



# TEST REPORT

## No. I22Z61437-WMD01

for

**TCL Communication Ltd.**

**GSM/UMTS/LTE/NR mobile phone**

**Model Name: T771A**

**FCC ID: 2ACCJH169**

with

**Hardware Version: 05**

**Software Version: HR1J-3**

**Issued Date: 2022-09-28**

**Note:**

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

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

**Test Laboratory:**

**CTTL, Telecommunication Technology Labs, CAICT**

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

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

Email: [cttl\\_terminals@caict.ac.cn](mailto:cttl_terminals@caict.ac.cn), website: [www.caict.ac.cn](http://www.caict.ac.cn)



## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I22Z61437-WMD01	Rev.0	1 <sup>st</sup> edition	2022-09-28

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

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## **1. Test Laboratory**

### **1.1. Introduction & Accreditation**

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

### **1.2. Testing Location**

Location 1: CTTL (huayuan North Road)

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

### 1.3. Testing Environment

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### 1.4. Project Data

Testing Start Date: 2022-08-26  
Testing End Date: 2022-09-08

### 1.5. Signature



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**Dong Yuan**  
**(Prepared this test report)**



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**Zhou Yu**  
**(Reviewed this test report)**



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**Zhao Hui Lin**  
**Deputy Director of the laboratory**  
**(Approved this test report)**



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong  
Contact: Annie Jiang  
Email: nianxiang.jiang@tcl.com  
Telephone: +86 755 3661 1621  
Fax: +86 755 3661 2000-81722

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong  
Contact: Annie Jiang  
Email: nianxiang.jiang@tcl.com  
Telephone: +86 755 3661 1621  
Fax: +86 755 3661 2000-81722

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

#### **3.1. About EUT**

Description	GSM/UMTS/LTE/NR mobile phone
Model Name	T771A
FCC ID	2ACCJH169
Antenna	Embedded
Extreme vol. Limits	3.6VDC to 4.4VDC (nominal: 3.85VDC)
Extreme temp. Tolerance	-10°C to +55°C

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

#### **3.2. Internal Identification of EUT used during the test**

<b>EUT ID*</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>	<b>Date of receipt</b>
UT01a	356613230200032	05	HR1J-3	2022-08-26

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

#### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Description</b>
AE1	Battery
AE2	Battery

##### AE1

Model	TLp048A7
Manufacturer	NINGBO VEKEN BATTERY CO., LTD
Capacitance	5000mAh

##### AE2

Model	TLp048A1
Manufacturer	Shenzhen BYD lithium BATTERY CO., LTD
Capacitance	5000mAh

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

## **4. Reference Documents**

### **4.1. Documents supplied by applicant**

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

### **4.2. Reference Documents for testing**

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

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 96	CITIZENS BROADBAND RADIO SERVICE	10-1-21 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01
KDB 940660 D01	CERTIFICATION AND TEST PROCEDURES FOR CITIZENS BROADBAND RADIO SERVICE DEVICES AUTHORIZED UNDER PART 96	v03



## 5. Summary Of Test Result

### LTE Band 48

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	96.41	P
2	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	96.41	P
5	Band Edge Compliance	96.41	P
6	Conducted Spurious Emission	96.41	P
7	Peak-to-Average Power Ratio	96.41	P
8	End User Device Additional Requirements (CBSD Protocol)	96.47	P

#### Terms used in Verdict column

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

All the test results are based on normal power.

#### Explanation of worst-case configuration

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

## 6. Test Equipment Utilized

Description	Type	Series Number	Manufacture	Cal Due Date	Calibration Interval
Wideband Radio Communication Tester	CMW500	159082	R&S	2023-01-17	25 months
Spectrum Analyzer	FSU	200030	R&S	2023-05-25	1 year
Radio Communication Analyzer	MT8821C	6201763159	Anritsu	2023-08-02	1 year
Signal&Spectrum Analyzer	FSW	104038	R&S	2023-06-20	1 year
Climate Chamber	SH-242	93008556	ESPEC	2023-12-23	3 years

## **Annex A: Measurement Results**

### **A.1 Output Power**

#### **A.1.1 Summary**

During the process of testing, the EUT was controlled via communication tester to ensure max power transmission and proper modulation.

In all cases, output power is within the specified limits.

#### **A.1.2 Conducted**

##### **A.1.2.1 Method of Measurements**

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

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

##### **A.1.2.2 Measurement Result**

#### **LTE band 48**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	3697.5	22.99	21.88	20.92
		3625.0	23.49	22.72	22.00
		3552.5	23.75	22.59	21.63
	1 RB low	3697.5	23.05	21.95	20.96
		3625.0	23.49	22.70	22.04
		3552.5	23.78	22.64	21.62
	50% RB mid	3697.5	21.89	20.96	19.93
		3625.0	22.41	21.46	20.28
		3552.5	22.58	21.71	20.44
	100% RB	3697.5	21.88	20.90	19.95
		3625.0	22.42	21.43	20.28
		3552.5	22.64	21.66	20.52
10MHz	1 RB high	3695.0	22.89	21.99	20.89
		3625.0	23.46	22.59	21.42
		3555.0	23.54	22.67	21.51
	1 RB low	3695.0	22.96	22.08	20.93
		3625.0	23.46	22.59	21.43
		3555.0	23.66	22.78	21.60
	50% RB mid	3695.0	21.83	20.89	19.90
		3625.0	22.43	21.41	20.32

	100% RB	3555.0	22.58	21.61	20.47
		3695.0	21.87	20.88	19.95
		3625.0	22.45	21.44	20.37
		3555.0	22.63	21.64	20.55
15MHz	1 RB high	3692.5	22.81	22.01	20.93
		3625.0	23.34	22.53	21.61
		3557.5	23.35	22.58	21.22
	1 RB low	3692.5	22.87	22.07	21.13
		3625.0	23.37	22.54	21.63
		3557.5	23.53	22.71	21.38
	50% RB mid	3692.5	21.82	20.89	19.93
		3625.0	22.40	21.42	20.30
		3557.5	22.51	21.59	20.45
	100% RB	3692.5	21.88	20.86	19.96
		3625.0	22.38	21.36	20.29
		3557.5	22.55	21.52	20.52
20MHz	1 RB high	3690.0	22.86	22.06	21.07
		3625.0	23.34	22.56	21.49
		3560.0	23.21	22.28	21.57
	1 RB low	3690.0	23.00	22.19	21.19
		3625.0	23.36	22.56	21.53
		3560.0	23.48	22.54	21.84
	50% RB mid	3690.0	21.92	20.91	19.99
		3625.0	22.40	21.46	20.38
		3560.0	22.43	21.56	20.43
	100% RB	3690.0	21.90	20.85	20.01
		3625.0	22.37	21.35	20.21
		3560.0	22.48	21.46	20.47

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

## **A.2 Frequency Stability**

### **A.2.1 Method of Measurement**

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

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°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 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°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 decrements 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.

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

## A.2.2 Measurement results

### LTE Band 48, 20MHz bandwidth QPSK (worst case of all bandwidths)

#### Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	3550.833	3699.167		
50				-1.06	0.0003
40				0.50	0.0001
30				-4.61	0.0013
10				-1.67	0.0005
0				-0.99	0.0003
-10				-4.61	0.0013
-20				-2.29	0.0006
-30				-8.23	0.0023

#### Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	3550.833	3699.167	-0.79	0.0002
4.4				-3.49	0.0010

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

### **A.3 Occupied Bandwidth**

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

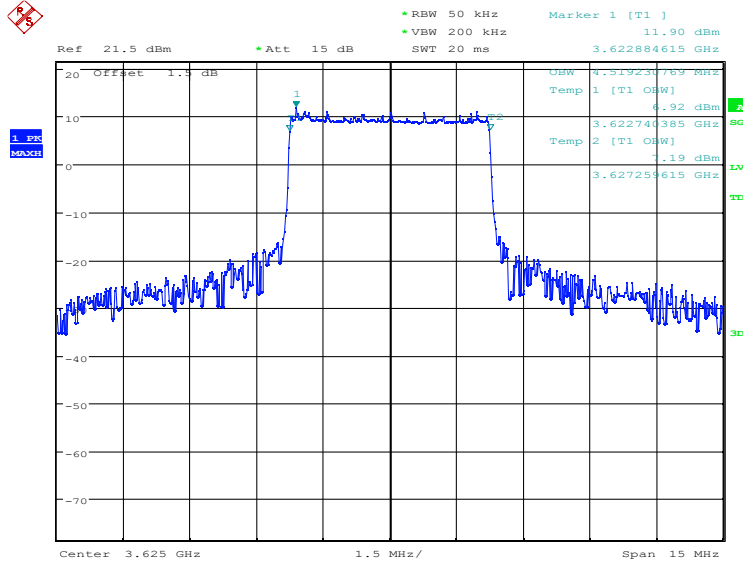
The measurement method is from ANSI C63.26:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts.
- b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set  $\geq 3 \times$  RBW.
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
- d) Set the detection mode to peak, and the trace mode to max-hold.

**LTE band 48, 5MHz (99%)**

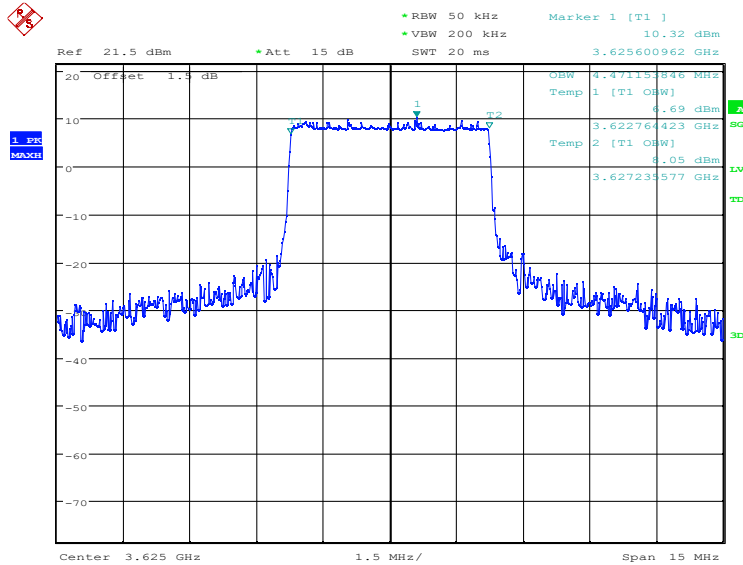
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	4519.23	4471.15

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



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



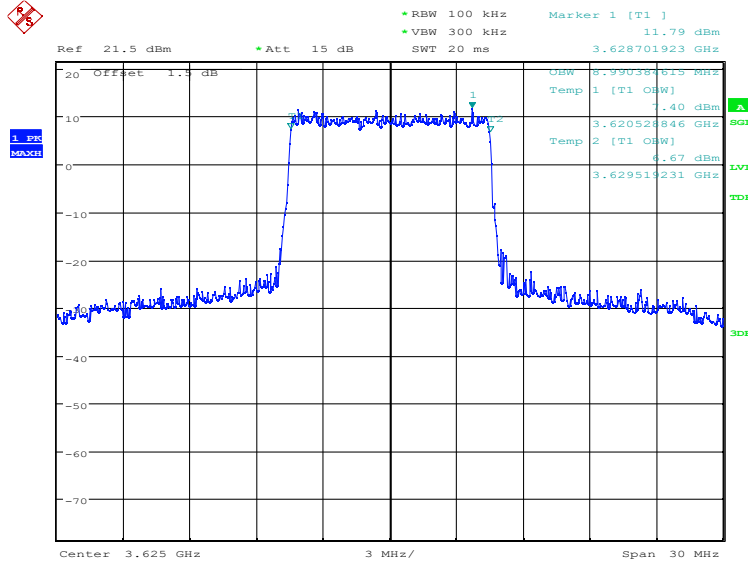
Date: 31.AUG.2022 16:48:42



**LTE band 48, 10MHz (99%)**

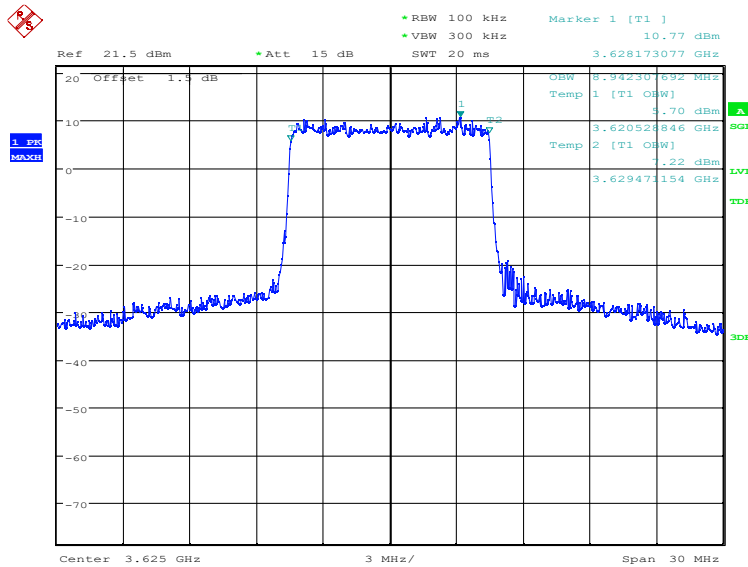
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	8990.38	8942.31

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



Date: 31.AUG.2022 16:49:23

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

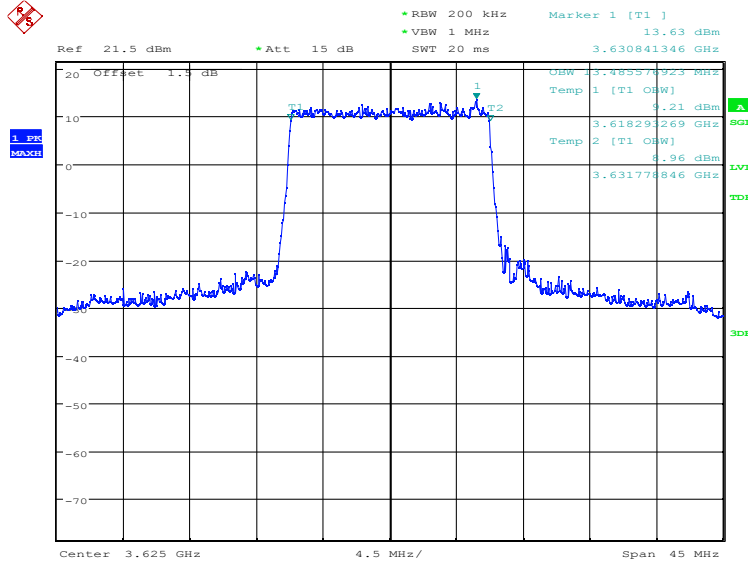


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**LTE band 48, 15MHz (99%)**

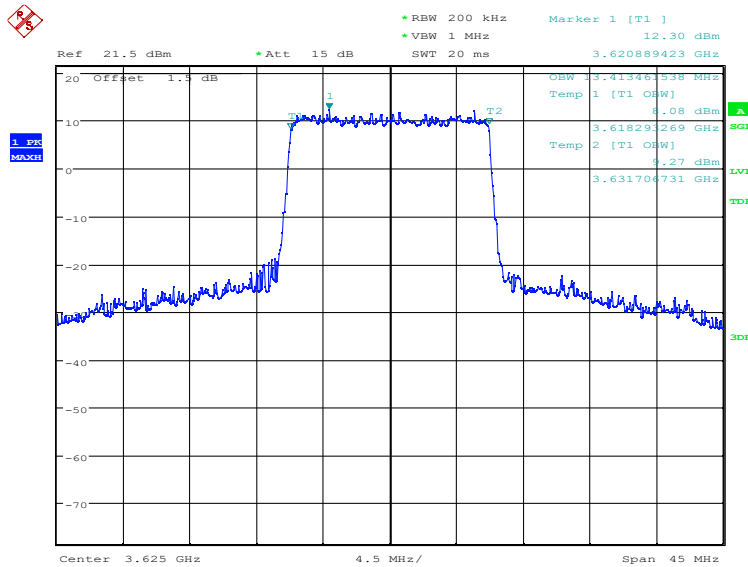
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	13485.58	13413.46

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



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

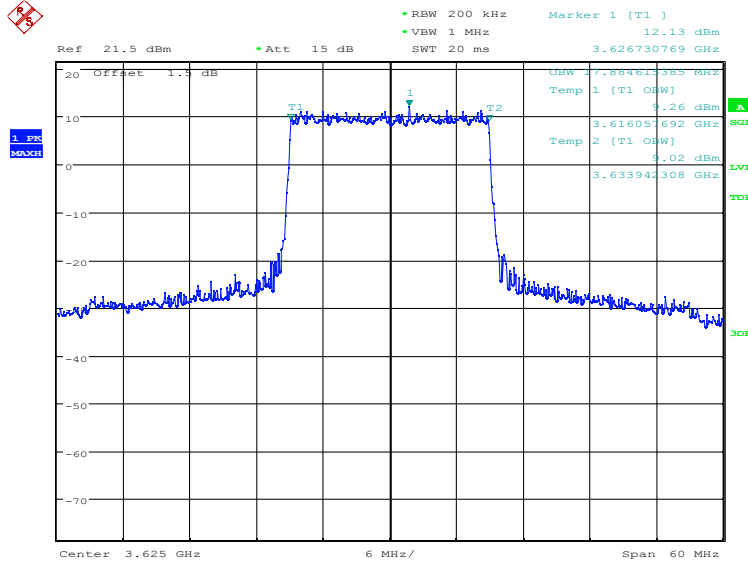


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### LTE band 48, 20MHz (99%)

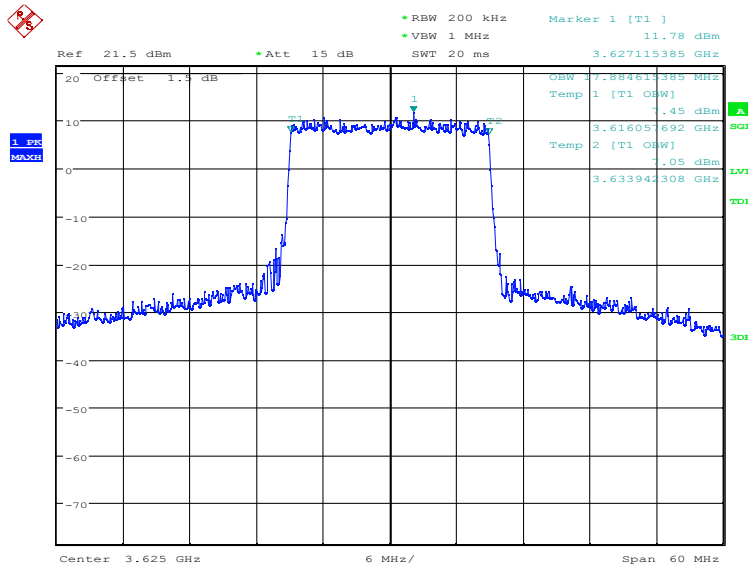
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
3625.0	QPSK	16QAM
	17884.62	17884.62

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



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



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Note: Expanded measurement uncertainty is  $U = 3428 \text{ Hz}$ ,  $k = 2$ .

#### **A.4 Emission Bandwidth**

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

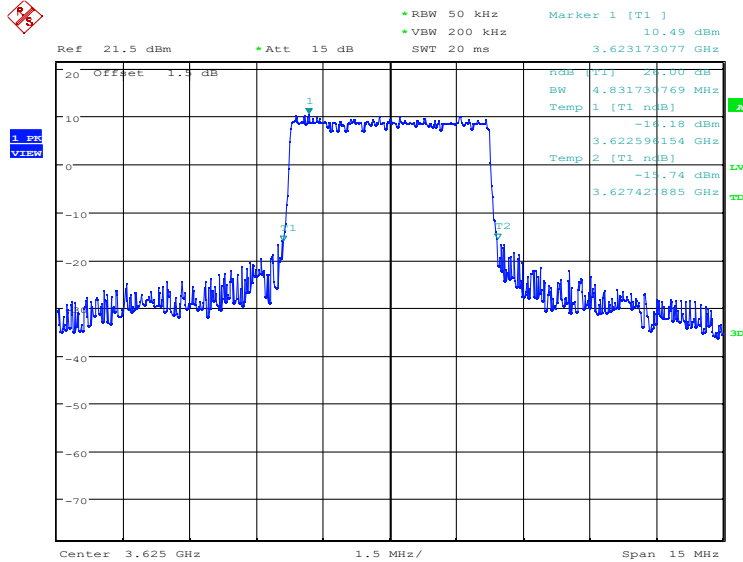
The measurement method is from ANSI C63.26:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set  $\geq 3 \times$  RBW.
- c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
- d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

**LTE band 48, 5MHz (-26dBc)**

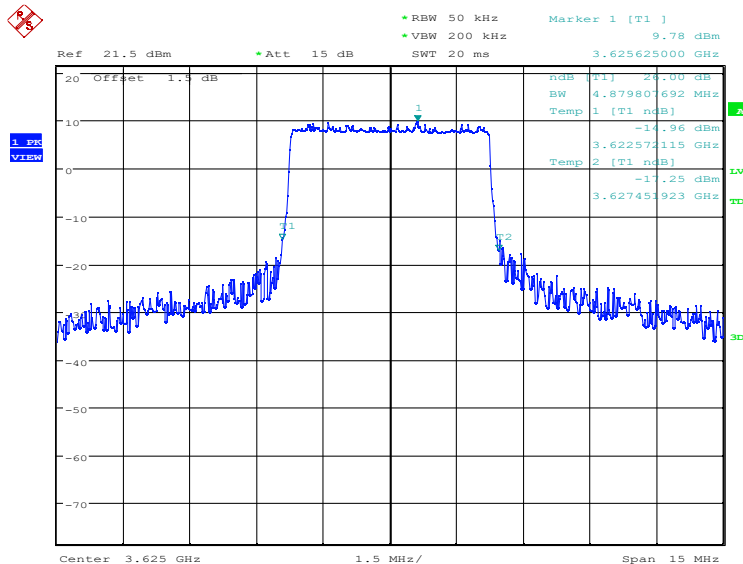
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
3625.0	QPSK	16QAM
	4831.73	4879.81

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



Date: 31.AUG.2022 16:54:20

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

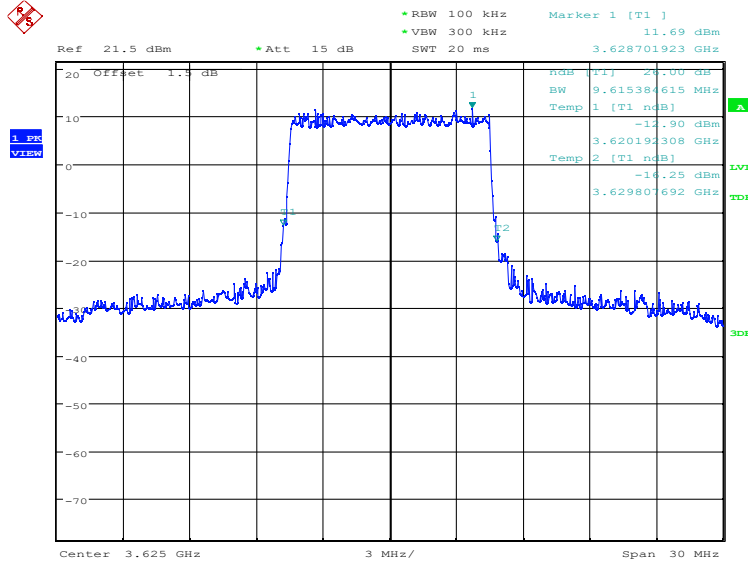


Date: 31.AUG.2022 16:55:00

**LTE band 48, 10MHz (-26dBc)**

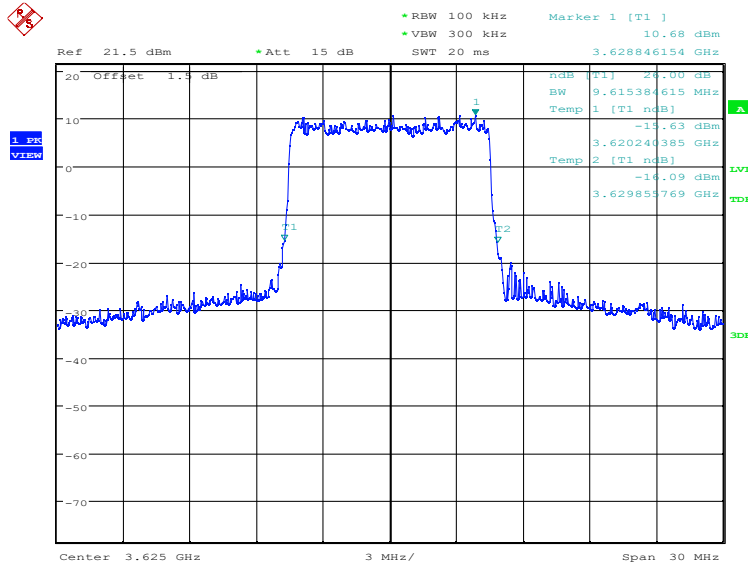
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
	3625.0	QPSK
	9615.38	9615.38

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



Date: 31.AUG.2022 16:55:41

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

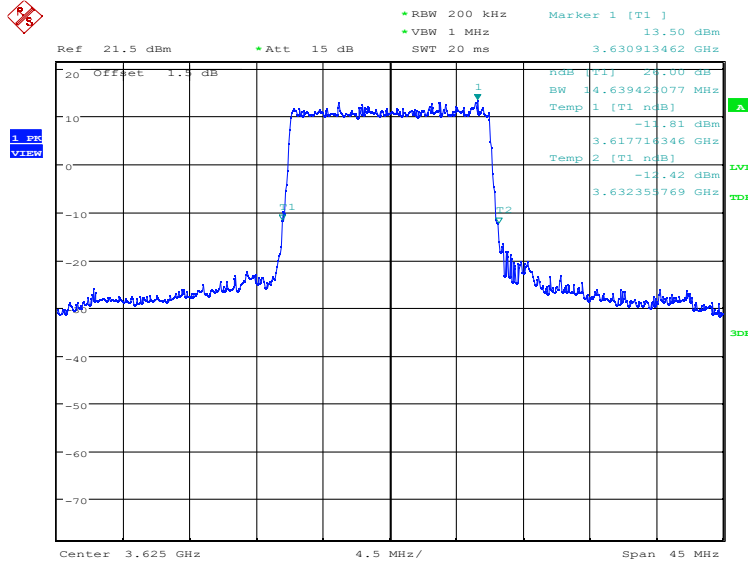


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**LTE band 48, 15MHz (-26dBc)**

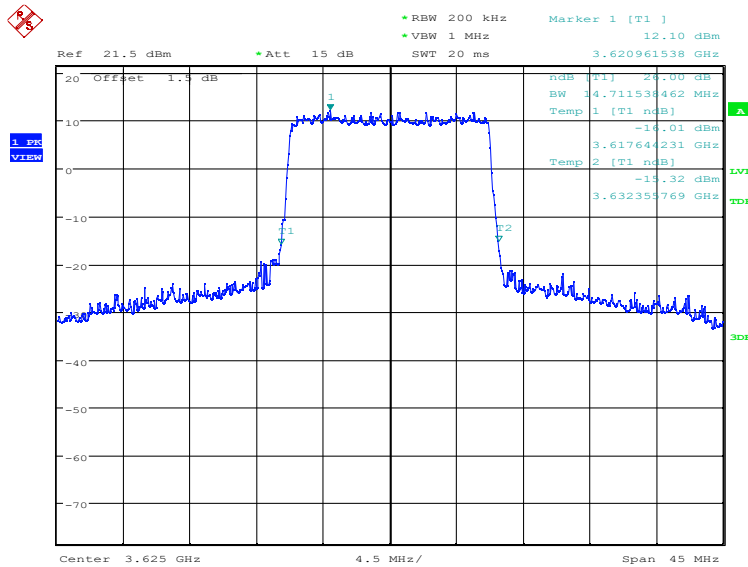
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
	3625.0	QPSK
	14639.42	14711.54

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



Date: 31.AUG.2022 16:57:02

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

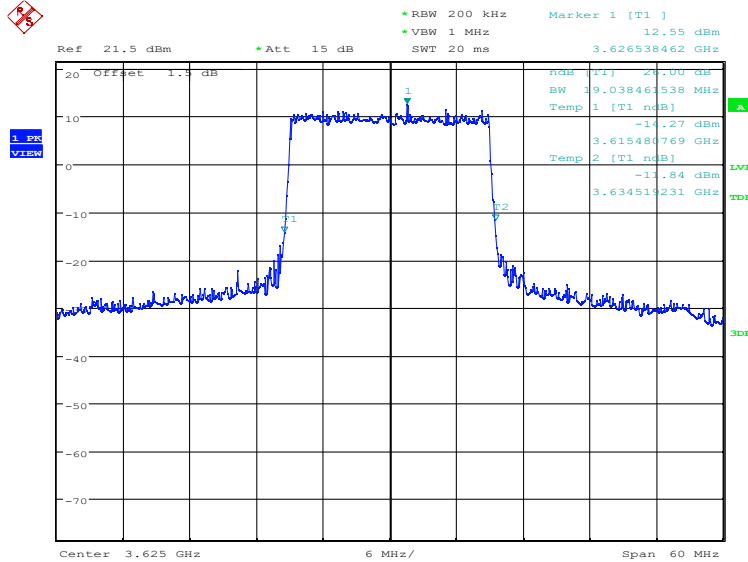


Date: 31.AUG.2022 16:57:42

### LTE band 48, 20MHz (-26dBc)

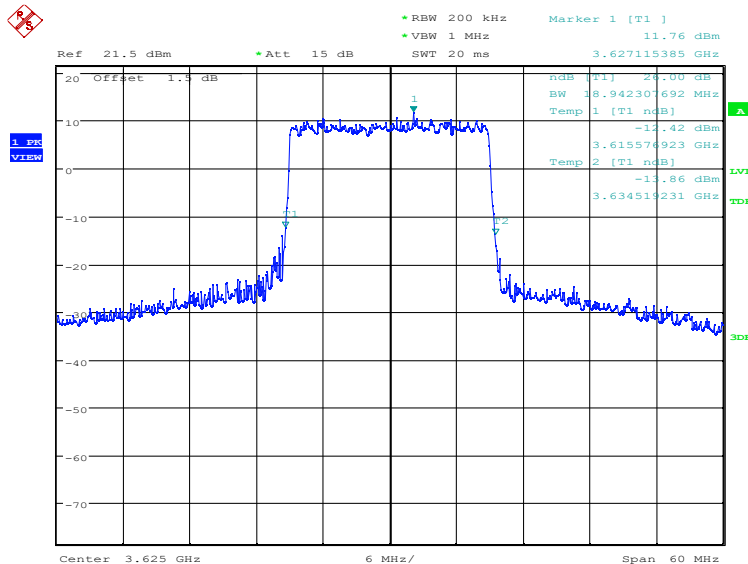
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
	3625.0	QPSK
	19038.46	18942.31

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



Date: 31.AUG.2022 16:58:24

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



Date: 31.AUG.2022 16:59:03

Note: Expanded measurement uncertainty is  $U = 3428 \text{ Hz}$ ,  $k = 2$ .



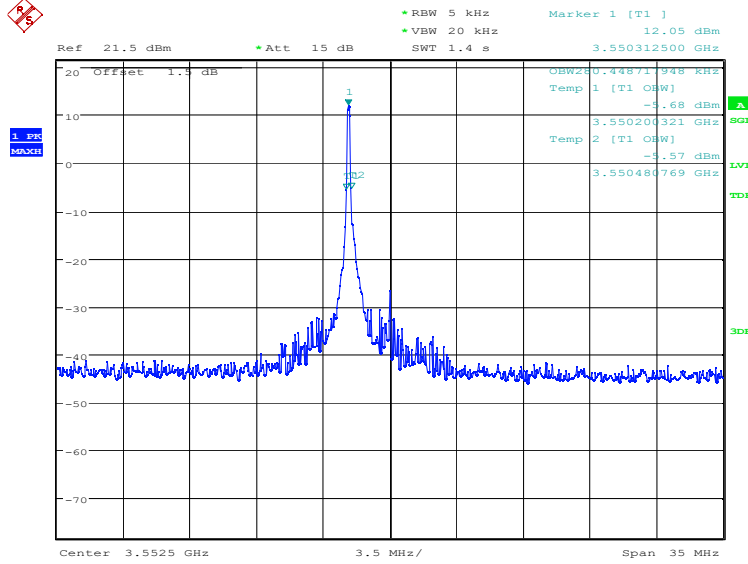
## **A.5 Band Edge Compliance**

### **A.5.1 Measurement limit**

Part 96.41(e) states 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. 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.

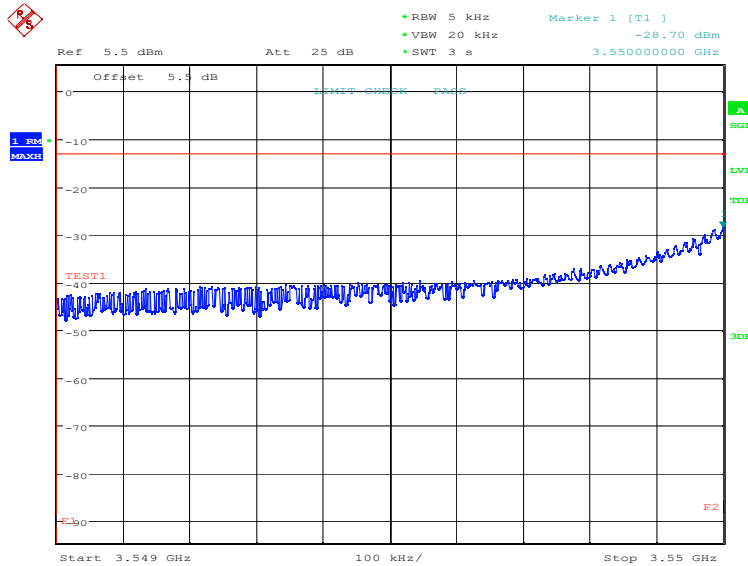
The spectrum analyzer readings are corrected by  $[10 \log (1/\text{duty cycle})]$  for the non-continuous transmitting scenario.

**A.5.2 Measurement result**  
**Only the worst case result is given below**  
**LTE band 48**  
**OBW: 1RB-low\_offset**

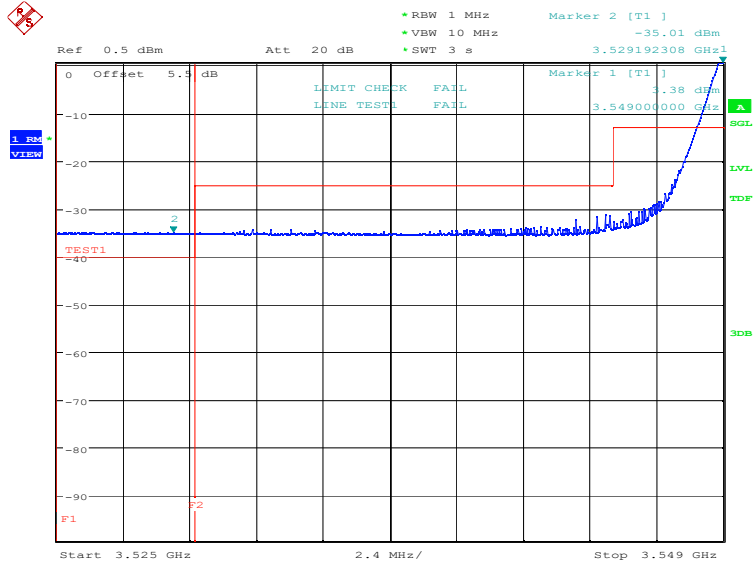


Date: 8.SEP.2022 08:48:08

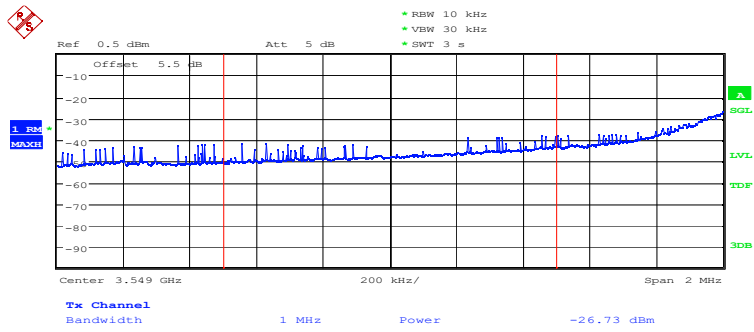
**LOW BAND EDGE BLOCK-1RB-low\_offset**



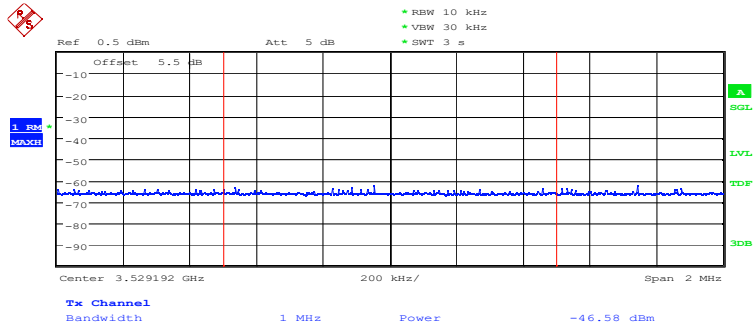
Date: 8.SEP.2022 08:48:49



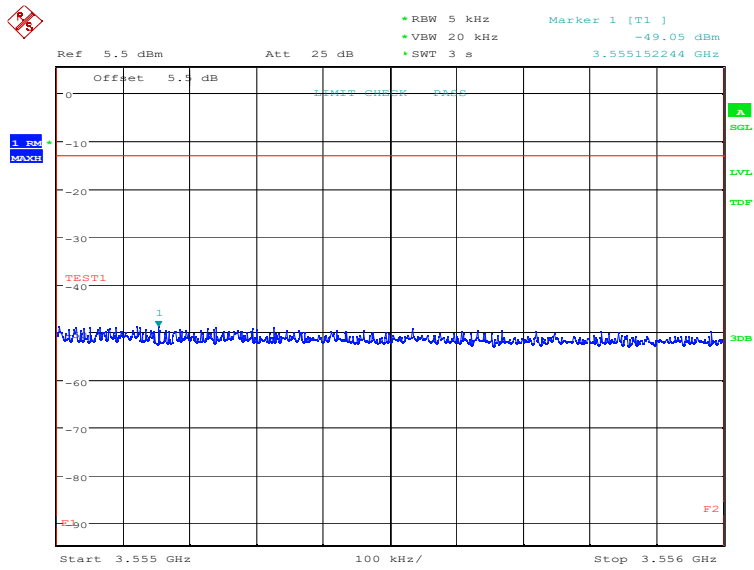
Date: 8.SEP.2022 08:50:17



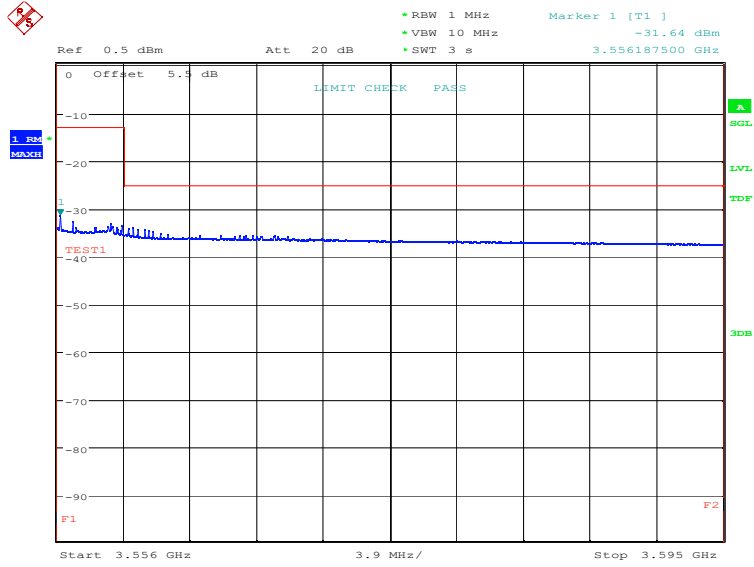
Date: 8.SEP.2022 08:50:35



Date: 8.SEP.2022 08:50:50

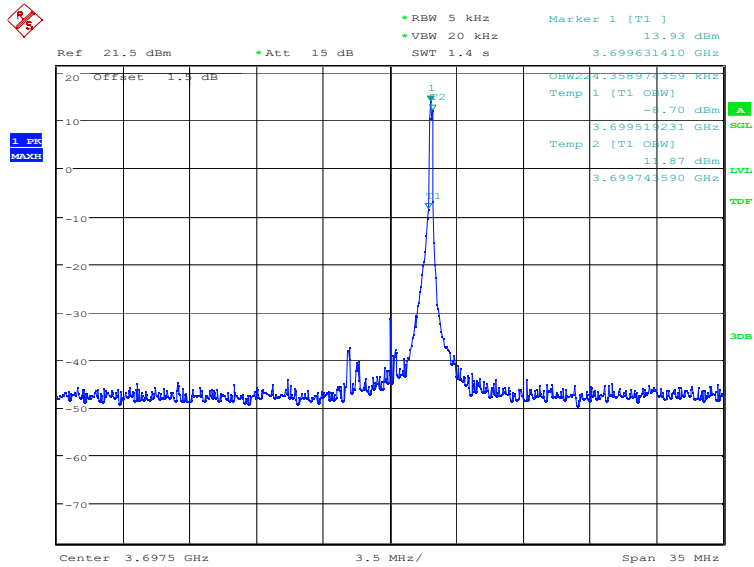


Date: 8.SEP.2022 08:49:31



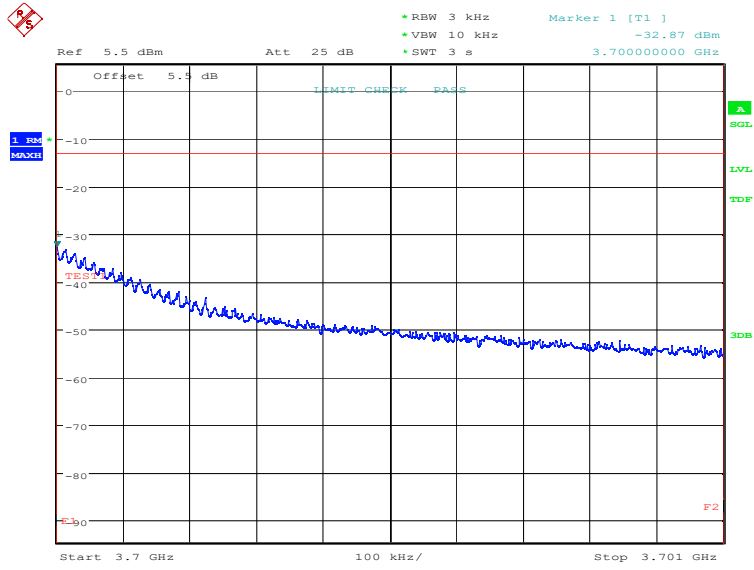
Date: 8.SEP.2022 08:51:29

### OBW: 1RB-high\_offset

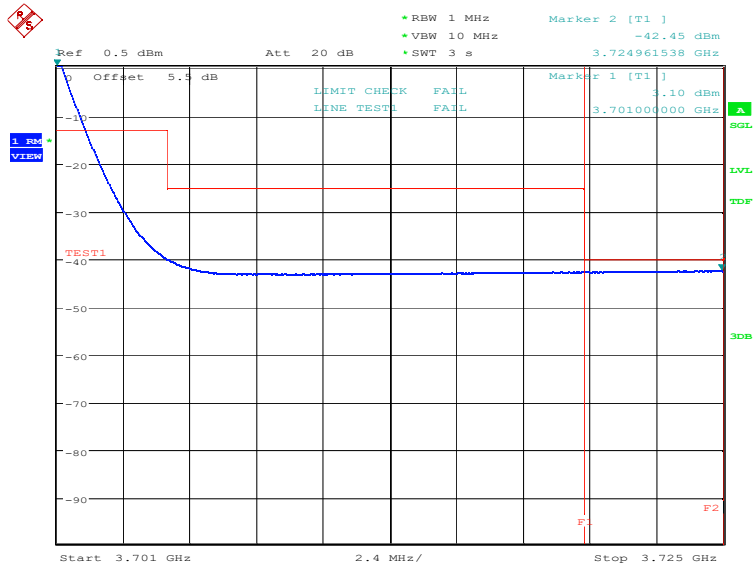


Date: 8.SEP.2022 08:52:07

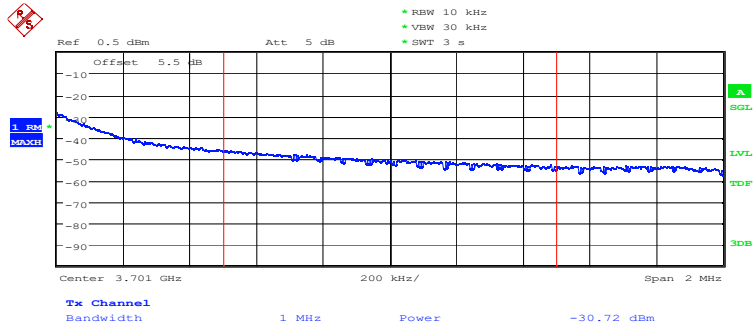
### HIGH BAND EDGE BLOCK-1RB-high\_offset



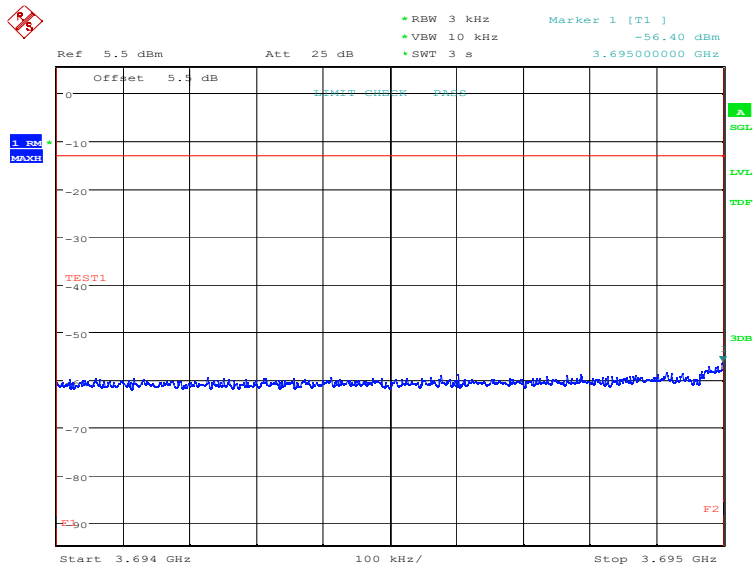
Date: 8.SEP.2022 08:52:48



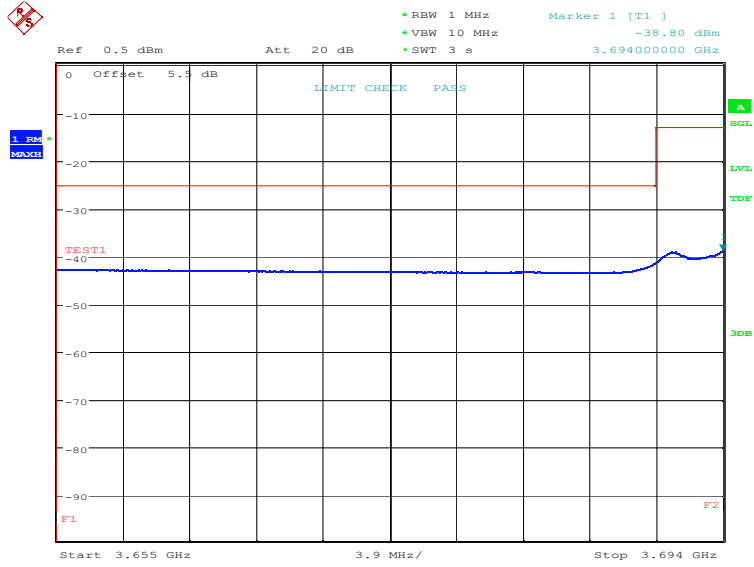
Date: 8.SEP.2022 08:54:15



Date: 8.SEP.2022 08:54:33

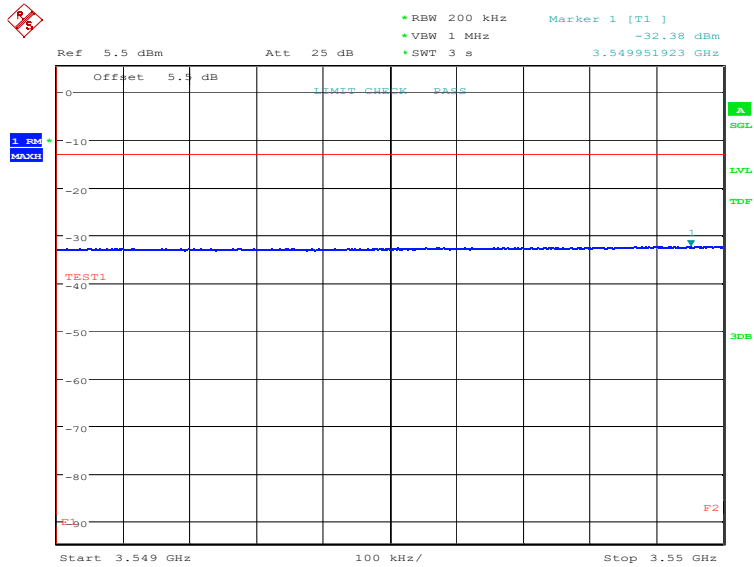


Date: 8.SEP.2022 08:53:29



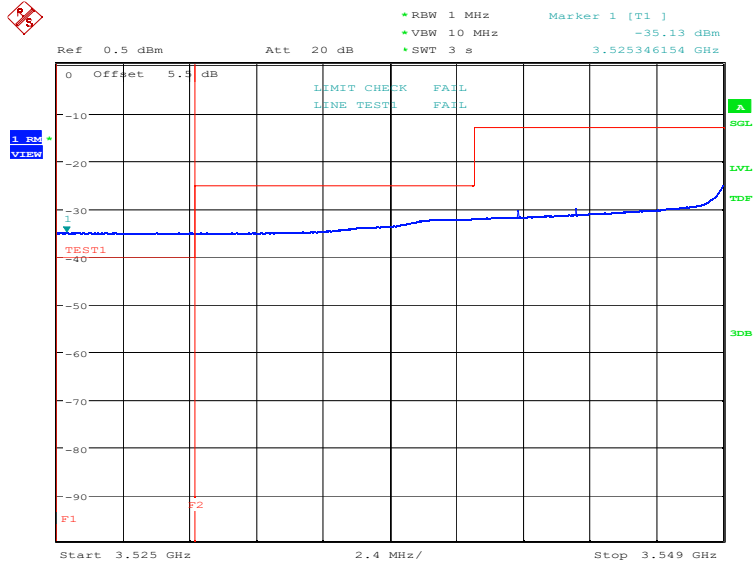
Date: 8.SEP.2022 08:55:12

### LOW BAND EDGE BLOCK-20MHz-100%RB

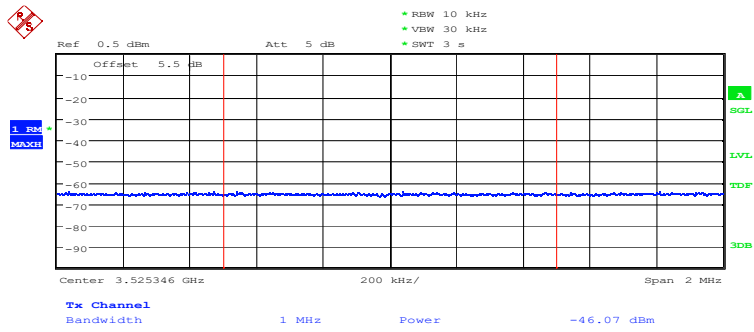


Date: 8.SEP.2022 08:35:34

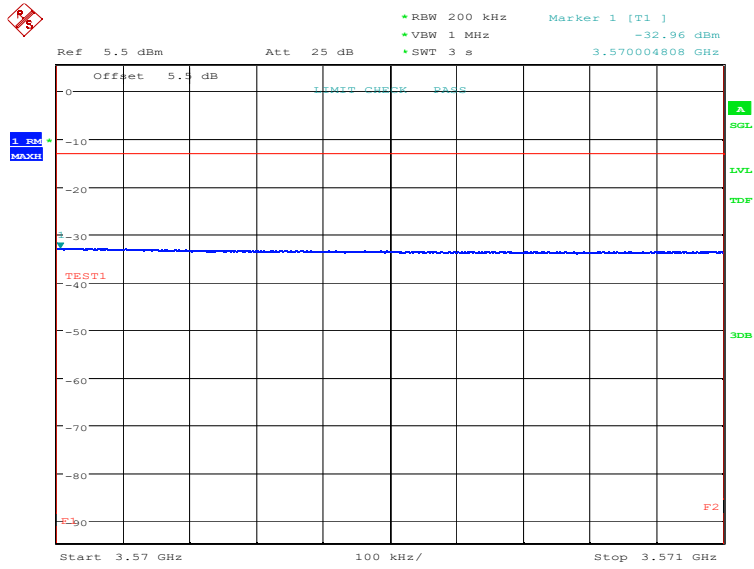




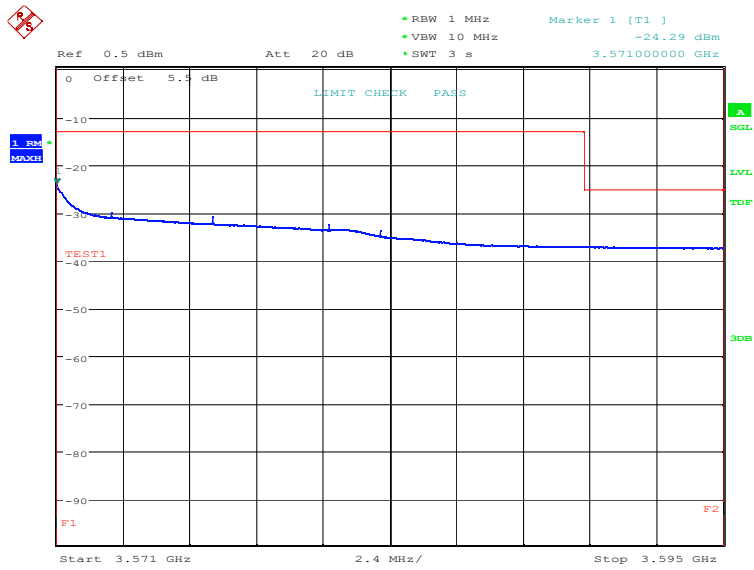
Date: 8.SEP.2022 08:37:01



Date: 8.SEP.2022 08:37:19

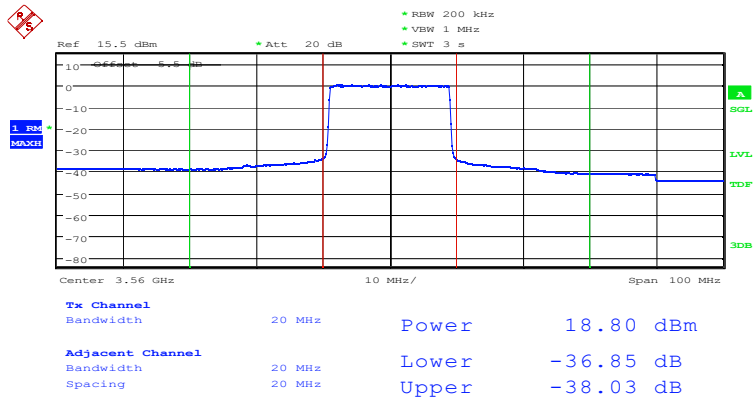


Date: 8.SEP.2022 08:36:15



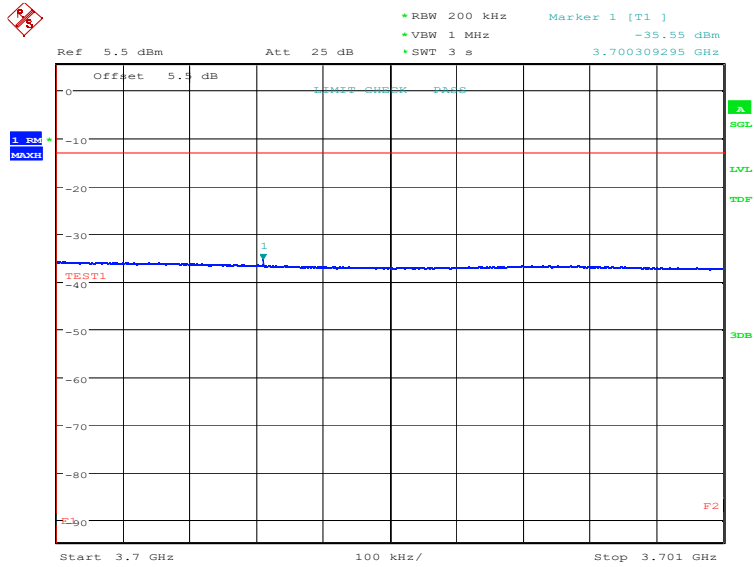
Date: 8.SEP.2022 08:37:57

### ACLR

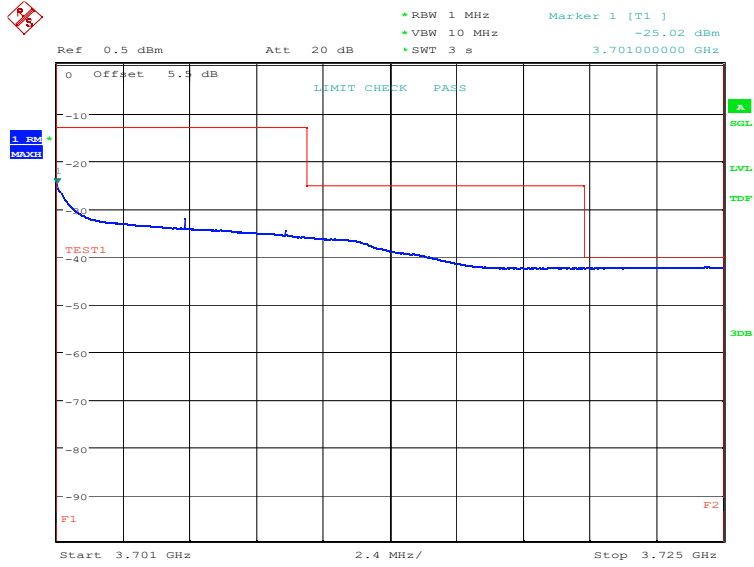


Date: 8.SEP.2022 08:39:15

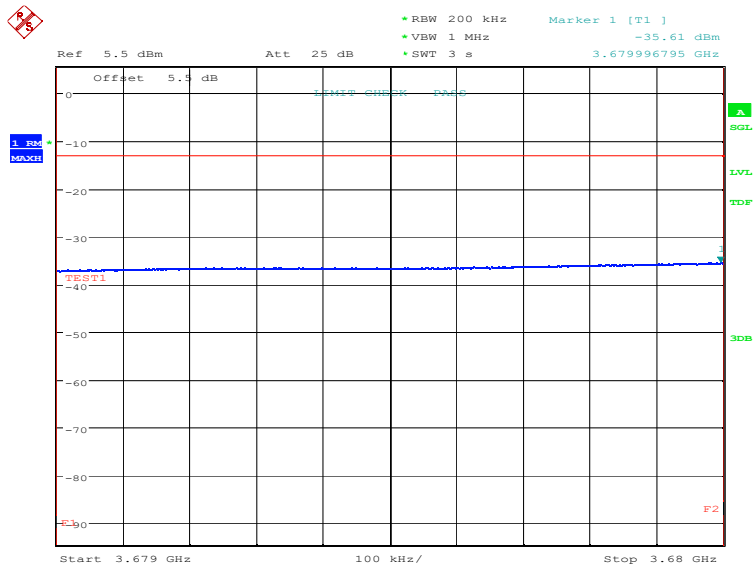
### HIGH BAND EDGE BLOCK-20MHz-100%RB



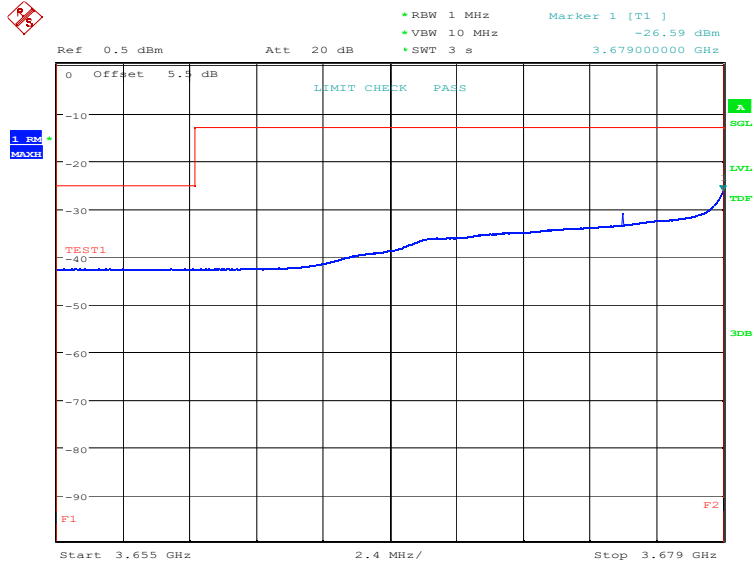
Date: 8.SEP.2022 08:40:10



Date: 8.SEP.2022 08:41:29

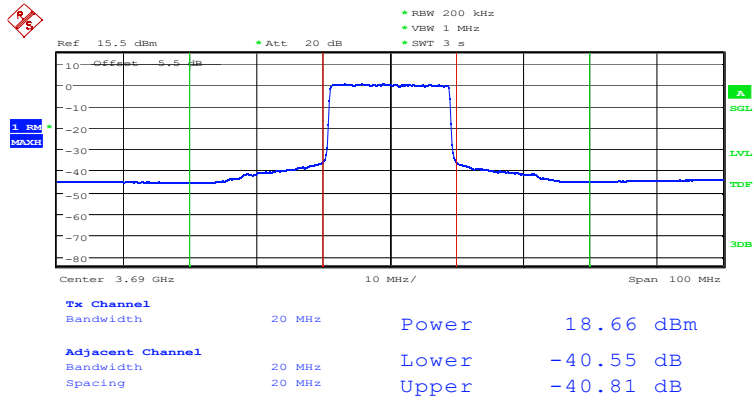


Date: 8.SEP.2022 08:40:51



Date: 8.SEP.2022 08:42:10

### ACLR



Date: 8.SEP.2022 08:43:27

Note: Expanded measurement uncertainty is  $U = 0.622$  dB,  $k = 2$ .

## **A.6 Conducted Spurious Emission**

### **A.6.1 Measurement Method**

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

1. In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:
  - (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
  - (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is greater than  $2 \times \text{span}/\text{RBW}$ .

### **A. 6.2 Measurement Limit**

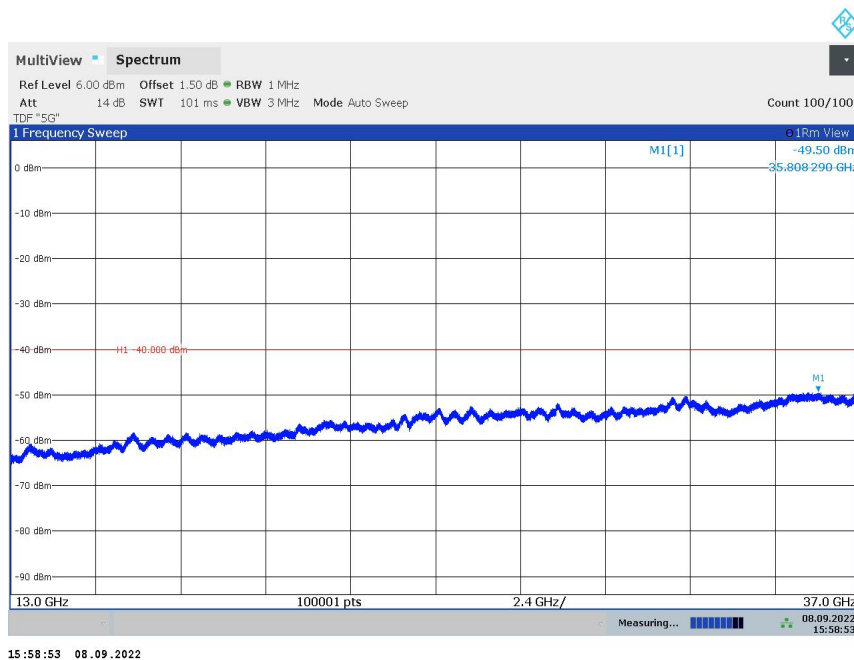
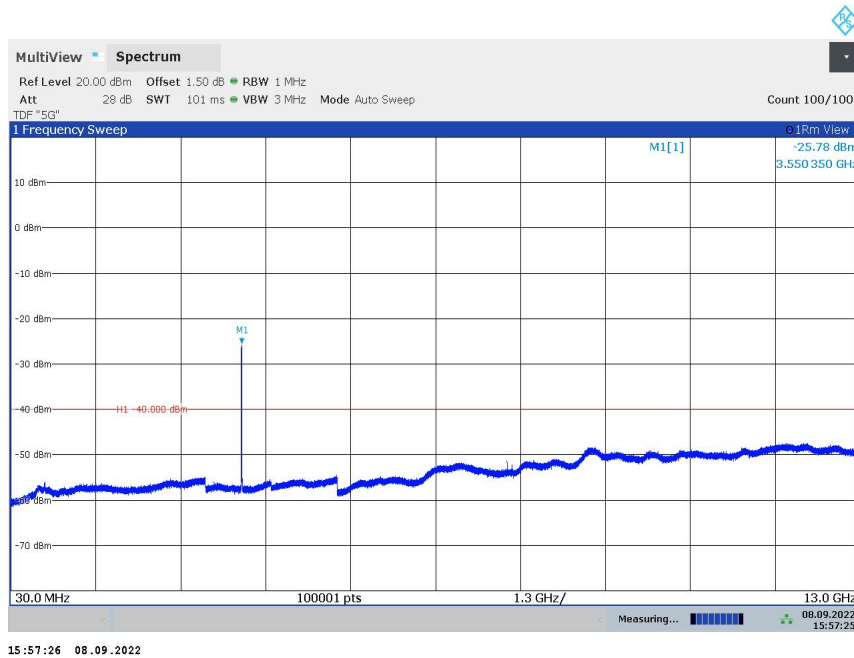
Part 96.41(e) states for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed  $-13$  dBm/MHz within 0 to B megahertz (where B is the bandwidth 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. 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.

### A. 6.3 Measurement result

Only the worst case result is given below

LTE band 48: 30MHz – 37.0GHz

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



Note: Expanded measurement uncertainty is  $U = 0.622$  dB,  $k = 2$ .

## **A.7 Peak-to-Average Power Ratio**

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Record the maximum PAPR level associated with a probability of 0.1%.

### **LTE band 48, 20MHz**

Frequency (MHz)	PAPR (dB)		
	QPSK	16QAM	64QAM
3625.0	8.24	8.94	9.07

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



## **A.8 End User Device Additional Requirement (CBSD Protocol)**

### **A.8.1 Measurement Limit**

End user device additional requirements (CBSD Protocol) are tested per the test procedures listed below. During testing, the EUT is connected to a certified CBSD (Baicells pBS2120 FCC ID: 2AG32PBS212096) as a companion device to show compliance with Part 96.47.

End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.

An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

### **A.8.2 Measurement Method**

The EUT was connected via an RF cable to a certified CBSD and spectrum analyzer.

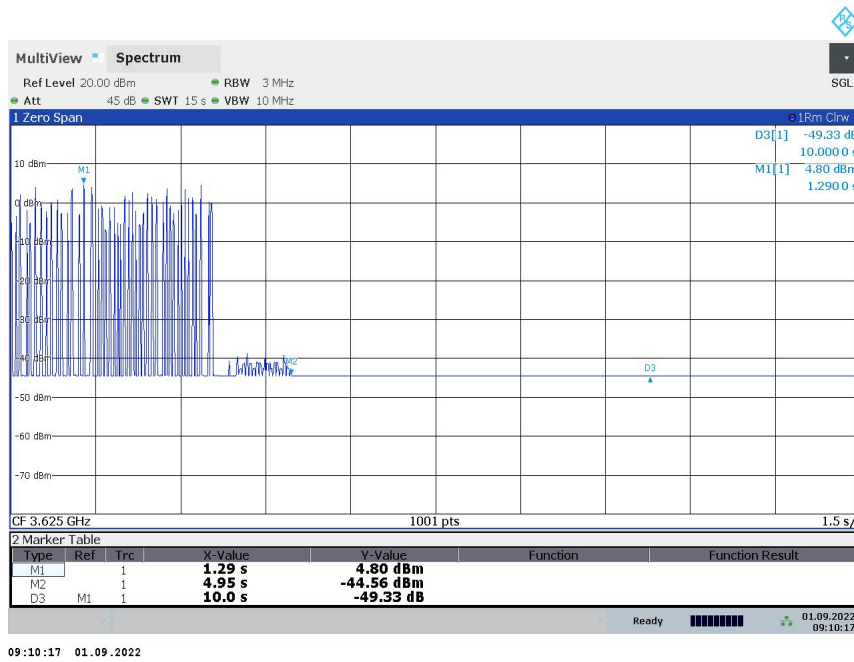
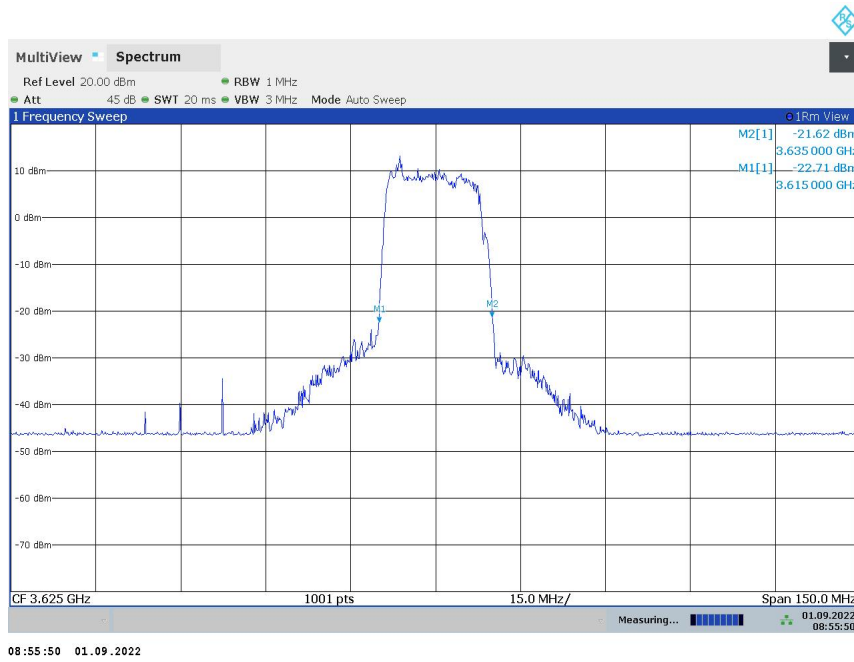
1. Run#1:

- a. Setup frequency with 3615MHz – 3635MHz.
- b. Check EUT Tx frequency.
- c. Disable AP service and check EUT stop transmission within 10s.

2. Run#2:

- a. Setup frequency with 3660MHz – 3680MHz.
- b. Check EUT Tx frequency.
- c. Disable AP service and check EUT stop transmission within 10s.

RUN#1:



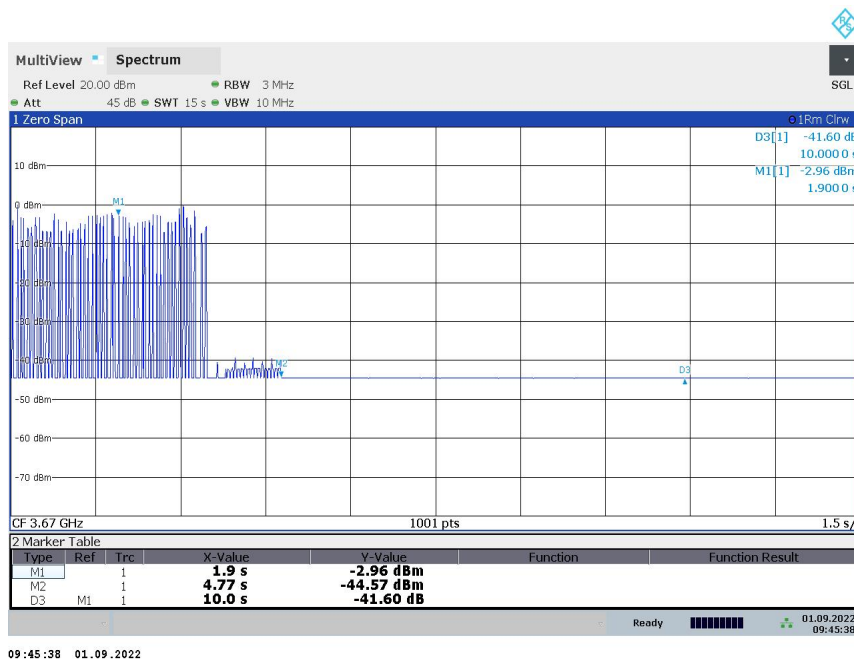
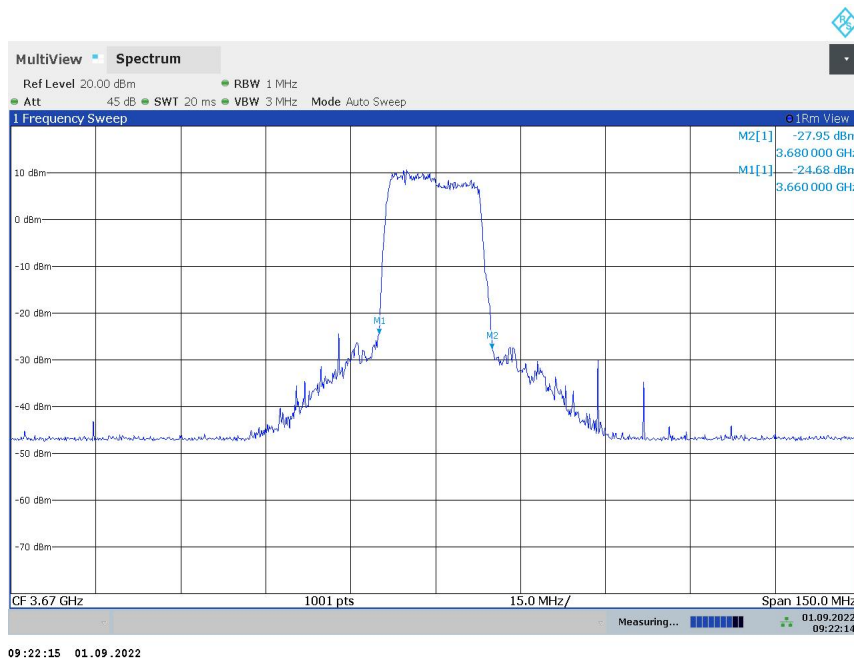
Note:

Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

RUN#2:



Note:

Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT

## Annex B: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p>  	
<hr/> <b>Certificate of Accreditation to ISO/IEC 17025:2017</b> <hr/>	
NVLAP LAB CODE: 600118-0	
<b>Telecommunication Technology Labs, CAICT</b> Beijing China	
<i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i>	
<b>Electromagnetic Compatibility &amp; Telecommunications</b>	
<i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).</i>	
<hr/> 2021-09-29 through 2022-09-30 <i>Effective Dates</i>	 <hr/> <i>[Signature]</i> For the National Voluntary Laboratory Accreditation Program

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