			0.14	0.0001
-30			0.09	0.0000

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1732.5	0.72	0.0004
4.2			0.32	0.0002

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.7	782	-0.44	0.0006
50			-0.84	0.0011
40			-0.53	0.0007
30			-0.64	0.0008
10			-0.37	0.0005
0			-0.66	0.0008
-10			-0.49	0.0006

-20			-0.24	0.0003
-30			-0.46	0.0006

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	782	-0.93	0.0012
4.2			-1.30	0.0017

6.9. Peak to Average Ratio

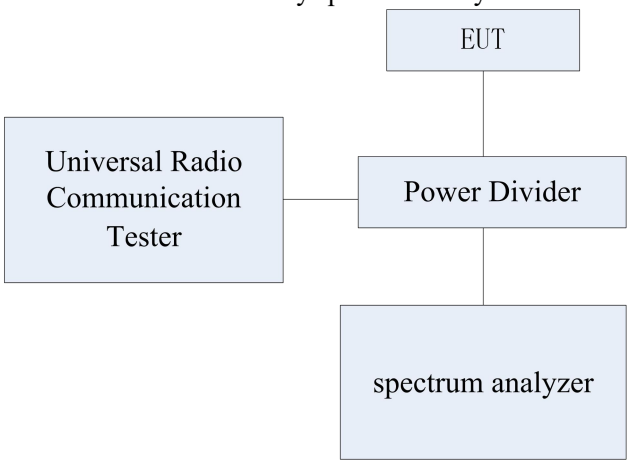
Specifications:	FCC Part 27.50
DUT Serial Number:	350807770292294
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.22 dB (k=2)

Test Method

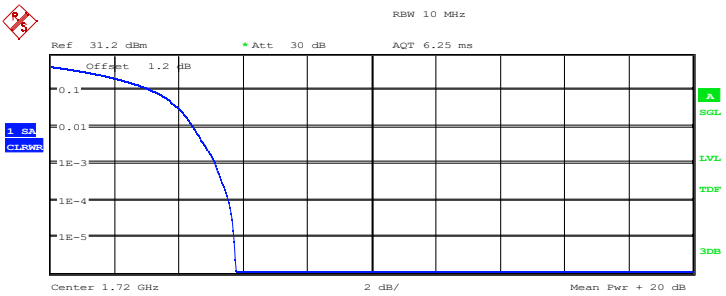
The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each Band on the Spectrum Analyzer.

6.9.1 Peak to Average Ratio Results

LTE Band 4, 20MHz

Frequency (MHz)	RB	PAPR (dB)
		QPSK
1720	100%,0	5.13
1732.5	100%,0	5.06
1745	100%,0	5.10

LTE band 4 , 20MHz Bandwidth,QPSK

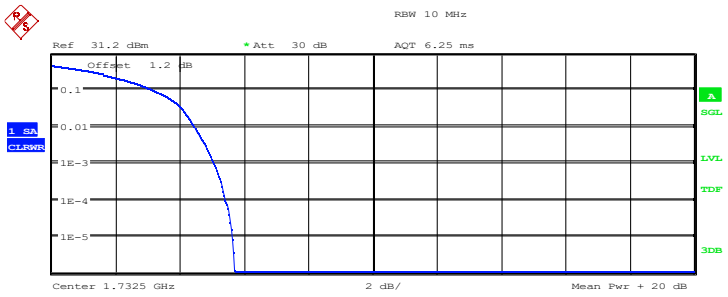


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	20.50 dBm
Peak	26.28 dBm
Crest	5.78 dB
10 %	3.14 dB
1 %	4.46 dB
.1 %	5.13 dB
.01 %	5.54 dB

Date: 22.NOV.2022 02:15:59

LTE band 4 , 20MHz Bandwidth,QPSK

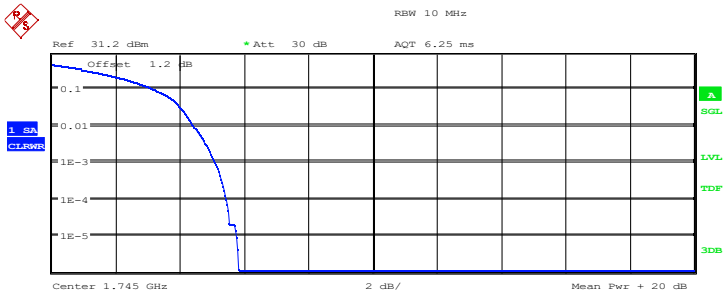


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	20.95 dBm
Peak	26.64 dBm
Crest	5.69 dB
10 %	3.17 dB
1 %	4.46 dB
.1 %	5.06 dB
.01 %	5.42 dB

Date: 22.NOV.2022 02:16:32

LTE band 4 , 20MHz Bandwidth,QPSK



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	20.10 dBm
Peak	25.91 dBm
Crest	5.82 dB
10 %	3.17 dB
1 %	4.42 dB
.1 %	5.10 dB
.01 %	5.45 dB

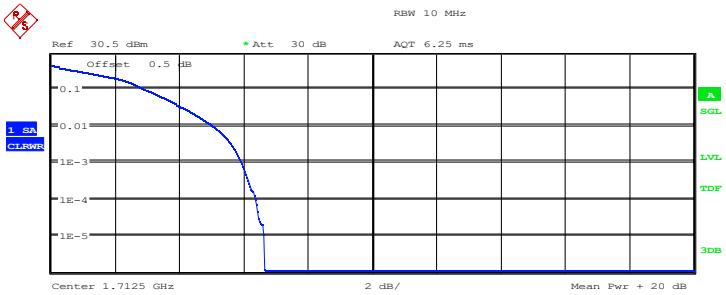
Date: 22.NOV.2022 02:17:10

LTE Band 4, 5MHz

Frequency (MHz)	RB	PAPR (dB)

		16QAM
1712.5	100%,0	5.93
1732.5	100%,0	5.74
1752.5	100%,0	5.93

LTE band 4 , 5MHz Bandwidth,16QAM

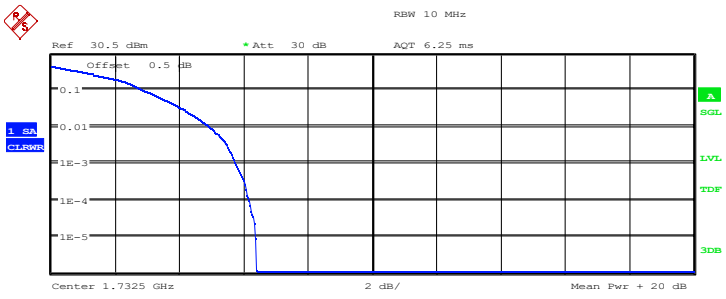


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	19.65 dBm
Peak	26.31 dBm
Crest	6.66 dB
10 %	2.92 dB
1 %	5.03 dB
.1 %	5.93 dB
.01 %	6.38 dB

Date: 2.JAN.2023 23:46:11

LTE band 4 , 5MHz Bandwidth,16QAM

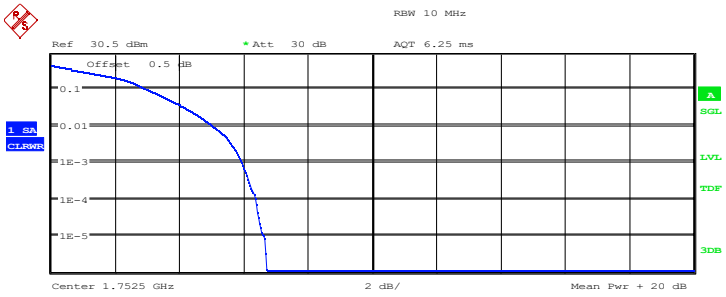


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	20.68 dBm
Peak	27.07 dBm
Crest	6.39 dB
10 %	2.88 dB
1 %	4.94 dB
.1 %	5.74 dB
.01 %	6.15 dB

Date: 2.JAN.2023 23:46:33

LTE band 4 , 5MHz Bandwidth,16QAM



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	19.62 dBm
Peak	26.33 dBm
Crest	6.71 dB
10 %	2.98 dB
1 %	5.03 dB
.1 %	5.93 dB
.01 %	6.38 dB

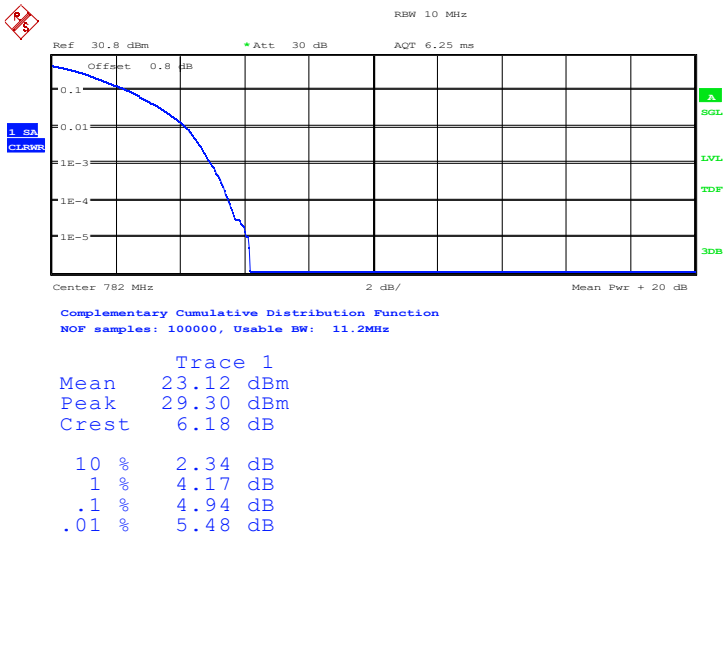
Date: 2.JAN.2023 23:46:52

LTE Band 13, 10MHz

Frequency (MHz)	RB	PAPR (dB)
		QPSK

782	100%,0	4.94

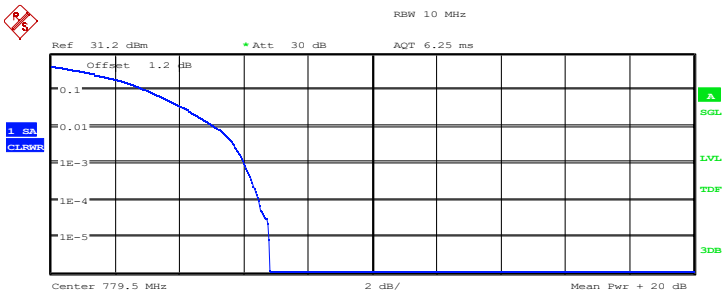
LTE band 13 , 10MHz Bandwidth,QPSK



LTE Band 13, 5MHz

Frequency (MHz)	RB	PAPR (dB)
		16QAM
779.5	100%,0	6.03
782	100%,0	5.96
784.5	100%,0	6.03

LTE band 13 , 5MHz Bandwidth,16QAM

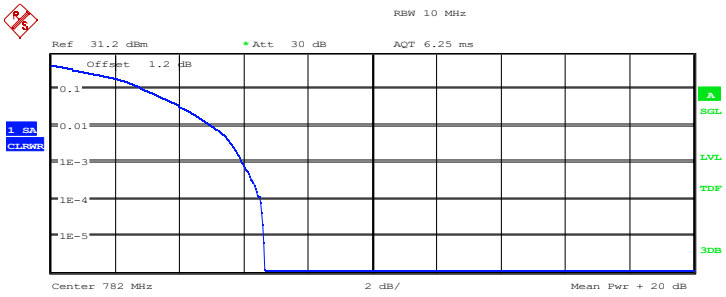


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.97 dBm
Peak	29.77 dBm
Crest	6.80 dB
10 %	2.95 dB
1 %	5.10 dB
.1 %	6.03 dB
.01 %	6.47 dB

Date: 2.JAN.2023 23:47:11

LTE band 13 , 5MHz Bandwidth,16QAM

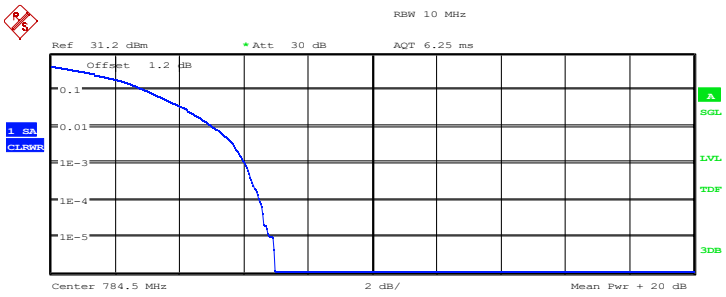


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.75 dBm
Peak	29.39 dBm
Crest	6.64 dB
10 %	2.88 dB
1 %	5.00 dB
.1 %	5.96 dB
.01 %	6.51 dB

Date: 2.JAN.2023 23:47:32

LTE band 13 , 5MHz Bandwidth,16QAM



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.74 dBm
Peak	29.71 dBm
Crest	6.97 dB
10 %	2.92 dB
1 %	5.03 dB
.1 %	6.03 dB
.01 %	6.47 dB

Date: 2.JAN.2023 23:47:50

Annex A EUT Photos

See the document" I22W00079-External Photos".
See the document" I22W00079-Internal Photos ".

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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