



TEST REPORT

REPORT NUMBER: I23W00006-LTE RF-Rev2

ON

Type of Equipment: 4G Module
Type of Designation: SIM7912A,SIM7906A
Brand Name: SIMCom
Manufacturer: SIMCom Wireless Solutions Limited
FCC ID: 2AJYU-8XM0001

ACCORDING TO

FCC CFR Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS;
GENERAL RULES AND REGULATIONS, e-CFR
PART 22, PUBLIC MOBILE SERVICES, e-CFR
PART 24,Personal Communications Services, e-CFR
PART 27,MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES, e-CFR
PART 90,PRIVATE LAND MOBILE RADIO SERVICES, e-CFR
PART 96,Citizens Broadband Radio Service,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

Jun, 29, 2023

Signature



Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report.
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Chongqing Academy of Information and Communications Technology.



Report No.: I23W00006-LTE-RF-Rev2

Revision Version

Report Number	Revision	Date	Memo
I23W00006-LTE-RF	00	2023-03-17	Initial creation of test report
I23W00006-LTE-RF-Rev1	01	2023-05-15	First change of test report
I23W00006-LTE-RF-Rev2	02	2023-06-29	Second change of test report

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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°C
Relative Humidity:	30-60%

1.3. Project data

Testing Start Date:	2023-02-21
Testing End Date:	2023-05-23

1.4. Signature



2023-06-29

Dong Junxin
(Prepared this test report)

Date

2023-06-29

Li Xu
(Reviewed this test report)

Date

2023-06-29

Xiang Luoyong
Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	862131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

2.2. Manufacturer Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
City:	Shanghai
Country:	China
Telephone:	862131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

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

3.1. About EUT

EUT Description	4G Module
Model name	SIM7912A,SIM7906A
Brand name	SIMCom
LTE Frequency Band	2/4/5/7/12/13/14/17/25/26/41/48/66/71
LTE_CA Frequency Band	CA_7C/41C
WCDMA Frequency Band	2/4/5
Type of modulation	QPSK/16QAM
Extreme Temperature	-10/+55°C
Nominal Voltage	3.8
Extreme High Voltage	4.2
Extreme Low Voltage	3.4

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
S1	IMEI:864542050020656	V1.02	SIM7912A:2110B02X12M42A-LGA SIM7906A:2110B02X12M43A-LGA	2023-02-21
S2	IMEI:864542050000326	V1.02	SIM7912A:2110B02X12M42A-LGA SIM7906A:2110B02X12M43A-LGA	2023-02-21

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

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3.3. Outline of Equipment under Test

Technology	Band	UL Freq.(MHz)	DL Freq.(MHz)	Note
WCDMA	B2	1852.4-1907.6	1932.4-1987.6	--
	B4	1712.4-1752.6	2112.4-2152.6	--
	B5	826.4-846.6	871.4-891.6	--
LTE	B2	1850 – 1910	1930 – 1990	--
	B4	1710 – 1755	2110 – 2155	--
	B5	824 – 849	869 – 894	--
	B7	2500-2570	2620-2690	--
	B12	699-716	729-746	--
	B13	777-787	746-756	--
	B14	788-798	758-768	--
	B17	704-716	734-746	--
	B25	1850-1915	1930-1995	--
	B26 Part22	824-849	869-894	--
	B26 Part90	814-824	859-869	--
	B41	2496-2690	2496-2690	--
	B48	3550-3700	3550-3700	--
	B66	1710-1780	2110-2200	--
	B71	663-698	617-652	--
LTE_CA	B7	2500-2570	2620-2690	--
	B41	2496-2690	2496-2690	--

3.4. Internal Identification of AE used during the test

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

dB*: is provided customer.

AE ID	Description	Information
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AE1	ADAPTER	Model: HY-0502000S Input: AC 100-240V 0.5A Output: DC 5V 2A
AE2	ANTENNA	--
AE3	Mainboard	SN: E2062125298E1C8

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 22	PUBLIC MOBILE SERVICES	
PART 24	Personal Communications Services, e-CFR	--
PART 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES, e-CFR	--
PART 90	PRIVATE LAND MOBILE RADIO SERVICES, e-CFR,	--
PART 96	PART 96,Citizens Broadband Radio Service	--
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	62015-60-6	L02000001587	--	--	Topward	2023-06-29
3	Universal Radio Communication Tester	CMW500	152395	--	--	R&S	2023-11-20
4	Spectrum analyzer	N9030B	MY57140816	--	--	Keysight	2023-06-29

5.2. RSE Test System

No.	Equipment	Model	SN	HW Version	SW Version	Manufa cture	Cal.Due Date
1	Universal Radio Communication Tester	CMW500	128181	--	--	R&S	2023-06-29
2	Test Receiver	ESU40	100350	01	4.43 SP3	R&S	2023-06-29
3	Ultra-wideband Log Periodic Antenna	VULB 9163	9163-586	--	--	Schwarzbeck	2024-10-28
4	Double Ridged Guide Antenna	9120D	9120D-1103	--	--	Schwarzbeck	2024-05-05
5	Ultra-wideband Log Periodic Antenna	VULB 9163	00995	--	--	Schwarzbeck	2024-04-03
6	Double Ridged Guide Antenna	9120D	9120D-1083	--	--	Schwarzbeck	2024-12-14
7	High gain horn antenna	DATE 1152	LM7127	--	--	ETS	2024-09-06
8	Fully-Anechoic Chamber	FAC5	--	--	--	TDK	2024-09-22
9	Generator	SMU 200A	104517	--	--	R&S	2023-06-29
10	Amplifier1	SCU-08F1	8320027	--	--	R&S	2023-06-29
11	Amplifier2	SCU-18F	180093	--	--	R&S	2023-06-29

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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	FAC-5	--	TDK	2024-08-30

Vibration table

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

5.4. Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 9.26.01	--	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
2.1046,96.41	Conducted RF Power Output	Pass
2.1046,96.41	ERP and EIRP	Pass
2.1049	Occupied Bandwidth	*Note 1
2.1051,2.1053, 96.41	Conducted spurious emissions	Pass
2.1051,2.1053, 96.41	Radiated Spurious Emission	Pass
2.1051,2.1053, 96.41	Band Edge	Pass
2.1055	Frequency Stability	Pass
96.41	Peak to Average Ratio	Pass
96.47	End user device additional requirements	Pass ^{note4}

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: This report only reflects B48 test data. See I22W00018 for other frequency band data.

Note 4: End user device additional requirements See report FG322308-1.

Note5: The test model is SIM7912A.The differences between the two models are the category of SIM7912A is CAT12, with 3CA and 2CA, and the category of SIM7906A is CAT6, only 2CA. Their difference is achieved through software.There is no hardware difference between the two models.

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6.2. Conducted RF Power Output

Specifications:	FCC Part 2.1046,96.41
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

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 48

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm)
5MHz	1 RB low	3552.5	QPSK	19.77
5MHz	1 RB mid	3552.5	QPSK	19.71
5MHz	1 RB high	3552.5	QPSK	19.66
5MHz	50%,low	3552.5	QPSK	18.63
5MHz	50% RB mid	3552.5	QPSK	18.69
5MHz	50%,high	3552.5	QPSK	18.65
5MHz	100% RB	3552.5	QPSK	18.62
5MHz	1 RB low	3552.5	16QAM	18.73
5MHz	1 RB mid	3552.5	16QAM	18.73
5MHz	1 RB high	3552.5	16QAM	18.63
5MHz	50%,low	3552.5	16QAM	17.74
5MHz	50% RB mid	3552.5	16QAM	17.73
5MHz	50%,high	3552.5	16QAM	17.66
5MHz	100% RB	3552.5	16QAM	17.61
5MHz	1 RB low	3625	QPSK	19.94
5MHz	1 RB mid	3625	QPSK	19.77
5MHz	1 RB high	3625	QPSK	19.71
5MHz	50%,low	3625	QPSK	18.71
5MHz	50% RB mid	3625	QPSK	18.76
5MHz	50%,high	3625	QPSK	18.71
5MHz	100% RB	3625	QPSK	18.71
5MHz	1 RB low	3625	16QAM	18.82
5MHz	1 RB mid	3625	16QAM	18.84
5MHz	1 RB high	3625	16QAM	18.77
5MHz	50%,low	3625	16QAM	17.73
5MHz	50% RB mid	3625	16QAM	17.69
5MHz	50%,high	3625	16QAM	17.63
5MHz	100% RB	3625	16QAM	17.72
5MHz	1 RB low	3697.5	QPSK	19.55
5MHz	1 RB mid	3697.5	QPSK	19.58
5MHz	1 RB high	3697.5	QPSK	19.59
5MHz	50%,low	3697.5	QPSK	18.64
5MHz	50% RB mid	3697.5	QPSK	18.67
5MHz	50%,high	3697.5	QPSK	18.59

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5MHz	100% RB	3697.5	QPSK	18.64
5MHz	1 RB low	3697.5	16QAM	18.85
5MHz	1 RB mid	3697.5	16QAM	18.86
5MHz	1 RB high	3697.5	16QAM	18.82
5MHz	50%,low	3697.5	16QAM	17.66
5MHz	50% RB mid	3697.5	16QAM	17.69
5MHz	50%,high	3697.5	16QAM	17.63
5MHz	100% RB	3697.5	16QAM	17.54
10MHz	1 RB low	3555	QPSK	19.80
10MHz	1 RB mid	3555	QPSK	19.67
10MHz	1 RB high	3555	QPSK	19.71
10MHz	50%,low	3555	QPSK	18.79
10MHz	50% RB mid	3555	QPSK	18.78
10MHz	50%,high	3555	QPSK	18.74
10MHz	100% RB	3555	QPSK	18.74
10MHz	1 RB low	3555	16QAM	18.93
10MHz	1 RB mid	3555	16QAM	18.88
10MHz	1 RB high	3555	16QAM	18.84
10MHz	50%,low	3555	16QAM	17.76
10MHz	50% RB mid	3555	16QAM	17.74
10MHz	50%,high	3555	16QAM	17.70
10MHz	100% RB	3555	16QAM	17.70
10MHz	1 RB low	3625	QPSK	19.86
10MHz	1 RB mid	3625	QPSK	19.78
10MHz	1 RB high	3625	QPSK	19.83
10MHz	50%,low	3625	QPSK	18.85
10MHz	50% RB mid	3625	QPSK	18.83
10MHz	50%,high	3625	QPSK	18.80
10MHz	100% RB	3625	QPSK	18.80
10MHz	1 RB low	3625	16QAM	18.72
10MHz	1 RB mid	3625	16QAM	18.69
10MHz	1 RB high	3625	16QAM	18.72
10MHz	50%,low	3625	16QAM	17.79
10MHz	50% RB mid	3625	16QAM	17.78
10MHz	50%,high	3625	16QAM	17.77
10MHz	100% RB	3625	16QAM	17.79
10MHz	1 RB low	3695	QPSK	19.67
10MHz	1 RB mid	3695	QPSK	19.71

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10MHz	1 RB high	3695	QPSK	19.72
10MHz	50%,low	3695	QPSK	18.69
10MHz	50% RB mid	3695	QPSK	18.70
10MHz	50%,high	3695	QPSK	18.69
10MHz	100% RB	3695	QPSK	18.69
10MHz	1 RB low	3695	16QAM	18.81
10MHz	1 RB mid	3695	16QAM	18.69
10MHz	1 RB high	3695	16QAM	18.78
10MHz	50%,low	3695	16QAM	17.73
10MHz	50% RB mid	3695	16QAM	17.74
10MHz	50%,high	3695	16QAM	17.69
10MHz	100% RB	3695	16QAM	17.67
15MHz	1 RB low	3557.5	QPSK	19.79
15MHz	1 RB mid	3557.5	QPSK	19.74
15MHz	1 RB high	3557.5	QPSK	19.76
15MHz	50%,low	3557.5	QPSK	18.83
15MHz	50% RB mid	3557.5	QPSK	18.84
15MHz	50%,high	3557.5	QPSK	18.84
15MHz	100% RB	3557.5	QPSK	18.83
15MHz	1 RB low	3557.5	16QAM	18.96
15MHz	1 RB mid	3557.5	16QAM	18.93
15MHz	1 RB high	3557.5	16QAM	18.94
15MHz	50%,low	3557.5	16QAM	17.81
15MHz	50% RB mid	3557.5	16QAM	17.79
15MHz	50%,high	3557.5	16QAM	17.79
15MHz	100% RB	3557.5	16QAM	17.72
15MHz	1 RB low	3625	QPSK	19.88
15MHz	1 RB mid	3625	QPSK	19.85
15MHz	1 RB high	3625	QPSK	19.92
15MHz	50%,low	3625	QPSK	18.89
15MHz	50% RB mid	3625	QPSK	18.92
15MHz	50%,high	3625	QPSK	18.92
15MHz	100% RB	3625	QPSK	18.90
15MHz	1 RB low	3625	16QAM	18.80
15MHz	1 RB mid	3625	16QAM	18.80
15MHz	1 RB high	3625	16QAM	18.83
15MHz	50%,low	3625	16QAM	17.81
15MHz	50% RB mid	3625	16QAM	17.85

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15MHz	50%,high	3625	16QAM	17.87
15MHz	100% RB	3625	16QAM	17.84
15MHz	1 RB low	3692.5	QPSK	19.75
15MHz	1 RB mid	3692.5	QPSK	19.77
15MHz	1 RB high	3692.5	QPSK	19.74
15MHz	50%,low	3692.5	QPSK	18.74
15MHz	50% RB mid	3692.5	QPSK	18.73
15MHz	50%,high	3692.5	QPSK	18.76
15MHz	100% RB	3692.5	QPSK	18.74
15MHz	1 RB low	3692.5	16QAM	18.91
15MHz	1 RB mid	3692.5	16QAM	18.89
15MHz	1 RB high	3692.5	16QAM	18.93
15MHz	50%,low	3692.5	16QAM	17.73
15MHz	50% RB mid	3692.5	16QAM	17.72
15MHz	50%,high	3692.5	16QAM	17.70
15MHz	100% RB	3692.5	16QAM	17.73
20MHz	1 RB low	3560	QPSK	19.74
20MHz	1 RB mid	3560	QPSK	19.70
20MHz	1 RB high	3560	QPSK	19.68
20MHz	50%,low	3560	QPSK	18.67
20MHz	50% RB mid	3560	QPSK	18.68
20MHz	50%,high	3560	QPSK	18.62
20MHz	100% RB	3560	QPSK	18.65
20MHz	1 RB low	3560	16QAM	18.88
20MHz	1 RB mid	3560	16QAM	18.78
20MHz	1 RB high	3560	16QAM	18.79
20MHz	50%,low	3560	16QAM	17.74
20MHz	50% RB mid	3560	16QAM	17.78
20MHz	50%,high	3560	16QAM	17.71
20MHz	100% RB	3560	16QAM	17.77
20MHz	1 RB low	3625	QPSK	19.91
20MHz	1 RB mid	3625	QPSK	19.83
20MHz	1 RB high	3625	QPSK	19.89
20MHz	50%,low	3625	QPSK	18.88
20MHz	50% RB mid	3625	QPSK	18.90
20MHz	50%,high	3625	QPSK	18.90
20MHz	100% RB	3625	QPSK	18.86
20MHz	1 RB low	3625	16QAM	18.89

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20MHz	1 RB mid	3625	16QAM	18.89
20MHz	1 RB high	3625	16QAM	18.83
20MHz	50%,low	3625	16QAM	17.88
20MHz	50% RB mid	3625	16QAM	17.86
20MHz	50%,high	3625	16QAM	17.88
20MHz	100% RB	3625	16QAM	17.83
20MHz	1 RB low	3690	QPSK	19.85
20MHz	1 RB mid	3690	QPSK	19.74
20MHz	1 RB high	3690	QPSK	19.69
20MHz	50%,low	3690	QPSK	18.67
20MHz	50% RB mid	3690	QPSK	18.76
20MHz	50%,high	3690	QPSK	18.68
20MHz	100% RB	3690	QPSK	18.73
20MHz	1 RB low	3690	16QAM	19.07
20MHz	1 RB mid	3690	16QAM	18.96
20MHz	1 RB high	3690	16QAM	19.03
20MHz	50%,low	3690	16QAM	17.62
20MHz	50% RB mid	3690	16QAM	17.77
20MHz	50%,high	3690	16QAM	17.68
20MHz	100% RB	3690	16QAM	17.59

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6.3. ERP and EIRP

Limit Level Construction:

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

According to Part 96.41(b): End User Device is limited to 23 dBm Maximum EIRP (dBm/10 megahertz)

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 48	1

6.3.1 LTE Band 48 result

LTE Band48

EIRP Limits 23dBm/10 megahertz

Bandwidth	RB size/offset	Frequency (MHz)	Modulation	Avg Power (dBm) 10MHz	EIRP(dBm/10 megahertz) Max EIRP:20.94
5MHz	1 RB low	3552.5	QPSK	19.77	20.77
5MHz	1 RB mid	3552.5	QPSK	19.71	20.71
5MHz	1 RB high	3552.5	QPSK	19.66	20.66
5MHz	50%,low	3552.5	QPSK	18.63	19.63
5MHz	50% RB mid	3552.5	QPSK	18.69	19.69
5MHz	50%,high	3552.5	QPSK	18.65	19.65
5MHz	100% RB	3552.5	QPSK	18.62	19.62
5MHz	1 RB low	3552.5	16QAM	18.73	19.73
5MHz	1 RB mid	3552.5	16QAM	18.73	19.73
5MHz	1 RB high	3552.5	16QAM	18.63	19.63
5MHz	50%,low	3552.5	16QAM	17.74	18.74
5MHz	50% RB mid	3552.5	16QAM	17.73	18.73
5MHz	50%,high	3552.5	16QAM	17.66	18.66
5MHz	100% RB	3552.5	16QAM	17.61	18.61
5MHz	1 RB low	3625	QPSK	19.94	20.94
5MHz	1 RB mid	3625	QPSK	19.77	20.77
5MHz	1 RB high	3625	QPSK	19.71	20.71
5MHz	50%,low	3625	QPSK	18.71	19.71
5MHz	50% RB mid	3625	QPSK	18.76	19.76
5MHz	50%,high	3625	QPSK	18.71	19.71
5MHz	100% RB	3625	QPSK	18.71	19.71
5MHz	1 RB low	3625	16QAM	18.82	19.82
5MHz	1 RB mid	3625	16QAM	18.84	19.84
5MHz	1 RB high	3625	16QAM	18.77	19.77
5MHz	50%,low	3625	16QAM	17.73	18.73
5MHz	50% RB mid	3625	16QAM	17.69	18.69
5MHz	50%,high	3625	16QAM	17.63	18.63
5MHz	100% RB	3625	16QAM	17.72	18.72
5MHz	1 RB low	3697.5	QPSK	19.55	20.55
5MHz	1 RB mid	3697.5	QPSK	19.58	20.58
5MHz	1 RB high	3697.5	QPSK	19.59	20.59
5MHz	50%,low	3697.5	QPSK	18.64	19.64

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5MHz	50% RB mid	3697.5	QPSK	18.67	19.67
5MHz	50%,high	3697.5	QPSK	18.59	19.59
5MHz	100% RB	3697.5	QPSK	18.64	19.64
5MHz	1 RB low	3697.5	16QAM	18.85	19.85
5MHz	1 RB mid	3697.5	16QAM	18.86	19.86
5MHz	1 RB high	3697.5	16QAM	18.82	19.82
5MHz	50%,low	3697.5	16QAM	17.66	18.66
5MHz	50% RB mid	3697.5	16QAM	17.69	18.69
5MHz	50%,high	3697.5	16QAM	17.63	18.63
5MHz	100% RB	3697.5	16QAM	17.54	18.54
10MHz	1 RB low	3555	QPSK	19.80	20.80
10MHz	1 RB mid	3555	QPSK	19.67	20.67
10MHz	1 RB high	3555	QPSK	19.71	20.71
10MHz	50%,low	3555	QPSK	18.79	19.79
10MHz	50% RB mid	3555	QPSK	18.78	19.78
10MHz	50%,high	3555	QPSK	18.74	19.74
10MHz	100% RB	3555	QPSK	18.74	19.74
10MHz	1 RB low	3555	16QAM	18.93	19.93
10MHz	1 RB mid	3555	16QAM	18.88	19.88
10MHz	1 RB high	3555	16QAM	18.84	19.84
10MHz	50%,low	3555	16QAM	17.76	18.76
10MHz	50% RB mid	3555	16QAM	17.74	18.74
10MHz	50%,high	3555	16QAM	17.70	18.70
10MHz	100% RB	3555	16QAM	17.70	18.70
10MHz	1 RB low	3625	QPSK	19.86	20.86
10MHz	1 RB mid	3625	QPSK	19.78	20.78
10MHz	1 RB high	3625	QPSK	19.83	20.83
10MHz	50%,low	3625	QPSK	18.85	19.85
10MHz	50% RB mid	3625	QPSK	18.83	19.83
10MHz	50%,high	3625	QPSK	18.80	19.80
10MHz	100% RB	3625	QPSK	18.80	19.80
10MHz	1 RB low	3625	16QAM	18.72	19.72
10MHz	1 RB mid	3625	16QAM	18.69	19.69
10MHz	1 RB high	3625	16QAM	18.72	19.72
10MHz	50%,low	3625	16QAM	17.79	18.79
10MHz	50% RB mid	3625	16QAM	17.78	18.78
10MHz	50%,high	3625	16QAM	17.77	18.77
10MHz	100% RB	3625	16QAM	17.79	18.79

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10MHz	1 RB low	3695	QPSK	19.67	20.67
10MHz	1 RB mid	3695	QPSK	19.71	20.71
10MHz	1 RB high	3695	QPSK	19.72	20.72
10MHz	50%,low	3695	QPSK	18.69	19.69
10MHz	50% RB mid	3695	QPSK	18.70	19.70
10MHz	50%,high	3695	QPSK	18.69	19.69
10MHz	100% RB	3695	QPSK	18.69	19.69
10MHz	1 RB low	3695	16QAM	18.81	19.81
10MHz	1 RB mid	3695	16QAM	18.69	19.69
10MHz	1 RB high	3695	16QAM	18.78	19.78
10MHz	50%,low	3695	16QAM	17.73	18.73
10MHz	50% RB mid	3695	16QAM	17.74	18.74
10MHz	50%,high	3695	16QAM	17.69	18.69
10MHz	100% RB	3695	16QAM	17.67	18.67
15MHz	1 RB low	3557.5	QPSK	19.79	20.79
15MHz	1 RB mid	3557.5	QPSK	19.74	20.74
15MHz	1 RB high	3557.5	QPSK	19.76	20.76
15MHz	50%,low	3557.5	QPSK	18.83	19.83
15MHz	50% RB mid	3557.5	QPSK	18.84	19.84
15MHz	50%,high	3557.5	QPSK	18.84	19.84
15MHz	100% RB	3557.5	QPSK	18.83	19.83
15MHz	1 RB low	3557.5	16QAM	18.96	19.96
15MHz	1 RB mid	3557.5	16QAM	18.93	19.93
15MHz	1 RB high	3557.5	16QAM	18.94	19.94
15MHz	50%,low	3557.5	16QAM	17.81	18.81
15MHz	50% RB mid	3557.5	16QAM	17.79	18.79
15MHz	50%,high	3557.5	16QAM	17.79	18.79
15MHz	100% RB	3557.5	16QAM	17.72	18.72
15MHz	1 RB low	3625	QPSK	19.88	20.88
15MHz	1 RB mid	3625	QPSK	19.85	20.85
15MHz	1 RB high	3625	QPSK	19.92	20.92
15MHz	50%,low	3625	QPSK	18.89	19.89
15MHz	50% RB mid	3625	QPSK	18.92	19.92
15MHz	50%,high	3625	QPSK	18.92	19.92
15MHz	100% RB	3625	QPSK	18.90	19.90
15MHz	1 RB low	3625	16QAM	18.80	19.80
15MHz	1 RB mid	3625	16QAM	18.80	19.80
15MHz	1 RB high	3625	16QAM	18.83	19.83

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15MHz	50%,low	3625	16QAM	17.81	18.81
15MHz	50% RB mid	3625	16QAM	17.85	18.85
15MHz	50%,high	3625	16QAM	17.87	18.87
15MHz	100% RB	3625	16QAM	17.84	18.84
15MHz	1 RB low	3692.5	QPSK	19.75	20.75
15MHz	1 RB mid	3692.5	QPSK	19.77	20.77
15MHz	1 RB high	3692.5	QPSK	19.74	20.74
15MHz	50%,low	3692.5	QPSK	18.74	19.74
15MHz	50% RB mid	3692.5	QPSK	18.73	19.73
15MHz	50%,high	3692.5	QPSK	18.76	19.76
15MHz	100% RB	3692.5	QPSK	18.74	19.74
15MHz	1 RB low	3692.5	16QAM	18.91	19.91
15MHz	1 RB mid	3692.5	16QAM	18.89	19.89
15MHz	1 RB high	3692.5	16QAM	18.93	19.93
15MHz	50%,low	3692.5	16QAM	17.73	18.73
15MHz	50% RB mid	3692.5	16QAM	17.72	18.72
15MHz	50%,high	3692.5	16QAM	17.70	18.70
15MHz	100% RB	3692.5	16QAM	17.73	18.73
20MHz	1 RB low	3560	QPSK	19.74	20.74
20MHz	1 RB mid	3560	QPSK	19.70	20.70
20MHz	1 RB high	3560	QPSK	19.68	20.68
20MHz	50%,low	3560	QPSK	18.67	19.67
20MHz	50% RB mid	3560	QPSK	18.68	19.68
20MHz	50%,high	3560	QPSK	18.62	19.62
20MHz	100% RB	3560	QPSK	18.65	19.65
20MHz	1 RB low	3560	16QAM	18.88	19.88
20MHz	1 RB mid	3560	16QAM	18.78	19.78
20MHz	1 RB high	3560	16QAM	18.79	19.79
20MHz	50%,low	3560	16QAM	17.74	18.74
20MHz	50% RB mid	3560	16QAM	17.78	18.78
20MHz	50%,high	3560	16QAM	17.71	18.71
20MHz	100% RB	3560	16QAM	17.77	18.77
20MHz	1 RB low	3625	QPSK	19.91	20.91
20MHz	1 RB mid	3625	QPSK	19.83	20.83
20MHz	1 RB high	3625	QPSK	19.89	20.89
20MHz	50%,low	3625	QPSK	18.88	19.88
20MHz	50% RB mid	3625	QPSK	18.90	19.90
20MHz	50%,high	3625	QPSK	18.90	19.90

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20MHz	100% RB	3625	QPSK	18.86	19.86
20MHz	1 RB low	3625	16QAM	18.89	19.89
20MHz	1 RB mid	3625	16QAM	18.89	19.89
20MHz	1 RB high	3625	16QAM	18.83	19.83
20MHz	50%,low	3625	16QAM	17.88	18.88
20MHz	50% RB mid	3625	16QAM	17.86	18.86
20MHz	50%,high	3625	16QAM	17.88	18.88
20MHz	100% RB	3625	16QAM	17.83	18.83
20MHz	1 RB low	3690	QPSK	19.85	20.85
20MHz	1 RB mid	3690	QPSK	19.74	20.74
20MHz	1 RB high	3690	QPSK	19.69	20.69
20MHz	50%,low	3690	QPSK	18.67	19.67
20MHz	50% RB mid	3690	QPSK	18.76	19.76
20MHz	50%,high	3690	QPSK	18.68	19.68
20MHz	100% RB	3690	QPSK	18.73	19.73
20MHz	1 RB low	3690	16QAM	19.07	20.07
20MHz	1 RB mid	3690	16QAM	18.96	19.96
20MHz	1 RB high	3690	16QAM	19.03	20.03
20MHz	50%,low	3690	16QAM	17.62	18.62
20MHz	50% RB mid	3690	16QAM	17.77	18.77
20MHz	50%,high	3690	16QAM	17.68	18.68
20MHz	100% RB	3690	16QAM	17.59	18.59

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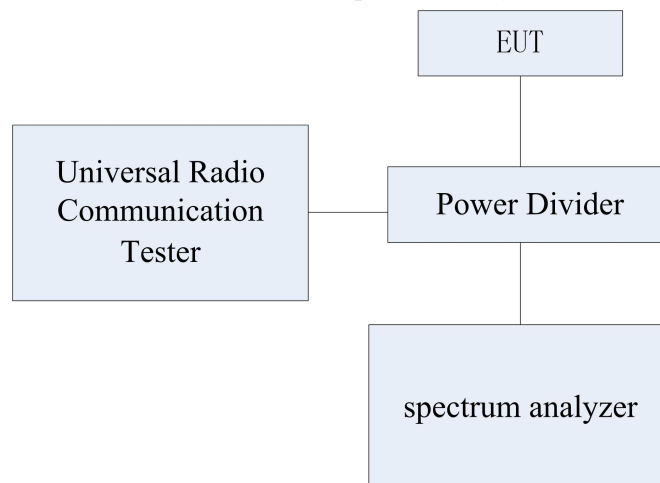
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6.4. Occupied Bandwidth

Specifications:	FCC Part 2.1049
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C 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: --

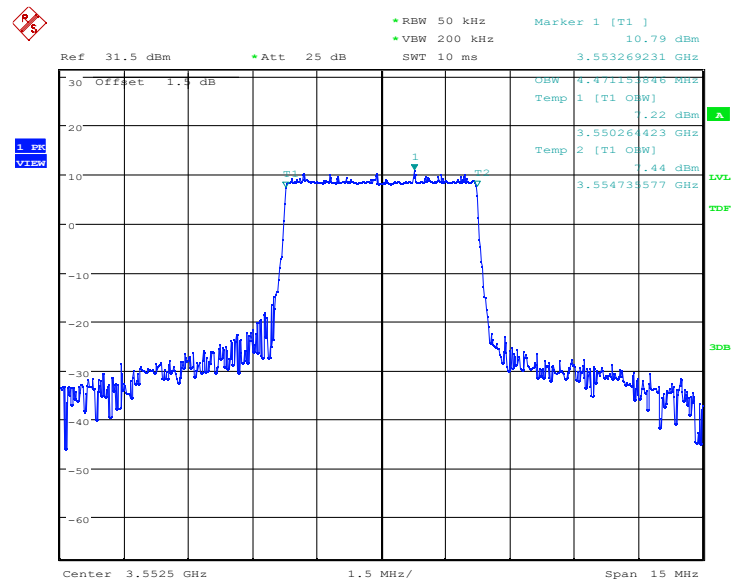
LTE band 48,5MHz(99%)

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Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
3552.5	4.471	4.471
3625	4.519	4.495
3697.5	4.495	4.495

LTE band 48 , 5MHz Bandwidth,LOW,QPSK (99% BW)

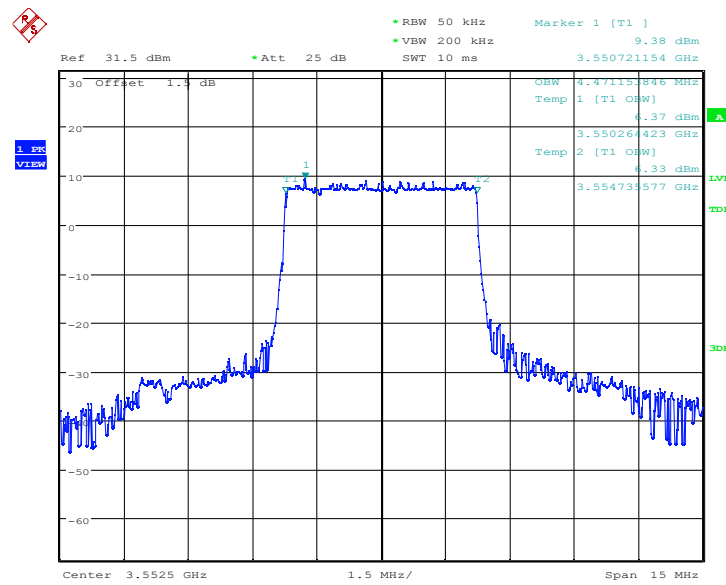


Date: 7.MAY.2023 21:07:33

LTE band 48 , 5MHz Bandwidth,LOW,16QAM (99% BW)

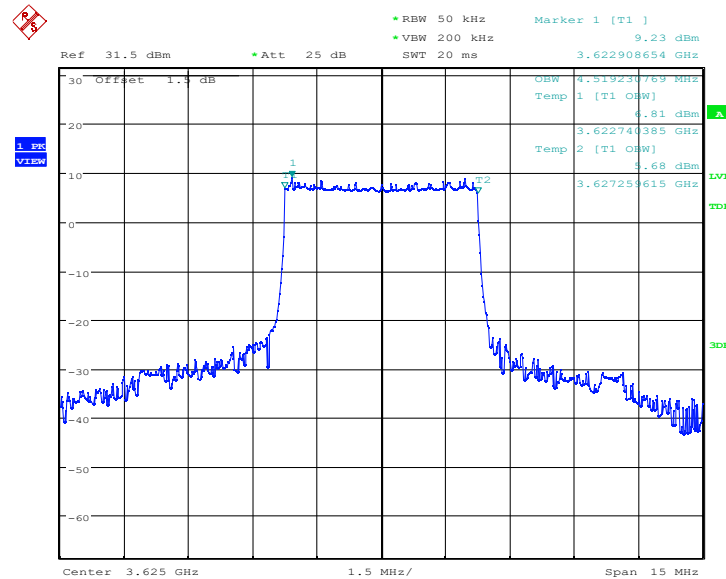
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Date: 7.MAY.2023 21:07:56

LTE band 48 , 5MHz Bandwidth,MID,QPSK (99% BW)

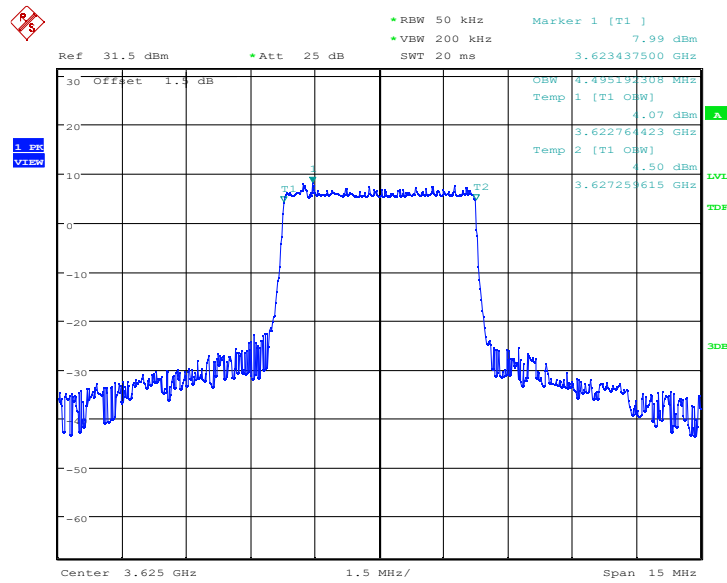


Date: 7.MAY.2023 21:08:25

LTE band 48 , 5MHz Bandwidth,MID,16QAM (99% BW)

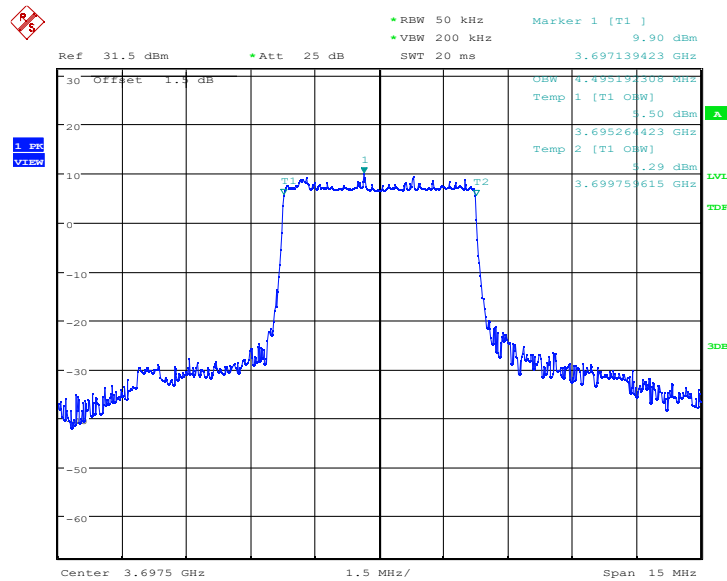
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Date: 7.MAY.2023 21:08:46

LTE band 48 , 5MHz Bandwidth,HIGH,QPSK (99% BW)

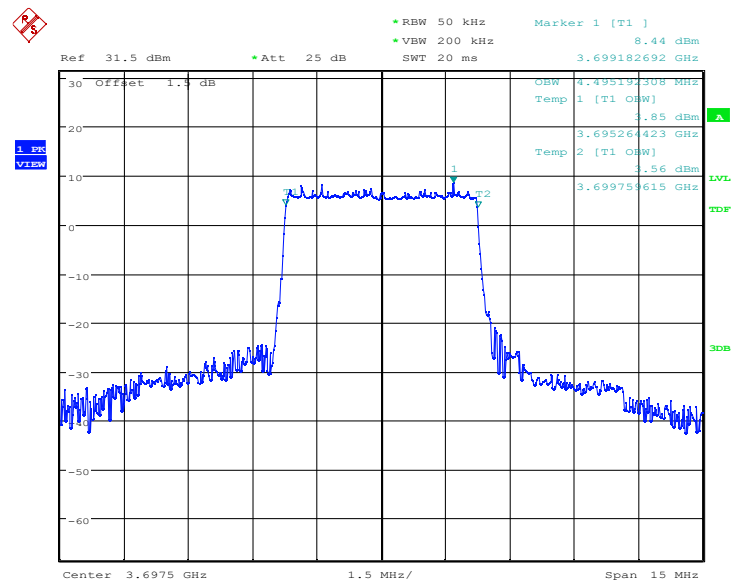


Date: 7.MAY.2023 21:09:12

LTE band 48 , 5MHz Bandwidth,HIGH,16QAM (99% BW)

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Date: 7.MAY.2023 21:09:35

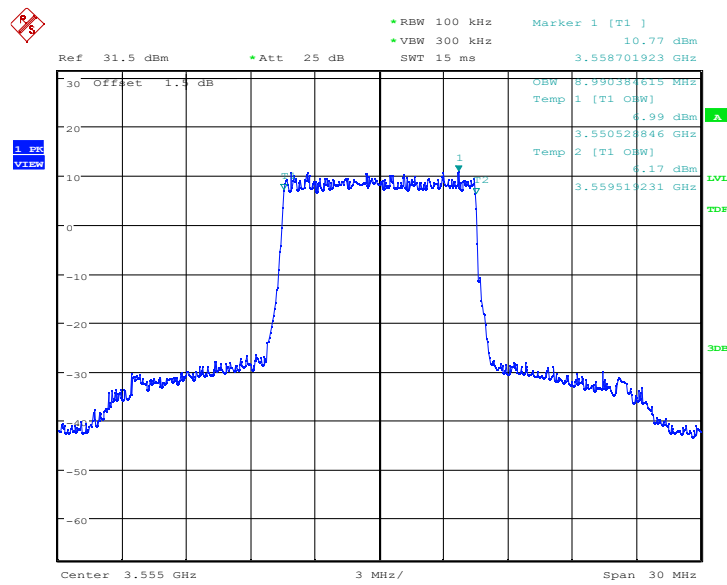
LTE band 48,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
3555	8.990	8.990
3625	8.990	8.942
3695	8.942	8.942

LTE band 48 , 10MHz Bandwidth,LOW,QPSK (99% BW)

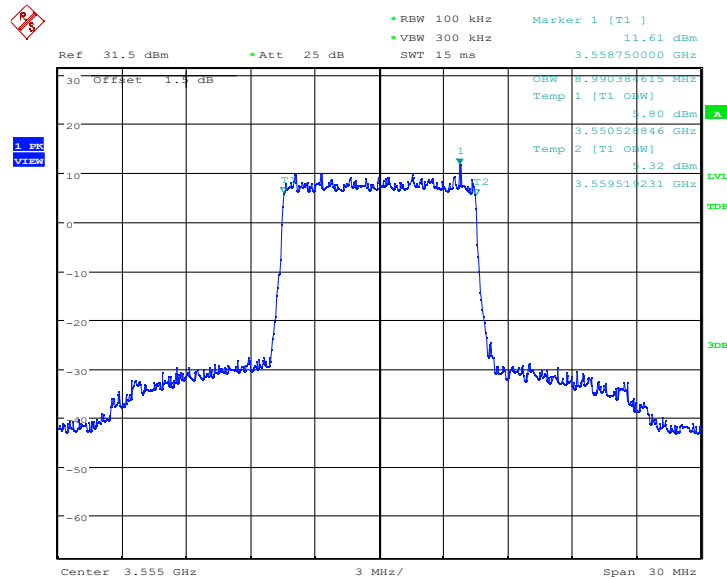
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Date: 7.MAY.2023 21:10:47

LTE band 48 , 10MHz Bandwidth,LOW,16QAM (99% BW)

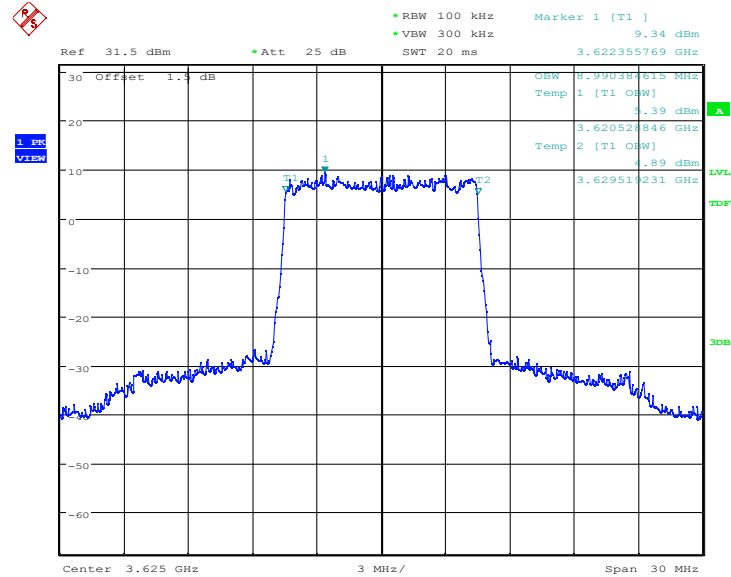


Date: 7.MAY.2023 21:11:13

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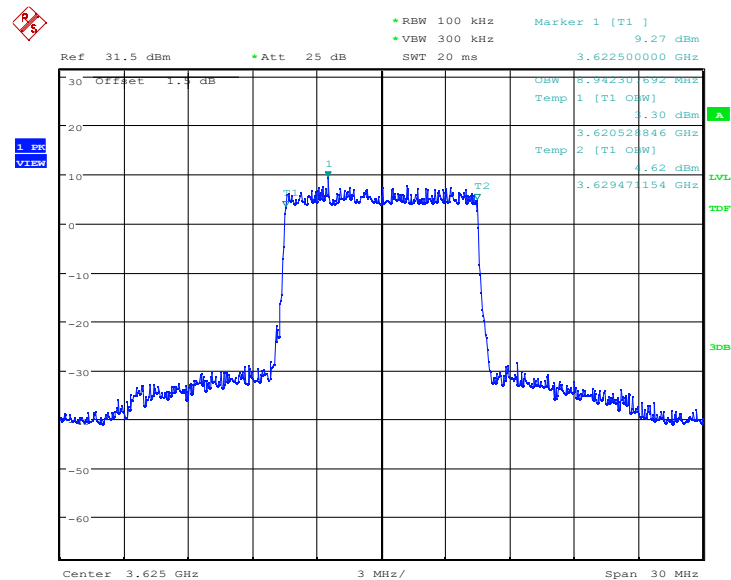
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LTE band 48 , 10MHz Bandwidth,MID,QPSK (99% BW)



Date: 7.MAY.2023 21:11:40

LTE band 48 , 10MHz Bandwidth,MID,16QAM (99% BW)

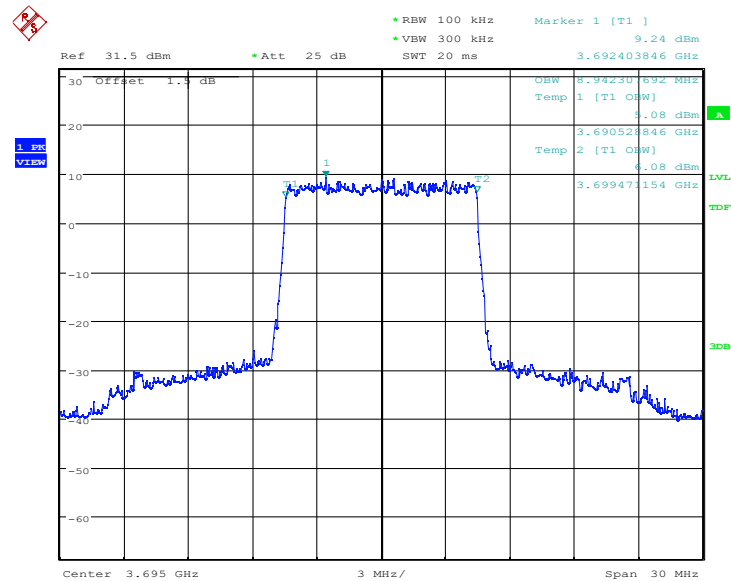


Date: 7.MAY.2023 21:12:03

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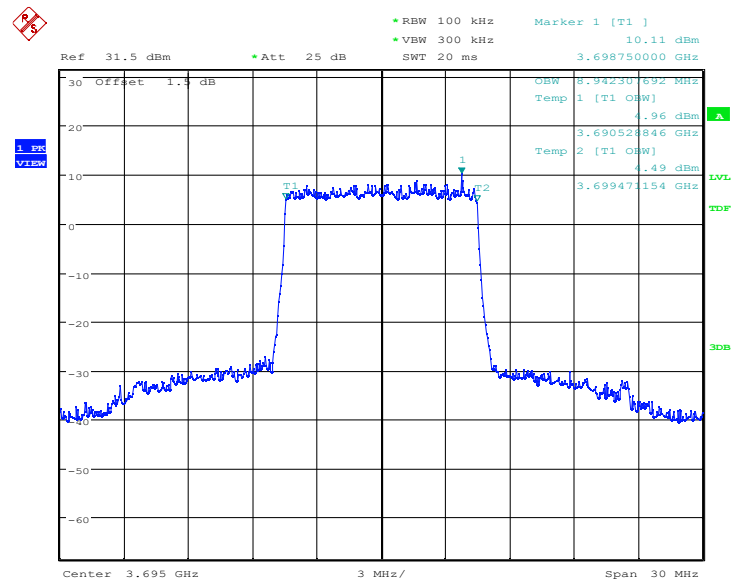
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LTE band 48 , 10MHz Bandwidth,HIGH,QPSK (99% BW)



Date: 7.MAY.2023 21:12:32

LTE band 48 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



Date: 7.MAY.2023 21:13:31

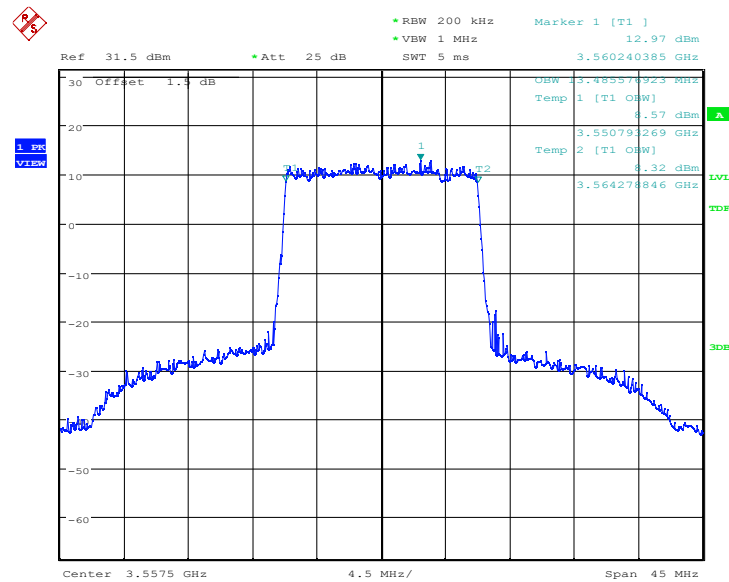
LTE band 48,15MHz(99%)

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Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
3557.5	13.486	13.413
3625	13.413	13.413
3692.5	13.486	13.486

LTE band 48 , 15MHz Bandwidth,LOW,QPSK (99% BW)

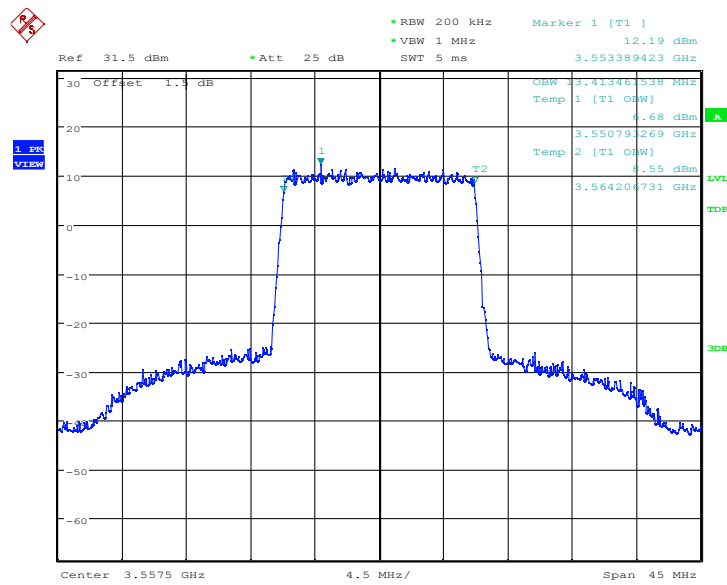


Date: 7.MAY.2023 21:14:42

LTE band 48 , 15MHz Bandwidth,LOW,16QAM (99% BW)

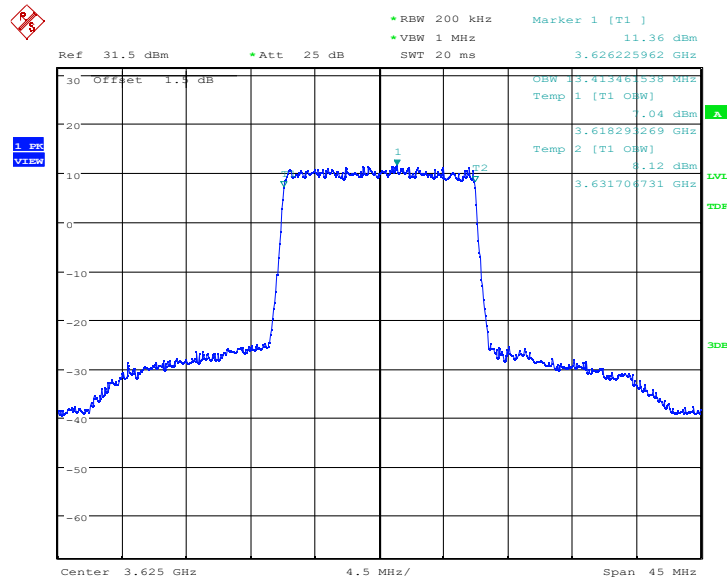
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Date: 7.MAY.2023 21:15:03

LTE band 48 , 15MHz Bandwidth,MID,QPSK (99% BW)

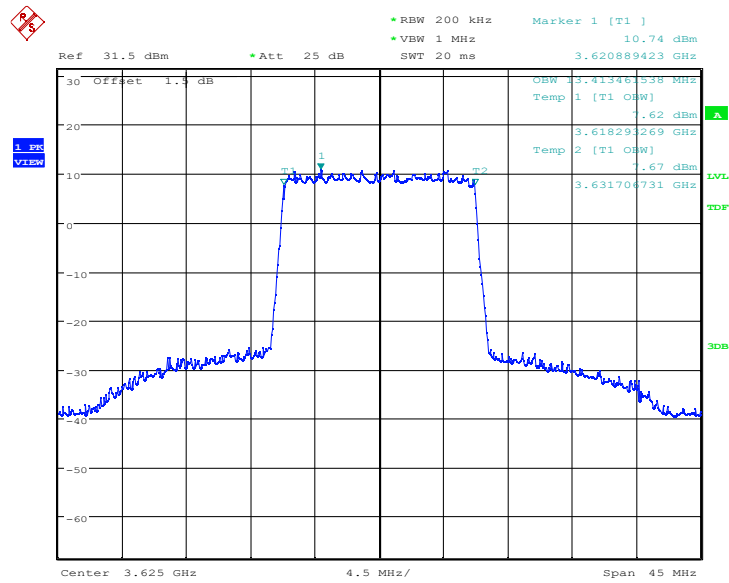


Date: 7.MAY.2023 21:15:33

LTE band 48 , 15MHz Bandwidth,MID,16QAM (99% BW)

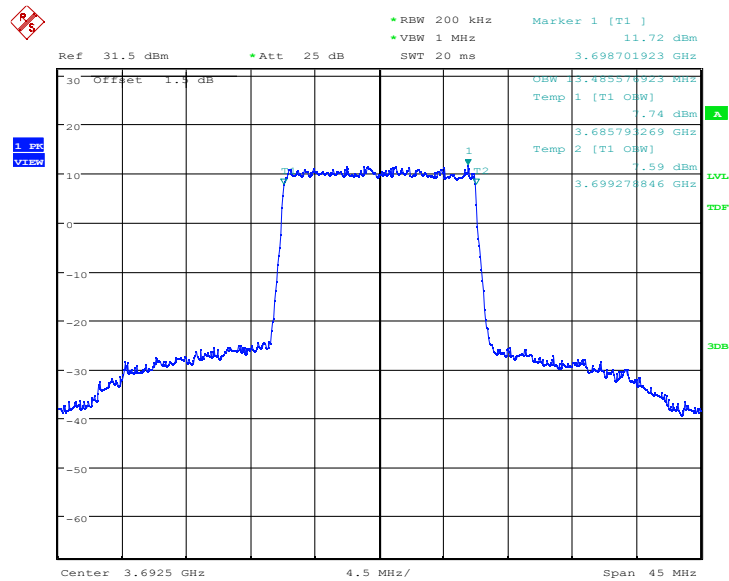
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Date: 7.MAY.2023 21:35:35

LTE band 48 , 15MHz Bandwidth,HIGH,QPSK (99% BW)

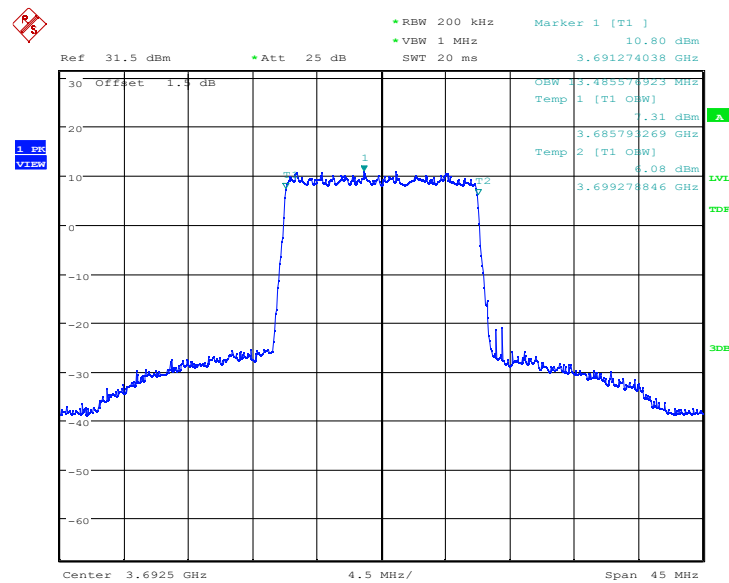


Date: 7.MAY.2023 21:16:30

LTE band 48 , 15MHz Bandwidth,HIGH,16QAM (99% BW)

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Date: 7.MAY.2023 21:17:10

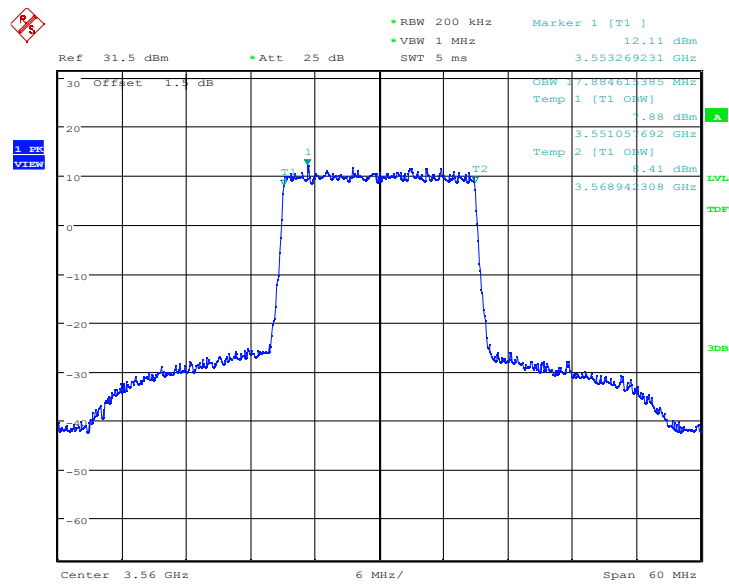
LTE band 48,20MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
3560	17.885	17.981
3625	17.885	17.885
3690	17.885	17.885

LTE band 48 , 20MHz Bandwidth,LOW,QPSK (99% BW)

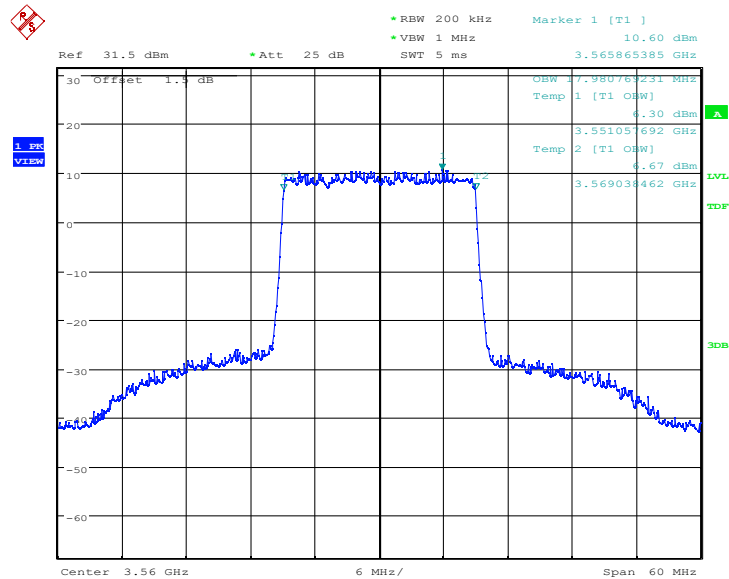
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Date: 7.MAY.2023 21:18:12

LTE band 48 , 20MHz Bandwidth,LOW,16QAM (99% BW)

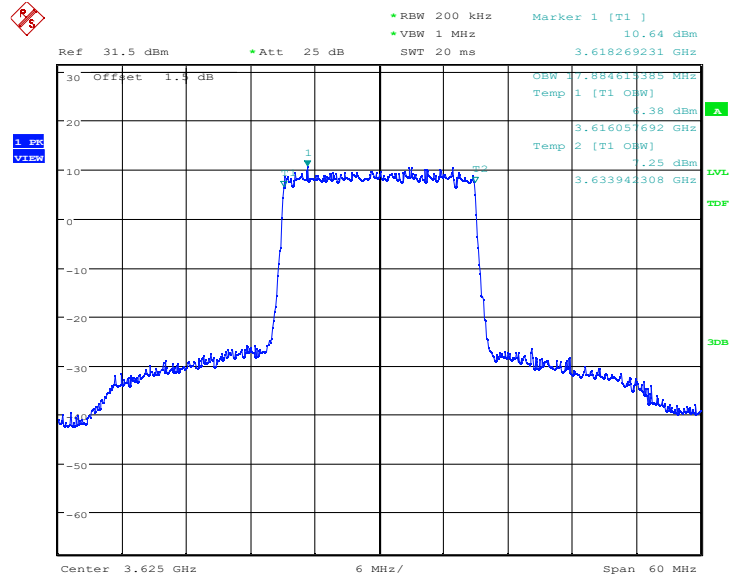


Date: 7.MAY.2023 21:18:50

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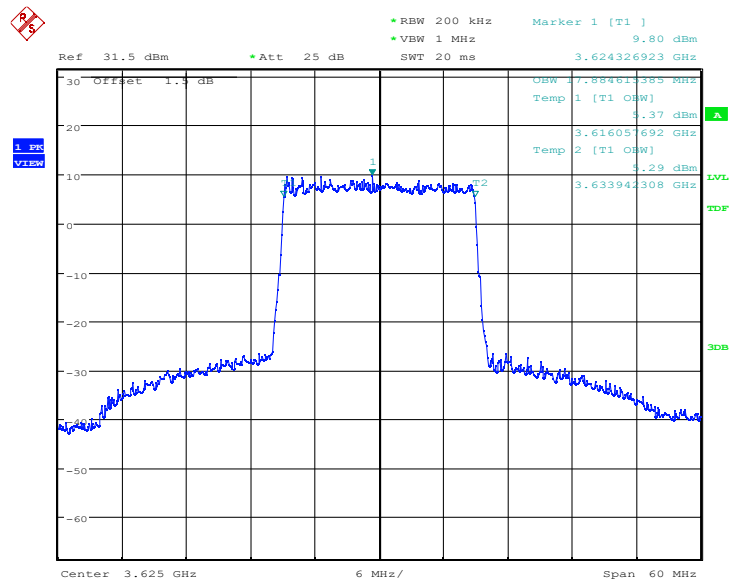
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LTE band 48 , 20MHz Bandwidth,MID,QPSK (99% BW)



Date: 7.MAY.2023 21:19:20

LTE band 48 , 20MHz Bandwidth,MID,16QAM (99% BW)

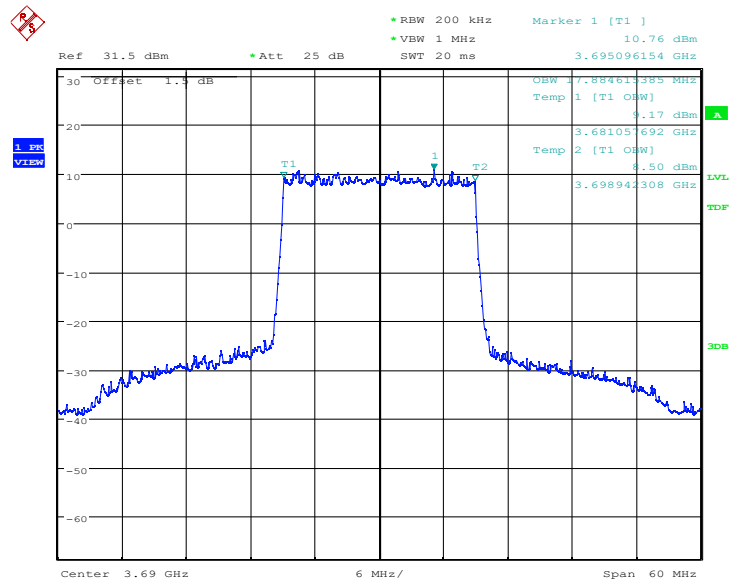


Date: 7.MAY.2023 21:19:45

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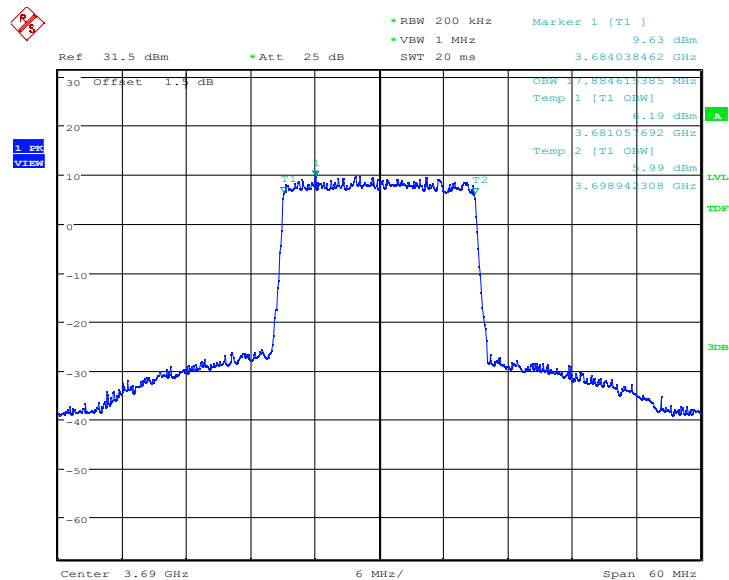
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LTE band 48 , 20MHz Bandwidth,HIGH,QPSK (99% BW)



Date: 7.MAY.2023 21:20:24

LTE band 48 , 20MHz Bandwidth,HIGH,16QAM (99% BW)



Date: 7.MAY.2023 21:20:47

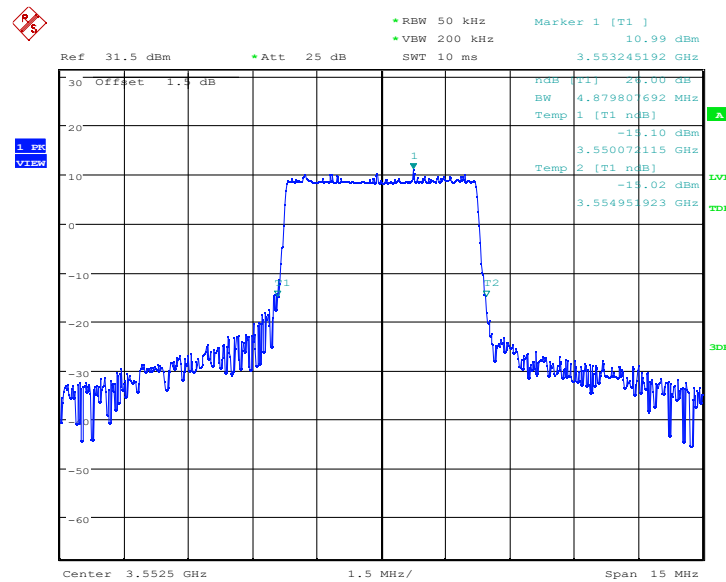
LTE band 48,5MHz(-26dBc)

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Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
3552.5	4.880	4.856
3625	4.856	4.880
3697.5	4.880	4.904

LTE band 48 , 5MHz Bandwidth,LOW,QPSK (-26dBc BW)

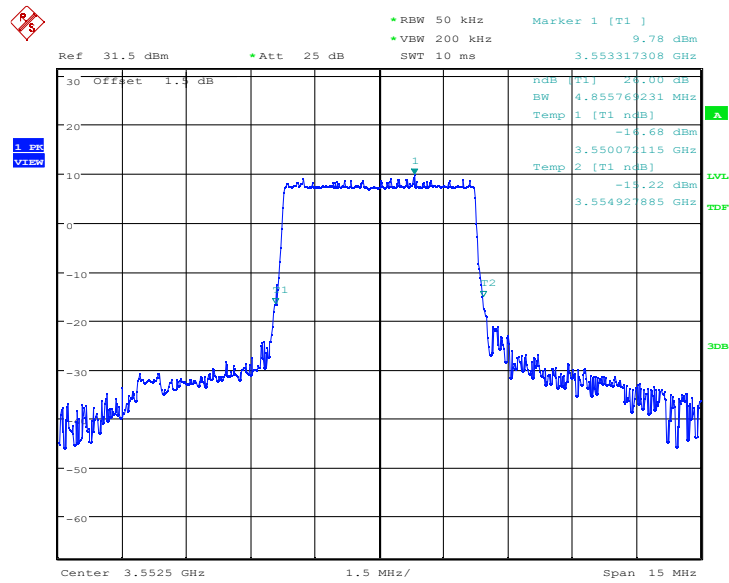


Date: 7.MAY.2023 21:21:51

LTE band 48 , 5MHz Bandwidth,LOW,16QAM (-26dBc BW)

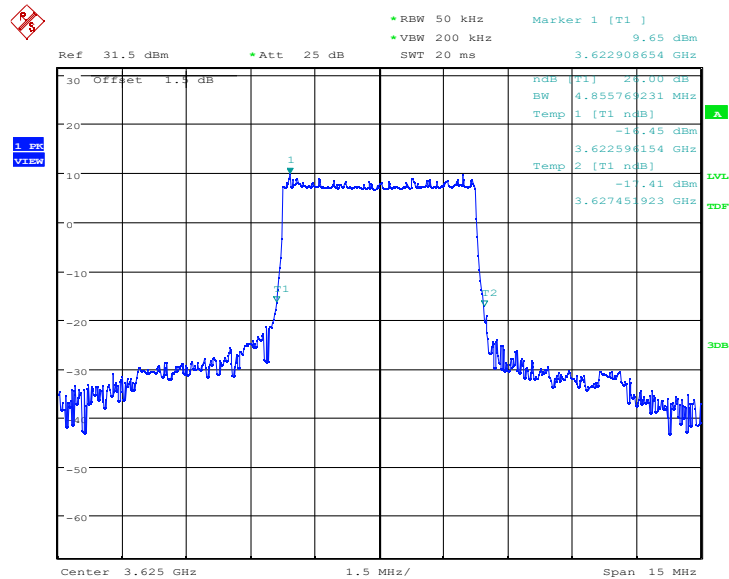
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Date: 7.MAY.2023 21:22:17

LTE band 48 , 5MHz Bandwidth,MID,QPSK (-26dBc BW)

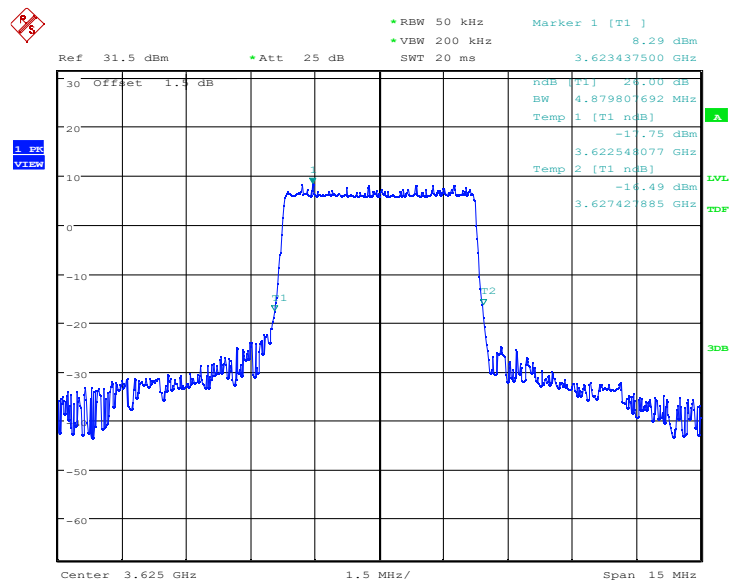


Date: 7.MAY.2023 21:22:47

LTE band 48 , 5MHz Bandwidth,MID,16QAM (-26dBc BW)

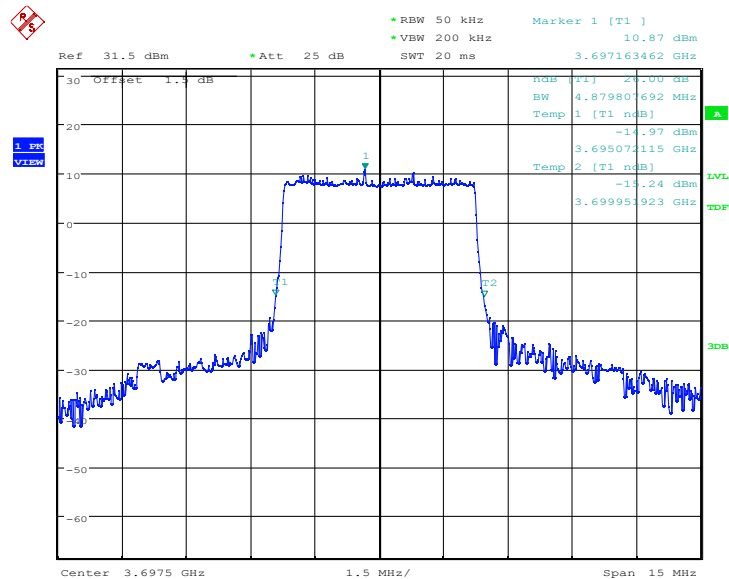
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Date: 7.MAY.2023 21:23:17

LTE band 48 , 5MHz Bandwidth,HIGH,QPSK (-26dBc BW)

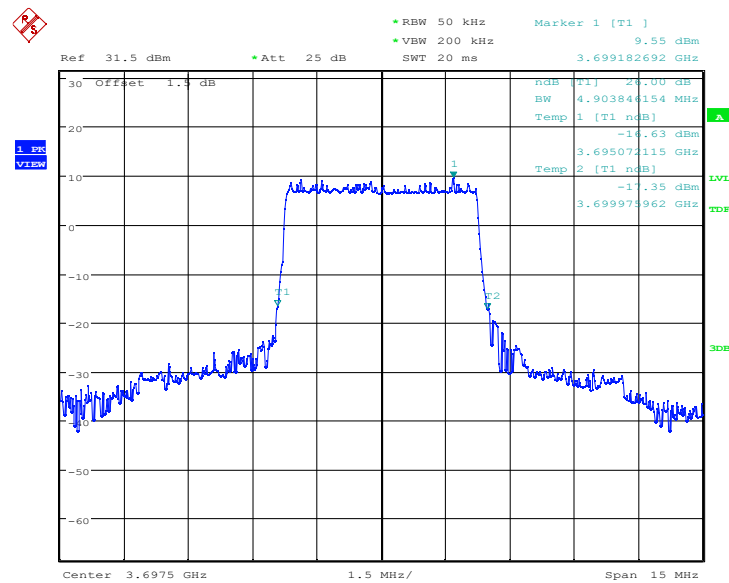


Date: 7.MAY.2023 21:23:47

LTE band 48 , 5MHz Bandwidth,HIGH,16QAM (-26dBc BW)

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Date: 7.MAY.2023 21:24:10

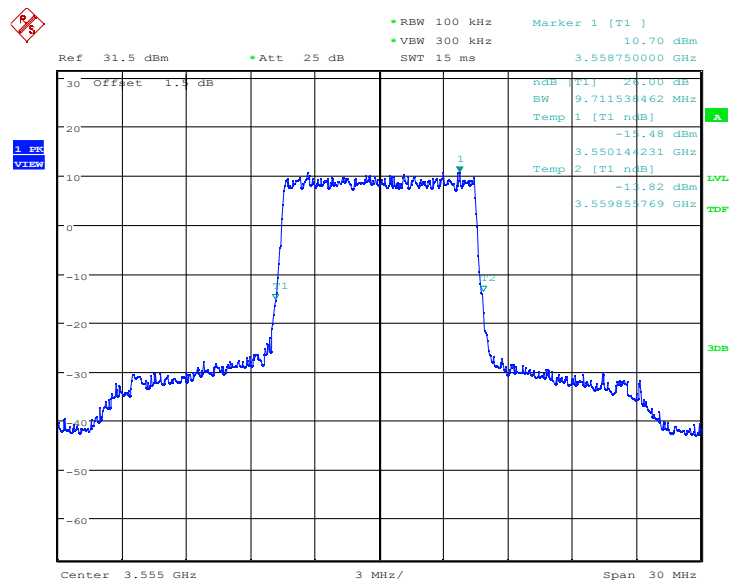
LTE band 48,10MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
3555	9.712	9.615
3625	9.760	9.615
3695	9.712	9.567

LTE band 48 , 10MHz Bandwidth,LOW,QPSK (-26dBc BW)

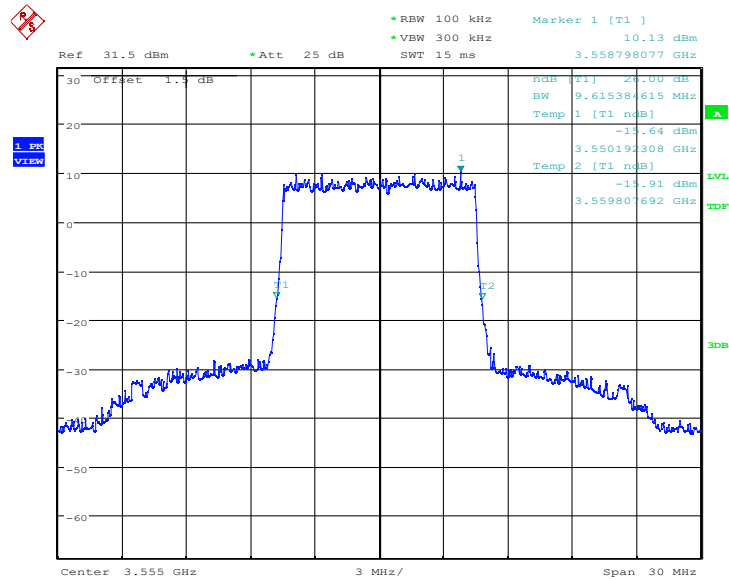
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Date: 7.MAY.2023 21:25:18

LTE band 48 , 10MHz Bandwidth,LOW,16QAM (-26dBc BW)

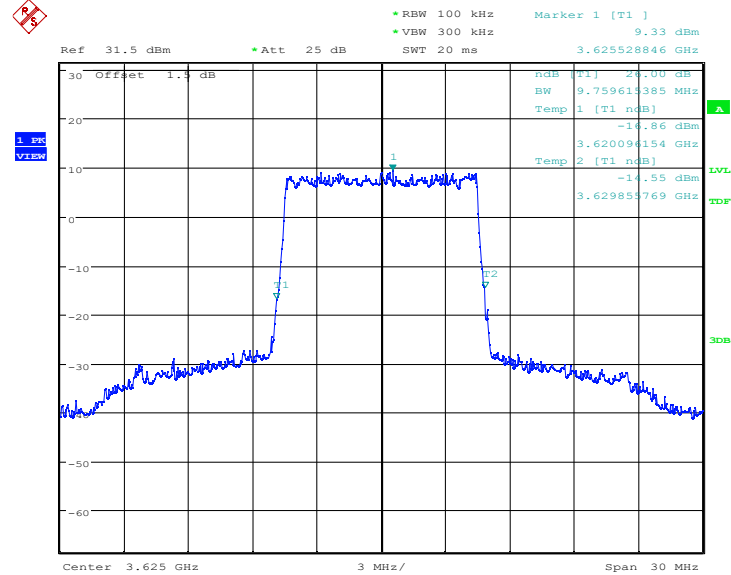


Date: 7.MAY.2023 21:25:39

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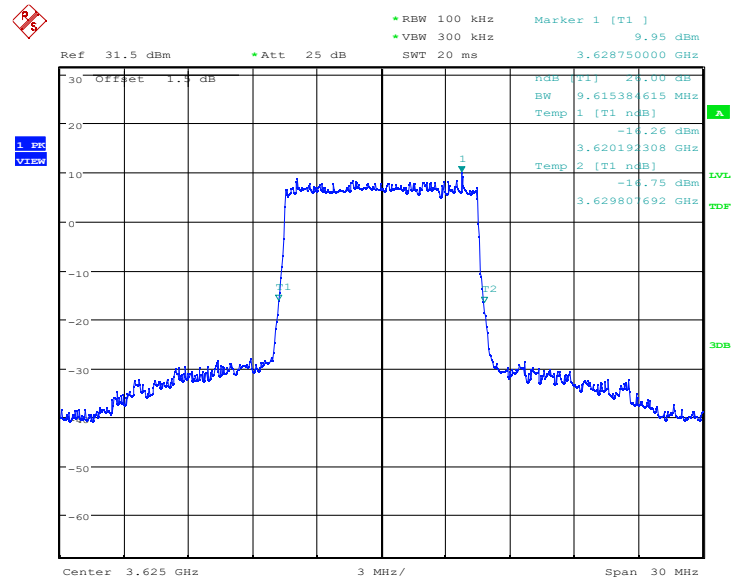
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LTE band 48 , 10MHz Bandwidth,MID,QPSK (-26dBc BW)



Date: 7.MAY.2023 21:26:06

LTE band 48 , 10MHz Bandwidth,MID,16QAM (-26dBc BW)

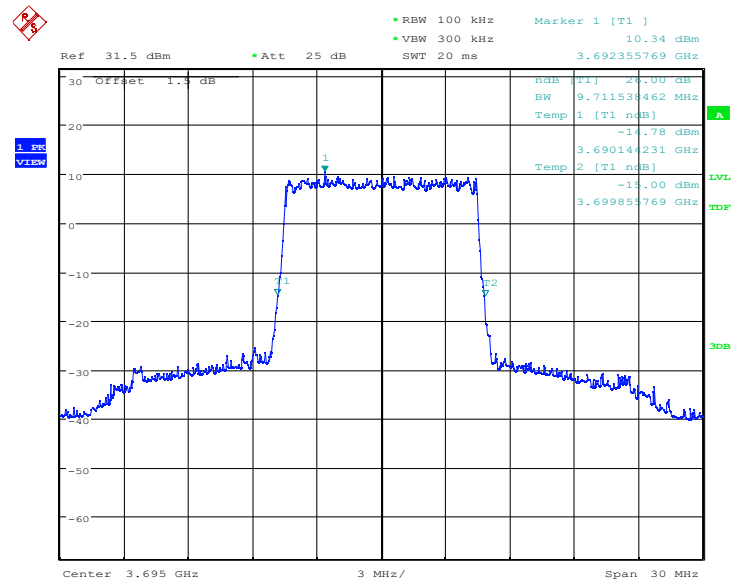


Date: 7.MAY.2023 21:36:32

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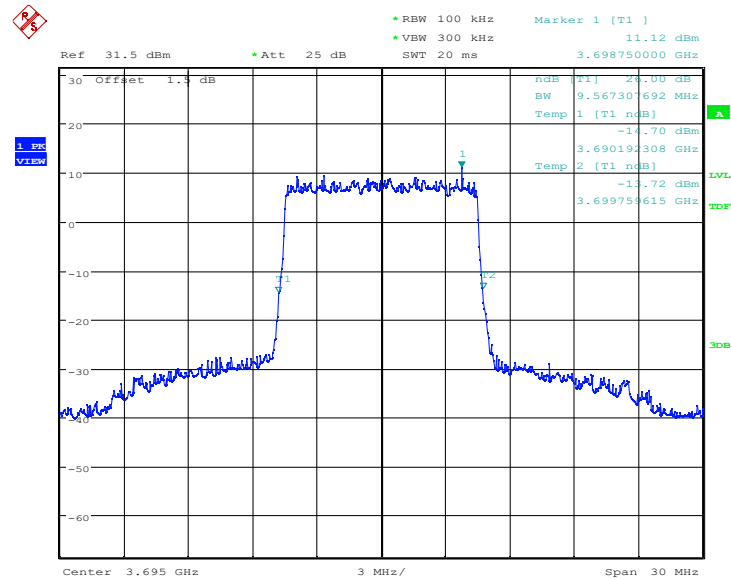
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LTE band 48 , 10MHz Bandwidth,HIGH,QPSK (-26dBc BW)



Date: 7.MAY.2023 21:36:58

LTE band 48 , 10MHz Bandwidth,HIGH,16QAM (-26dBc BW)



Date: 7.MAY.2023 21:27:40

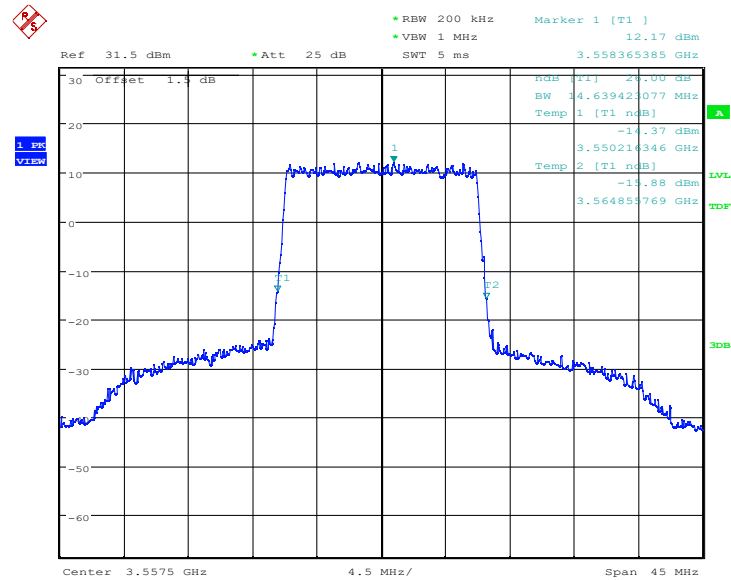
LTE band 48,15MHz(-26dBc)

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Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
3557.5	14.639	14.495
3625	14.639	14.639
3692.5	14.639	14.639

LTE band 48 , 15MHz Bandwidth,LOW,QPSK (-26dBc BW)

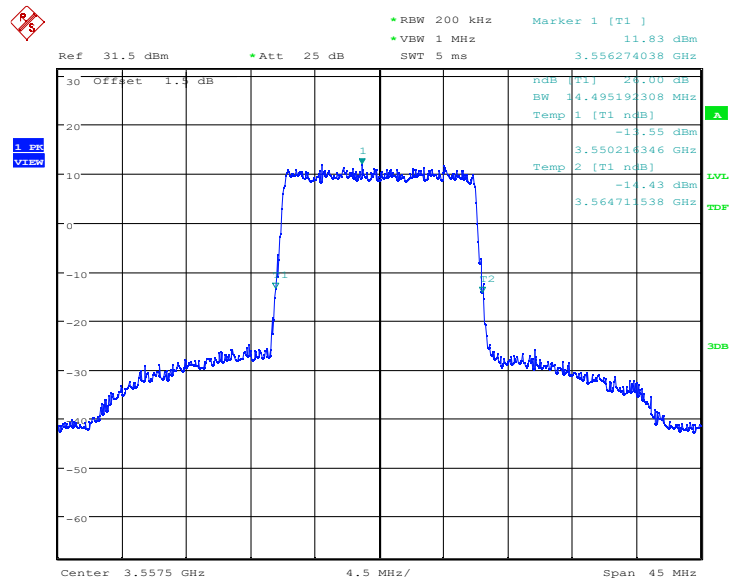


Date: 7.MAY.2023 21:28:49

LTE band 48 , 15MHz Bandwidth,LOW,16QAM (-26dBc BW)

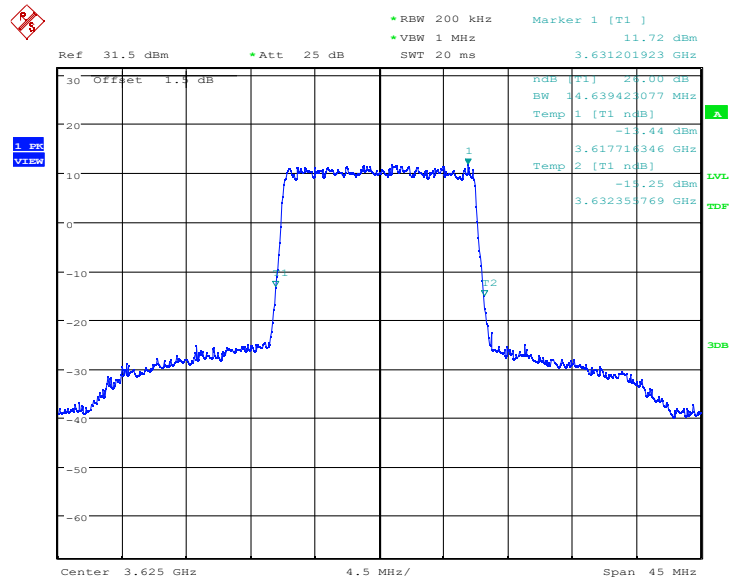
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Date: 7.MAY.2023 21:29:10

LTE band 48 , 15MHz Bandwidth,MID,QPSK (-26dBc BW)

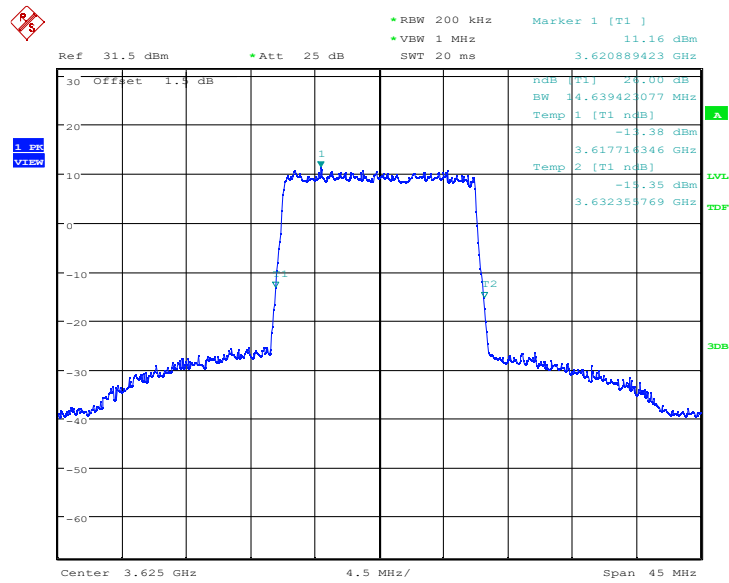


Date: 7.MAY.2023 21:29:38

LTE band 48 , 15MHz Bandwidth,MID,16QAM (-26dBc BW)

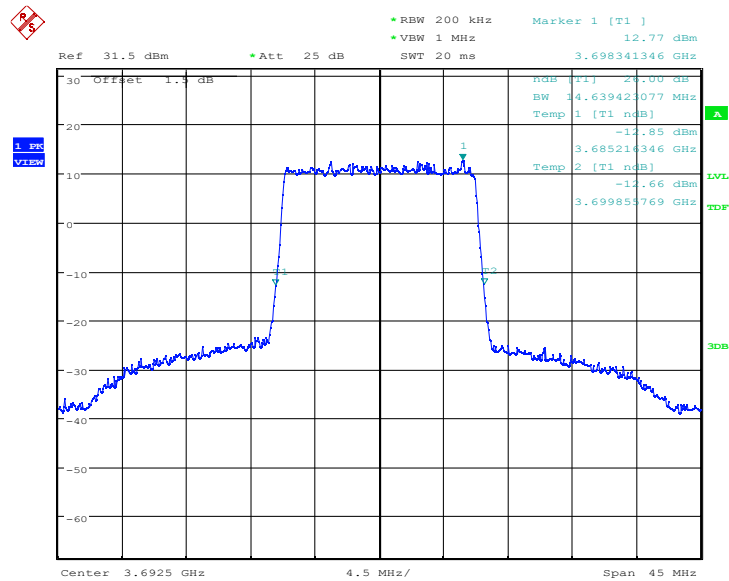
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Date: 7.MAY.2023 21:38:06

LTE band 48 , 15MHz Bandwidth,HIGH,QPSK (-26dBc BW)

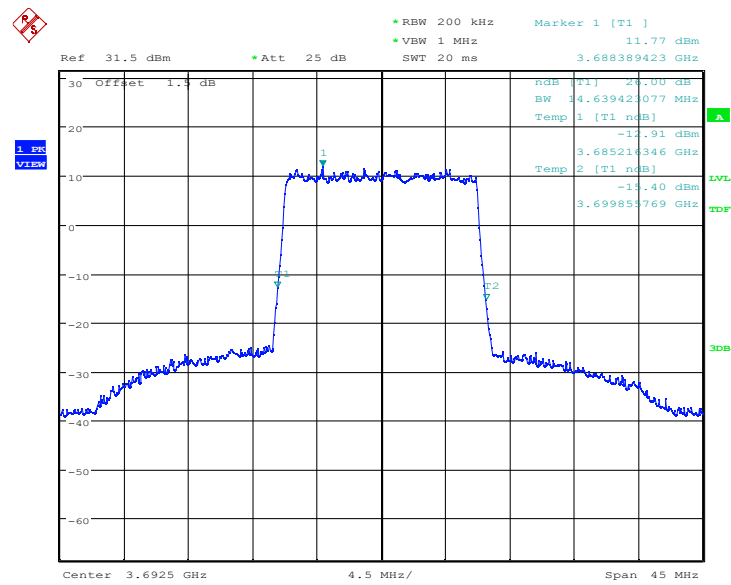


Date: 7.MAY.2023 21:30:41

LTE band 48 , 15MHz Bandwidth,HIGH,16QAM (-26dBc BW)

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Date: 7.MAY.2023 21:31:03

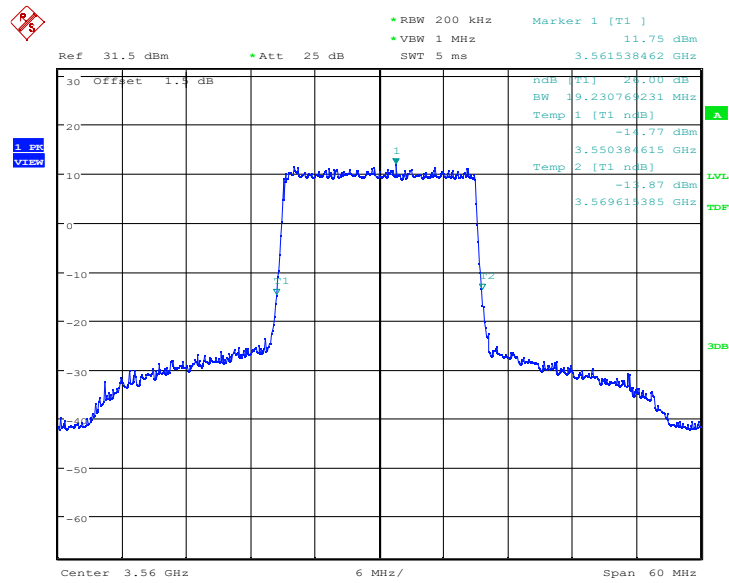
LTE band 48,20MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
3560	19.231	19.327
3625	19.231	19.135
3690	19.423	19.231

LTE band 48 , 20MHz Bandwidth,LOW,QPSK (-26dBc BW)

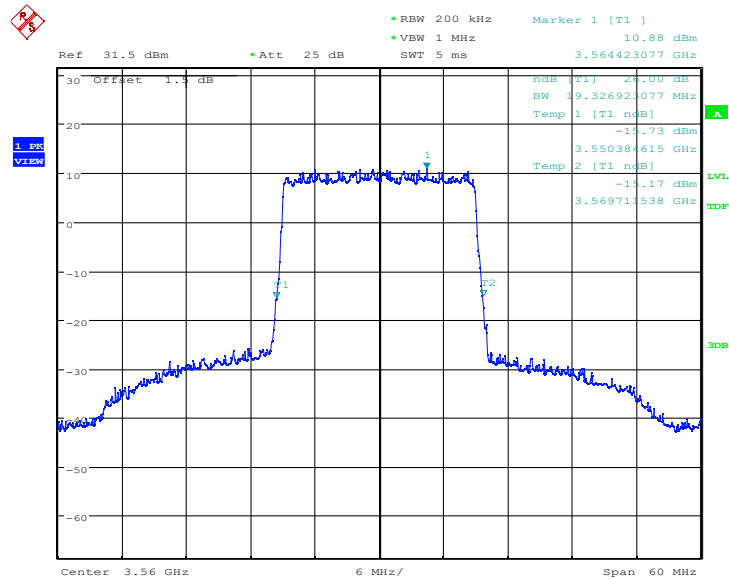
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Date: 7.MAY.2023 21:32:11

LTE band 48 , 20MHz Bandwidth,LOW,16QAM (-26dBc BW)

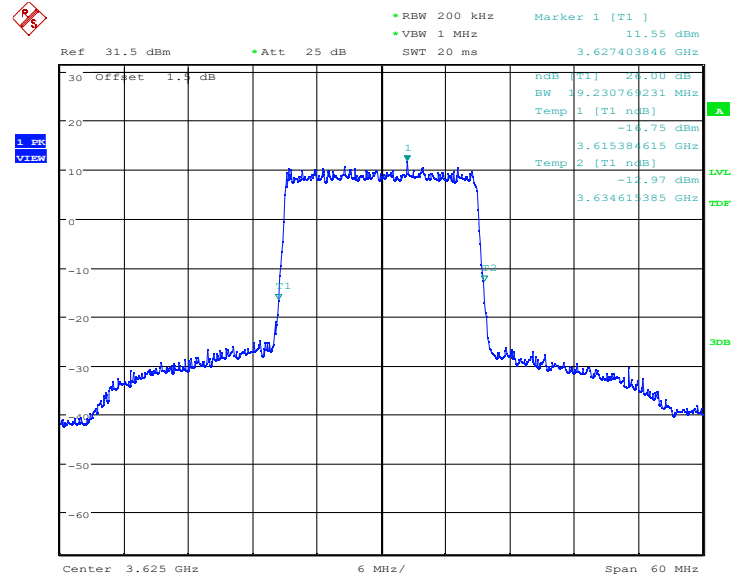


Date: 7.MAY.2023 21:32:33

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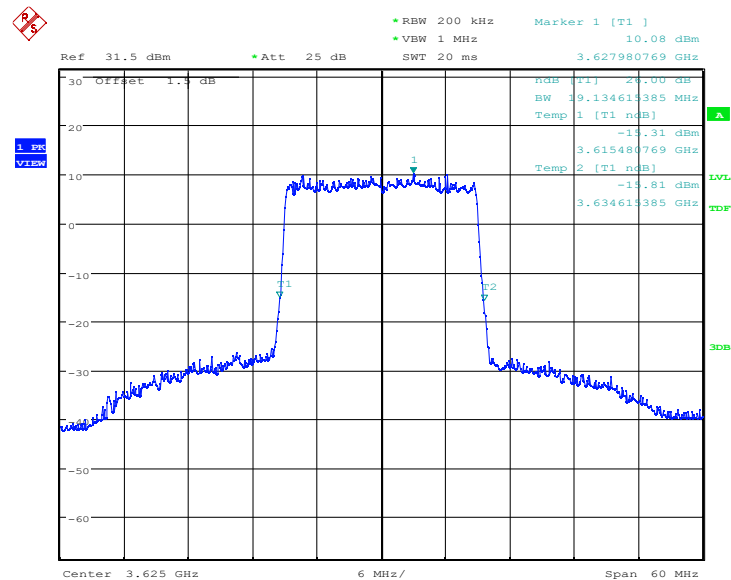
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LTE band 48 , 20MHz Bandwidth,MID,QPSK (-26dBc BW)



Date: 7.MAY.2023 21:33:01

LTE band 48 , 20MHz Bandwidth,MID,16QAM (-26dBc BW)

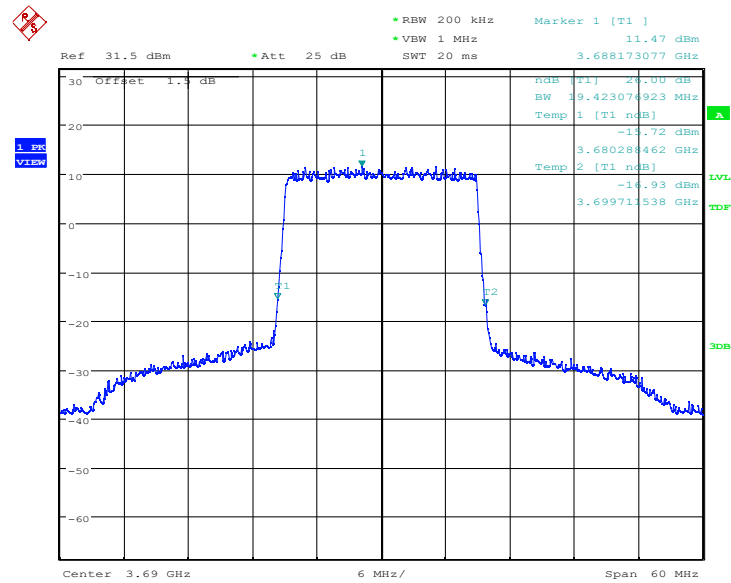


Date: 7.MAY.2023 21:33:30

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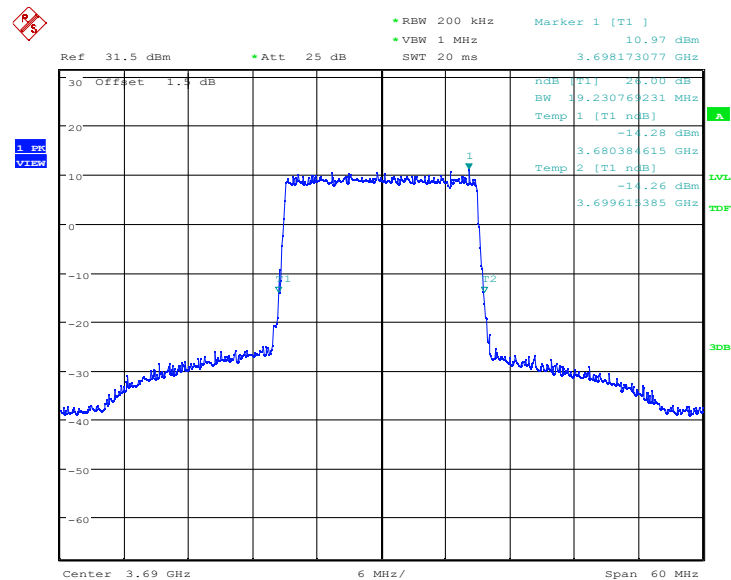
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LTE band 48 , 20MHz Bandwidth,HIGH,QPSK (-26dBc BW)



Date: 7.MAY.2023 21:33:57

LTE band 48 , 20MHz Bandwidth,HIGH,16QAM (-26dBc BW)



Date: 7.MAY.2023 21:34:19

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6.5. Conducted spurious emissions

Specifications:	FCC Part 2.1051,2.1053, 96.41
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 96.41(e)(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.74 dB (k=2)

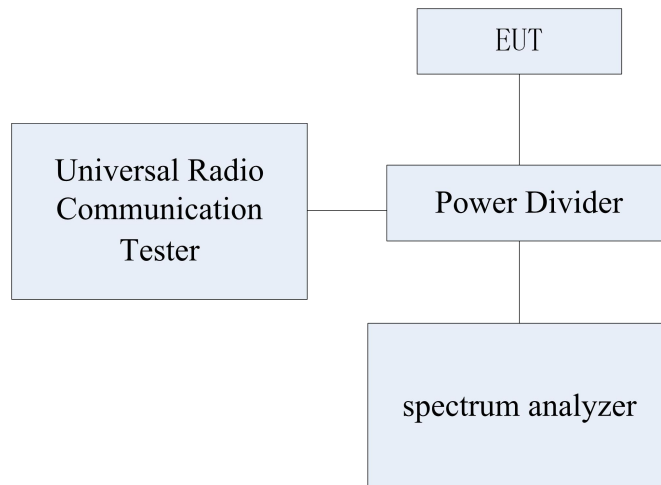
Test Setup:

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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:**

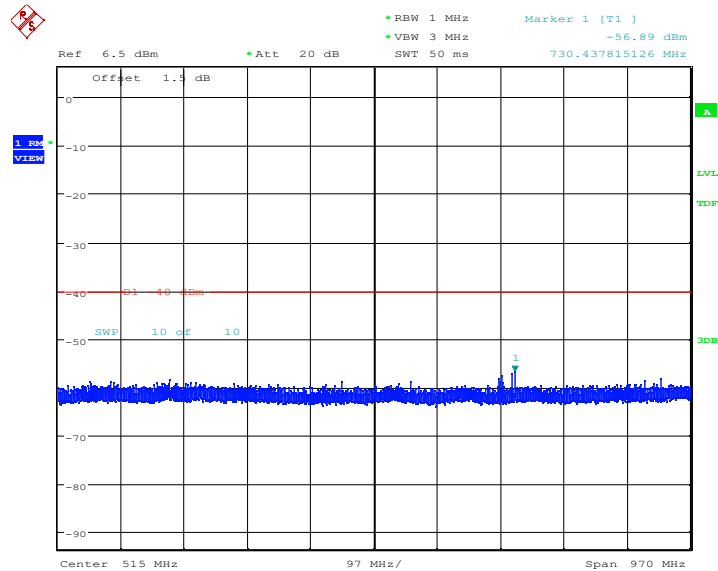
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-Band emissions, if any, up to 10th harmonic. The EUT was scanned for spurious emissions from 30MHz to 26.5GHz with sufficient Bandwidth and video resolution. 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.

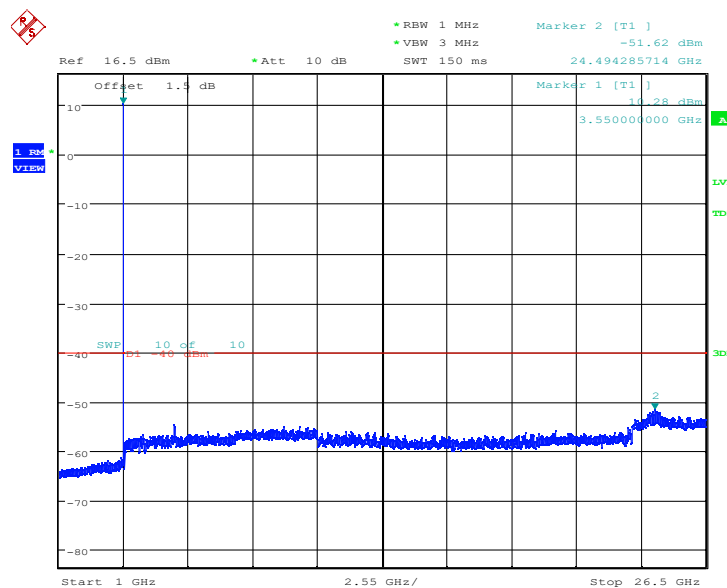
6.5.1 Conducted Spurious Emission Results

LTE band 48-5MHz-QPSK-LOW-1RB

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



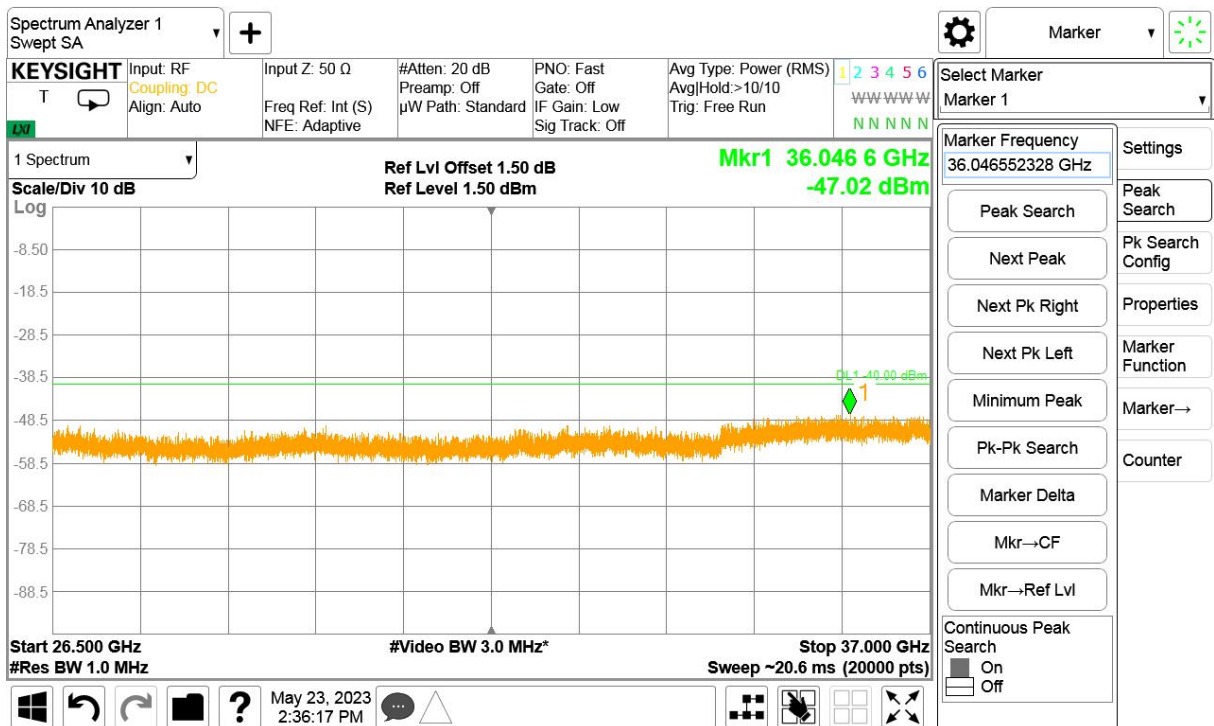
Date: 12.MAY.2023 22:13:21



Date: 12.MAY.2023 23:26:44

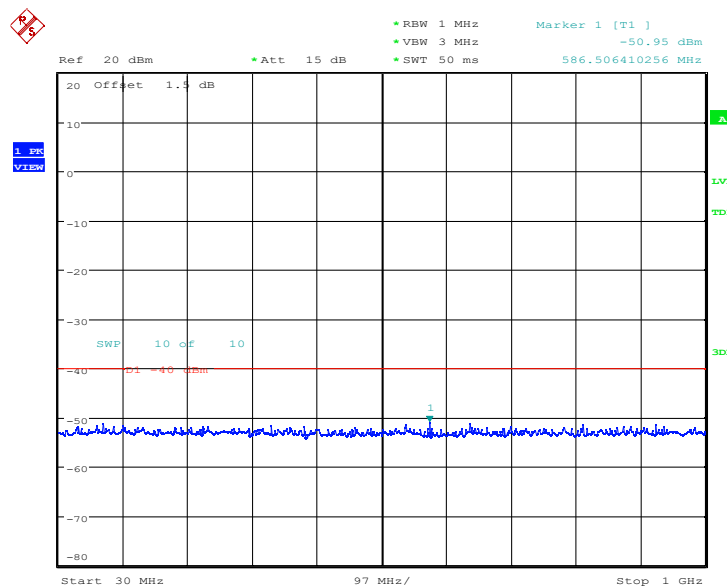
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LTE band 48-10MHz-QPSK-MID-1RB

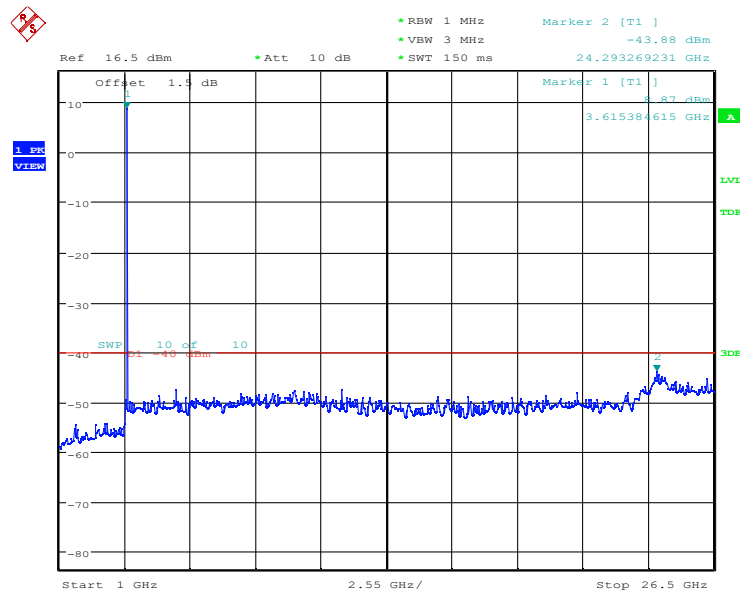
NOTE: peak above the limit line is the carrier frequency.



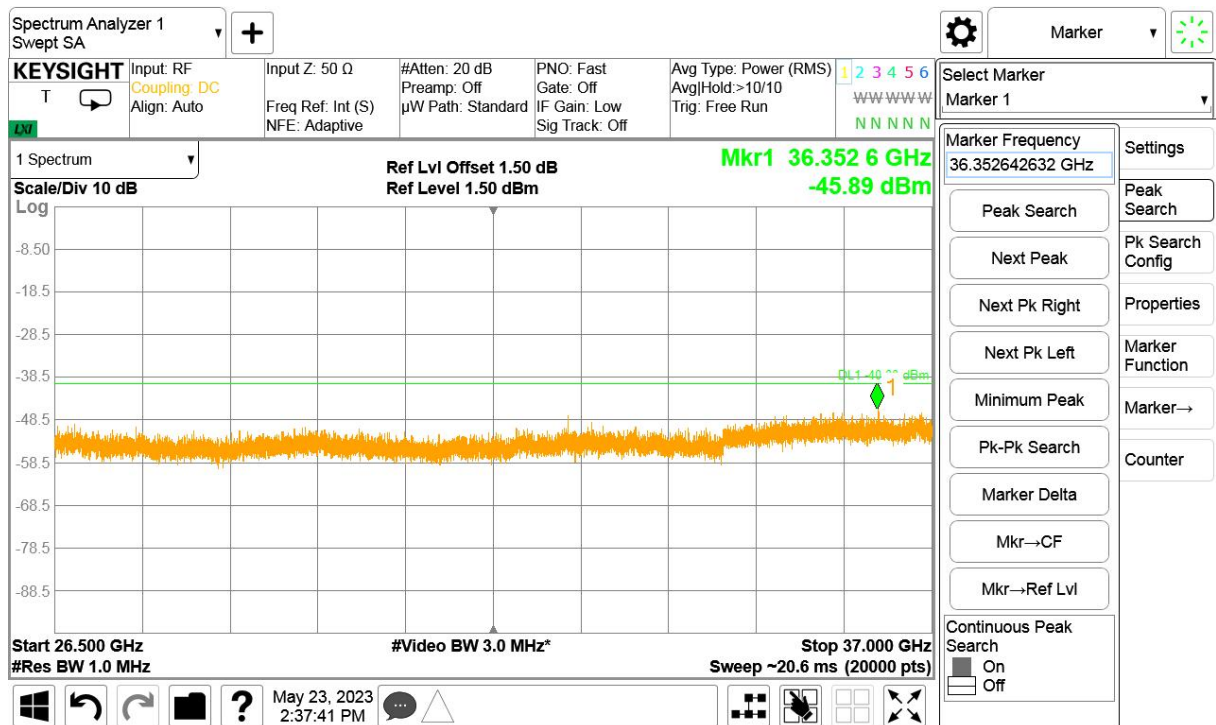
Date: 12.MAY.2023 23:31:09

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Date: 12.MAY.2023 23:33:16

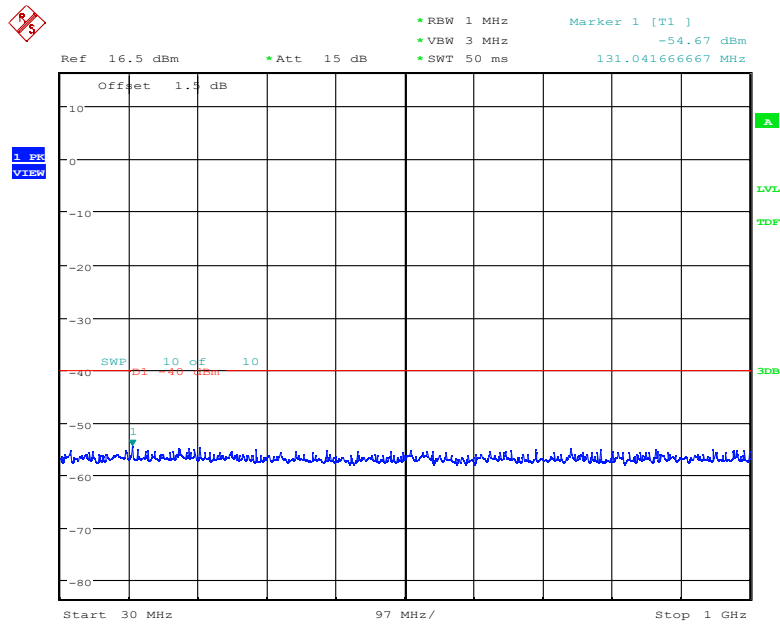


LTE band 48-15MHz-QPSK-MID-1RB

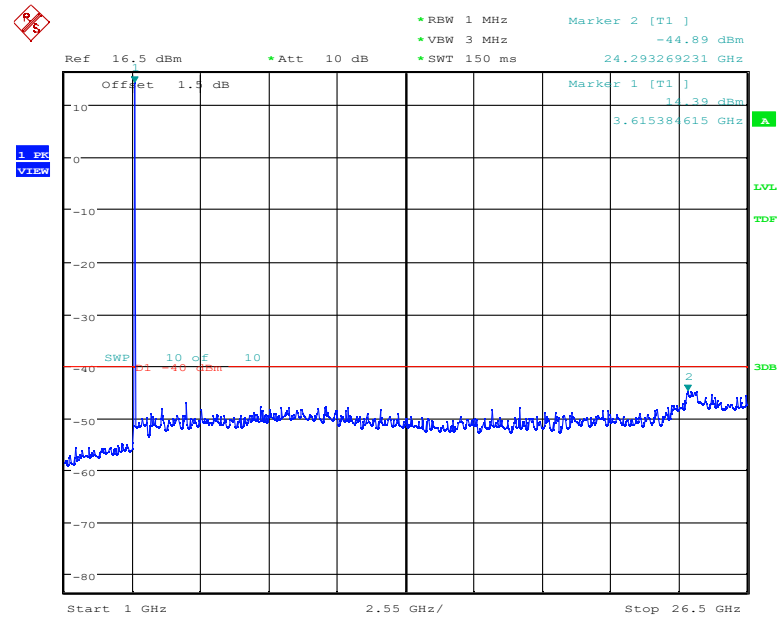
NOTE: peak above the limit line is the carrier frequency.

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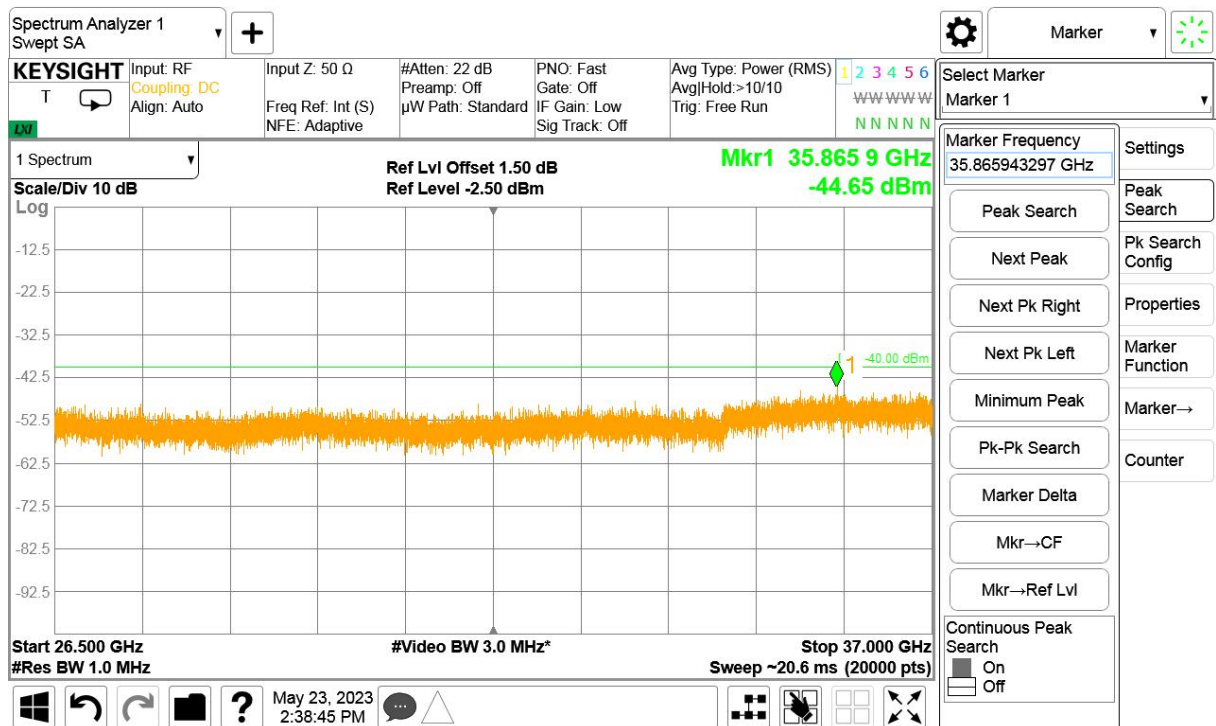
Date: 12.MAY.2023 23:35:40



Date: 12.MAY.2023 23:34:55

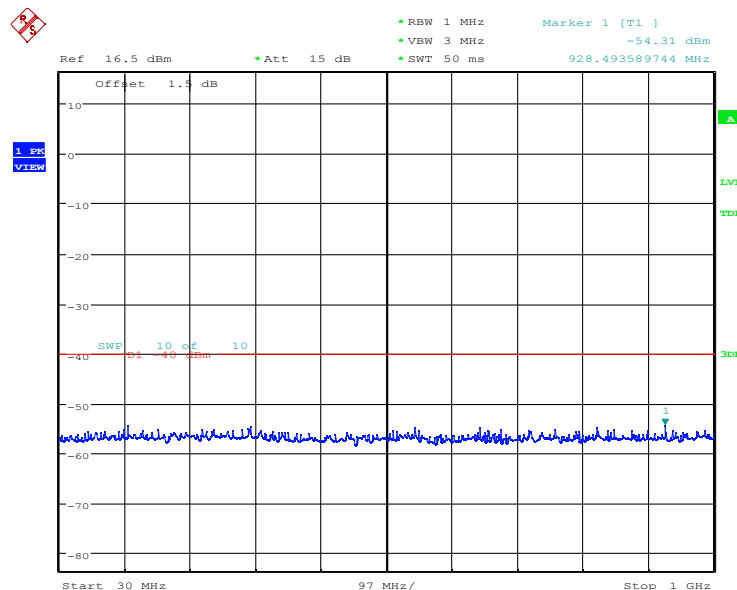
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LTE band 48-20MHz-QPSK-MID-1RB

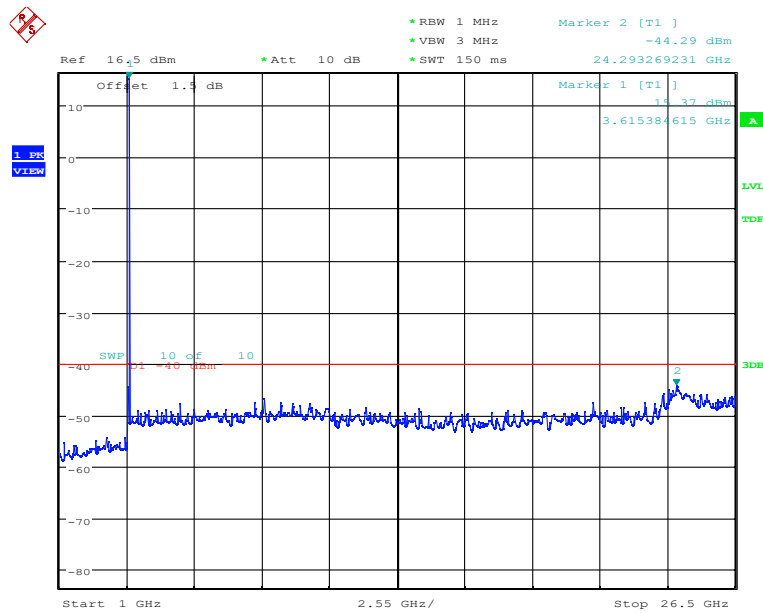
NOTE: peak above the limit line is the carrier frequency.



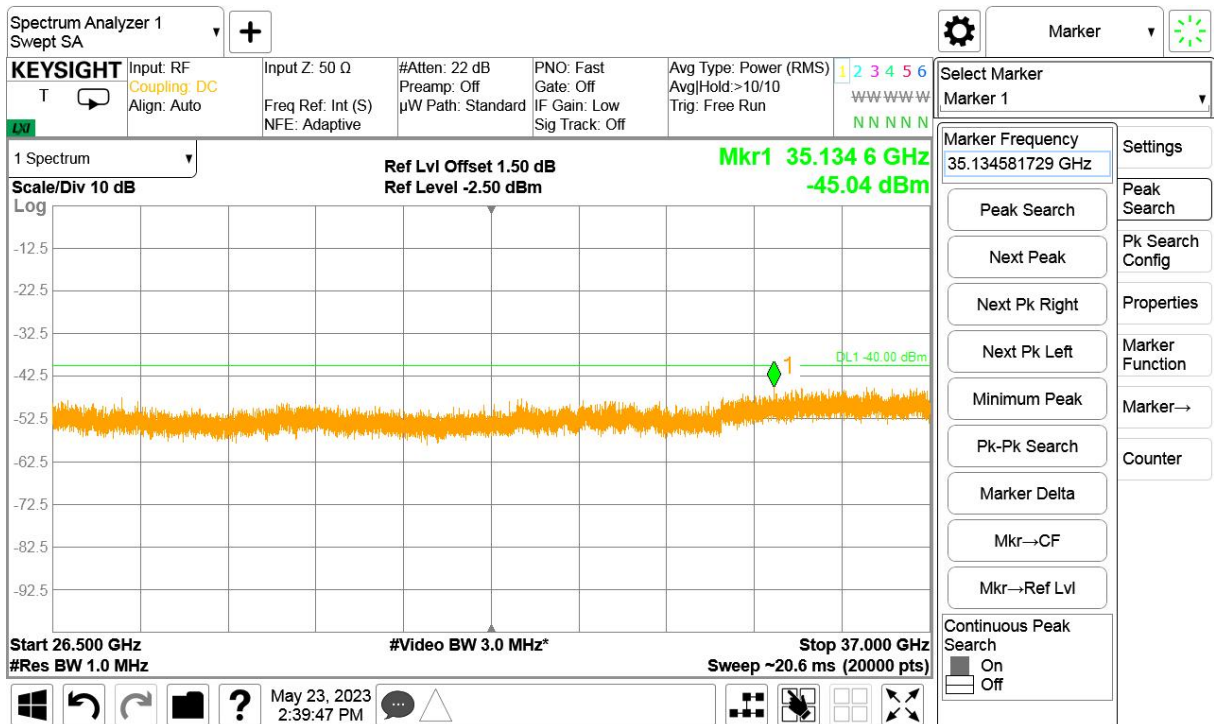
Date: 12.MAY.2023 23:36:15

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Date: 12.MAY.2023 23:37:23



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6.6. Radiated Spurious Emission

Specifications:	FCC Part 2.1051,2.1053, 96.41
DUT Serial Number:	IMEI:864542050020326
Test conditions:	Ambient Temperature:22.3-23.7°C Relative Humidity:53-56% Air pressure:97.9-98.6kPa
Test Results:	Pass

Limit Level Construction:

According to Part 96.41(e)(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

Limits for Radiated spurious emissions(UE)	
Frequency range	Limit Level /Resolution Bandwidth

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30 MHz to 37000 MHz	-13dBm/1MHz
---------------------	-------------

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty (30MHz-150MHz)	3.82 dB (k=2)
Expanded Uncertainty (150MHz-1000MHz)	3.97dB (k=2)
Expanded Uncertainty (1GHz-3GHz)	3.09dB (k=2)
Expanded Uncertainty (3GHz-6GHz)	3.29dB (k=2)
Expanded Uncertainty (6GHz-18GHz)	3.91dB (k=2)
Expanded Uncertainty (18GHz-26GHz)	4.60dB (k=2)
Expanded Uncertainty (26GHz-40GHz)	4.77dB (k=2)

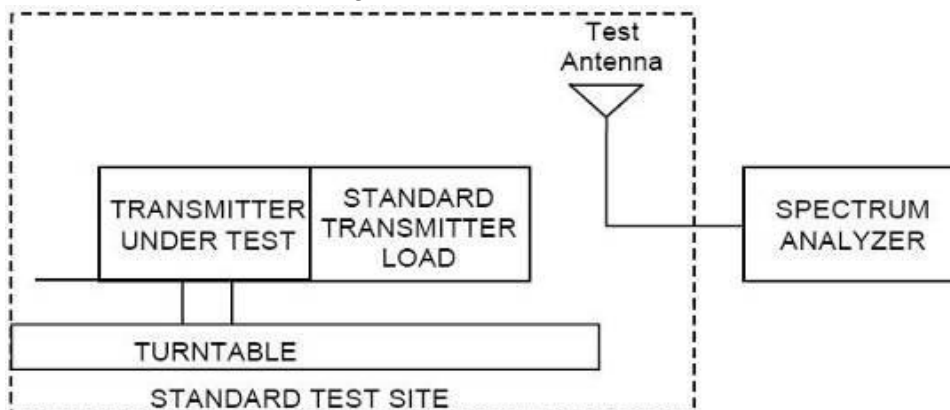
Test Setup:

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.

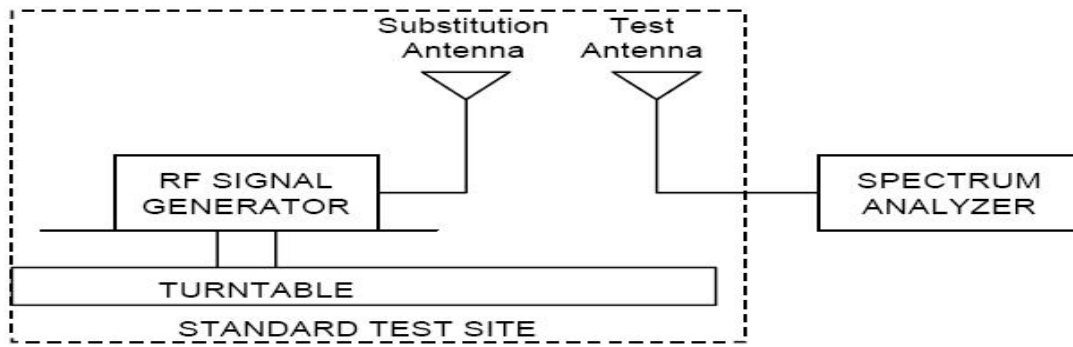
(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above. The distance from the device to the antenna is 3 m .



(b) Reconnect the equipment as illustrated.

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(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:

$$P_d(\text{dBm}) = P_g(\text{dBm}) - \text{cable loss (dB)} + \text{Antenna Gain (dB)}$$

where:

P_d is the dipole equivalent power and P_g 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-37GHz

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

LTE B48 Radiated Spurious Emission Results

Test Data (5M bandwidth QPSK Mode CH55265)

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
74.982000	-81.42	0.2	-2.8	-84.42	V
125.760000	-86.28	0.3	3.9	-82.68	V
2204.400000	-65.00	1.2	9.0	-57.20	H
7103.225807	-75.14	2.5	11.4	-66.24	V
9203.500000	-68.18	3.3	11.3	-60.18	V
10364.000000	-66.45	3.3	10.9	-58.85	V

LTE B48 Radiated Spurious Emission Results

Test Data (5M bandwidth QPSK Mode CH55990)

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
126.516000	-86.23	0.3	3.9	-82.63	V
409.386000	-78.49	0.5	6.5	-72.49	V
2805.500000	-64.83	1.4	11.0	-55.23	V
7249.838710	-72.66	2.6	11.3	-63.96	V
8221.935484	-73.66	2.7	11.8	-64.56	V
10388.500000	-66.15	3.5	10.9	-58.75	V

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LTE B48 Radiated Spurious Emission Results

Test Data (5M bandwidth QPSK Mode CH56714)

Frequency [MHz]	Generator output power(Pg) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (Pd) [dBm]	Antenna Polarization [H/V]
124.878000	-84.57	0.3	2.1	-82.77	V
2811.500000	-64.75	1.4	11.0	-55.15	V
5344.354839	-67.98	2.1	13.4	-56.68	H
7395.483871	-70.17	2.5	11.3	-61.37	V
8220.967742	-73.54	2.7	11.8	-64.44	V
10362.000000	-66.41	3.3	10.9	-58.81	V

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6.7. Band Edge

Specifications:	FCC Part 2.1051,2.1053, 96.41
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit Level Construction:

According to Part 96.41(e)(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.28 dB (k=2)

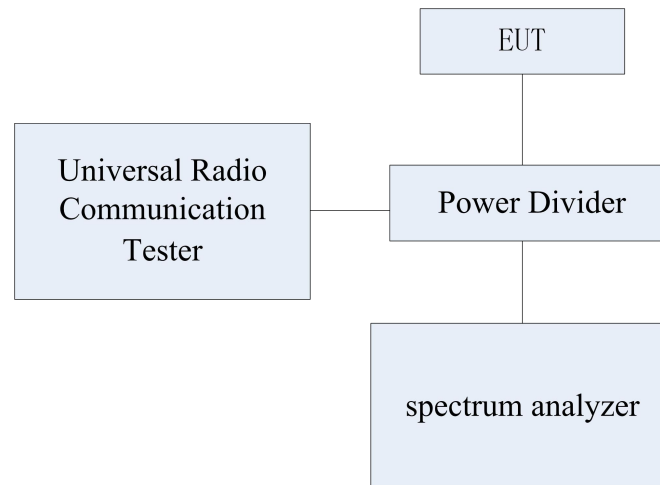
Test Setup:

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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 loss 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.

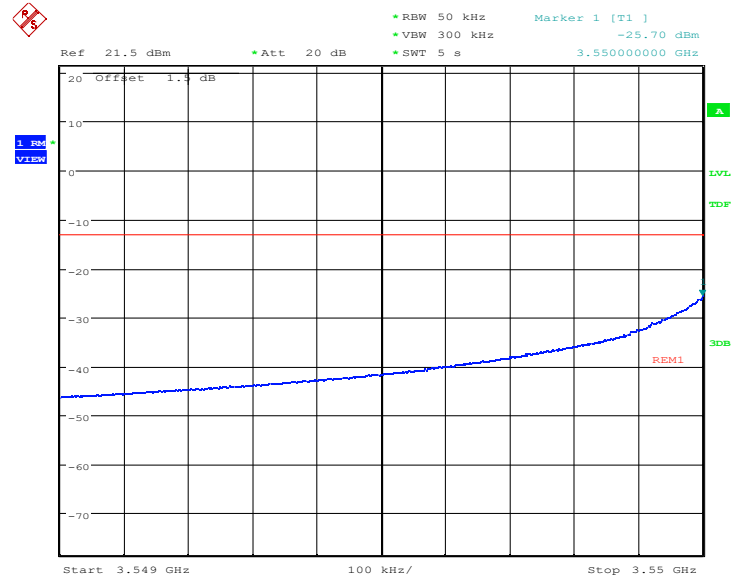
Note1: The Band Edge test data include QPSK and 16QAM. The following test results only reflect the data of the worse mode.

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 48-5MHz-QPSK

LOW BAND EDGE BLOCK-1RB-LOW_offset



Date: 23.MAY.2023 12:45:07

LOW BAND EDGE BLOCK-1RB-LOW_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.

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The screenshot displays a Spectrum Analyzer interface. At the top, a red diamond icon with a white 'R' is visible. The main display area shows a blue signal trace (labeled 'REM1') and a red reference line. The signal trace is relatively flat at approximately -60 dBm from 3.5345 GHz to 2.9 MHz, then rises sharply to about -45 dBm at 29 MHz. The red reference line is a step function, starting at -40 dBm, rising to -25 dBm at 2.9 MHz, and then to -15 dBm at 29 MHz. The y-axis is labeled 'Offset 1.5 dB' and ranges from -20 to -70 dBm. The x-axis is labeled 'Center 3.5345 GHz', '2.9 MHz/', and 'Span 29 MHz'. On the left side, there are two green buttons labeled '1.500' and 'V150M'. On the right side, there are three green buttons labeled 'A', 'LVL', and 'TDF'. At the bottom, there are three green buttons labeled 'REM1', '3dB', and '3dB'.

Ref 21.5 dBm Att 20 dB RBW 100 kHz VBW 300 kHz SWT 5 s Marker 1 [T1] -43.45 dBm 3.549000000 GHz

Offset 1.5 dB

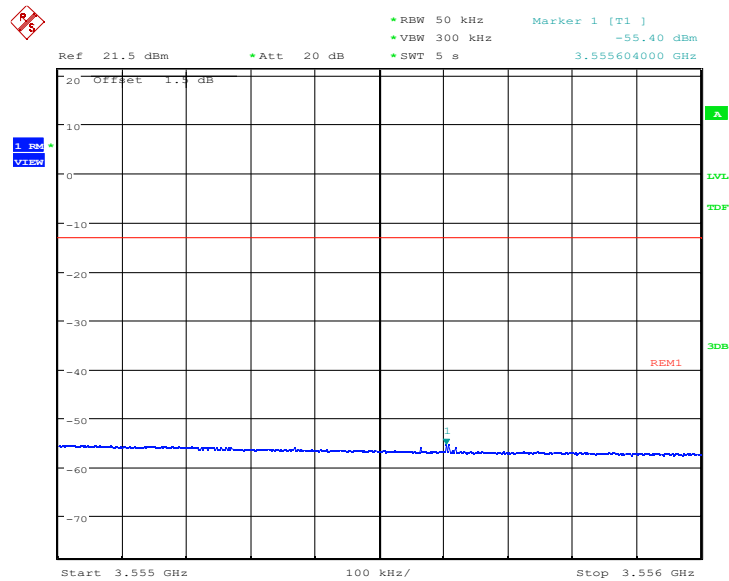
1.500
V150M

A
LVL
TDF
3dB

REM1

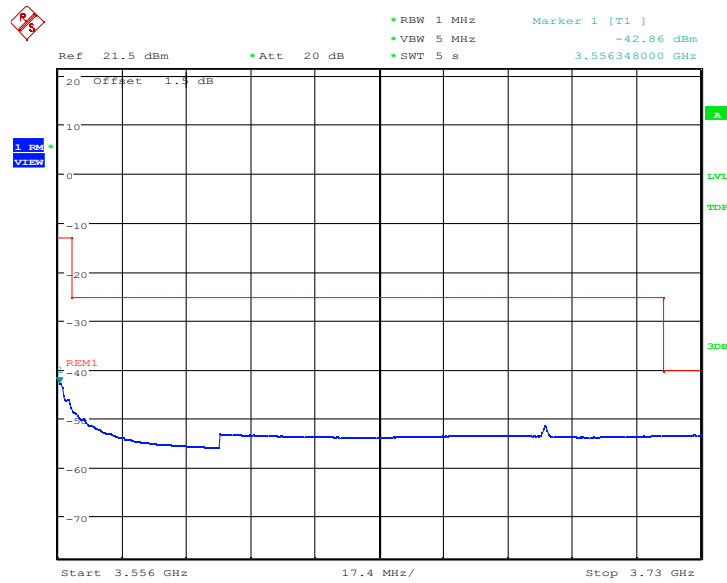
Center 3.5345 GHz 2.9 MHz/ Span 29 MHz

LOW BAND EDGE BLOCK-1RB-LOW_offset



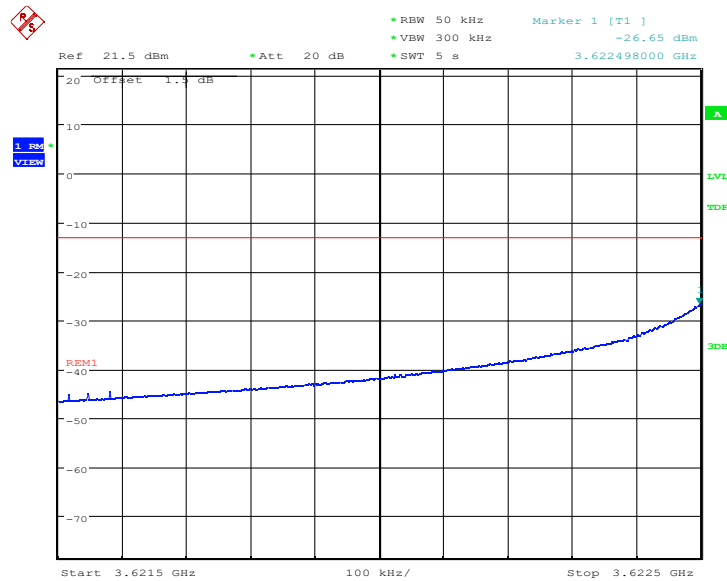
LOW BAND EDGE BLOCK-1RB-LOW_offset

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Date: 23.MAY.2023 12:47:13

MID BAND EDGE BLOCK-1RB-MID_offset



Date: 23.MAY.2023 12:53:14

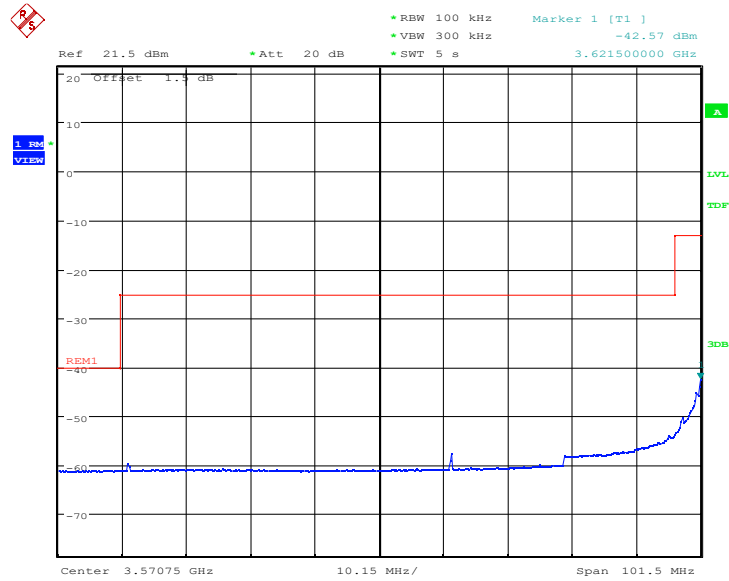
MID BAND EDGE BLOCK-1RB-MID_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with

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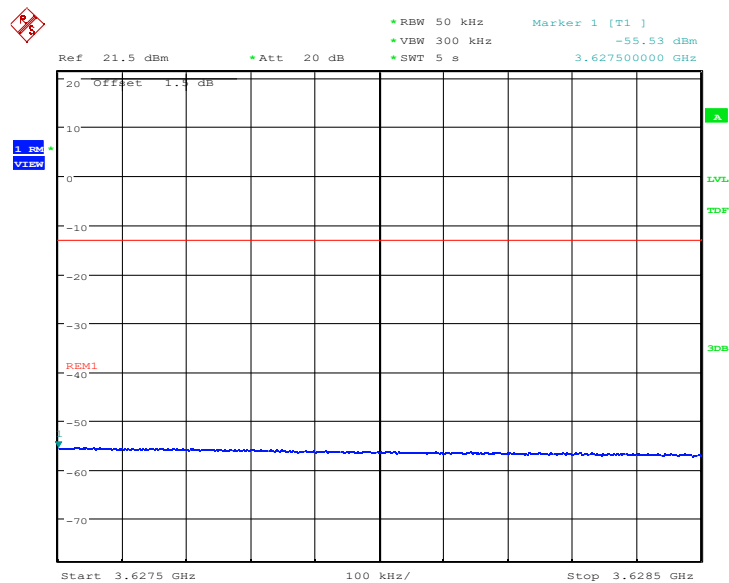
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10LOG (1M/100K)=10dBm.



Date: 23.MAY.2023 12:55:00

MID BAND EDGE BLOCK-1RB-MID_offset

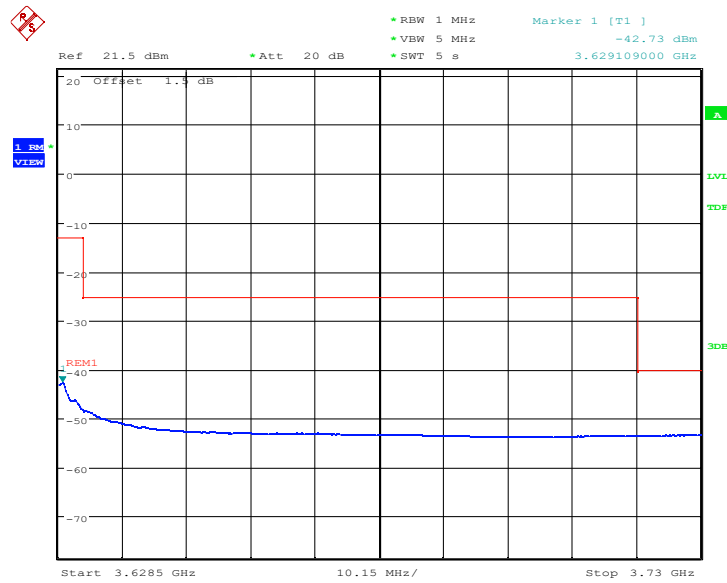


Date: 23.MAY.2023 12:55:42

MID BAND EDGE BLOCK-1RB-MID_offset

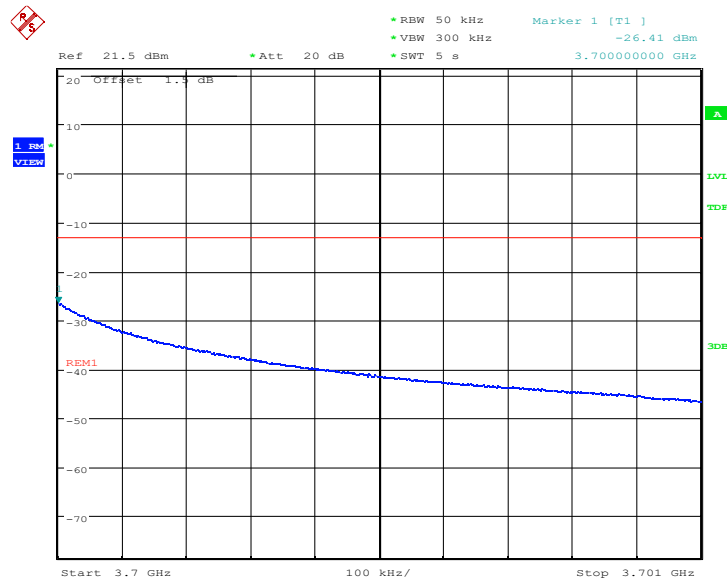
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Date: 23.MAY.2023 12:56:24

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



Date: 23.MAY.2023 13:01:14

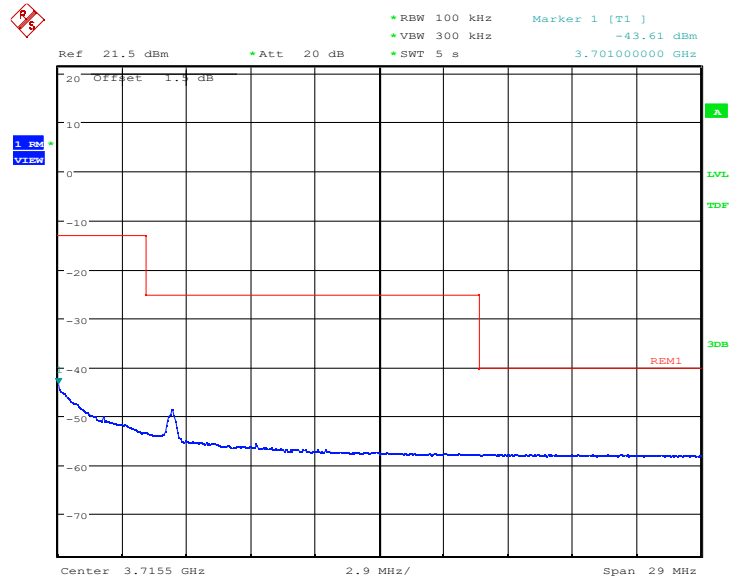
HIGH BAND EDGE BLOCK-1RB-HIGH_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with

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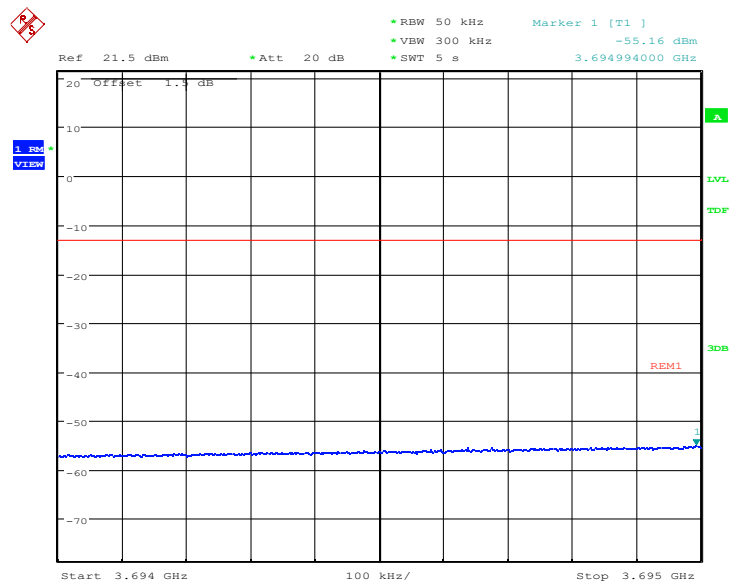
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10LOG (1M/100K)=10dBm.



Date: 23.MAY.2023 13:01:56

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

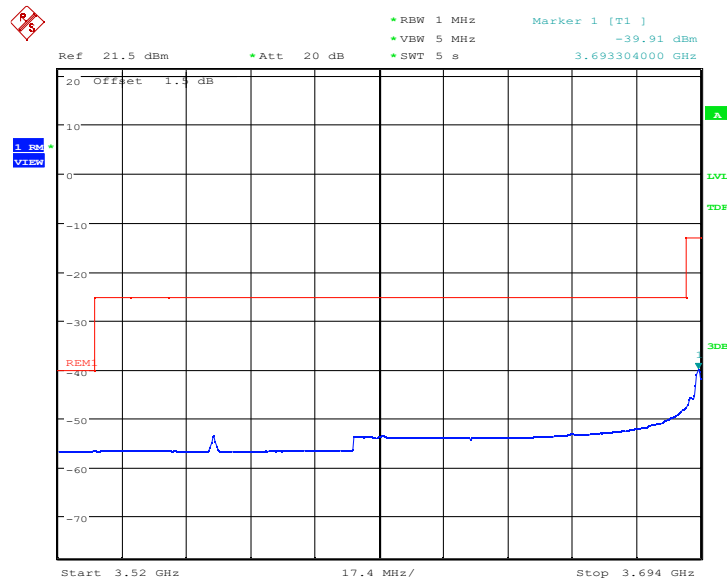


Date: 23.MAY.2023 13:02:38

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

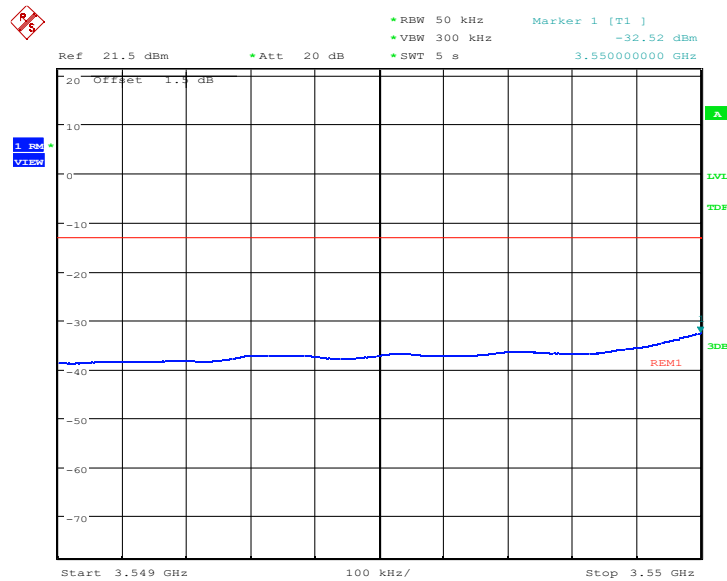
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Date: 23.MAY.2023 13:03:21

LOW BAND EDGE BLOCK-5M-100%RB



Date: 23.MAY.2023 12:48:29

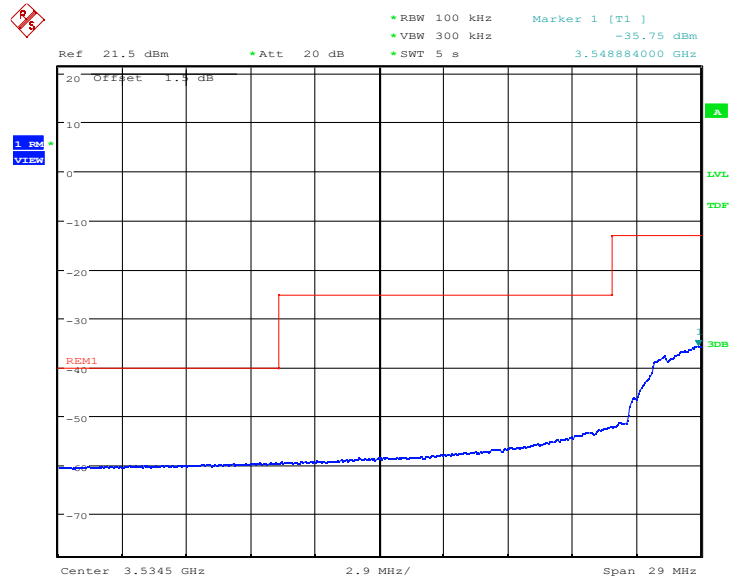
LOW BAND EDGE BLOCK-5M-100%RB

Due to the reduction of RBW, the limit value in the screenshot needs to be added with

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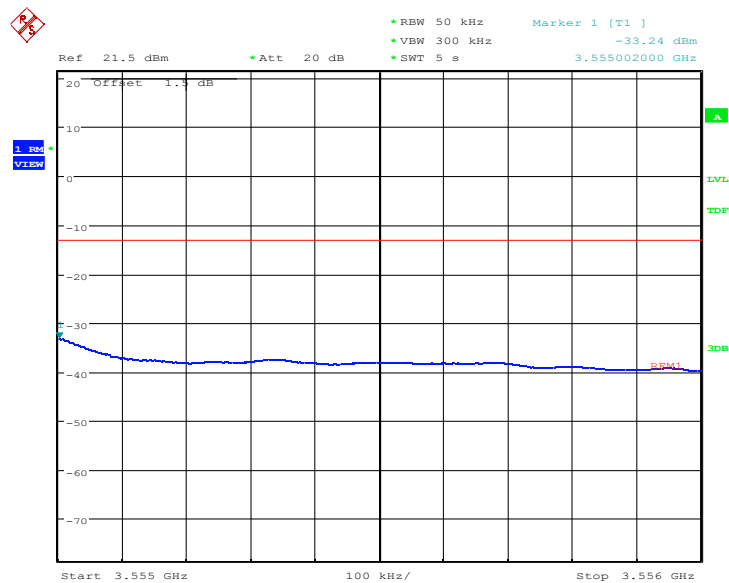
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10LOG (1M/100K)=10dBm.



Date: 23.MAY.2023 12:49:11

LOW BAND EDGE BLOCK-5M-100%RB



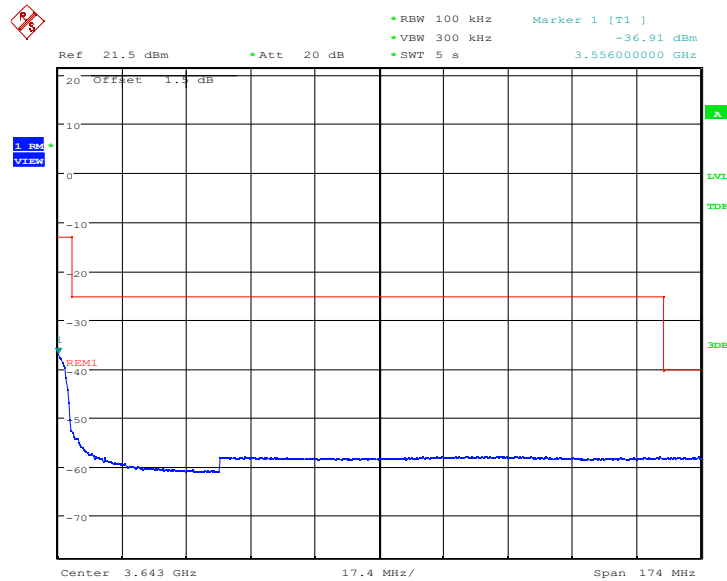
Date: 23.MAY.2023 12:49:58

LOW BAND EDGE BLOCK-5M-100%RB

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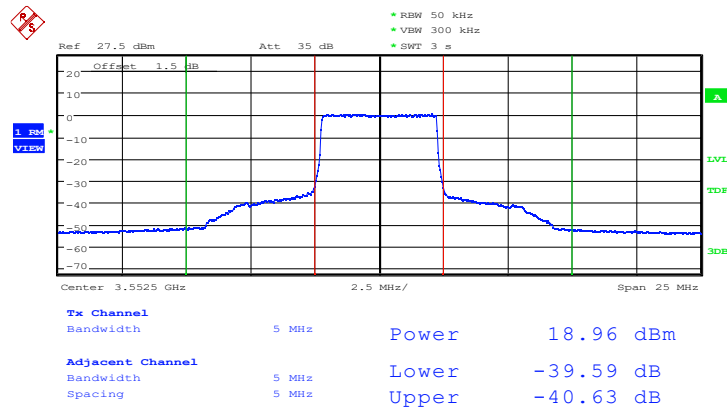
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
Tel: 0086-23-88069965 FAX: 0086-23-88608777

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 12:50:40

Channel power

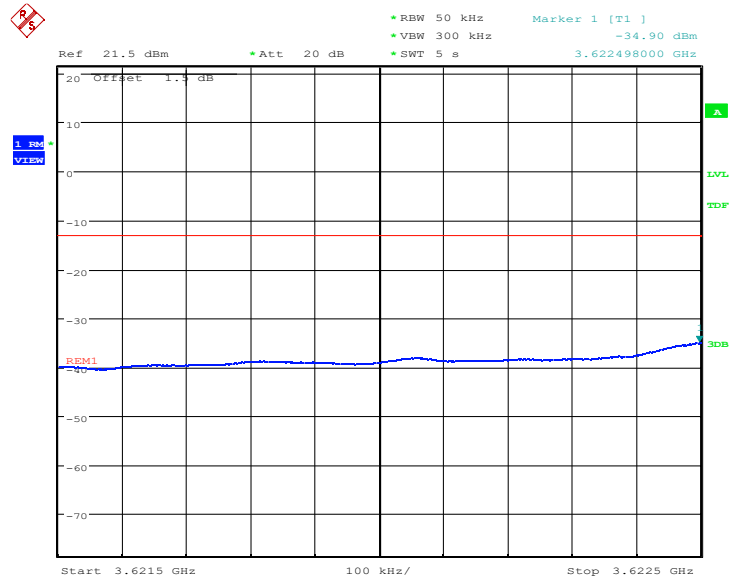


Date: 23.MAY.2023 12:51:06

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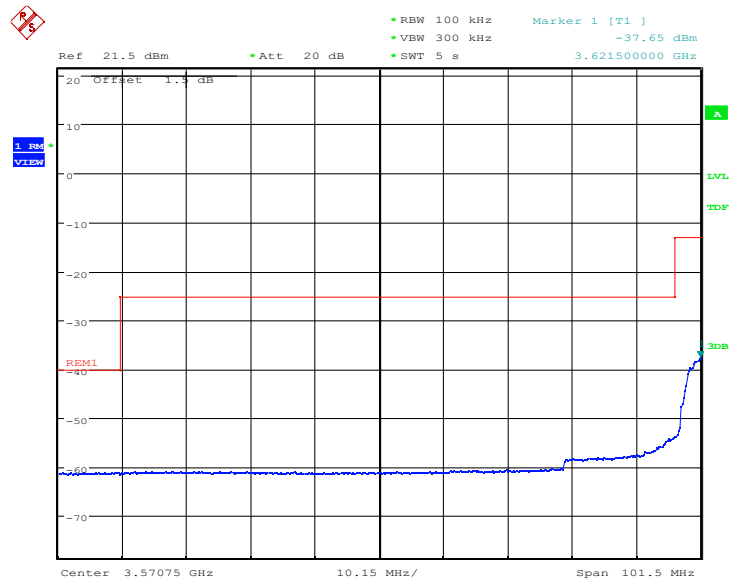
MID BAND EDGE BLOCK-5M-100%RB



Date: 23.MAY.2023 12:57:30

MID BAND EDGE BLOCK-5M-100%RB

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.

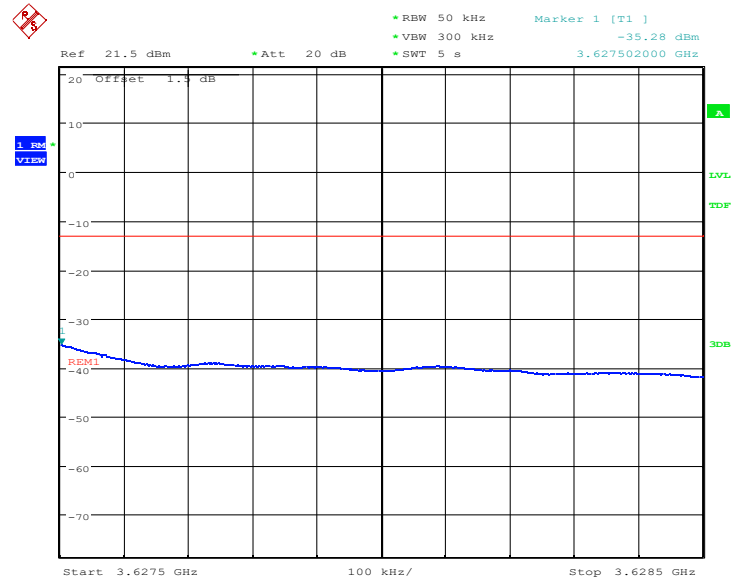


Date: 23.MAY.2023 12:58:12

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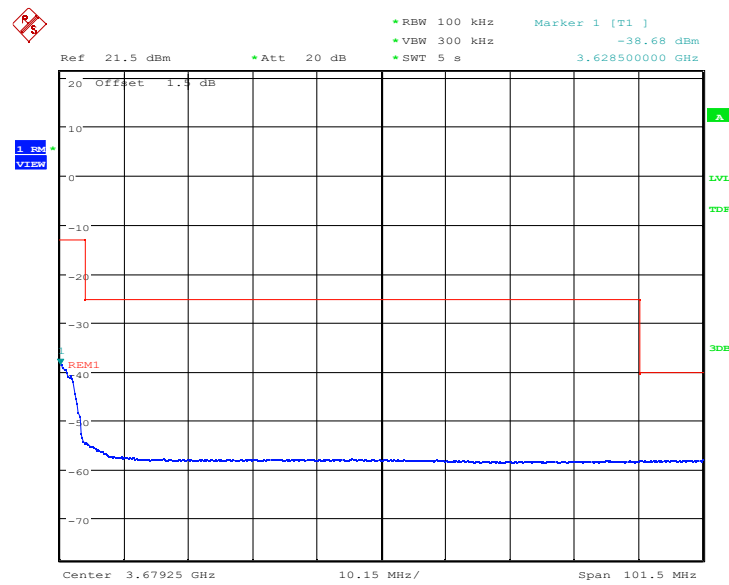
MID BAND EDGE BLOCK-5M-100%RB



Date: 23.MAY.2023 12:58:54

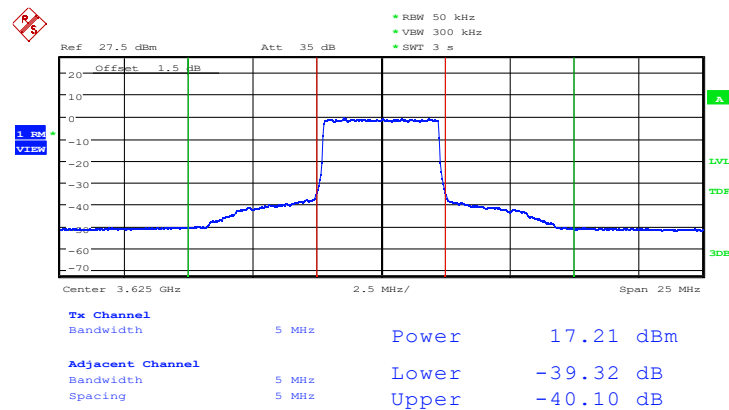
MID BAND EDGE BLOCK-5M-100%RB

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 12:59:37

Channel power

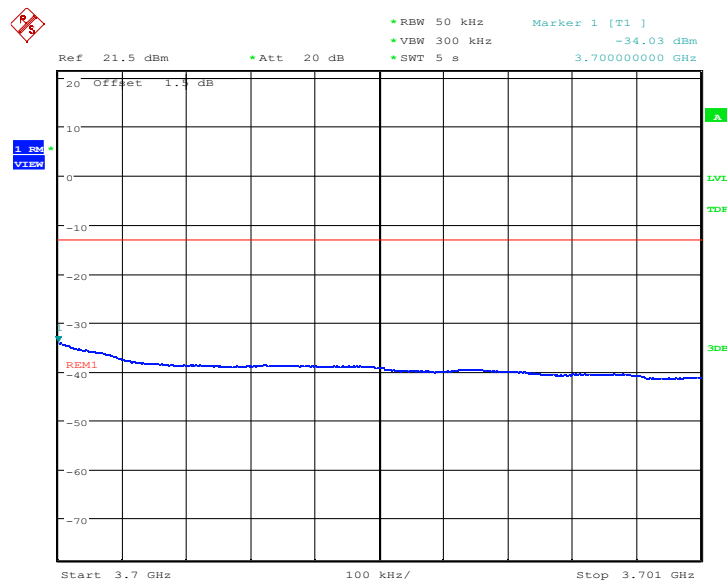


Date: 23.MAY.2023 13:00:02

HIGH BAND EDGE BLOCK-5M-100%RB

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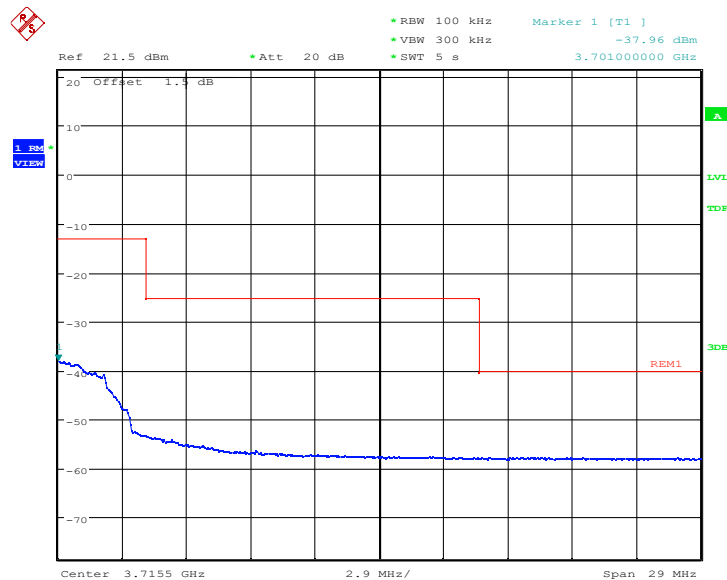
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Date: 23.MAY.2023 13:04:23

HIGH BAND EDGE BLOCK-5M-100%RB

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



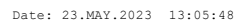
Date: 23.MAY.2023 13:05:05

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HIGH BAND EDGE BLOCK-5M-100%RB

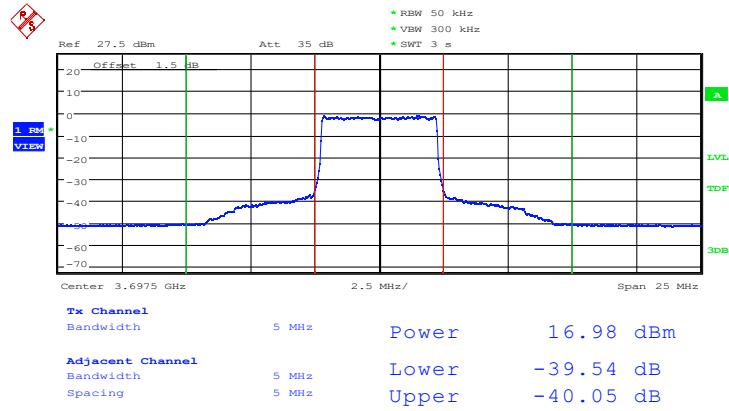


Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\text{LOG}(1\text{M}/100\text{K})=10\text{dBm}$.



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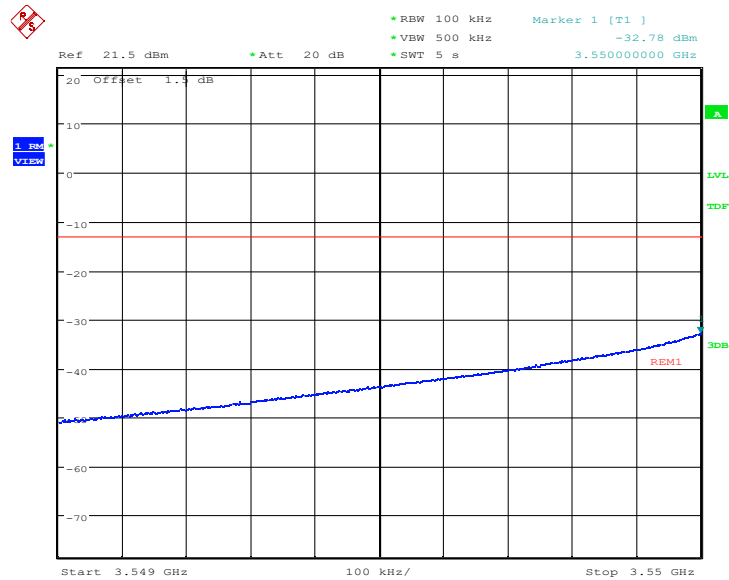
Channel power



Date: 23.MAY.2023 13:06:55

LTE band 48-10MHz-QPSK

LOW BAND EDGE BLOCK-1RB-LOW_offset



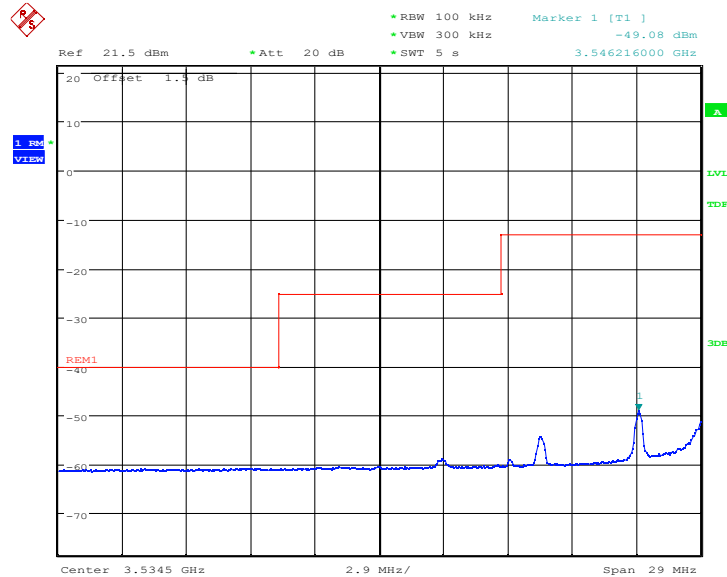
Date: 23.MAY.2023 13:08:44

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Tel: 0086-23-88069965 FAX: 0086-23-88608777

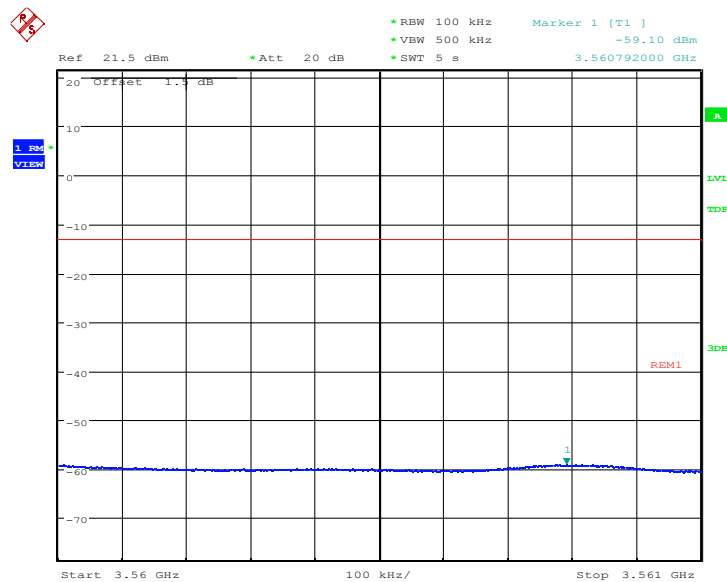
LOW BAND EDGE BLOCK-1RB-LOW_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 13:09:26

LOW BAND EDGE BLOCK-1RB-LOW_offset

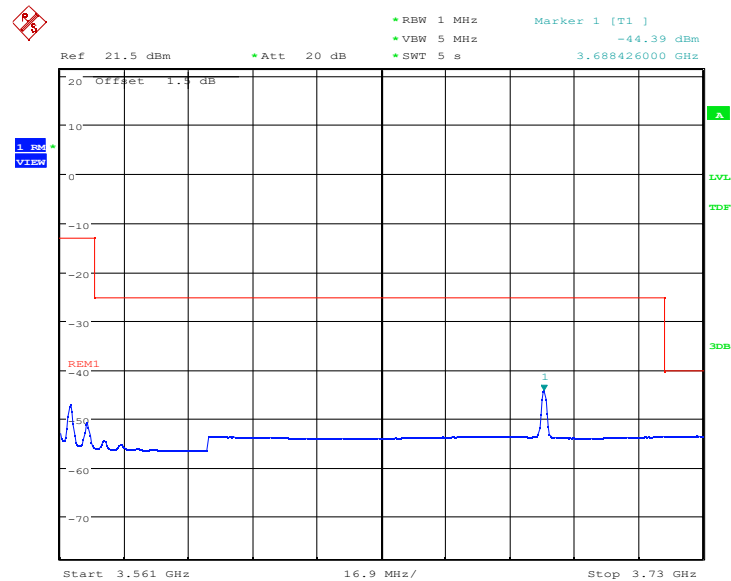


Date: 23.MAY.2023 13:10:08

Chongqing Academy of Information and Communication Technology

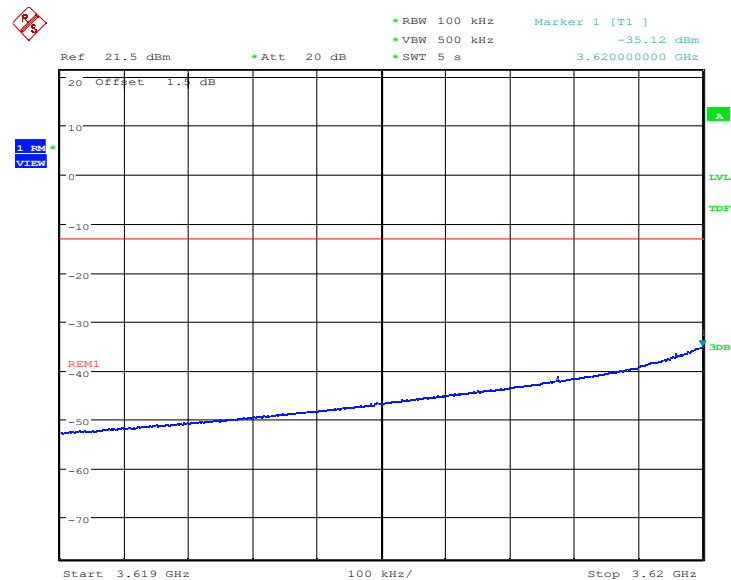
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LOW BAND EDGE BLOCK-1RB-LOW_offset



Date: 23.MAY.2023 13:10:50

MID BAND EDGE BLOCK-1RB-MID_offset



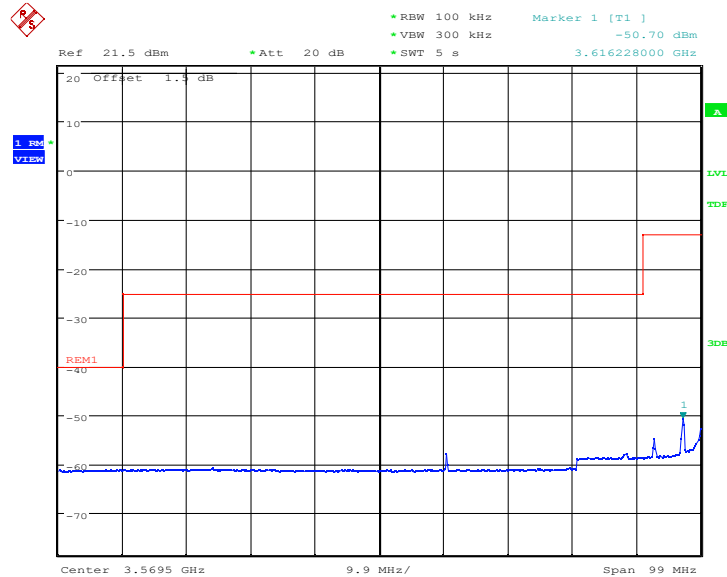
Date: 23.MAY.2023 13:15:37

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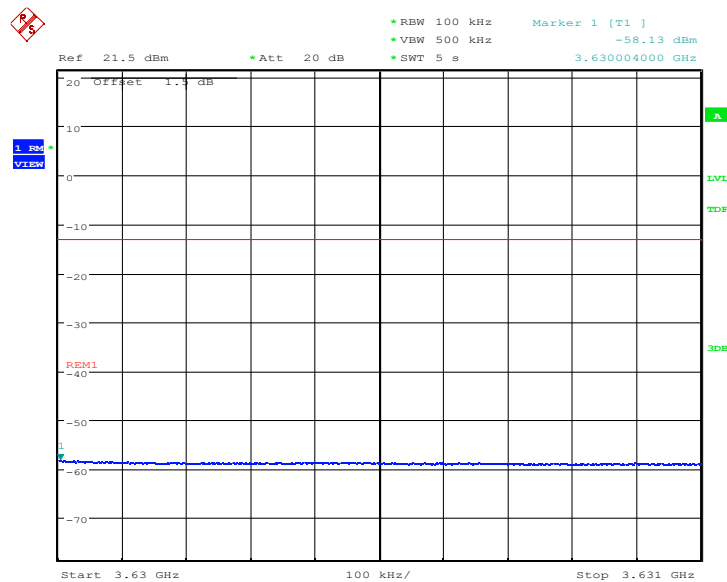
MID BAND EDGE BLOCK-1RB-MID_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 13:16:20

MID BAND EDGE BLOCK-1RB-MID_offset

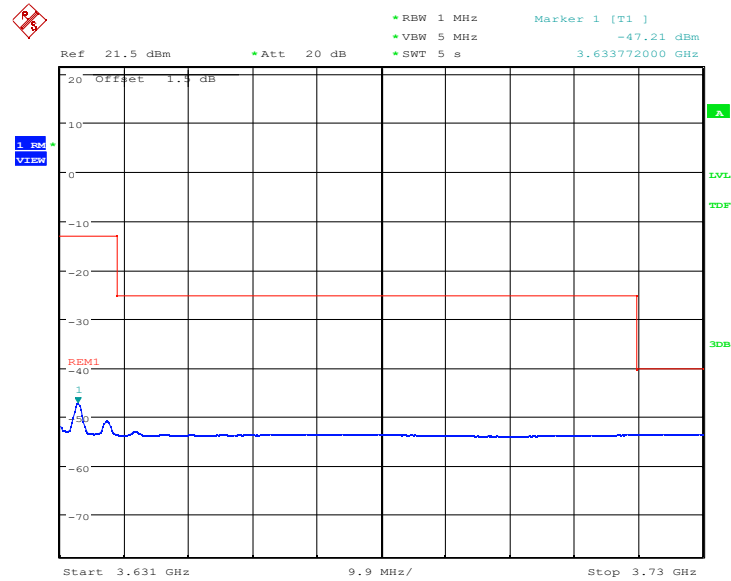


Date: 23.MAY.2023 13:17:01

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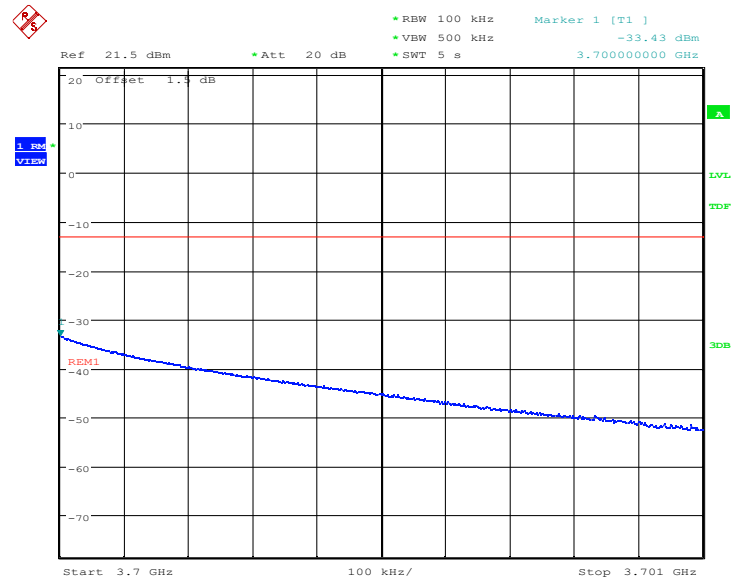
Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336
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MID BAND EDGE BLOCK-1RB-MID_offset



Date: 23.MAY.2023 13:17:43

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



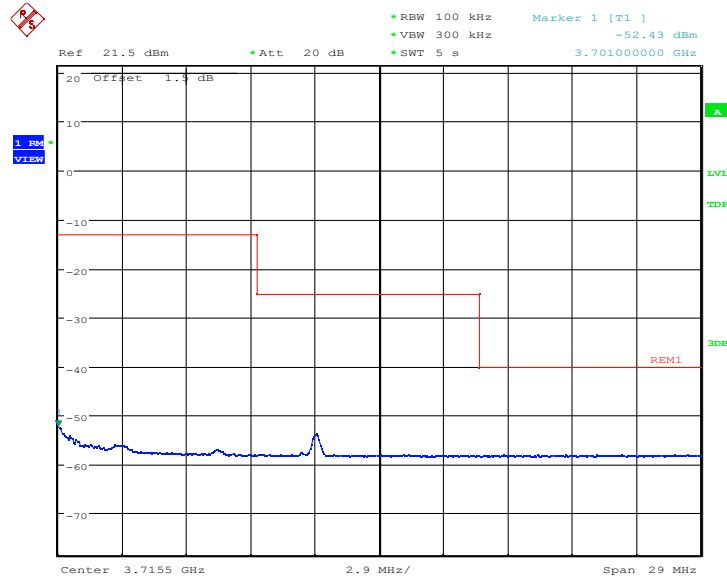
Date: 23.MAY.2023 13:22:26

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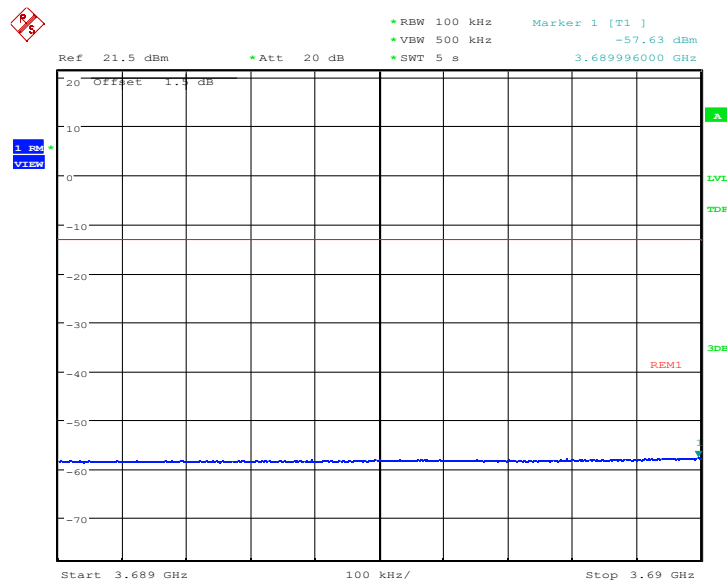
HIGH BAND EDGE BLOCK-1RB-HIGH_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 13:23:09

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

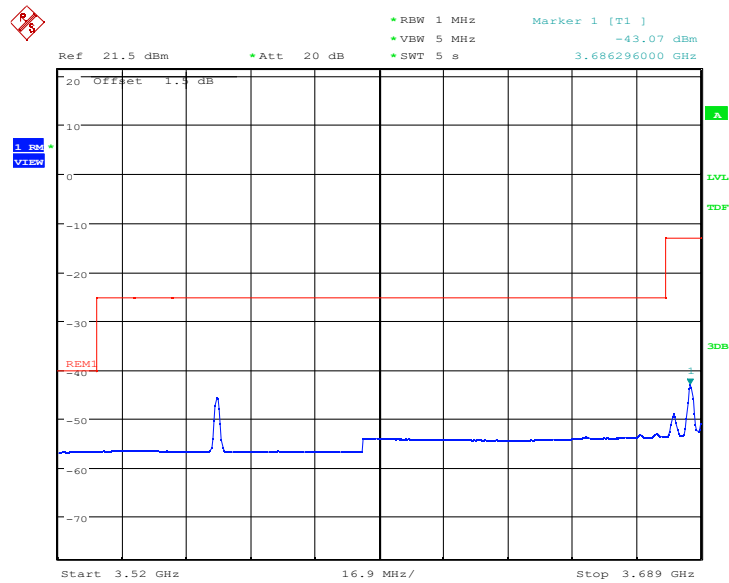


Date: 23.MAY.2023 13:23:51

Chongqing Academy of Information and Communication Technology

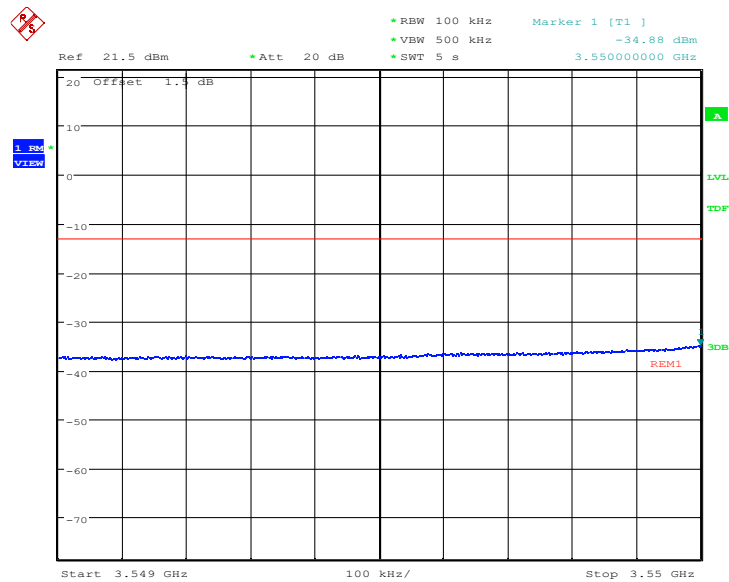
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HIGH BAND EDGE BLOCK-1RB-HIGH_offset



Date: 23.MAY.2023 13:24:33

LOW BAND EDGE BLOCK-10M-100%RB



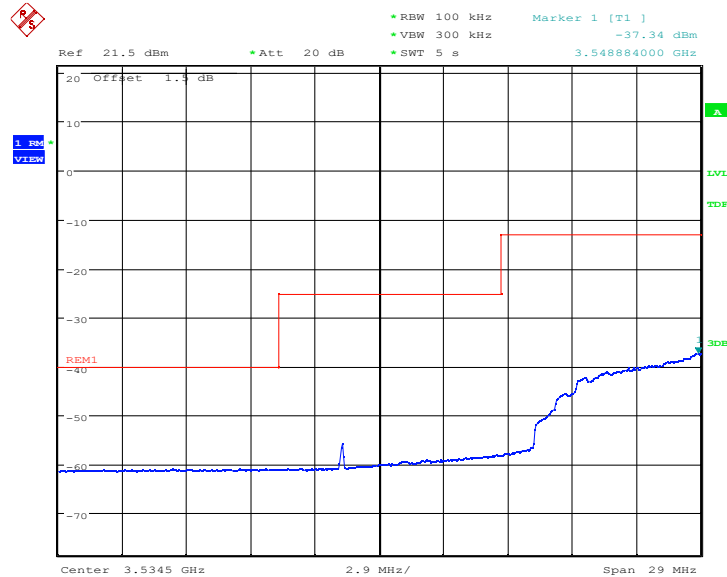
Date: 23.MAY.2023 13:11:56

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Tel: 0086-23-88069965 FAX: 0086-23-88608777

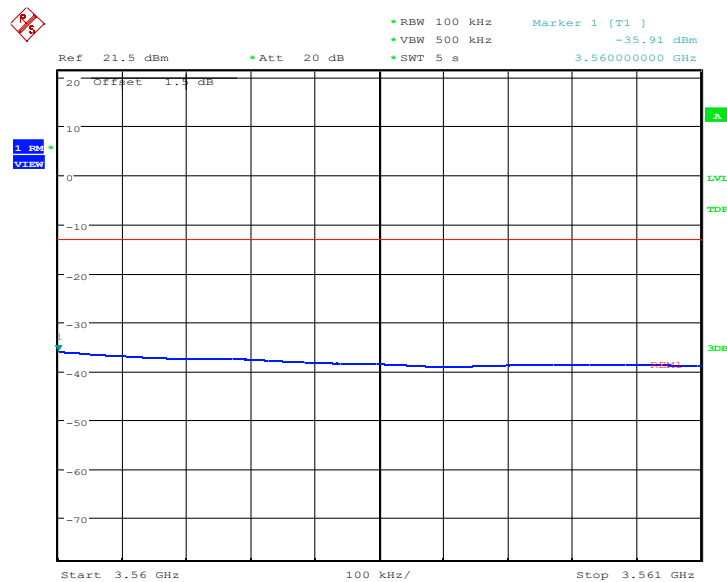
LOW BAND EDGE BLOCK-10M-100%RB

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/100K)=10\text{dBm}$.



Date: 23.MAY.2023 13:12:38

LOW BAND EDGE BLOCK-10M-100%RB

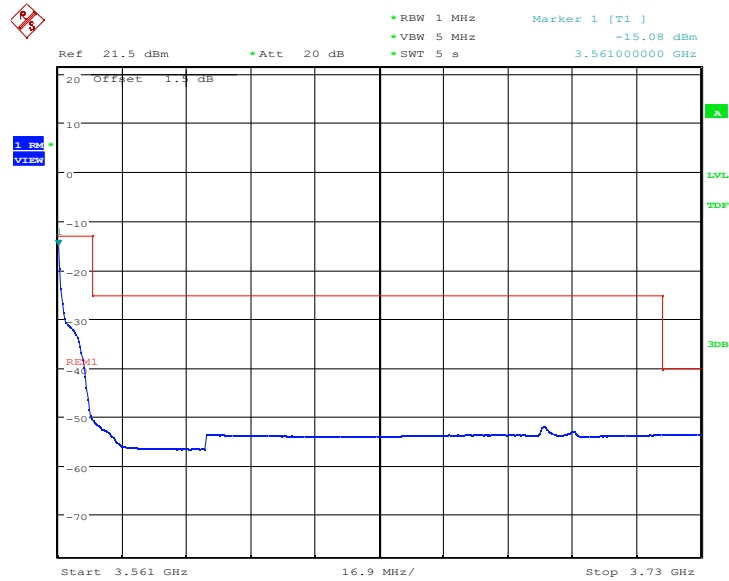


Date: 23.MAY.2023 13:13:20

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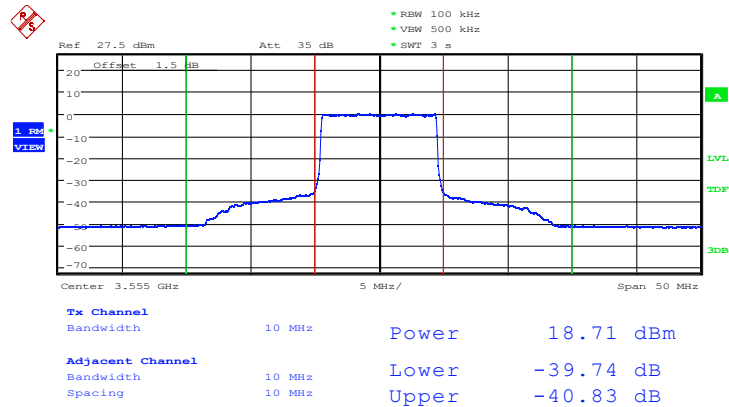
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LOW BAND EDGE BLOCK-10M-100%RB



Date: 23.MAY.2023 13:14:02

Channel power

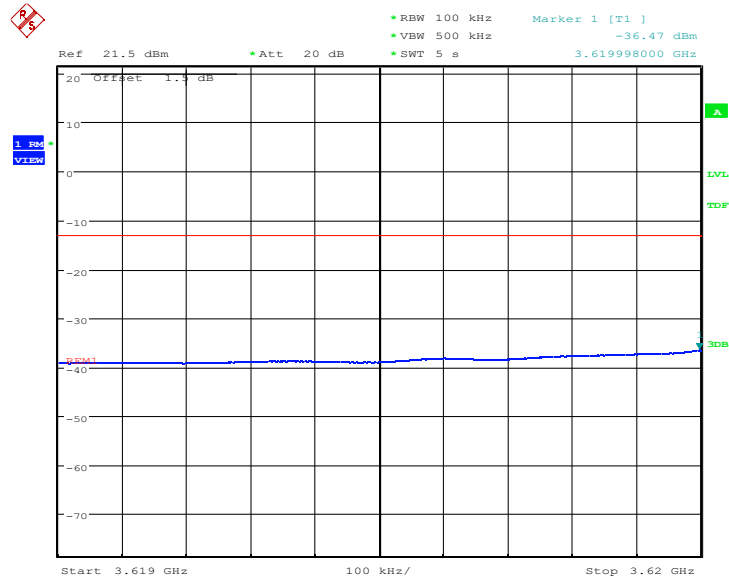


Date: 23.MAY.2023 13:14:27

Chongqing Academy of Information and Communication Technology

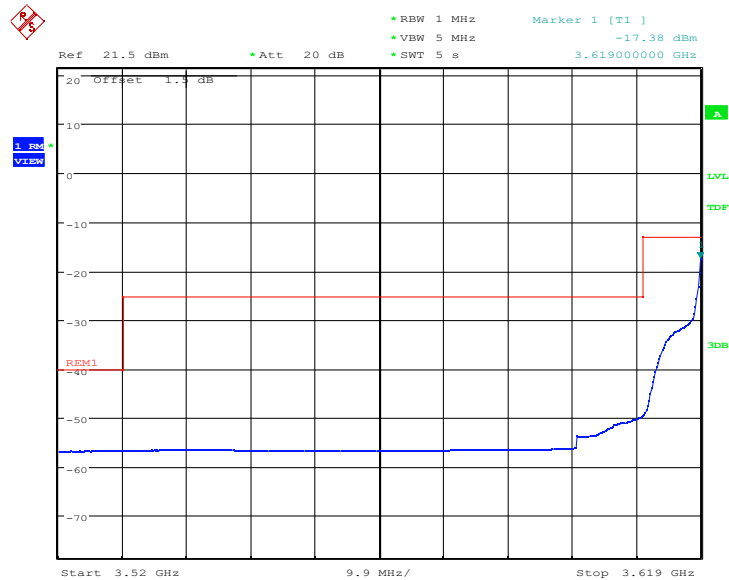
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MID BAND EDGE BLOCK-10M-100%RB



Date: 23.MAY.2023 13:18:49

MID BAND EDGE BLOCK-10M-100%RB

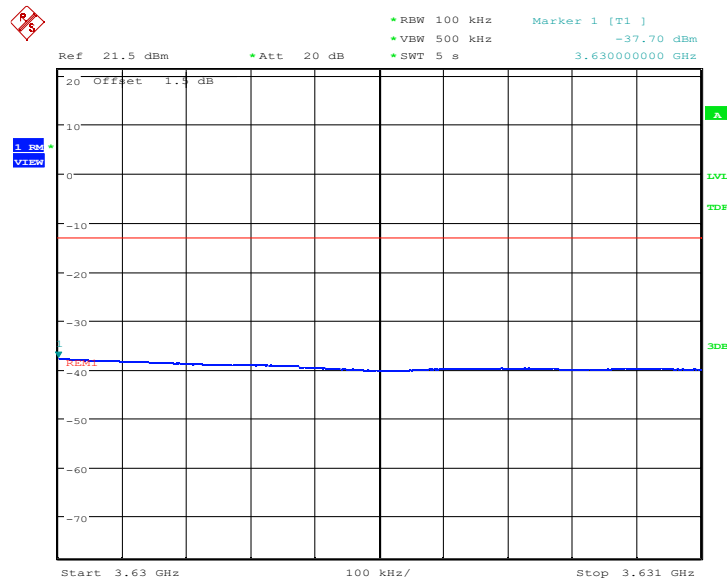


Date: 23.MAY.2023 13:19:31

MID BAND EDGE BLOCK-10M-100%RB

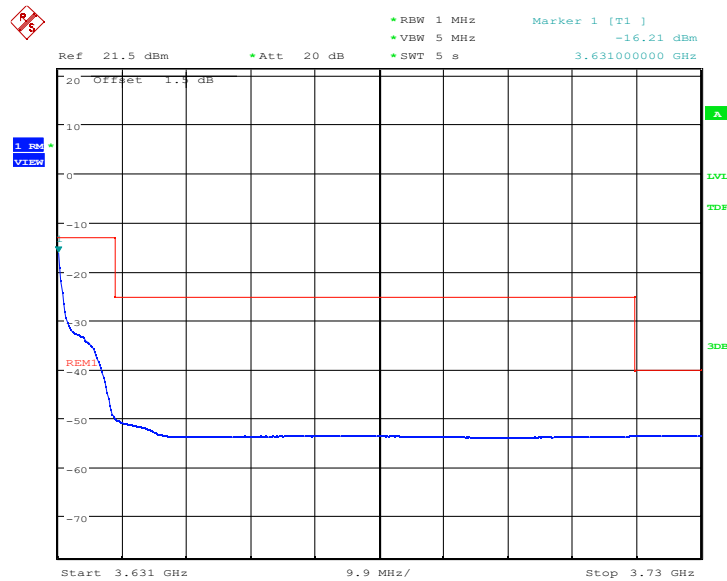
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Date: 23.MAY.2023 13:20:13

MID BAND EDGE BLOCK-10M-100%RB

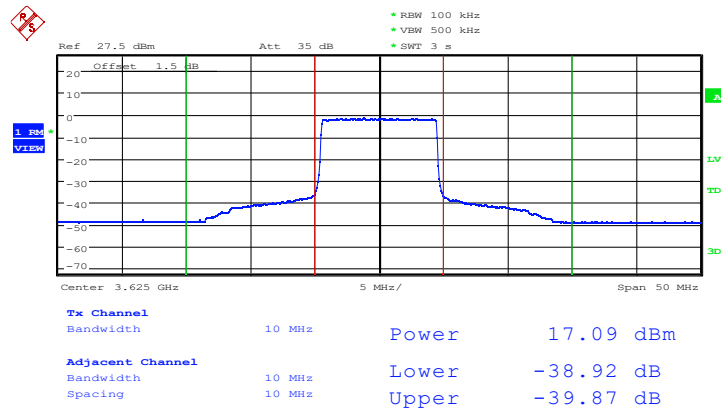


Date: 23.MAY.2023 13:20:55

Channel power

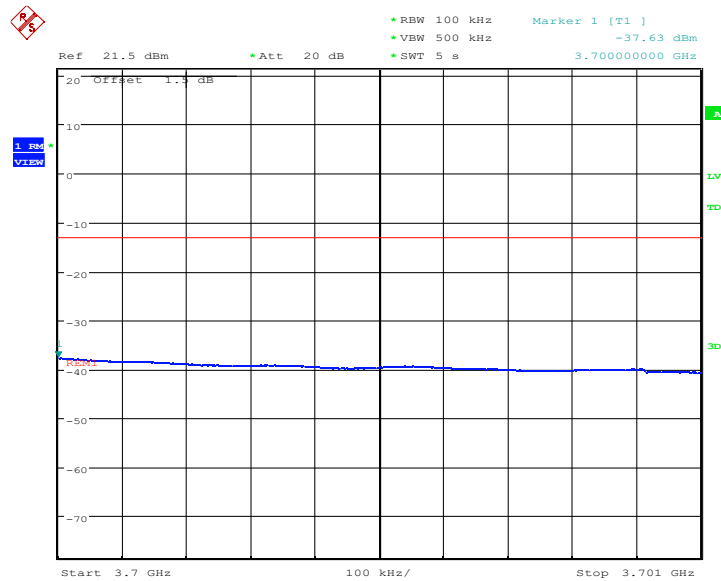
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Date: 23.MAY.2023 13:21:20

HIGH BAND EDGE BLOCK-10M-100%RB

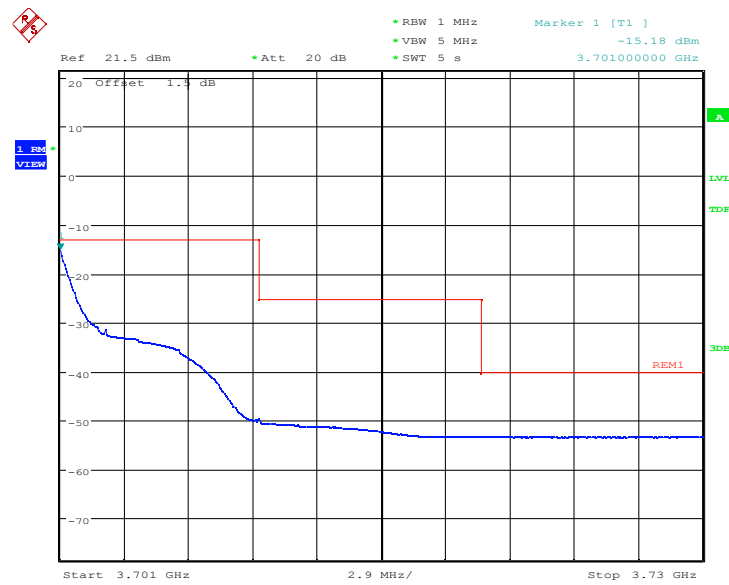


Date: 23.MAY.2023 13:25:39

HIGH BAND EDGE BLOCK-10M-100%RB

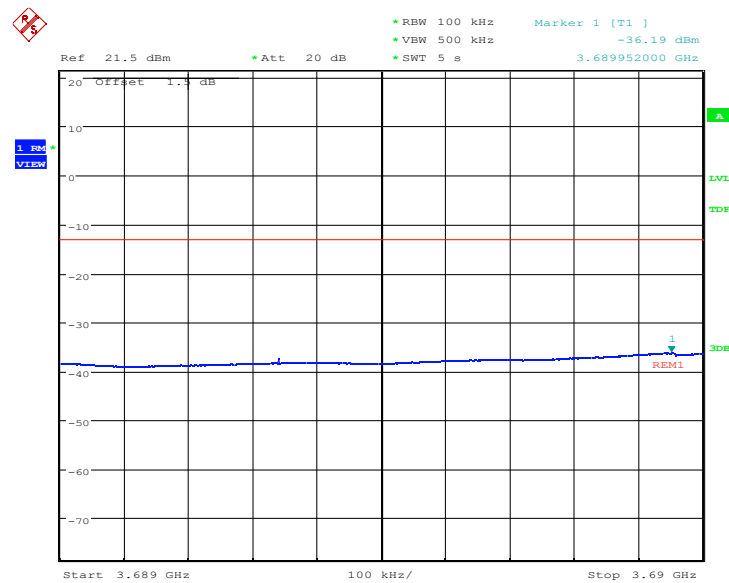
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Date: 23.MAY.2023 13:26:21

HIGH BAND EDGE BLOCK-10M-100%RB

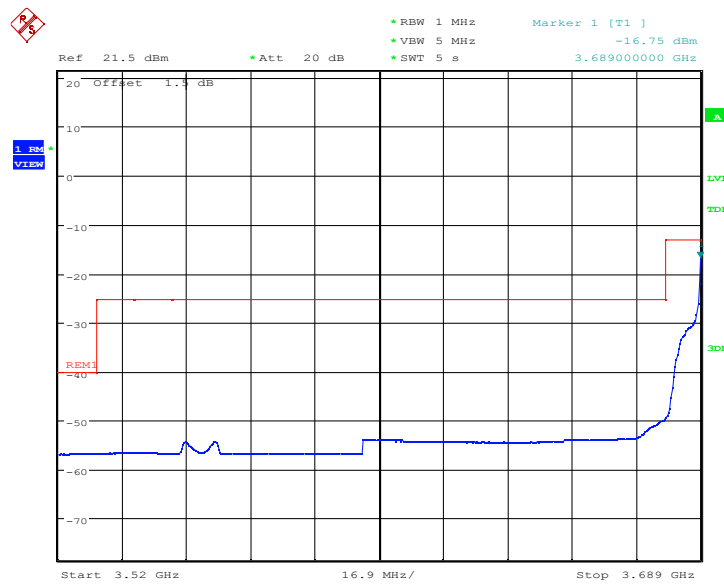


Date: 23.MAY.2023 13:27:03

HIGH BAND EDGE BLOCK-10M-100%RB

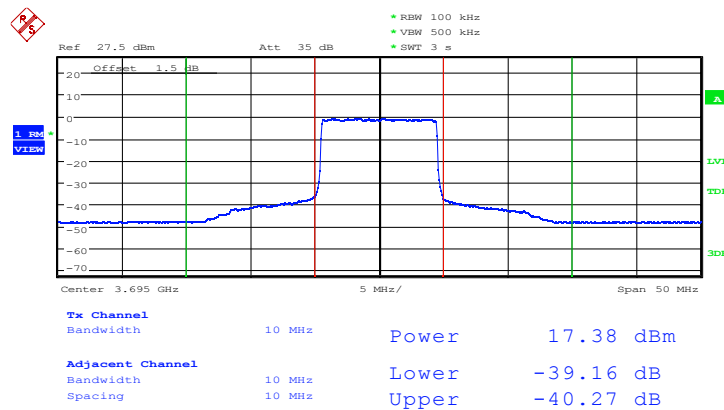
Chongqing Academy of Information and Communication Technology

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Date: 23.MAY.2023 13:27:45

Channel power



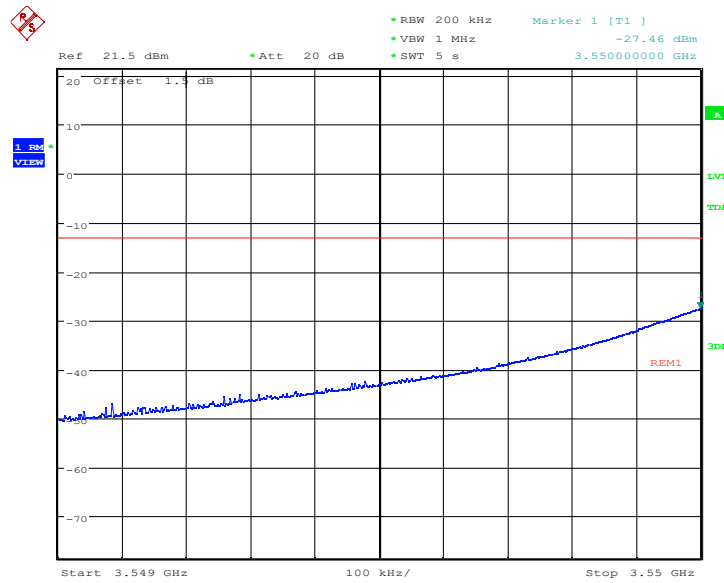
Date: 23.MAY.2023 13:28:11

LTE band 48-15MHz-QPSK

LOW BAND EDGE BLOCK-1RB-LOW_offset

Chongqing Academy of Information and Communication Technology

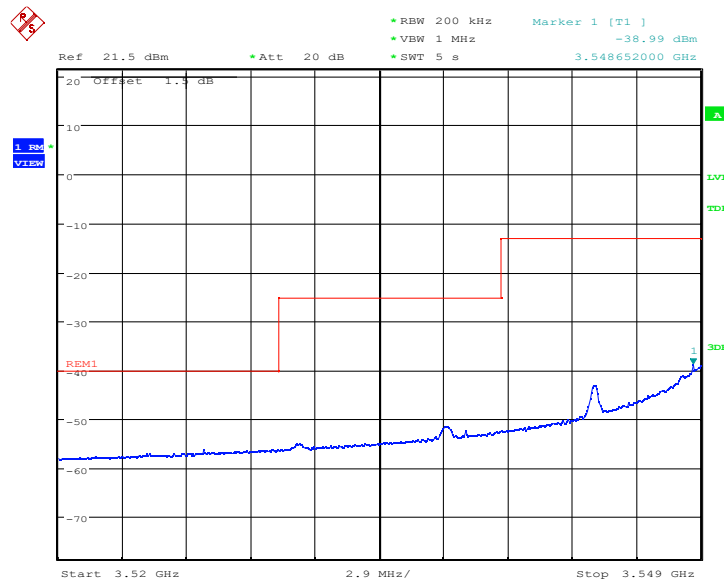
Address: No. 8,Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China,401336
Tel: 0086-23-88069965 FAX:0086-23-88608777



Date: 23.MAY.2023 13:30:02

LOW BAND EDGE BLOCK-1RB-LOW_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/200K)=6.99\text{dBm}$.



Date: 23.MAY.2023 16:53:37

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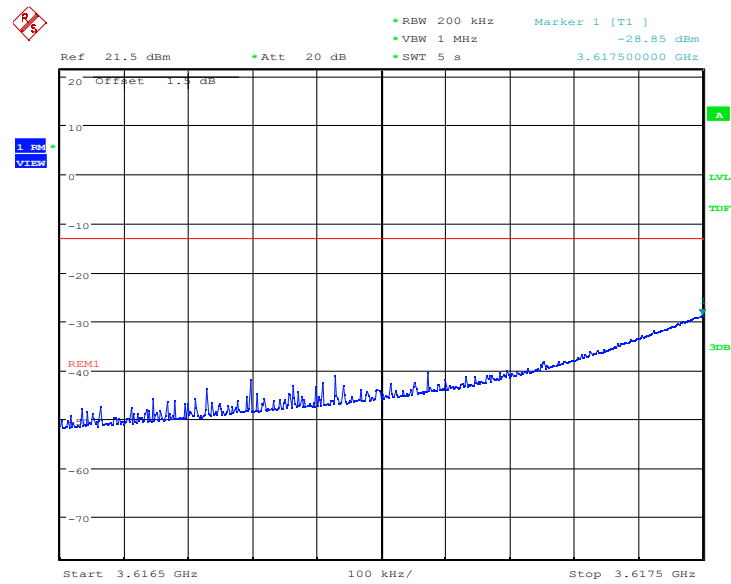
LOW BAND EDGE BLOCK-1RB-LOW_offset



Date: 23.MAY.2023 13:32:09

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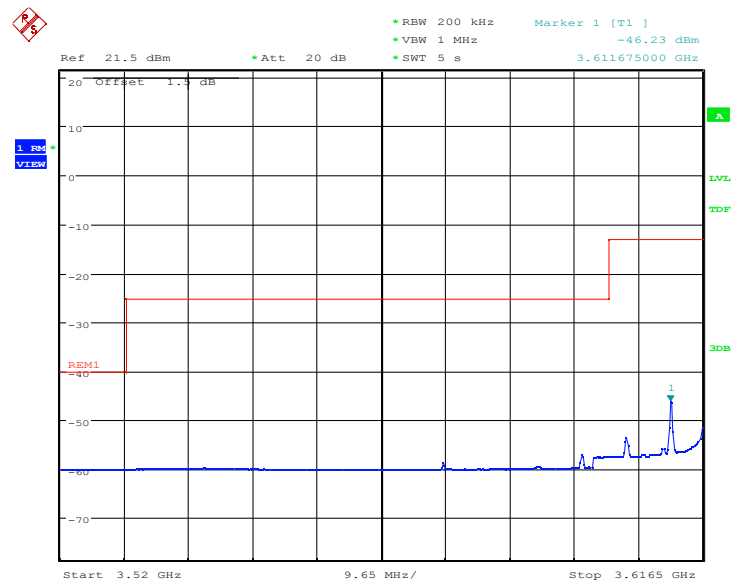
MID BAND EDGE BLOCK-1RB-MID_offset



Date: 23.MAY.2023 13:36:50

MID BAND EDGE BLOCK-1RB-MID_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/200K)=6.99\text{dBm}$.

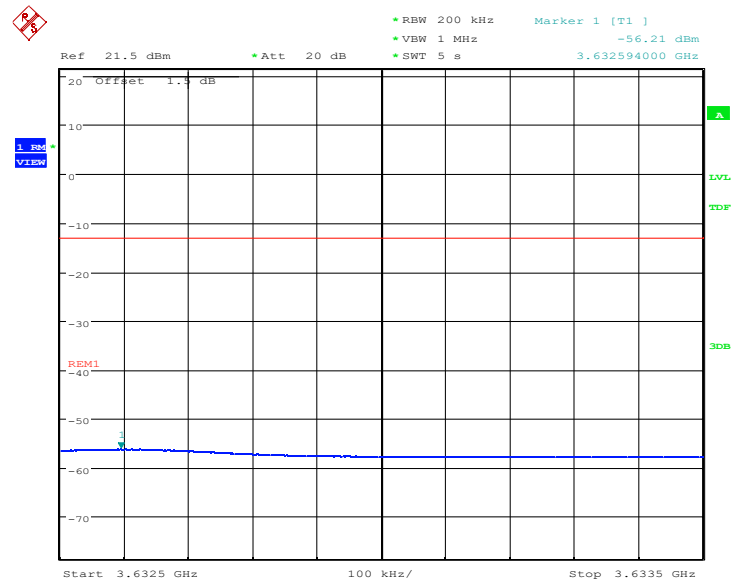


Date: 23.MAY.2023 13:37:32

Chongqing Academy of Information and Communication Technology

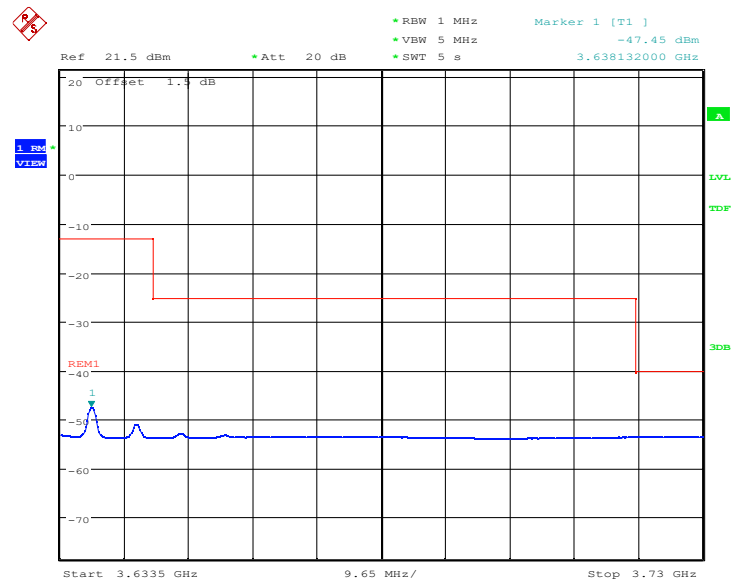
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MID BAND EDGE BLOCK-1RB-MID_offset



Date: 23.MAY.2023 13:38:14

MID BAND EDGE BLOCK-1RB-MID_offset

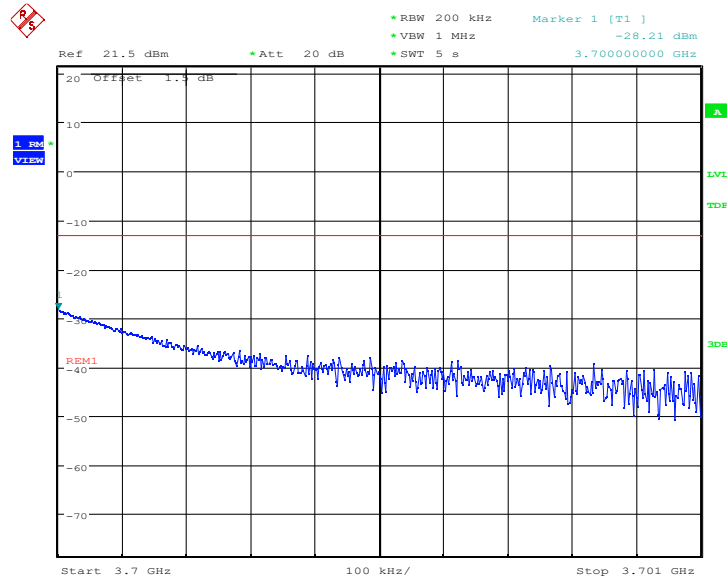


Date: 23.MAY.2023 13:38:56

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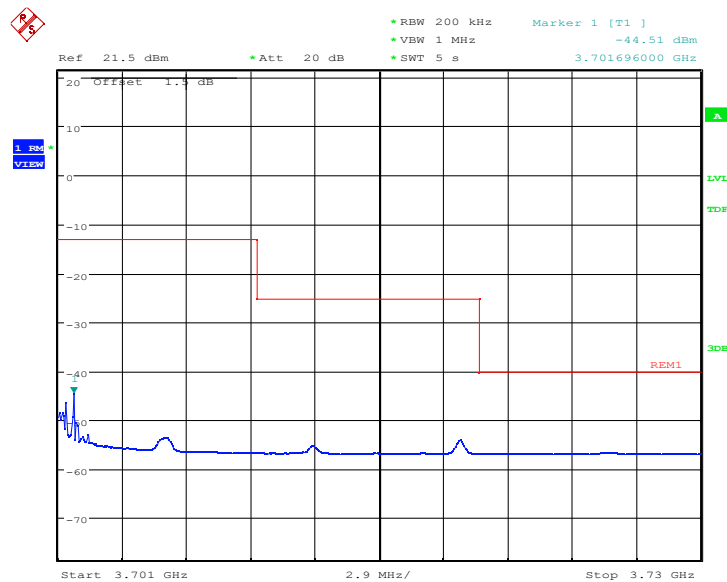
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



Date: 23.MAY.2023 13:43:47

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with $10\log(1M/200K)=6.99\text{dBm}$.

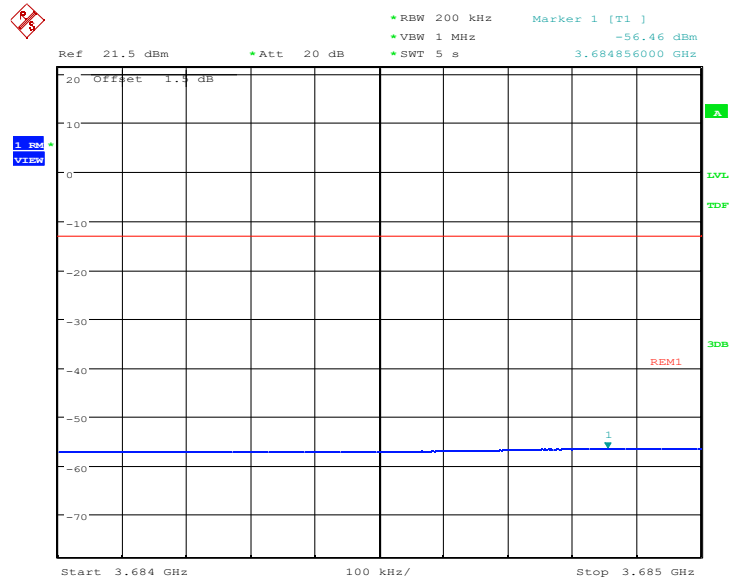


Date: 23.MAY.2023 13:44:29

Chongqing Academy of Information and Communication Technology

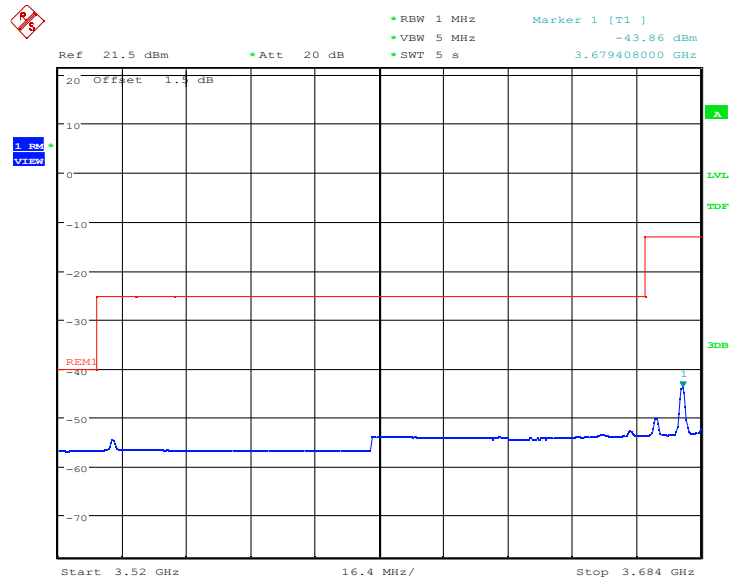
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HIGH BAND EDGE BLOCK-1RB-HIGH_offset



Date: 23.MAY.2023 13:45:11

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



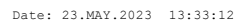
Date: 23.MAY.2023 13:45:53

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LOW BAND EDGE BLOCK-15M-100%RB



Date: 23.MAY.2023 13:33:54

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Ref 21.5 dBm Att 20 dB RBW 200 kHz VBW 1 MHz SWT 5 s Marker 1 [T1] -34.15 dBm

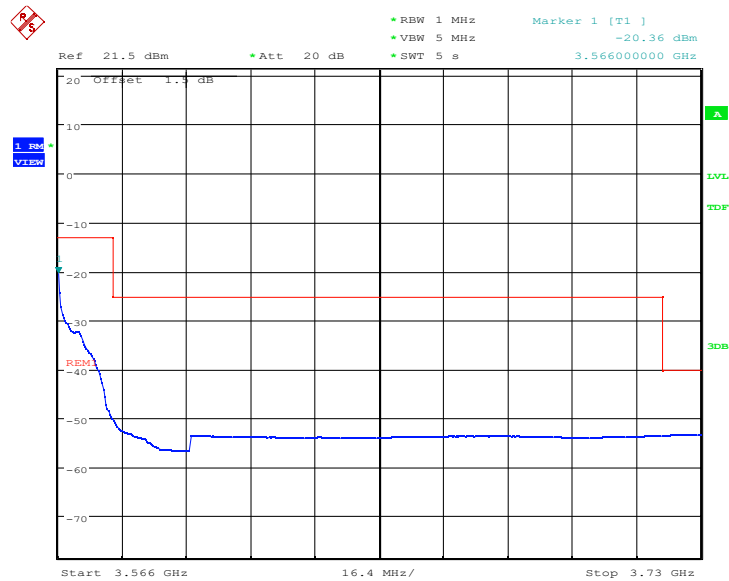
Offset 1.5 dB

1.500 V150M

REM1

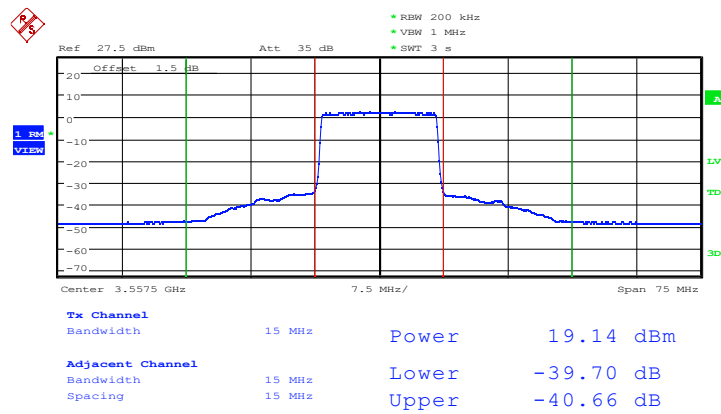
Start 3.565 GHz 100 kHz/ Stop 3.566 GHz

LOW BAND EDGE BLOCK-15M-100%RB



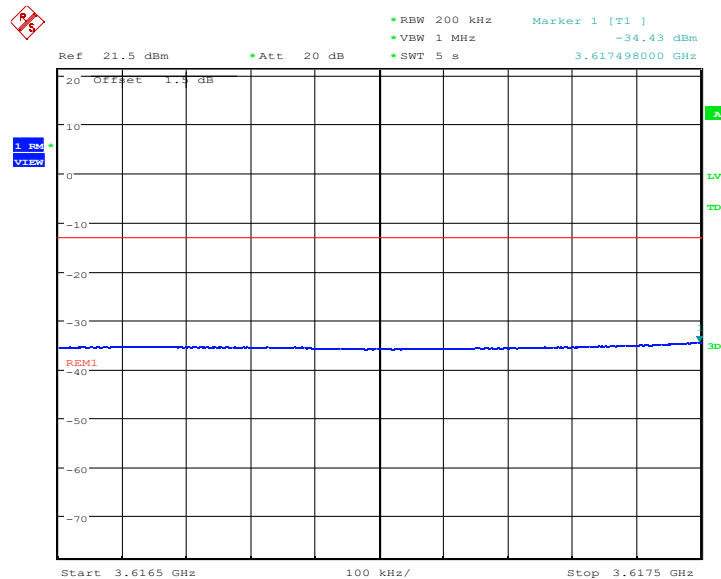
Channel power

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Date: 23.MAY.2023 13:35:42

MID BAND EDGE BLOCK-15M-100%RB

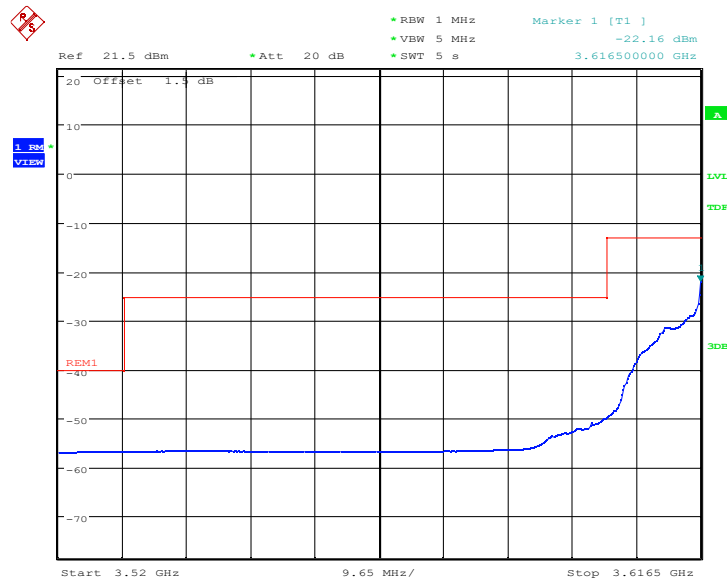


Date: 23.MAY.2023 13:40:08

MID BAND EDGE BLOCK-15M-100%RB

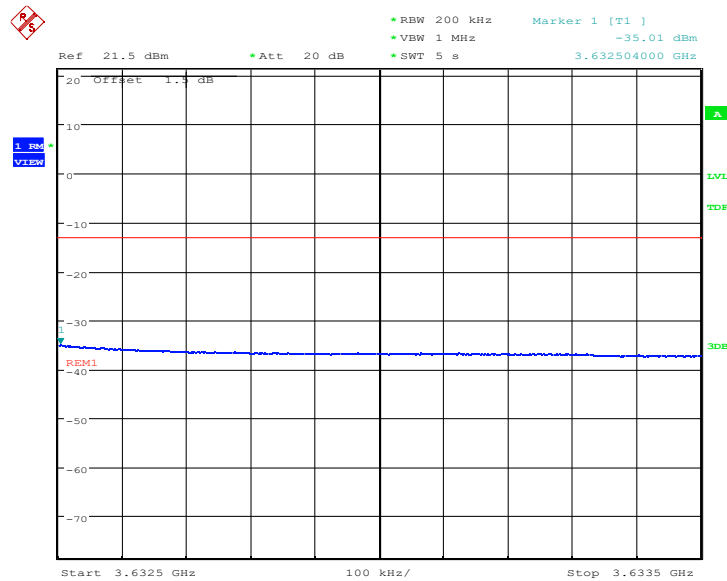
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Date: 23.MAY.2023 13:40:50

MID BAND EDGE BLOCK-15M-100%RB

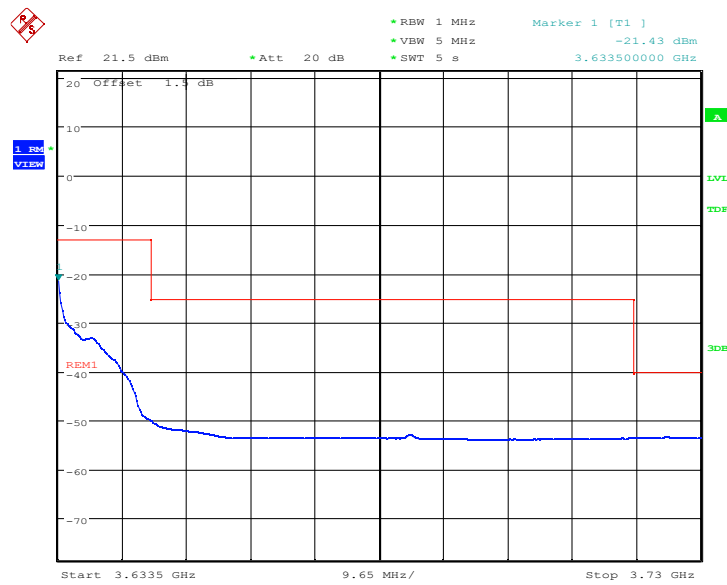


Date: 23.MAY.2023 13:41:32

MID BAND EDGE BLOCK-15M-100%RB

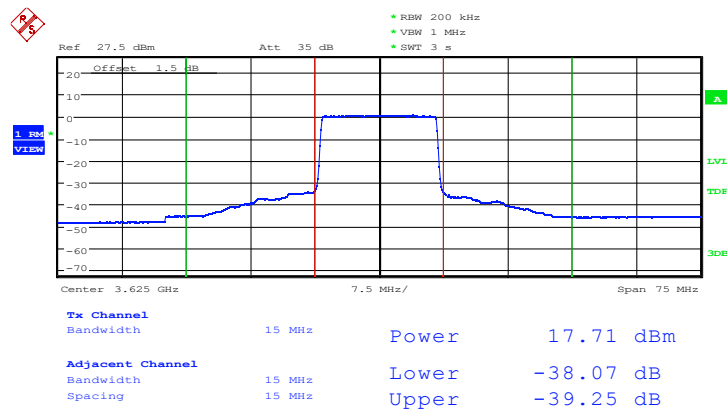
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Tel: 0086-23-88069965 FAX: 0086-23-88608777



Date: 23.MAY.2023 13:42:14

Channel power

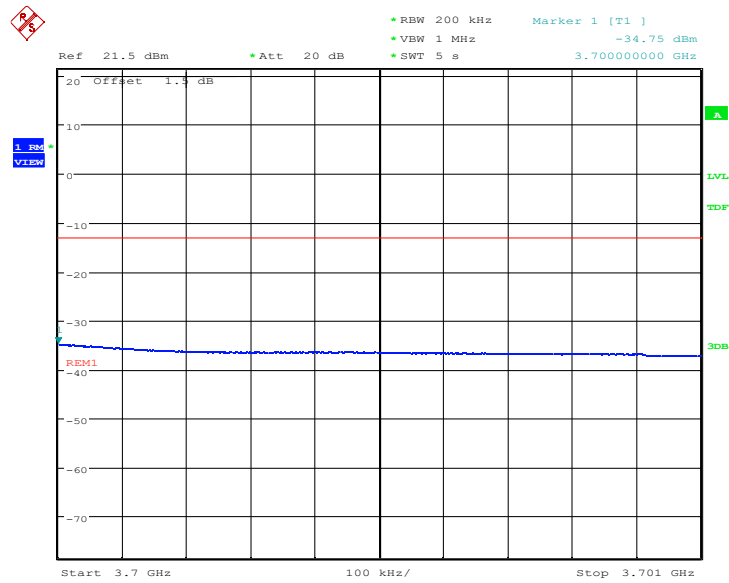


Date: 23.MAY.2023 13:42:39

HIGH BAND EDGE BLOCK-15M-100%RB

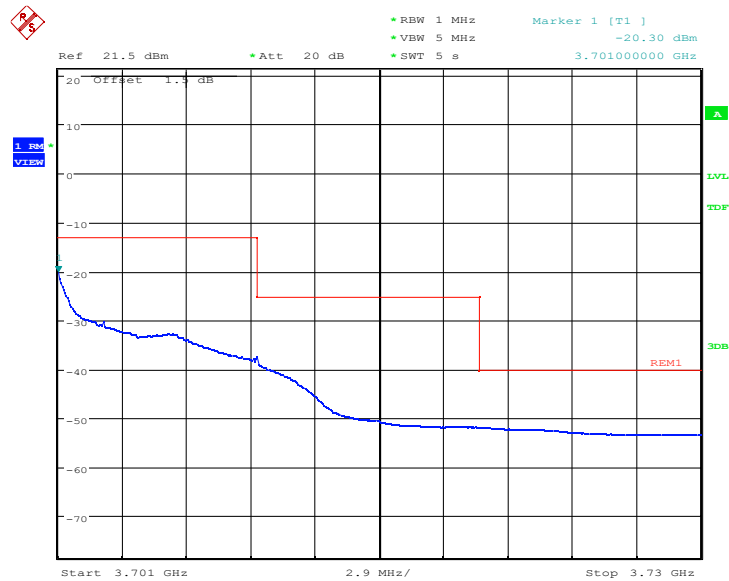
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Date: 23.MAY.2023 13:47:08

HIGH BAND EDGE BLOCK-15M-100%RB



Date: 23.MAY.2023 13:47:50

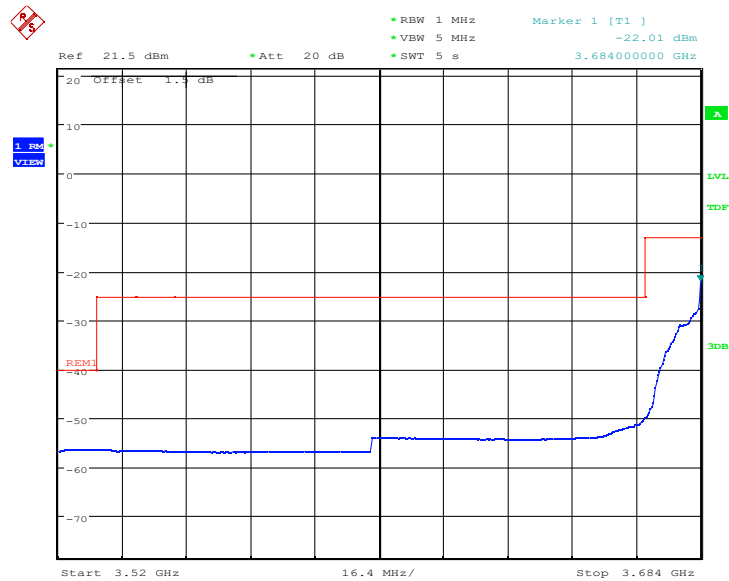
HIGH BAND EDGE BLOCK-15M-100%RB

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HIGH BAND EDGE BLOCK-15M-100%RB



Channel power

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Ref 27.5 dBm Att 35 dB * RBW 200 kHz
* VBW 1 MHz * SWT 3 s

Offset 1.5 dB

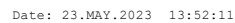
1.5 MHz

Center 3.6925 GHz 7.5 MHz/ Span 75 MHz

Tx Channel
Bandwidth 15 MHz Power 17.69 dBm

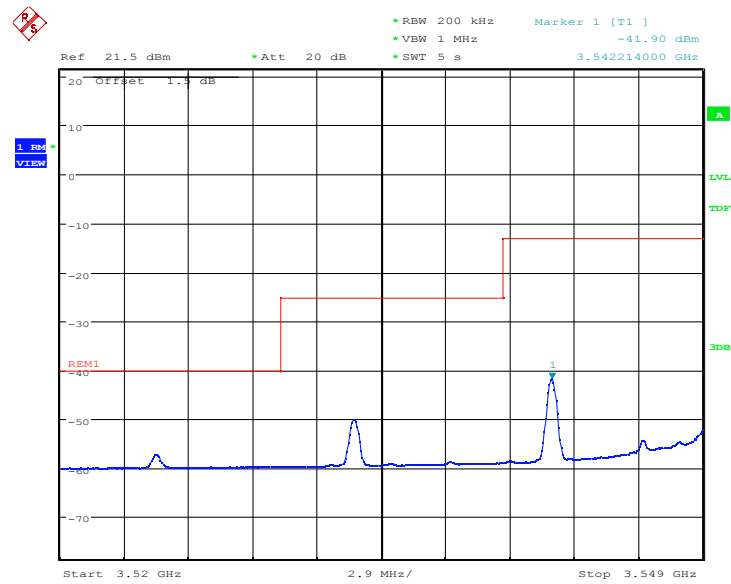
Adjacent Channel
Bandwidth 15 MHz Lower -38.26 dB
Spacing 15 MHz Upper -39.56 dB

LTE band 48-20MHz-QPSK
LOW BAND EDGE BLOCK-1RB-LOW_offset



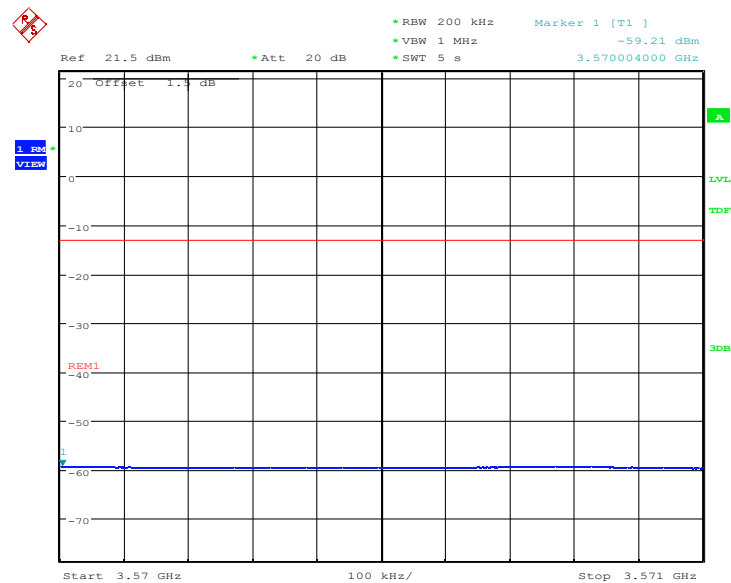
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10LOG (1M/200K)=6.99dBm.



Date: 23.MAY.2023 13:53:00

LOW BAND EDGE BLOCK-1RB-LOW_offset

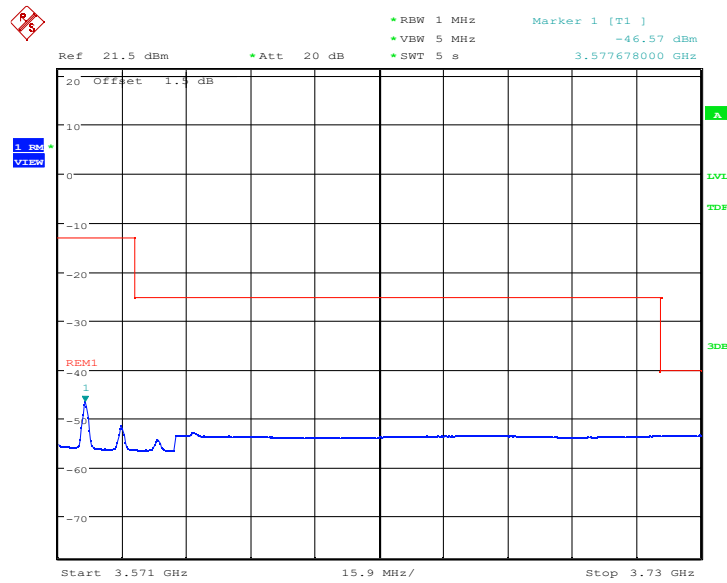


Date: 23.MAY.2023 13:53:42

LOW BAND EDGE BLOCK-1RB-LOW_offset

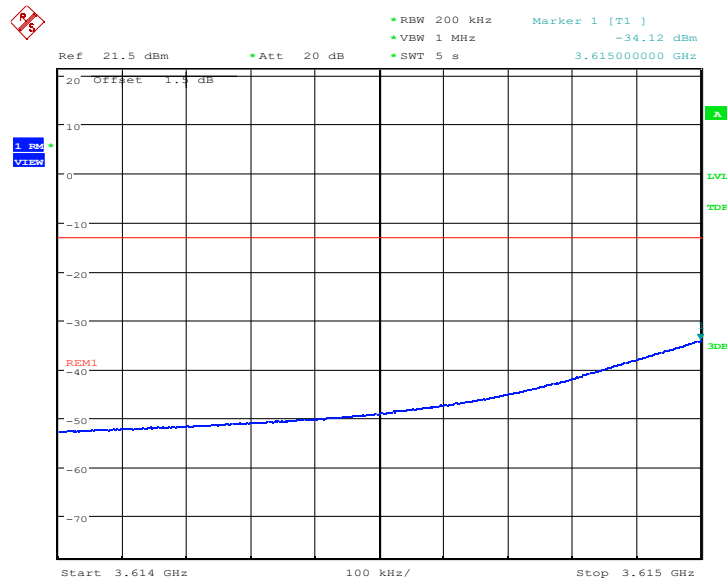
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Date: 23.MAY.2023 13:54:24

MID BAND EDGE BLOCK-1RB-MID_offset



Date: 23.MAY.2023 13:59:24

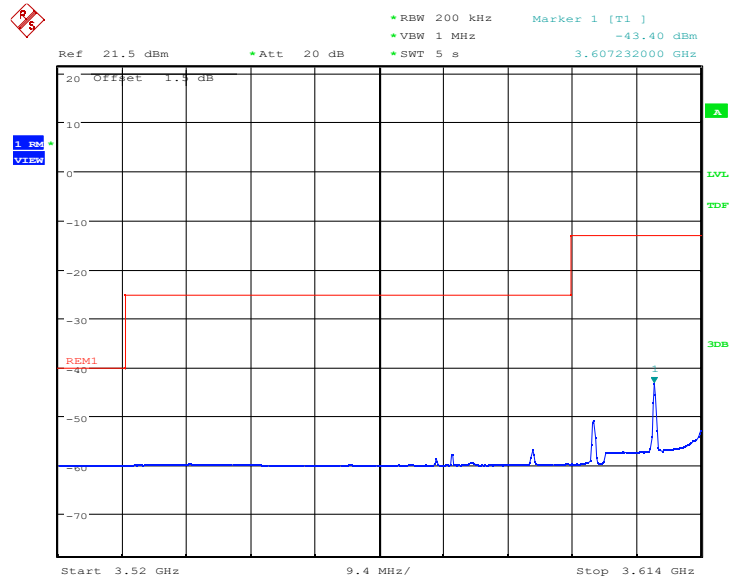
MID BAND EDGE BLOCK-1RB-MID_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with

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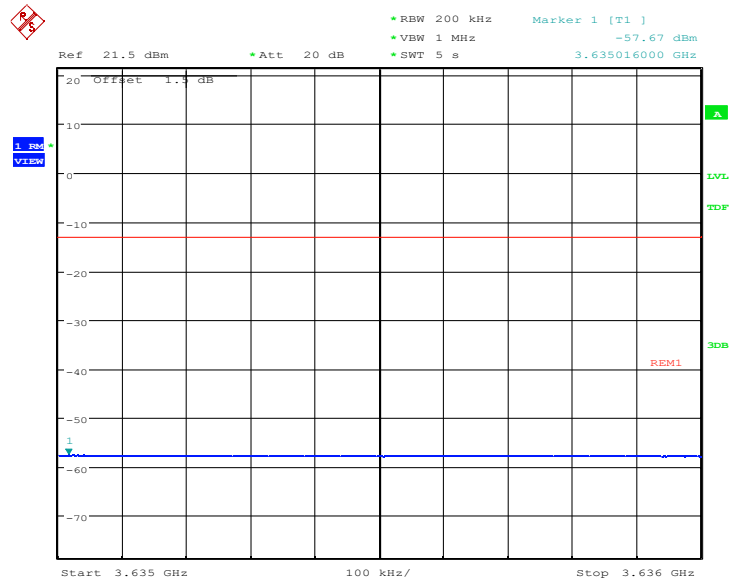
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Tel: 0086-23-88069965 FAX: 0086-23-88608777

10LOG (1M/200K)=6.99dBm.



Date: 23.MAY.2023 14:00:10

MID BAND EDGE BLOCK-1RB-MID_offset

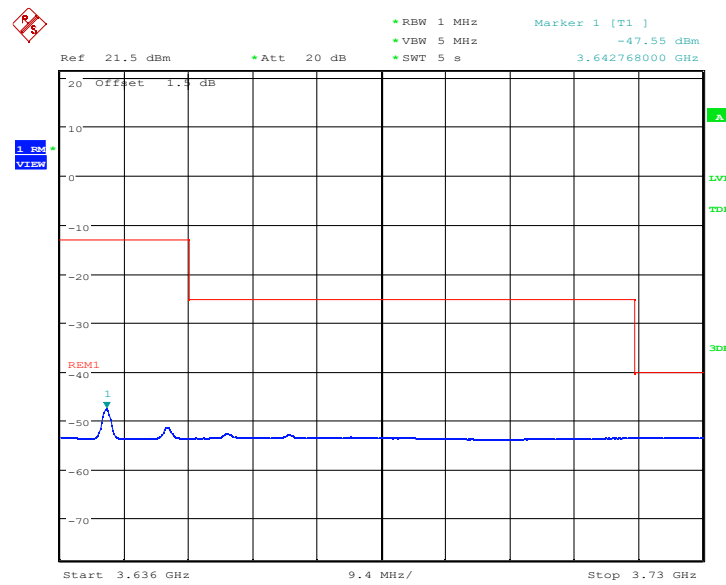


Date: 23.MAY.2023 14:00:52

MID BAND EDGE BLOCK-1RB-MID_offset

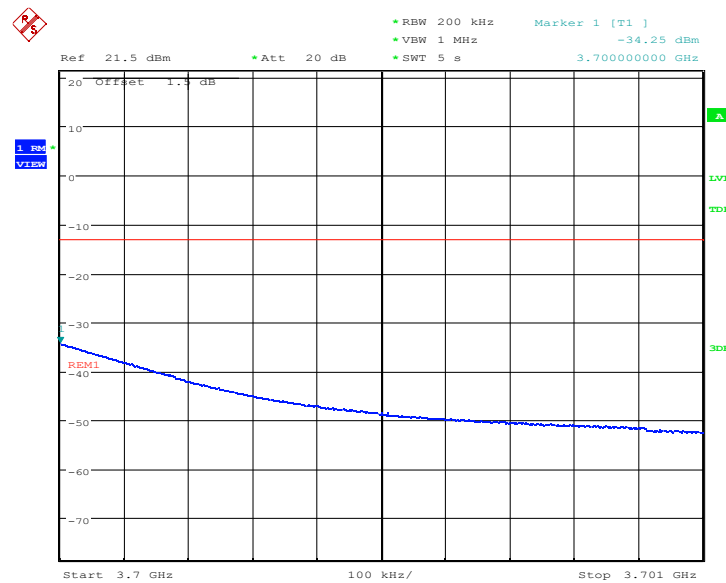
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Date: 23.MAY.2023 14:01:33

HIGH BAND EDGE BLOCK-1RB-HIGH_offset



Date: 23.MAY.2023 14:06:28

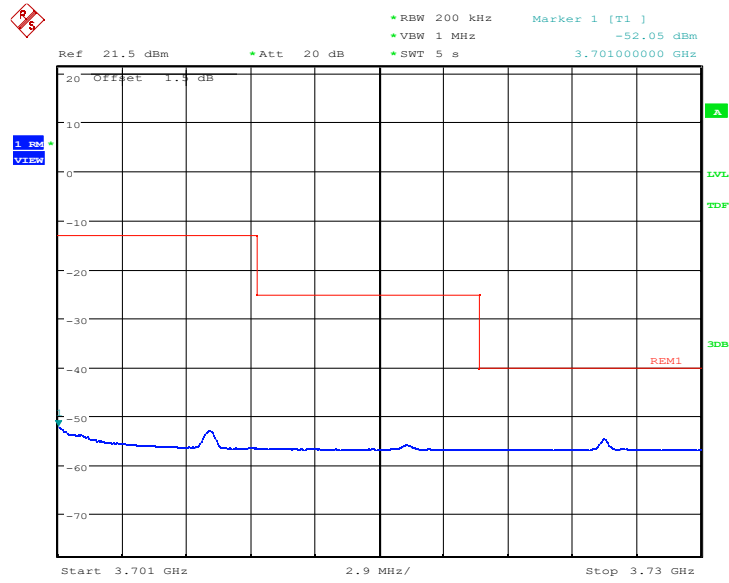
HIGH BAND EDGE BLOCK-1RB-HIGH_offset

Due to the reduction of RBW, the limit value in the screenshot needs to be added with

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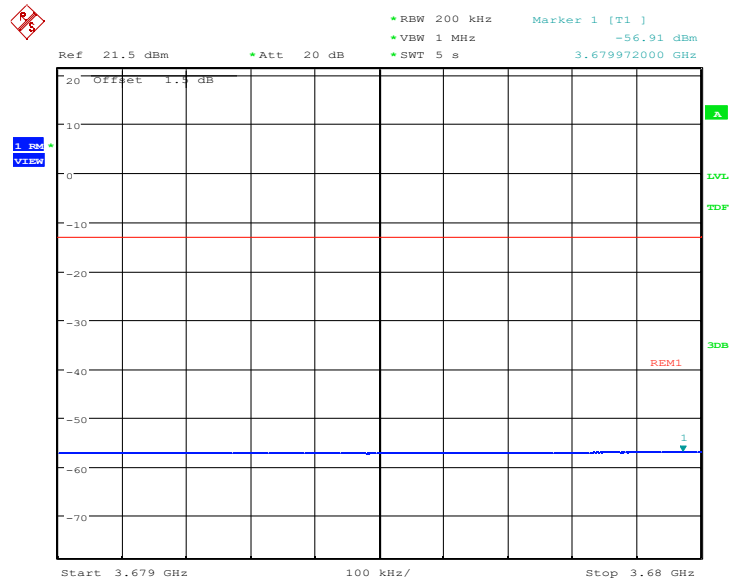
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10LOG (1M/200K)=6.99dBm.



Date: 23.MAY.2023 14:07:10

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

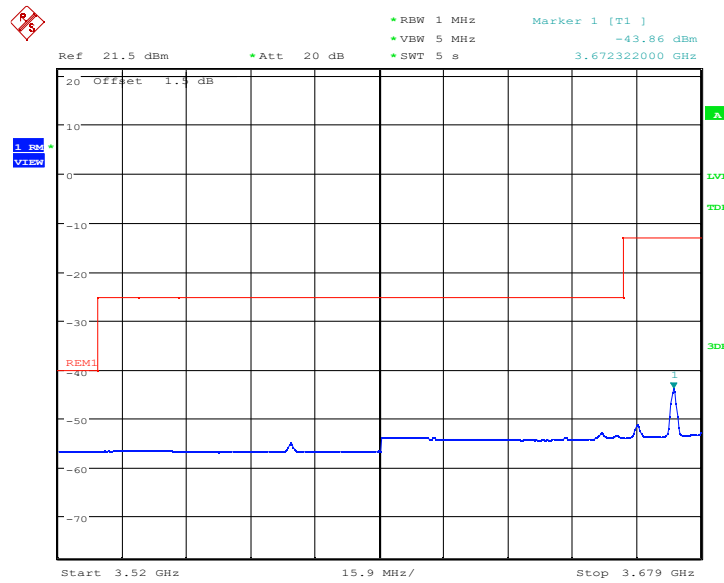


Date: 23.MAY.2023 14:07:52

HIGH BAND EDGE BLOCK-1RB-HIGH_offset

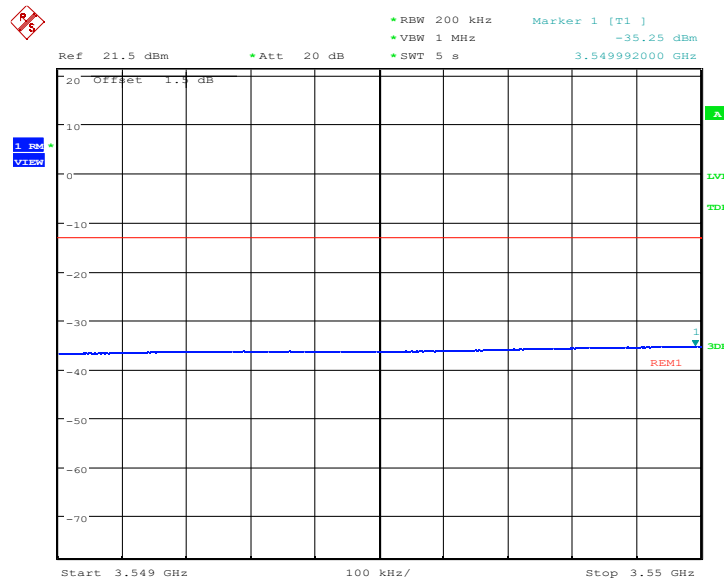
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Date: 23.MAY.2023 14:08:34

LOW BAND EDGE BLOCK-20M-100%RB

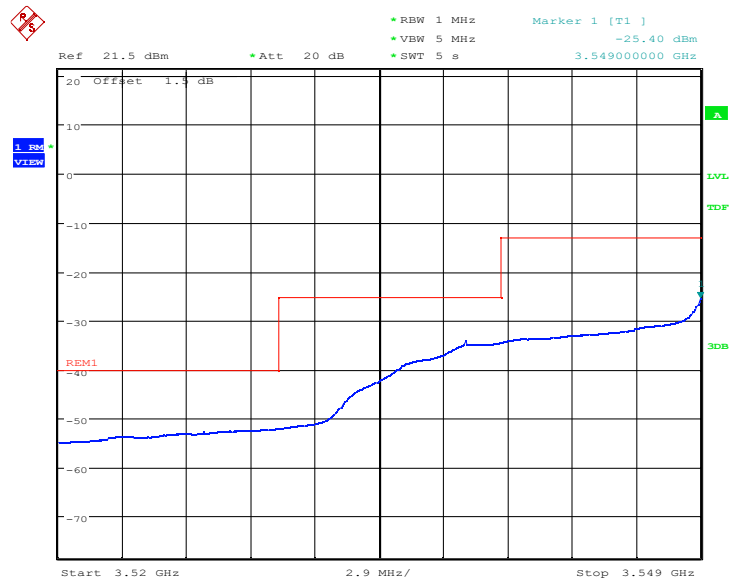


Date: 23.MAY.2023 13:55:26

LOW BAND EDGE BLOCK-20M-100%RB

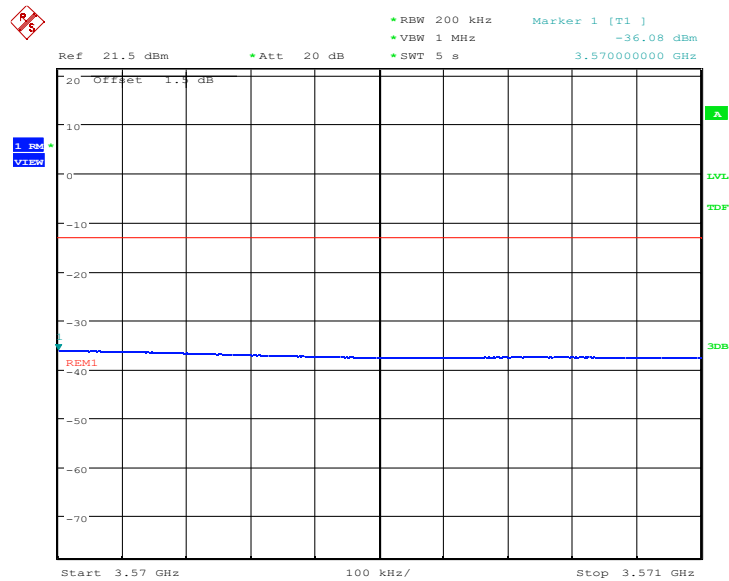
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Date: 23.MAY.2023 13:56:08

LOW BAND EDGE BLOCK-20M-100%RB

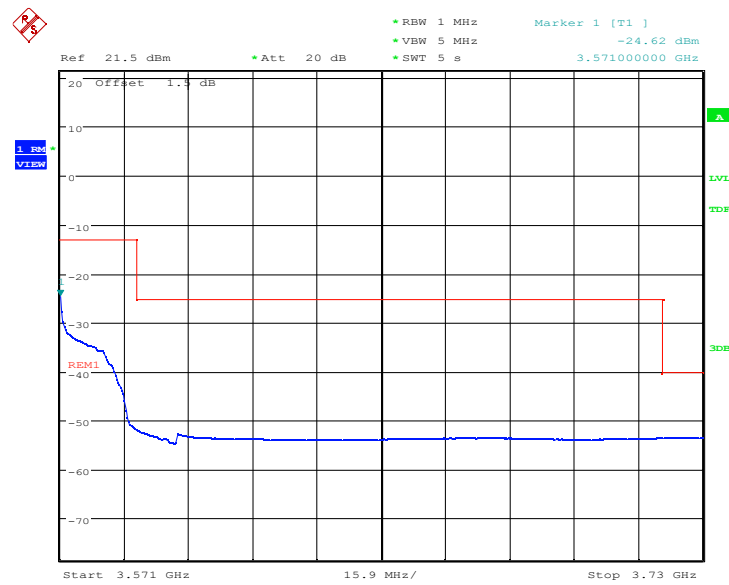


Date: 23.MAY.2023 13:56:49

LOW BAND EDGE BLOCK-20M-100%RB

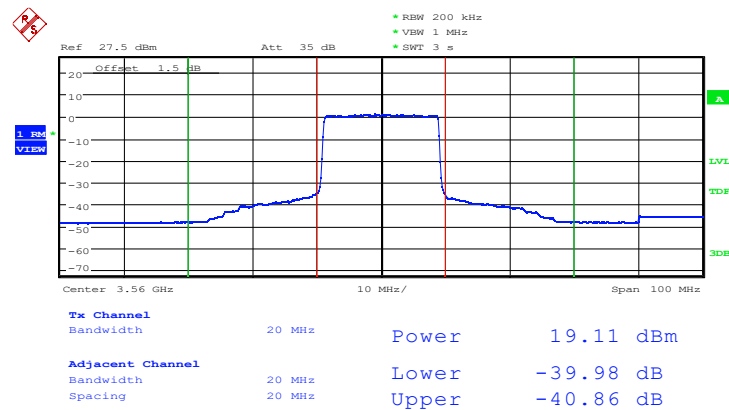
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Date: 23.MAY.2023 13:57:31

Channel power

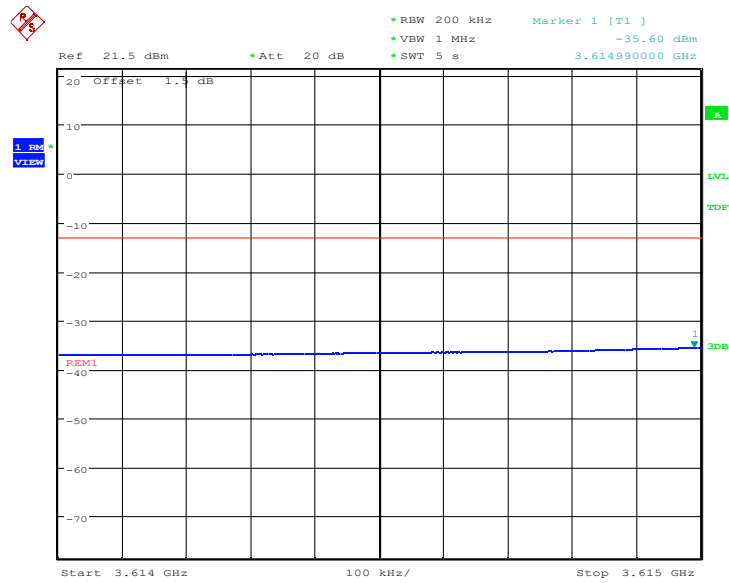


Date: 23.MAY.2023 13:57:56

MID BAND EDGE BLOCK-20M-100%RB

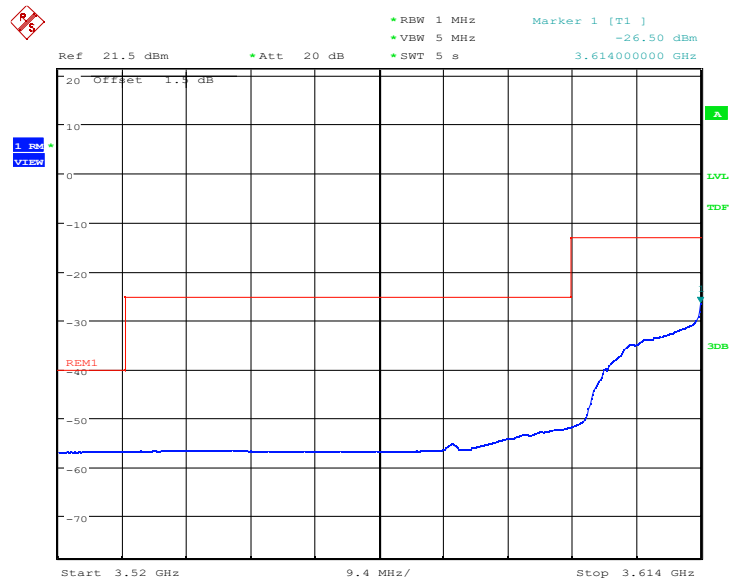
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Date: 23.MAY.2023 14:02:44

MID BAND EDGE BLOCK-20M-100%RB

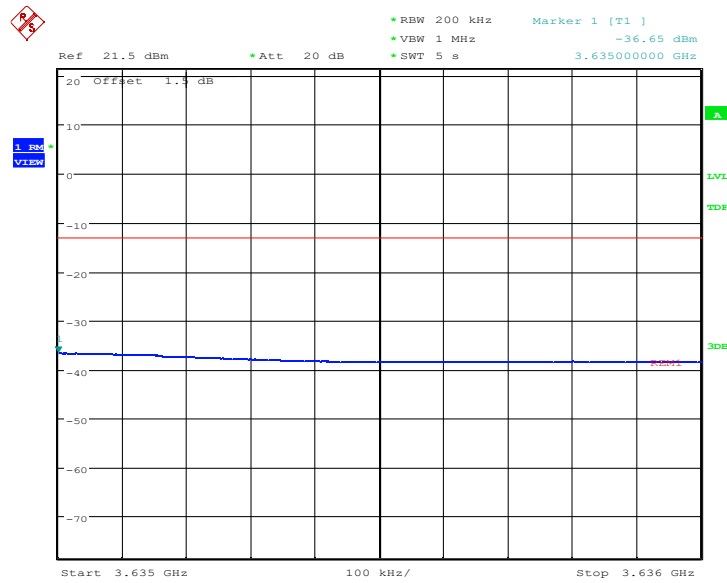


Date: 23.MAY.2023 14:03:26

MID BAND EDGE BLOCK-20M-100%RB

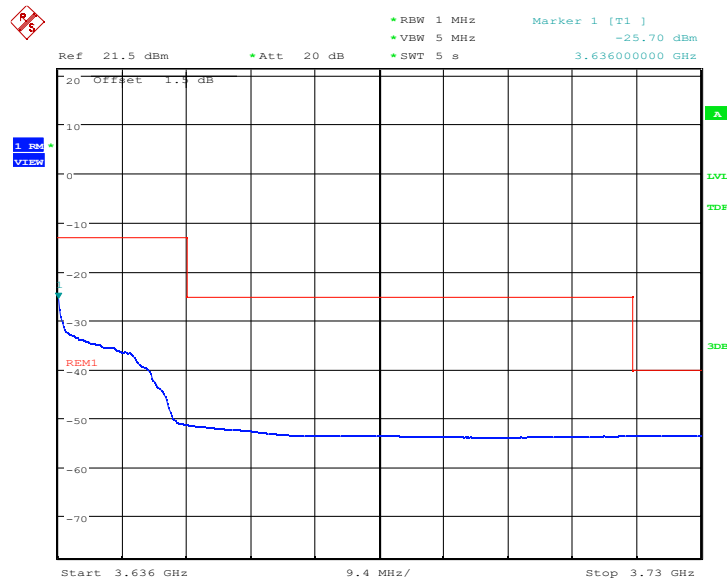
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Date: 23.MAY.2023 14:04:08

MID BAND EDGE BLOCK-20M-100%RB

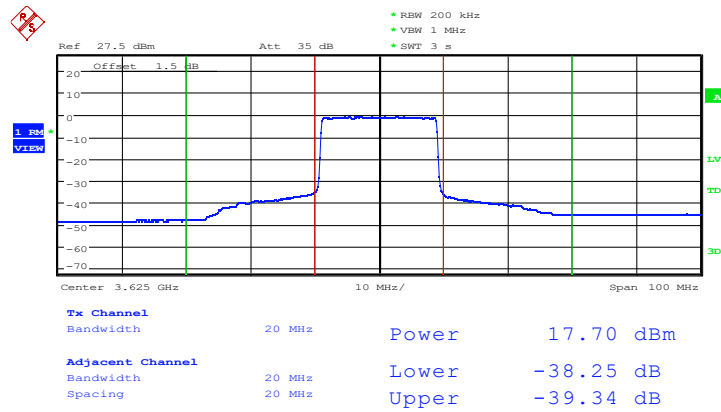


Date: 23.MAY.2023 14:04:50

Channel power

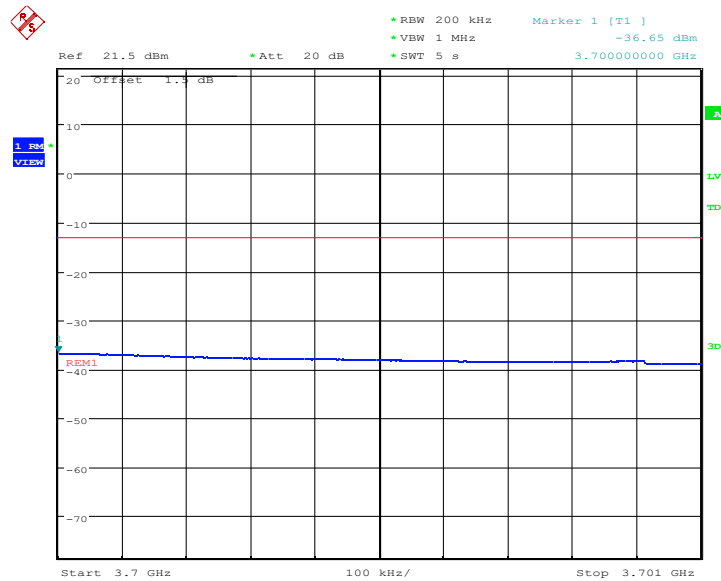
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Date: 23.MAY.2023 14:05:15

HIGH BAND EDGE BLOCK-20M-100%RB

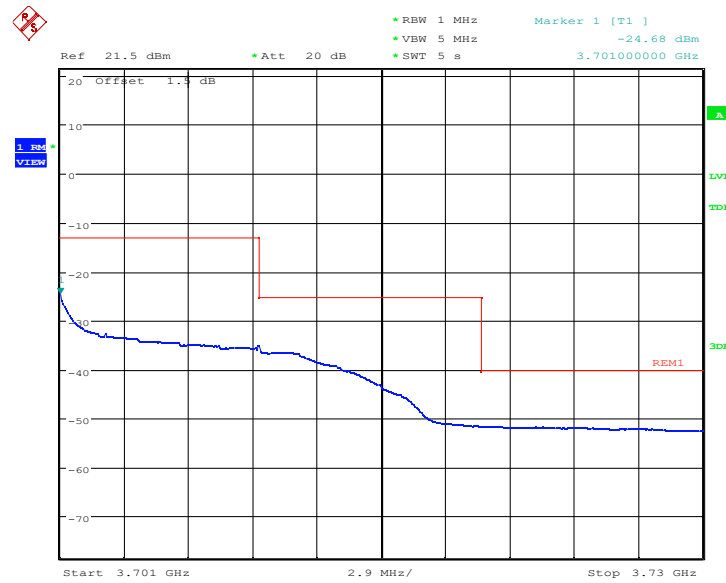


Date: 23.MAY.2023 14:09:54

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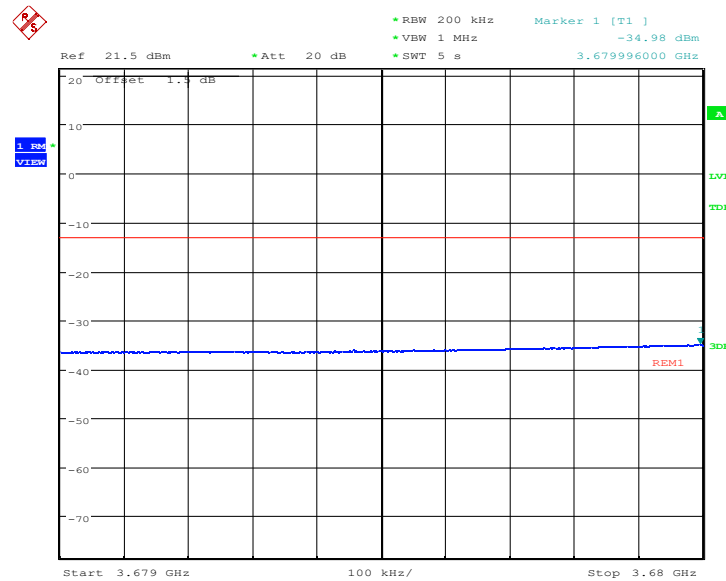
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Date: 23.MAY.2023 14:10:37

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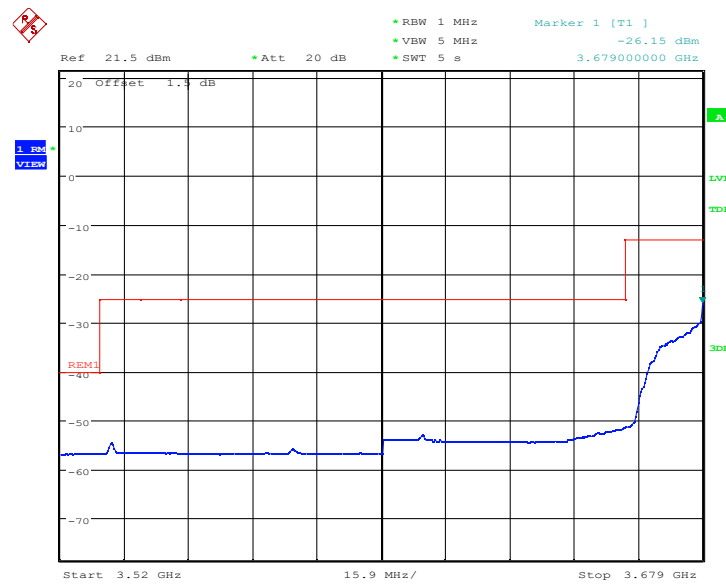


Date: 23.MAY.2023 14:11:19

HIGH BAND EDGE BLOCK-20M-100%RB

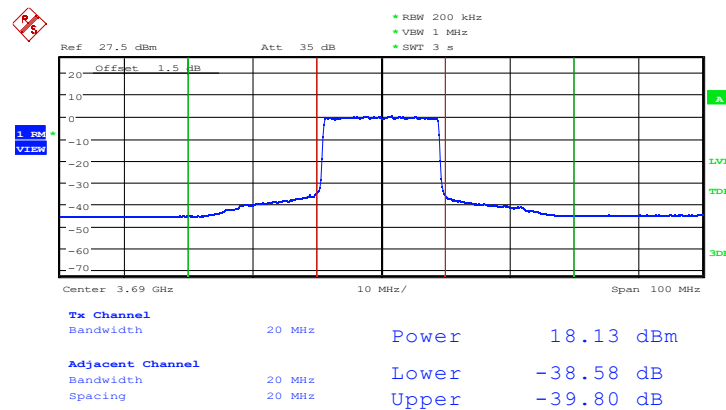
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Date: 23.MAY.2023 14:12:01

Channel power



Date: 23.MAY.2023 14:12:27

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6.8. Frequency Stability

Specifications:	FCC Part 2.1055
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C 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°C.
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°C increments from -30°C to +50°C. 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 0.1 Volt 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.

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6. Subject the EUT to overnight soak at +50°C.
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 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

6.8.1 Frequency Stability over Temperature Variation Results

LTE band 48, 20MHz bandwidth MID,QPSK(worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	3625	-4.41	0.0012
50			-2.50	0.0007
40			-1.52	0.0004
30			-2.78	0.0008
10			-2.19	0.0006
0			-2.39	0.0007
-10			-1.43	0.0004
-20			-2.69	0.0007
-30			-2.42	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.4	20	3625	-2.20	0.0006
4.2			-5.11	0.0014

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6.9. Peak to Average Ratio

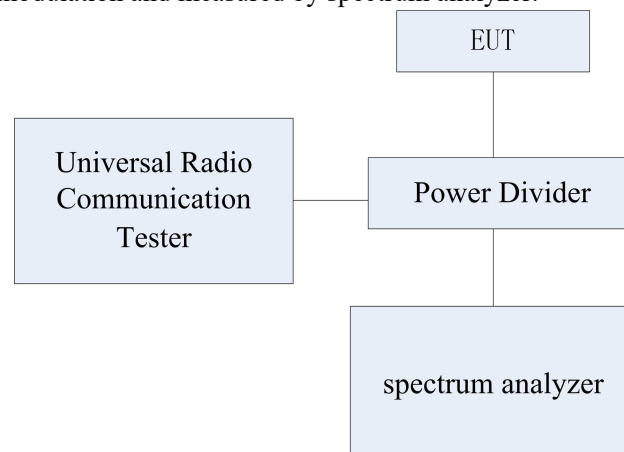
Specifications:	FCC Part 96.41
DUT Serial Number:	IMEI:864542050020656
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

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.

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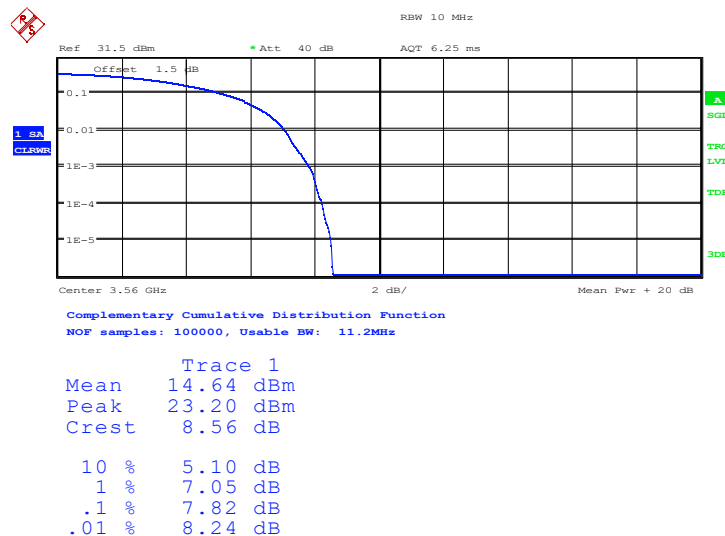
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6.9.1 Peak to Average Ratio Results

LTE Band 48, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
3560	100%,0	7.82	8.88
3625	100%,0	7.82	8.94
3690	100%,0	7.79	8.91

LTE band 48 , 20MHz Bandwidth,QPSK

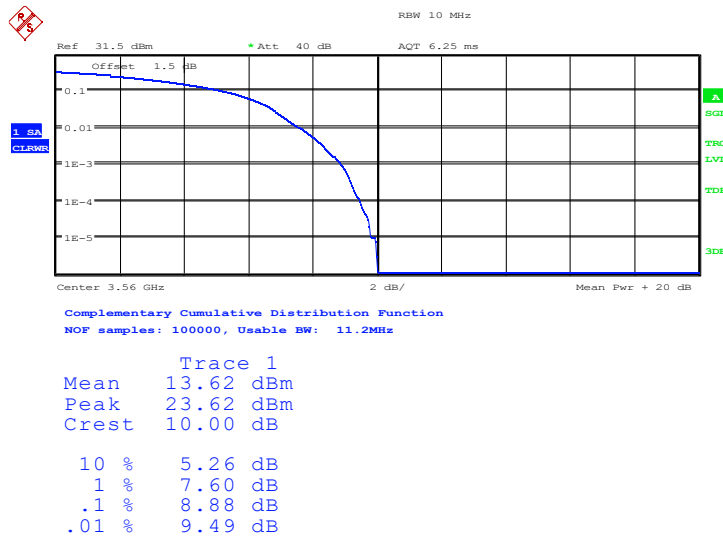


Date: 7.MAY.2023 23:35:31

LTE band 48 , 20MHz Bandwidth,16QAM

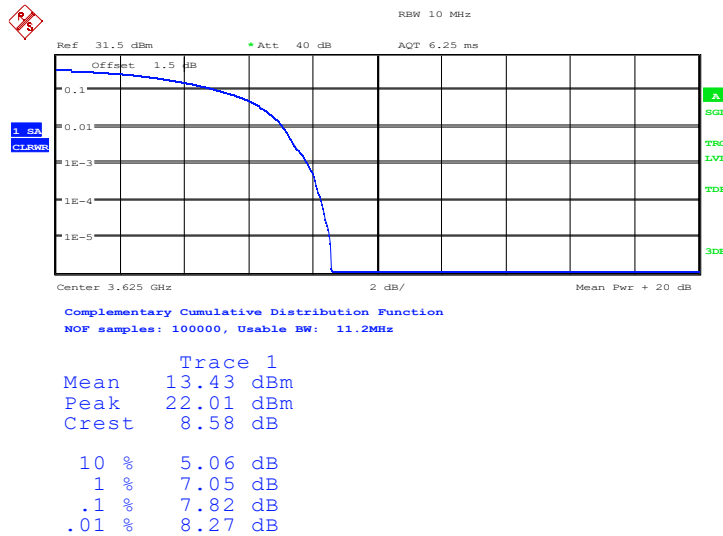
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Date: 7.MAY.2023 23:35:44

LTE band 48 , 20MHz Bandwidth,QPSK

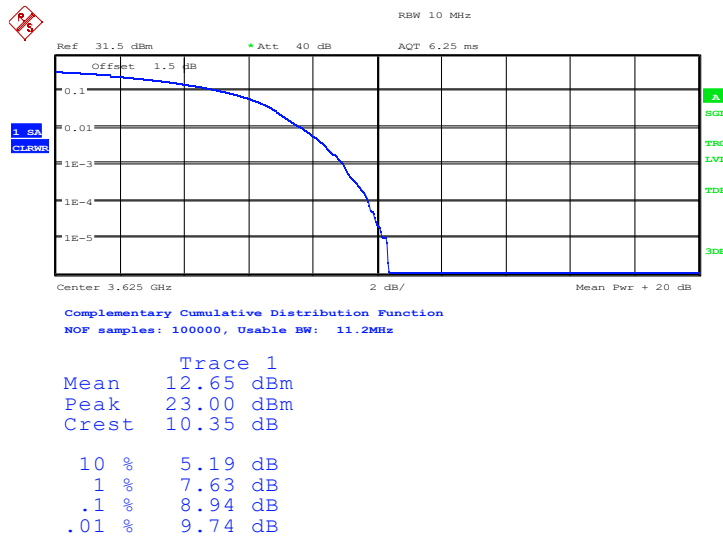


Date: 7.MAY.2023 23:36:08

LTE band 48 , 20MHz Bandwidth,16QAM

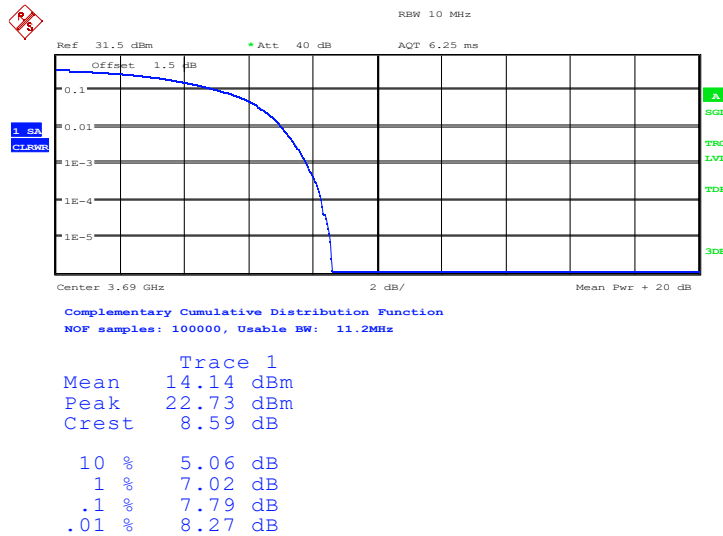
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Date: 7.MAY.2023 23:36:21

LTE band 48 , 20MHz Bandwidth,QPSK

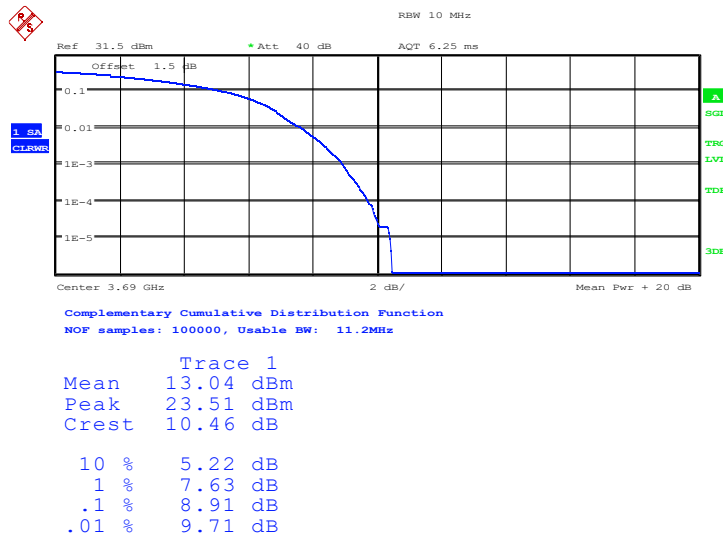


Date: 7.MAY.2023 23:36:40

LTE band 48 , 20MHz Bandwidth,16QAM

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Date: 7.MAY.2023 23:36:53



Report No.: I23W00006-LTE-RF-Rev2

Annex A EUT Photos

See the document "I23W00006-External Photos".

See the document "I23W00006-Internal Photos".

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Report No.: I23W00006-LTE-RF-Rev2

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

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

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