Report On

Application for Grant of Equipment Authorization of the Nextivity Inc. Cel-Fi G41 Cellphone Signal Booster

In accordance with:
FCC CFR 47 Part 20
RSS-131 Issue 4

Prepared for:
Nextivity Inc.
16550 West Bernardo Drive, Bldg 5, Suite 550,
San Diego, CA 92127, USA

Issue Date: November 2023
Document Number: 72189913D | Issue: 01

RESPONSIBLE FOR	NAME	TITLE	DATE	SIGNATURE
Prepared By	Miguel Rabago	JR EMC/Wireless Engineer	11/03/2023	
Authorized Signatory	Ferdinand S. Custodio	Senior RADIO Test Engineer / Wireless Team Lead	11/03/2023	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

EXECUTIVE SUMMARY
Report and test data representing the EUT are verified and the EUT itself found to be in compliance with FCC CFR 47 Part 20 and RSS-131 Issue 4 for ISED

A2LA Cert. No. 2955.13

TÜV SÜD America, Inc.
10040 Mesa Rim Road
San Diego, CA 92121-2912

TÜV SÜD America, Inc.
Rancho Bernardo Facility
16936 Via Del Campo
San Diego, CA 92127

Phone: 858 678 1400
www.tuv-sud-america.com

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	Initial Release	11/03/2023

1.2 Introduction

The information contained in this report is intended to show verification of the Nextivity Inc. Cel-Fi G41 to the requirements of FCC CFR 47 Part 20 and RSS-131.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Nextivity Inc. 16550 West Bernardo Drive, Bldg 5, Suite 550, San Diego, CA 92127, USA
Applicant Contact Information	CK Li Sr. Principal Engineer, Regulatory CLi@NextivityInc.com (858) 485-9442
FCC ID	YETG41-BE
ISED Certification Number:	9298A-G41BE
Model Number(s)	G41-BE
Test Specification/Issue/Date	• FCC CFR 47 Part 20 (October 1, 2022). • RSS-131 – Zone Enhancers (Issue 4, December 2022).
Start of Test	August 02 2023
Finish of Test	October 29 2023
Name of Engineer(s)	Miguel Angel Rabago Garcia
Related Document(s)	• Product Spec for RFQ_Sapporo G41-BE_US_v1.pdf • KDB935210 (D04 Provider Specific Booster Measurements v02r04) Provider-Specific Consumer Signal Booster Compliance Measurements Guidance.

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 20 with cross-reference to the corresponding requirements of KDB935210 D04 and ISED RSS-131 is shown below.
By client request only Band 25 High Channel was tested in some test cases, because it is superset of Band 2

Section	Spec Clause			Test Description	Results
	FCC Part	KDB935210 D04	RSS		
2.1	20.21 (e)(3) Frequency Bands	7.1.1	-	Authorized Frequency Band Verification	Compliant
2.2	20.21 (e)(3) Frequency Bands 20.21 (e)(4) Self-Monitoring	7.1.2	-	Test Authorized CMRS provider test	Compliant
2.3	20.21(e)(9)(i)(D) Power Limits 20.21(e)(9)(i)(B) Bidirectional Capability 20.21(e)(9)(i)(C)(2) Booster Gain Limits	7.2 7.3	RSS-131 Clause 6.1.2 RSS-131 Clause 8.3	Maximum Power measurement procedure Maximum Booster Gain Computer	Compliant
2.4	20.21(e)(9)(i)(G) Intermodulation Limit	7.4	RSS-131 Clause 8.6	Intermodulation Product	Compliant
2.5	20.21(e)(9)(i)(F) Out of Band Emission Limit	7.5	RSS-131 Clause 8.5	Out-of-Band Emissions	Compliant
2.6	20.21(e)(9)(i)(F) Out of Band Emission Limit 2.1051 Measurements required: Spurious emissions at antenna terminals. 22.917 (a) Emission limitations for cellular equipment. 24.238 (a) Emission limitations for Broadband PCS equipment.	7.6	RSS-13 8.5	Conducted Spurious Emissions	Compliant
2.7	20.21(e)(9)(i)(A) Noise Limits 20.21(e)(9)(i)(I) Transmit Power Off Mode	7.7	RSS-131 Clause 8.1 RSS-131 Clause 8.7	Noise Limits	Compliant
2.8	20.21(e)(9)(i)(J) Uplink Inactivity	7.8	RSS-131 Clause 8.8	Uplink inactivity	Compliant
2.9	20.21(e)(9)(i)(C)(1) Booster Gain Limits 20.21(e)(9)(i)(I) Transmit Power Off Mode	7.9	RSS-131 Clause 8.2 RSS-131 Clause 8.7	Variable Booster Gain	Compliant
2.10	2.1049 Measurements required: Occupied bandwidth. 22.917 (b) Emission limitations for cellular equipment. 24.238 (b) Emission limitations for Broadband PCS equipment.	7.10	RSS-Gen 6.7	Occupied Bandwidth	Compliant
2.11	20.21(e)(9)(ii)(A) Anti-Oscillation	7.11	RSS-131 Clause 6.1.1	Oscillation Detection	Compliant
-	20.21(e)(9)(i)(C)(2)(iii) Automatic Feedback Cancellation	7.12	-	Mobile Booster Automatic Feedback Cancellation	N/A; Applicable to Mobile Booster

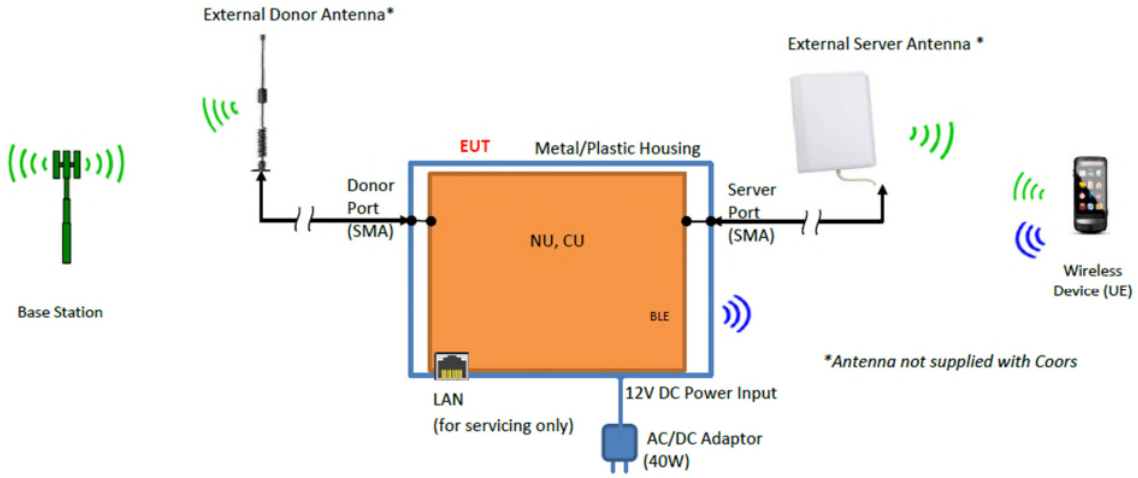
-	20.21(e)(9)(i)(B) Bidirectional Capability 20.21(e)(3) Frequency Band	7.14	-	Spectrum Block Filtering	N/A***
2.12	20.21(e)(9)(i)(E) Out of Band Gain Limit	7.15	RSS-131 Clause 8.4	Out of Band Gain	Compliant
2.13	2.1055 Measurements required: Frequency stability. 22.355 Frequency tolerance 24.235 Frequency stability. 27.54 Frequency stability.	7.16	RSS 132 Clause 5.3 RSS 133 Clause 6.3 RSS 139 Clause 6.4 RSS 130 Clause 4.5 RSS 195 Clause 5.4	Frequency Stability	Compliant

*N/A*** Not Applicable. The EUT does not utilize spectrum block filtering.*

1.4 Product Information

1.4.1 Technical Description

Cel-Fi G41-BE is a single box LTE Provider Specific Signal Booster to improve voice and data cellular performance in indoor environments. Both Network Unit (NU), and the Coverage Unit (CU) are on a single PCB and installed metal/plastic housing. The NU comprises a transmitter and receiver which communicate with the cell tower. The CU comprises a transmitter and receiver which communicate with the wireless devices.
G41-BE includes Bluetooth LE and LAN connectivity. With the use of Nextivity smartphone application or the LAN, it allows user to register the product, update software, capture/display details metrics of the system.
EUT is powered by external 12VDC Power adaptor.



Sapporo Block Diagram

Cell Band Combinations:

One Cell	Two Cells
4	4,2
2	4,5
5	4,13
13	4,12
12	4,14
14	2,5
	2,13
	2,12
	2,14
	5,13
	5,12
	5,14

Mutually Exclusive Bands
Band 12 and 13
Band 13 and 14
Band 12 and 14

1.4.2 EUT Specification

EUT Description	Cellphone Signal Booster	
Trade Name	Cel-Fi™	
Model Name	Cel-Fi G41	
Model Number(s)	G41-BE	
Rated Voltage	12V DC via external AC/DC adaptor	
Mode Verified	LTE Band 2, 4, 5, 12, 13 and 25	
Frequency Bands	LTE Band 2:	UL: 1850 - 1910MHz
		DL: 1930 - 1990MHz
	LTE Band 4:	UL: 1710 - 1755MHz
		DL: 2110 - 2155MHz
	LTE Band 5:	UL: 824 - 849MHz
		DL: 869 - 894MHz
	LTE Band 12:	UL: 699 - 716MHz
		DL: 729 - 746MHz
	LTE Band 13:	UL: 777 - 787MHz
		DL: 746 - 756MHz
	LTE Band 25:	UL: 1850 - 1915MHz
		DL: 1930 - 1995MHz

Rated Power

Signal Bandwidth (MHz)	LTE Band 2, 4, 25		LTE Band 5, 12, 13	
	DL (dBm)	UL (dBm)	DL (dBm)	UL (dBm)
5	Max. 16	22	Max. 16	20
10				
15			N/A	
20			N/A	

Capability: LTE Band 2, 4, 5, 12, 13 and 25

Channel Bandwidth: LTE Band 2, 4, 25: 5MHz, 10MHz, 15MHz and 20MHz
LTE Band 5, 12, 13: 5MHz and 10MHz

Primary Unit (EUT)

☐ Production

☐ Pre-Production

☒ Engineering (same as Production)

Manufacturer Declared Temperature Range	0°C to 40°C
Antenna Type	External (SMA Connectors)
Manufacturer	N/A
Antenna Model	N/A
Input and Output ports Impedance	50 Ohm

Gain

Freq	Max System Gain
< 1 GHZ	95 dB
>1 GHz	100 dB

Maximum Antenna System
(Antenna + Cable) Gain

Port	Max System (Antenna & Cable) Gain
Server Port	0.17 dBi for LTE Band 2 0.05 dBi for LTE Band 4 0.08 dBi for LTE Band 5 0.27 dBi for LTE Band 12 0.05 dBi for LTE Band 13 0.3 dBi for LTE Band 25
Donnor Port	8.14 dBi for LTE Band 2 7.68 dBi for LTE Band 4 10.34 dBi for LTE Band 5 10.19 dBi for LTE Band 12 10.22 dBi for LTE Band 13 8.4 dBi for LTE Band 25

1.4.3 Transmit Frequency Table

Mode	Signal Bandwidth (MHz)	Tx Frequency (MHz)	Emission Designator	EIRP	
				Max. Power Avg (dBm)	Max. Power Avg (W)
LTE Band 2 Downlink	5	1932.5 – 1987.5	4M63F9W	9.83	0.009616123
	10	1935 – 1985	8M96F9W	12.46	0.01761976
	15	1937 – 1982.5	13M4F9W	14.46	0.027925438
	20	1940 – 1980	17M9F9W	15.87	0.038636698
LTE Band 2 Uplink	5	1852.5 – 1907.5	4M47F9W	21.79	0.151008015
	10	1855 – 1905	8M98F9W	21.86	0.153461698
	15	1857.5 – 1902.5	13M4F9W	21.72	0.148593564
	20	1860 - 1900	17M9F9W	21.62	0.145211162
LTE Band 4 Downlink	5	2110 - 2155	4M72F9W	9.95	0.009885531
	10	2110 - 2155	9M31F9W	12.57	0.018071741
	15	2110 - 2155	13M6F9W	14.45	0.027861212
	20	2110 - 2155	18M4F9W	15.59	0.0362243
LTE Band 4 Uplink	5	1710 - 1755	4M64F9W	22.08	0.161435856
	10	1710 - 1755	9M26F9W	22.2	0.165958691
	15	1710 - 1755	13M6F9W	22.32	0.170608239
	20	1710 - 1755	18M4F9W	22.09	0.161808004
LTE Band 5 Downlink	5	871.4 – 891.6	4M73F9W	9.92	0.009817479
	10	871.4 – 891.6	9M24F9W	12.1	0.016218101
LTE Band 5 Uplink	5	826.4 – 846.6	4M73F9W	19.66	0.092469817
	10	826.4 – 846.6	9M24F9W	19.57	0.09057326
LTE Band 12 Downlink	5	729 - 746	4M73F9W	9.73	0.009397233
	10	729 - 746	9M24F9W	12.7	0.018620871
LTE Band 12 Uplink	5	699 - 716	4M64F9W	19.56	0.090364947
	10	699 - 716	9M25F9W	19.81	0.095719407
LTE Band 13 Downlink	5	746 - 756	4M62F9W	9.95	0.009885531
	10	746 - 756	9M20F9W	11.41	0.013835664
LTE Band 13 Uplink	5	777 - 787	4M72F9W	19.78	0.095060479
	10	777 - 787	9M17F9W	19.49	0.088920112
LTE Band 25 Downlink	5	1932.5 – 1992.5	4M63F9W	9.68	0.009289664
	10	1935 – 1990	8M96F9W	12.31	0.017021585

	15	1937.5 – 1987.5	13M4F9W	13.6	0.022908677
	20	1940 – 1985	17M9F9W	13.89	0.024490632
LTE Band 25 Uplink	5	1852.5 – 1912.5	4M47F9W	20.84	0.121338885
	10	1855 – 1910	8M98F9W	20.79	0.11994993
	15	1857.5 – 1907.5	13M4F9W	20.95	0.124451461
	20	1860 – 1905	17M9F9W	21.6	0.144543977

Note: EIRP was computed with power output results on section 2.3.9 and maximum system gain from table 1.4.2

1.4.4 Test Configuration

Configuration Number	Description
A	Test Mode - Downlink (CU TX). Input signal is applied to antenna port of NU. Output is monitored from antenna port of CU. (refer to 1.4.4 Figure 3)
B	Test Mode - Uplink (NU TX). Input signal is applied to antenna port of CU. Output is monitored from antenna port of NU. (refer to 1.4.4 Figure 2)
C	Normal Mode - Downlink (CU TX). Base Station Simulator is employed to send a modulated signal to antenna port of NU. Antenna port of CU is terminated with a 50Ω load. (refer to 1.4.4 Figure 1)
D	Normal Mode - Uplink (NU TX). Base Station Simulator is employed to send a modulated signal to antenna port of NU. Input signal is applied to antenna port of CU. (refer to 1.4.4 Figure 1)
E	Inter-modulation. Test setup identical to Test Configuration A and B above with the addition of another signal applied to the input of the EUT. A coupler was used in the setup to ensure that the additional signal is directed to the EUT input port. (refer to 1.4.4 Figure 5)
F	Max Downlink noise limit testing - A 50 Ohm Termination is connected to the NU antenna port and Measure the Noise Limit at the CU antenna port. (refer to 1.4.4 Figure 6)
G	Max Uplink RSSI-dependent noise limit testing - A 50 Ohm Termination is connected to the CU antenna port. A signal is connected to a step attenuator and then applied to the NU antenna port. Output is monitored from antenna port of NU. (refer to 1.4.4 Figure 7)
H	Max Downlink RSSI-dependent noise limit testing - A 50 Ohm Termination is connected to the CU antenna port. A signal is connected to a step attenuator and then applied to the NU antenna port. Output is monitored from antenna port of CU. (refer to 1.4.4 Figure 8)

1.4.5 EUT Exercise Software

Manufacturer Provided a Nextivity Chart Interface v2.0.0.16

1.4.6 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Lenovo	Support Laptop	M/N: 20AR-S4250S, S/N: PC-03DGHKK 125/02
Lenovo	Support Laptop AC Adapter	M/N: ADLX90NLC2A S/N: 11S45N0247Z1ZS9B6926Z5
Nextivity	Support USB cable x 1	Custom 1.0 meter shielded USB Type A to Micro B cable

SIMSUKIAN	AC/DC Adapter	M/N: SK03T1-1200250V S/N: 22080308000658 IP: 100-240VAC 50/60Hz 0.6A; OP: 12VDC 2.5A 30.0W
Rohde & Schwarz	Vector Signal Generator	M/N: SMBV100A, S/N: 259021
Agilent	ESG Vectot Signal Generator	S/N: MY47271206 M/N:E4438C
Aeroflex	Signal Generator	M/N: 3005, S/N: 3005A/09L

1.4.7 Simplified Test Configuration Diagram

Figure 1 – Test configuration in EUT normal operational mode

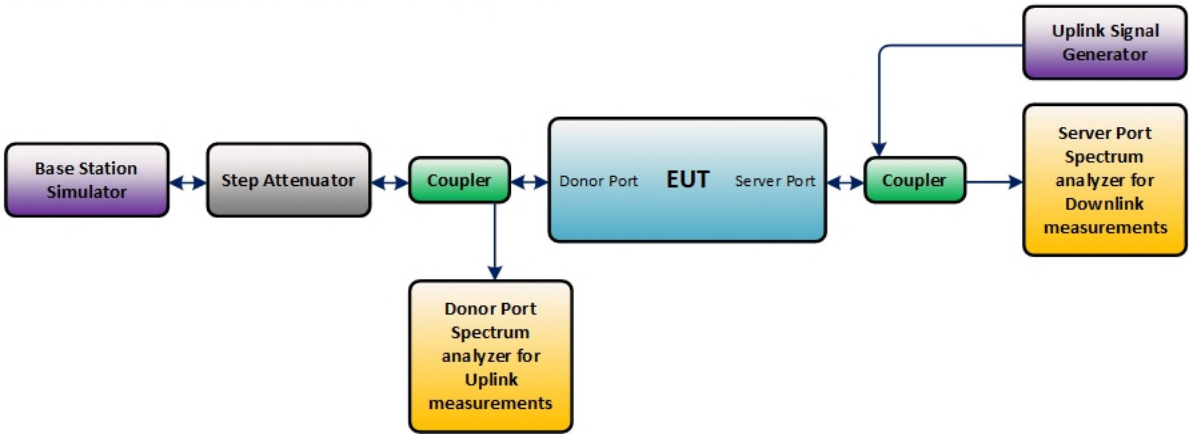


Figure 2 – Uplink test configuration in EUT test mode

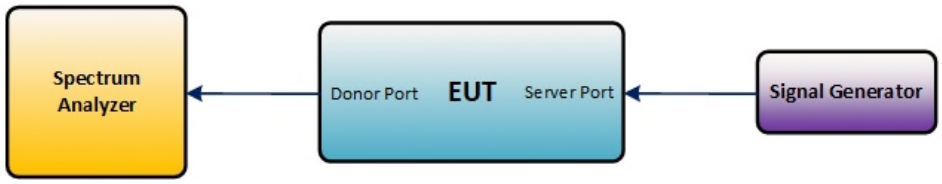


Figure 3 – Downlink test configuration in EUT test mode

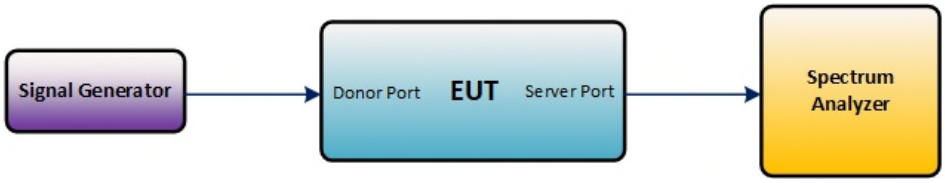


Figure 5 – Intermodulation product instrumentation test setup

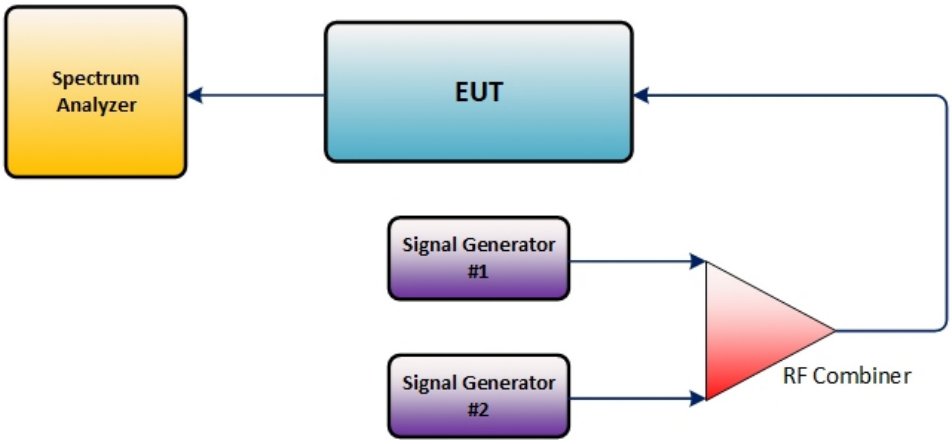


Figure 6 – Maximum downlink noise limit test configuration

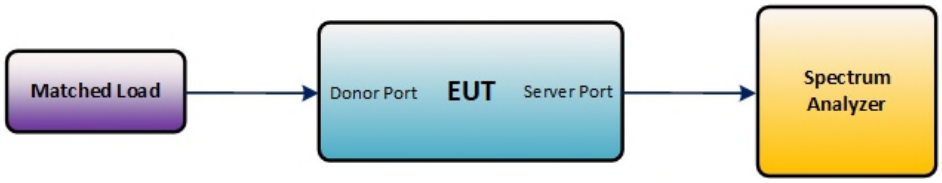


Figure 7 – Uplink RSSI-dependent noise limit test configuration

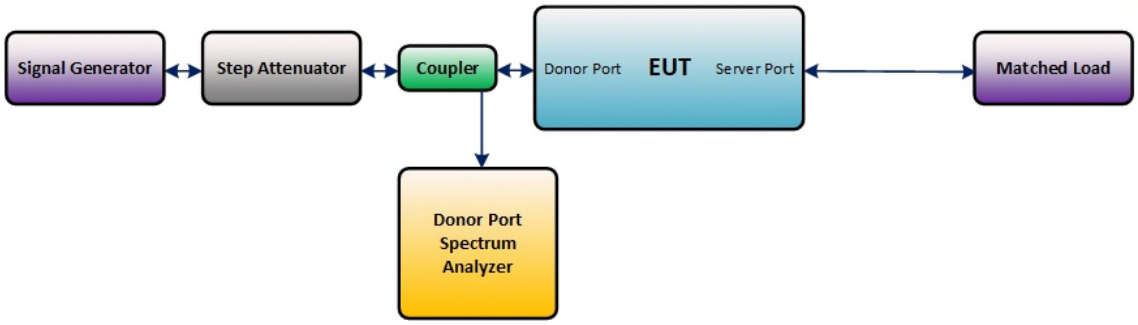
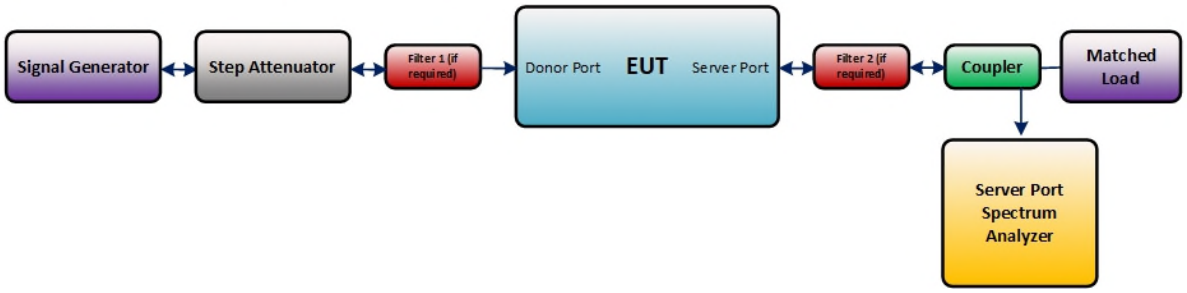


Figure 8 –Downlink RSSI-dependent noise limit test configuration



1.5 Deviations from the Standard

There were no deviations made during testing from the applicable test standard or test plan.

1.6 EUT Modification Record

The table below details modifications made to the EUT during the test program. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the manufacturer	-	-

1.7 Test Methods

All measurements contained in this report were conducted as per KDB935210 D04 Provider-Specific Consumer Signal Boosters Compliance Measurements Guidance (April 03, 2020).

1.8 Test Location

TÜV SÜD America conducted the following tests at our San Diego CA, Test Laboratory's.

Office Address:

TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681).
Phone: (858) 678 1400 Fax: (858) 546 0364.

TÜV SÜD America Inc. (Rancho Bernardo)

16936 Via Del Campo, San Diego, CA 92127-1708 (33.018644,-117.092409).
Phone: (858) 678 1400 Fax: (858) 546 0364.

1.9 Test Facility Registration

1.9.1 FCC – Designation No.: US1146

TÜV SÜD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Designation is US1146.

1.9.2 Innovation, Science and Economic Development Canada (ISED) Registration No.: 3067A-1 & 22806-1

The 10m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Rancho Bernardo) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 3067A-1.

The 3m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Mira Mesa) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 22806-1.

1.9.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TÜV Product Service Inc. (San Diego) is a recognized RADIO testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

1.9.4 NCC (National Communications Commission - US0102)

TÜV SÜD America Inc. (San Diego) is listed as a Foreign Recognized Telecommunication Equipment Testing Laboratory and is accredited to ISO/IEC 17025 (A2LA Certificate No.2955.13) which under APEC TEL MRA Phase 1 was designated as a Conformity Assessment Body competent to perform testing of equipment subject to the Technical Regulations covered under its scope of accreditation including RTTE01, PLMN01 and PLMN08 for TTE type of testing and LP0002 for Low-Power RF Device type of testing.

1.9.5 VCCI – Registration No. A-0280 and A-0281

TÜV SÜD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

1.9.6 RRA – Identification No. US0102

TÜV SÜD America Inc. (San Diego) is National Radio Research Agency (RRA) recognized laboratory under Phase I of the APEC Tel MRA.

1.9.7 OFCA – U.S. Identification No. US0102

TÜV SÜD America Inc. (San Diego) is recognized by Office of the Communications Authority (OFCA) under Appendix B, Phase I of the APEC Tel MRA.

2 Test Details

2.1 Authorized Frequency Band Verification

2.1.1 Specification Reference

FCC 47 CFR Part 20, Clause 20.21 (e)(3)
KDB935210 D04, Clause 7.1

2.1.2 Standard Applicable

FCC 47 CFR Part 20, Clause 20.21 (e)(3) Frequency Bands:
Consumer Signal Boosters must be designed and manufactured such that they only operate on the frequencies used for the provision of subscriber-based services under parts 22 (Cellular), 24 (Broadband PCS), 27 (AWS–1, 700 MHz Lower A–E Blocks, and 700 MHz Upper C Block), and 90 (Specialized Mobile Radio) of this chapter. The Commission will not certificate any Consumer Signal Boosters for operation on part 90 of this chapter (Specialized Mobile Radio) frequencies until the Commission releases a public notice announcing the date Consumer Signal Boosters may be used in the band.

2.1.3 Equipment Under Test and Modification State

Serial No: 560311000026 / Test Configuration A and B

2.1.4 Date of Test/Initial of test personnel who performed the test

August 02, 2023 /MARG

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	27.0°C
Relative Humidity	51.5%
ATM Pressure	99.0kPa

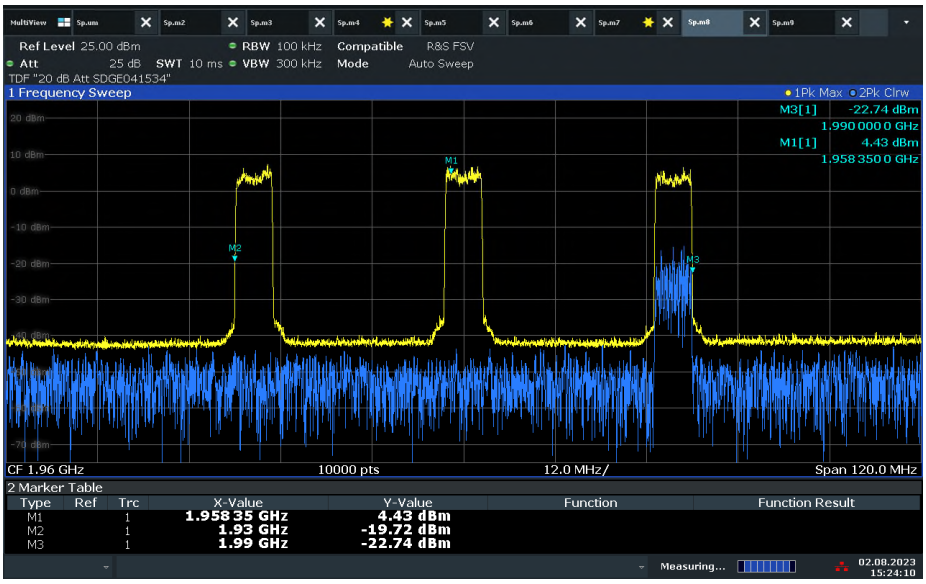
2.1.7 Additional Observations

- This is conducted Test. Test procedure is per Section 7.1.1 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The EUT operated in Test Mode, with the gain set to the maximum gain and a minimum bandwidth setting (5MHz).
- Setup the EUT according to Figure 2 or 3 of Section 6.3.3 of KDB935210 as appropriate.
- Both downlink and uplink bands for LTE Band 2, 4, 5, 12, 13, were tested.
- The signal generator was set to transmit a 5MHz LTE signal.
- The transducer factor (TDF) used is from the external attenuators and cables used.
- Frequency Range:

Technology	Band	DL Frequency Range (MHz)	UL Frequency Range (MHz)
LTE	2	1930-1990	1850-1910
LTE	4	2110 - 2155	1710 - 1755
LTE	5	869 - 894	824 - 849
LTE	12	729 – 746	699 – 716
LTE	13	746 - 756	777 - 787
LTE	25	1930 - 1995	1850 - 1915

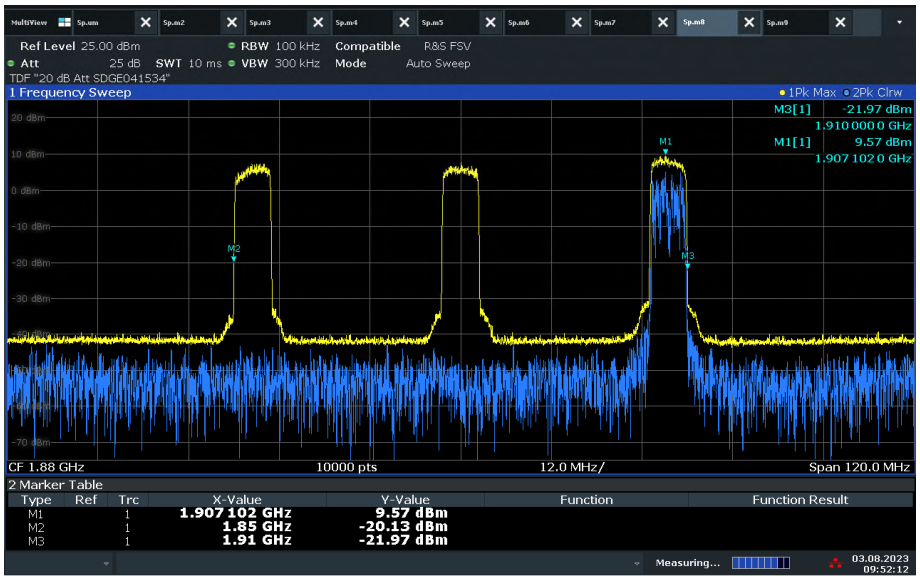
2.1.8 Test Results

LTE Band 2 Downlink Authorized Frequency Range (1930-1990MHz)



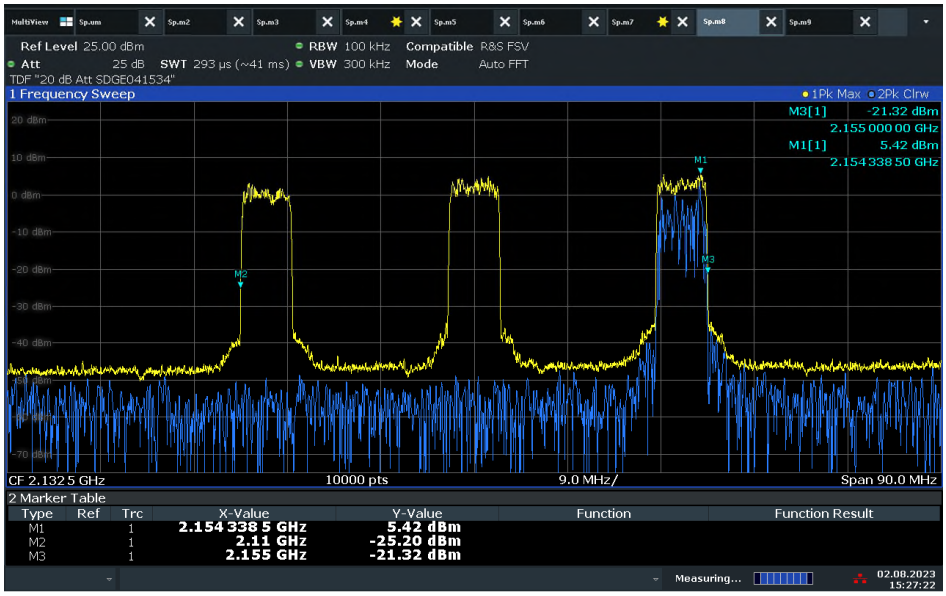
15:24:10 02.08.2023

LTE Band 2 Uplink Authorized Frequency Range (1850-1910MHz)



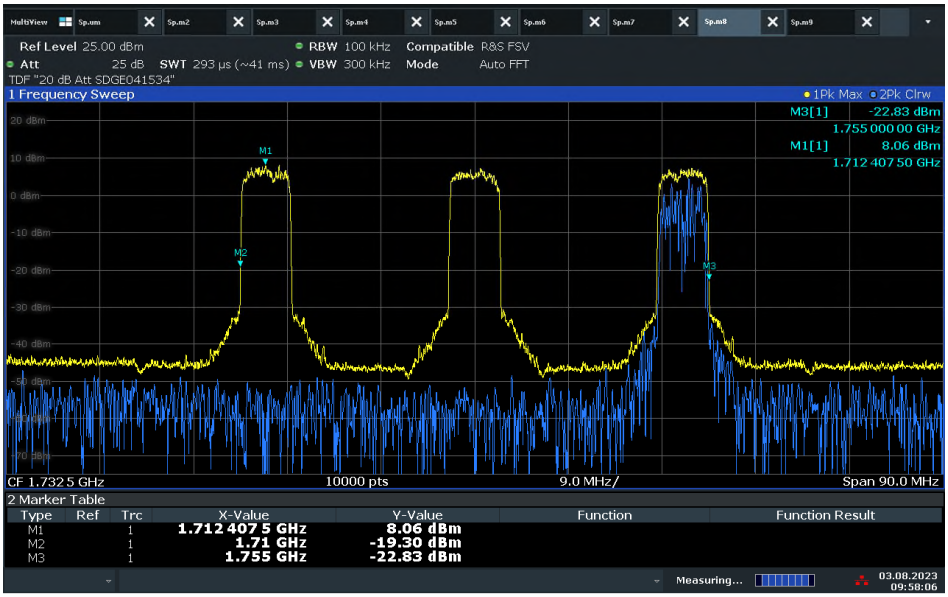
09:52:13 03.08.2023

LTE Band 4 Downlink Authorized Frequency Range (2110 – 2155 MHz)



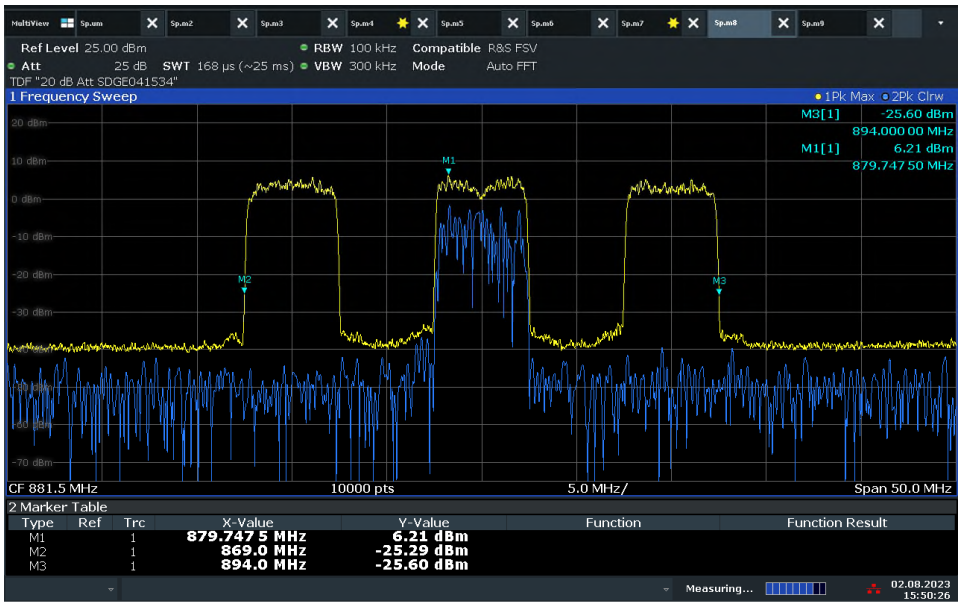
15:27:23 02.08.2023

LTE Band 4 Uplink Authorized Frequency Range (1710 – 1755 MHz)



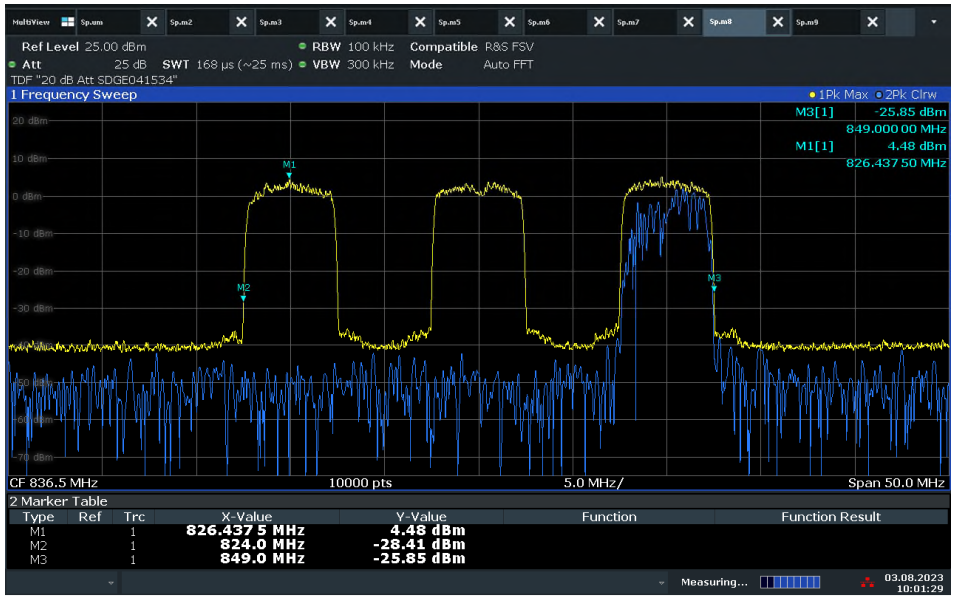
09:58:07 03.08.2023

LTE Band 5 Downlink Authorized Frequency Range (869 - 894MHz)



15:50:27 02.08.2023

LTE Band 5 Uplink Authorized Frequency Range (824 - 849MHz)

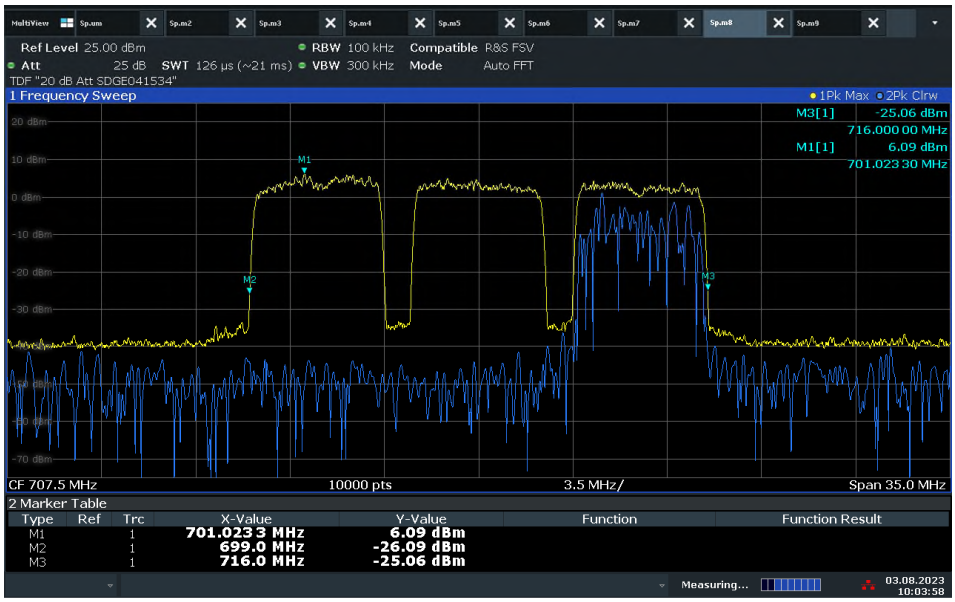


10:01:30 03.08.2023

LTE Band 12 Downlink Authorized Frequency Range (729 – 746 MHz)

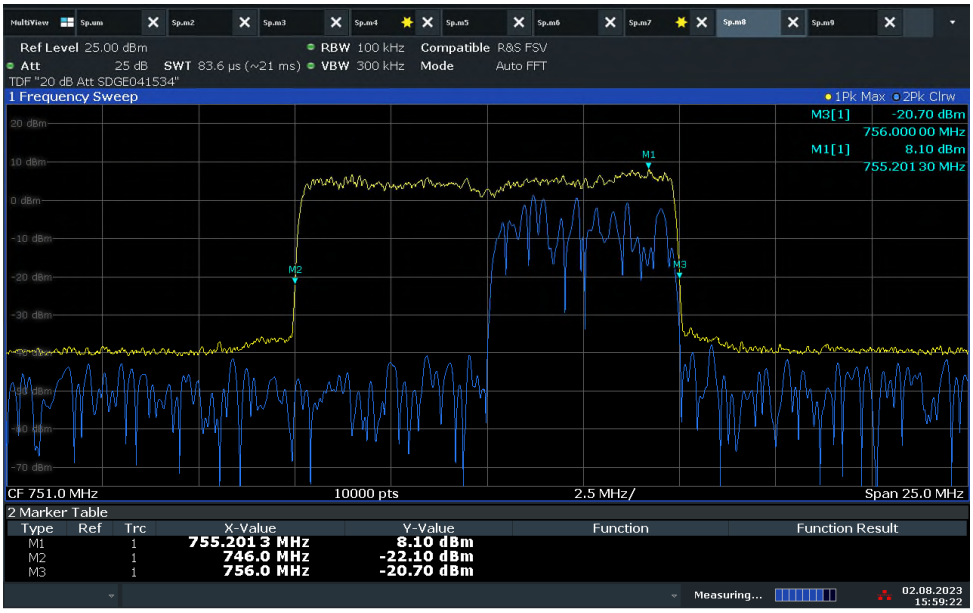
15:55:11 02.08.2023

LTE Band 12 Uplink Authorized Frequency Range (699 – 716 MHz)



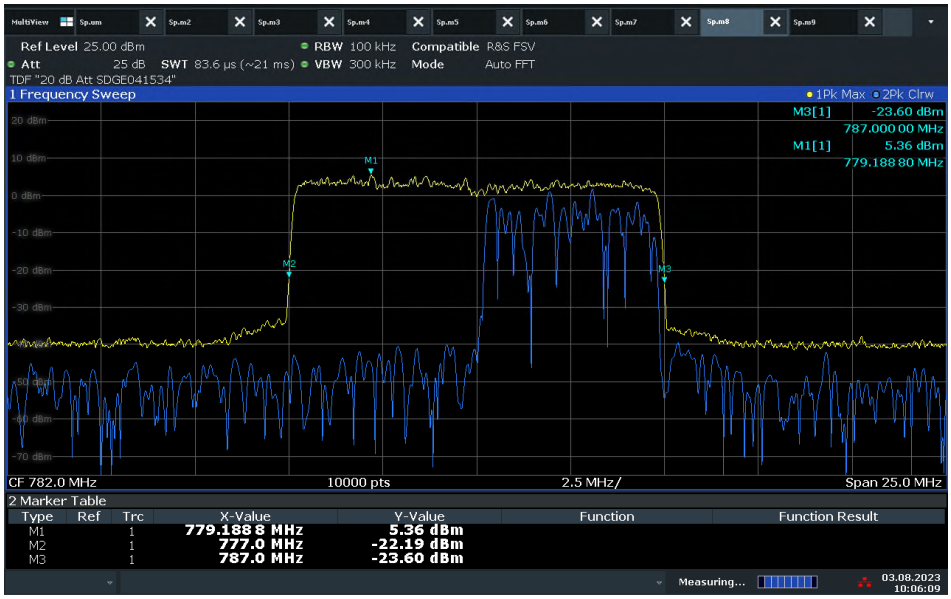
10:03:59 03.08.2023

LTE Band 13 Downlink Authorized Frequency Range (746 – 756 MHz)



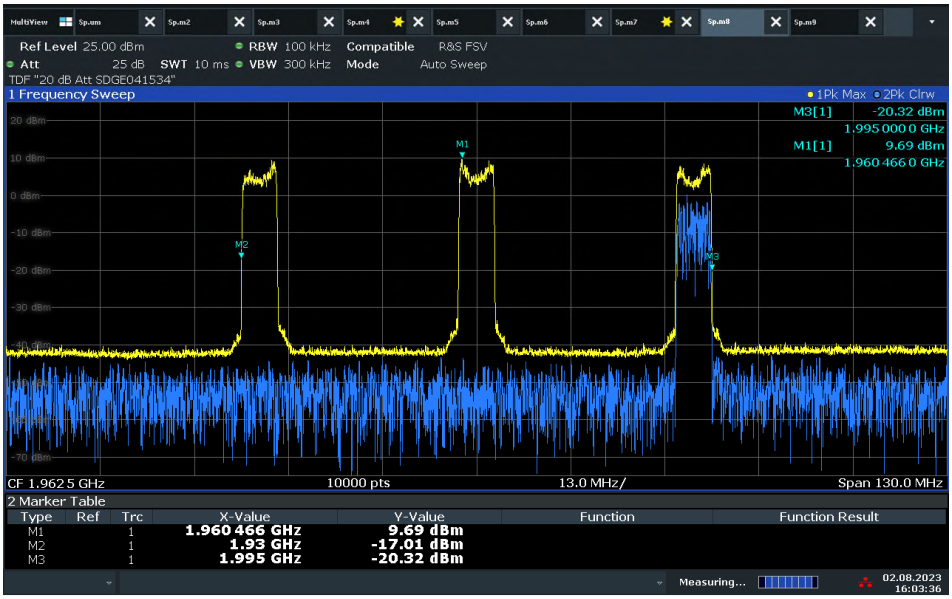
15:59:22 02.08.2023

LTE Band 13 Uplink Authorized Frequency Range (777 – 787 MHz)



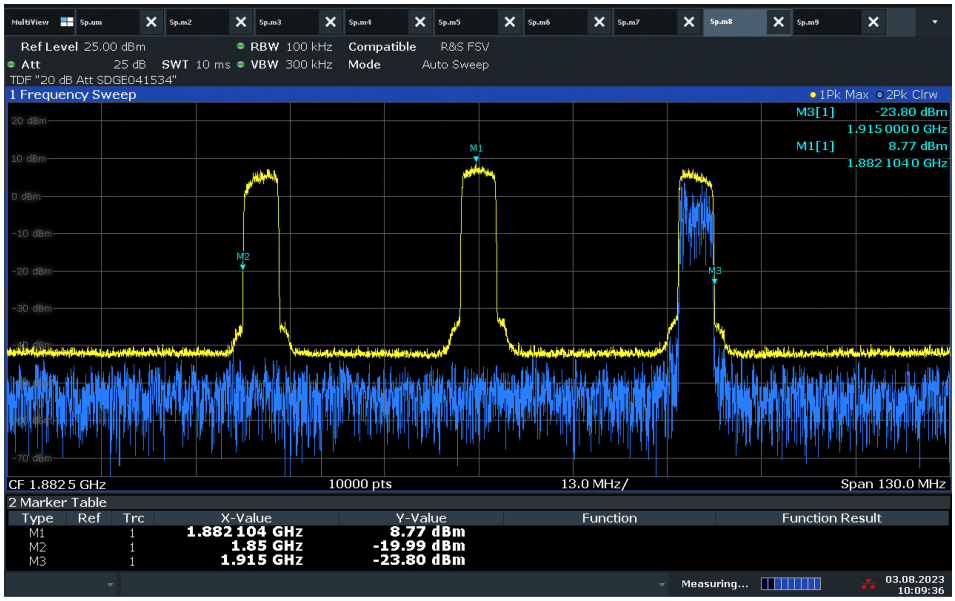
10:06:10 03.08.2023

LTE Band 25 Downlink Authorized Frequency Range (1930 – 1995 MHz)



16:03:36 02.08.2023

LTE Band 25 Uplink Authorized Frequency Range (1850 – 1915 MHz)



10:09:36 03.08.2023

2.2 Authorized CMRS Provider

2.2.1 Specification Reference

FCC 47 CFR Part 27, Clause 27.50 (h)(1)
FCC 47 CFR Part 27, Clause 27.50 (a((1)
RSS-139, Clause 6.5
RSS-195, Clause 5.5

2.2.2 Standard Applicable

FCC 47 CFR Part 20, Clause 20.21 (e)(3) Frequency Bands:
Consumer Signal Boosters must be designed and manufactured such that they only operate on the frequencies used for the provision of subscriber-based services under parts 22 (Cellular), 24 (Broadband PCS), 27 (AWS–1, 700 MHz Lower A–E Blocks, and 700 MHz Upper C Block), and 90 (Specialized Mobile Radio) of this chapter. The Commission will not certificate any Consumer Signal Boosters for operation on part 90 of this chapter (Specialized Mobile Radio) frequencies until the Commission releases a public notice announcing the date Consumer Signal Boosters may be used in the band.

FCC 47 CFR Part 20, Clause 20.21(e)(4) Self Monitoring:
Consumer Signal Boosters must automatically self-monitor their operation to ensure compliance with applicable noise and gain limits and either self-correct or shut down automatically if their operation exceeds those parameters.

2.2.1 Equipment Under Test and Modification State

Serial No: 560311000026/ Test Configuration C and D

2.2.2 Date of Test/Initial of test personnel who performed the test.

August 31 and October 9, 2023/ MARG

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	24.5 - 26.3°C
Relative Humidity	45.0 - 53.3%
ATM Pressure	98.8 - 99.0kPa

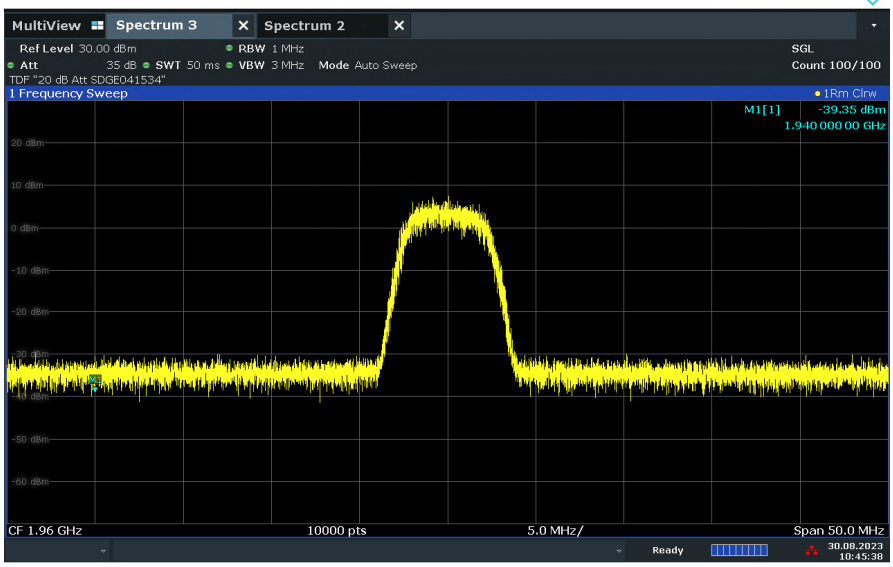
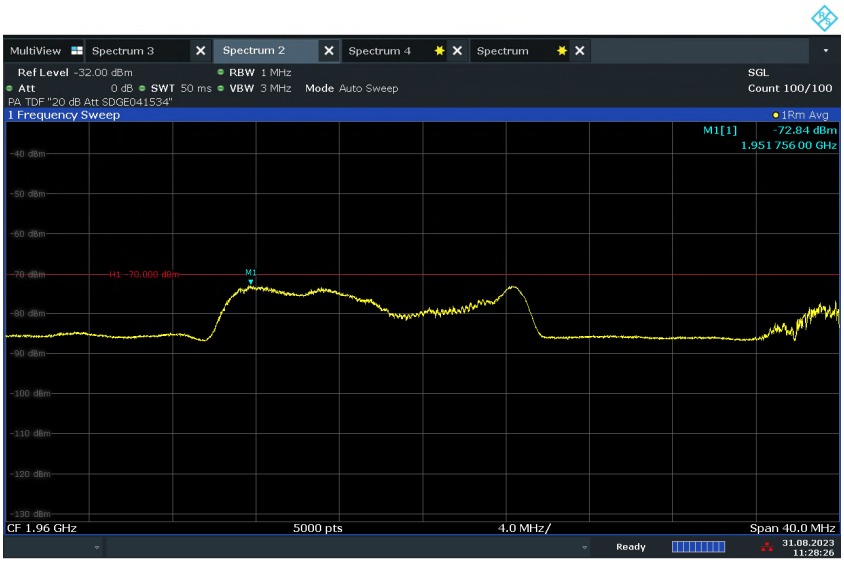
2.2.5 Additional Observations

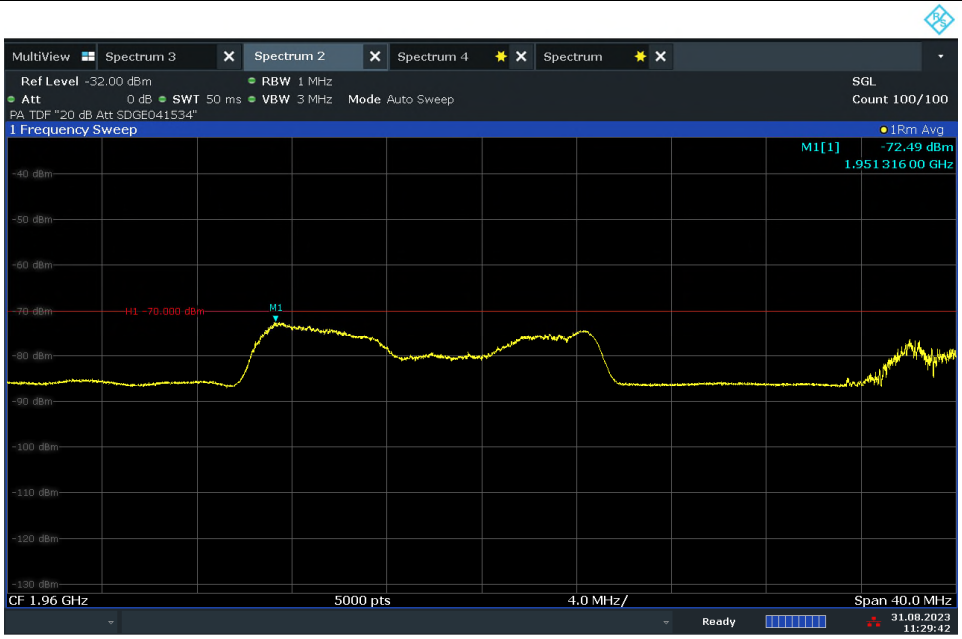
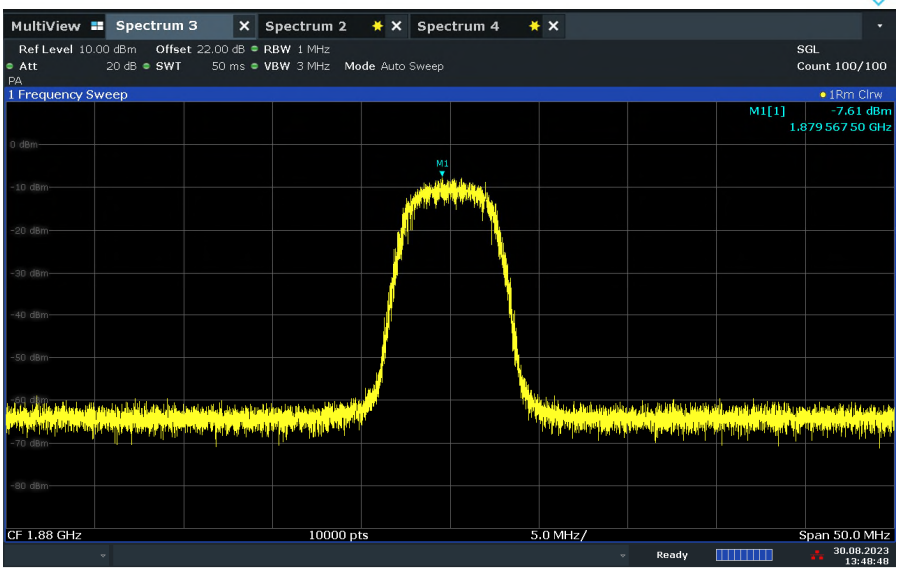
- This is conducted Test. Test procedure is per Section 7.1.2 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line loses) applied.

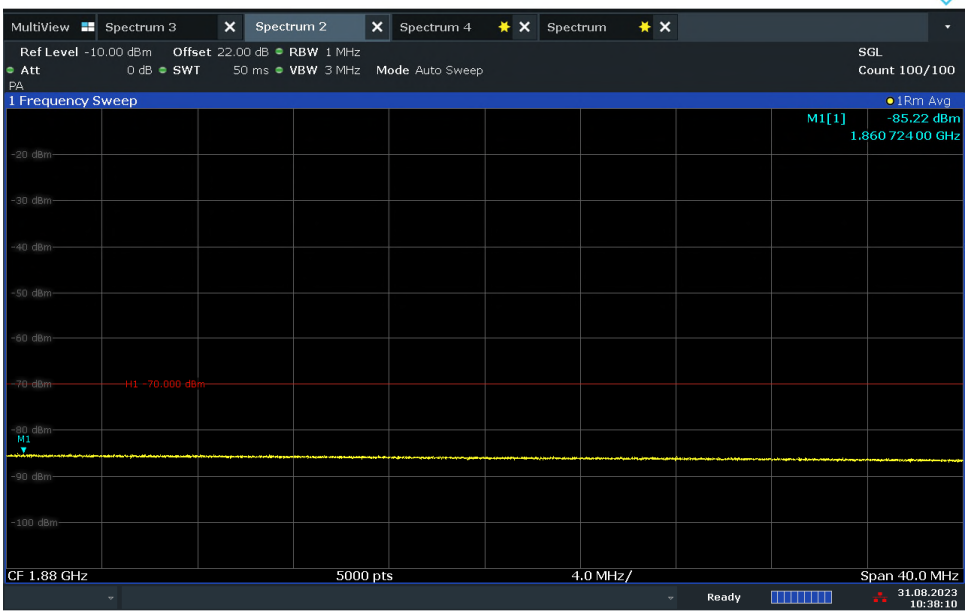
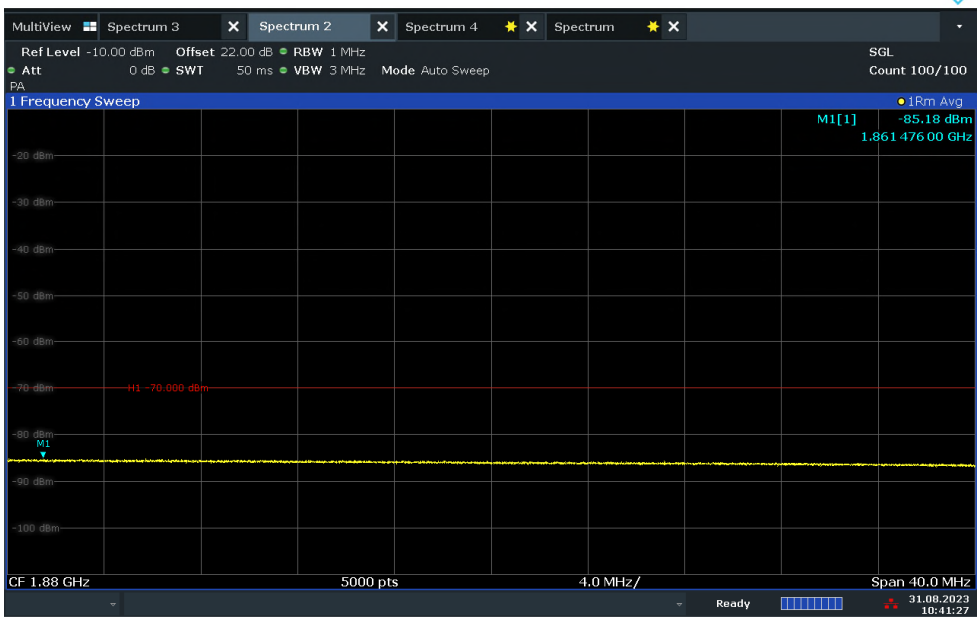
- The EUT operated in Normal Mode, with the gain set to the maximum gain and a minimum bandwidth setting (5MHz).
- Setup the EUT according to Figure 1 of Section 6.3.2 of KDB935210 with the Base Station Simulator transmitting an authorized CMRS provider signal to the booster.
- Evaluations are conducted.
- The transducer factor (TDF) used is from the external attenuators and cables used.
- Per Client request only High Channel for Band 25 was tested.
- Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, and 13 were tested.
- The Base Station Simulator was set to transmit a 5MHz LTE signal.
- The authorized CMRS Provider ID is: 123-456
- Two Non- authorized CMRS Provider signals for each band were verified.
- Frequency Range:

Technology	Band	DL Frequency Range (MHz)	UL Frequency Range (MHz)
LTE	2	1930-1990	1850-1910
LTE	4	2110 - 2155	1710 - 1755
LTE	5	869 - 894	824 - 849
LTE	12	729 – 746	699 – 716
LTE	13	746 - 756	777 - 787
LTE	25	1930 - 1995	1850 - 1915

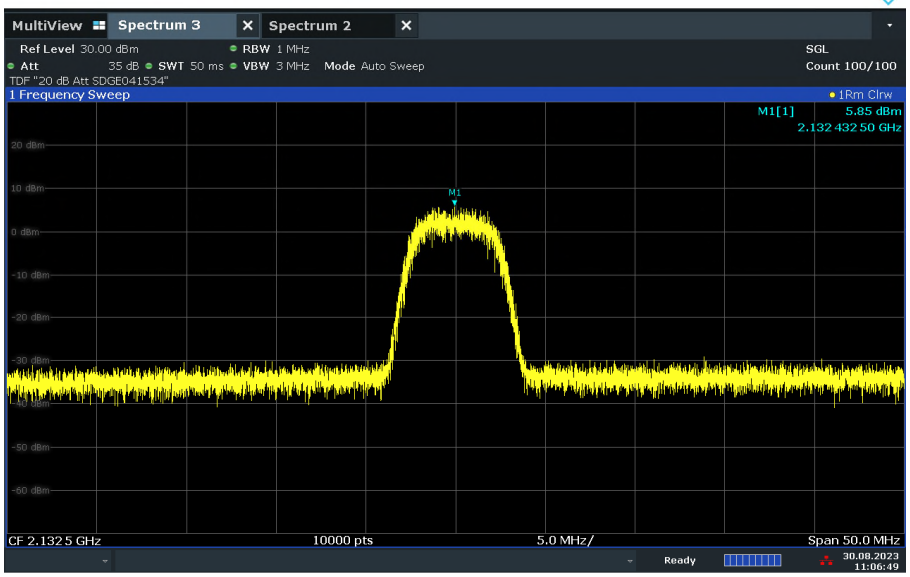
2.2.6 Test Results

LTE Band 2 Downlink Authorized Frequency Range (1930-1990MHz) (MCC/MNC: 123-456)
 10:45:39 30.08.2023
LTE Band 2 Downlink Authorized Frequency Range (1930-1990MHz) (MCC/MNC: 123-619)
 11:28:27 31.08.2023

LTE Band 2 Downlink Authorized Frequency Range (1930-1990MHz) (MCC/MNC: 123-916)
 11:29:43 31.08.2023
LTE Band 2 Uplink Authorized Frequency Range (1850-1910MHz) (MCC/MNC: 123-456)
 13:48:49 30.08.2023

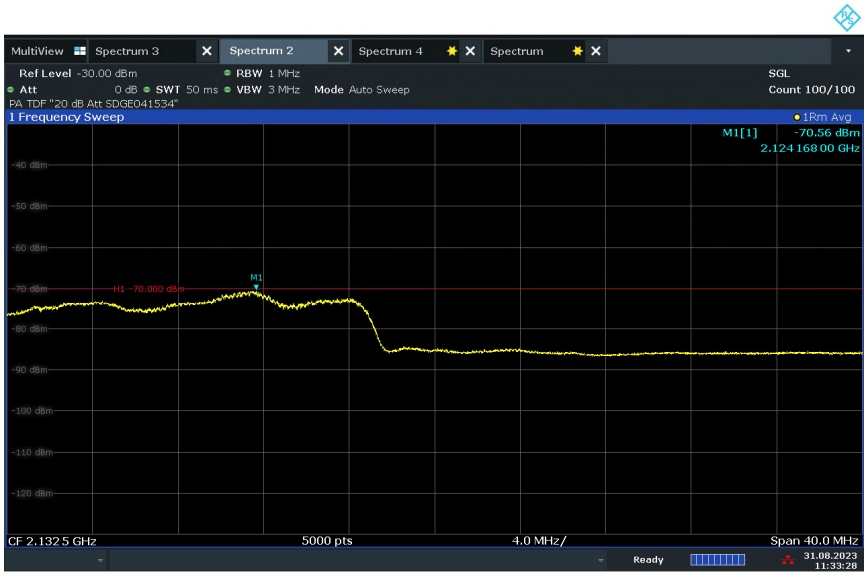
LTE Band 2 Uplink Authorized Frequency Range (1850-1910MHz) (MCC/MNC: 123-619)
 10:38:10 31.08.2023
LTE Band 2 Uplink Authorized Frequency Range (1850-1910MHz) (MCC/MNC: 123-916)
 10:41:28 31.08.2023

LTE Band 4 Downlink Authorized Frequency Range (2110 – 2155 MHz) (MCC/MNC: 123-456)

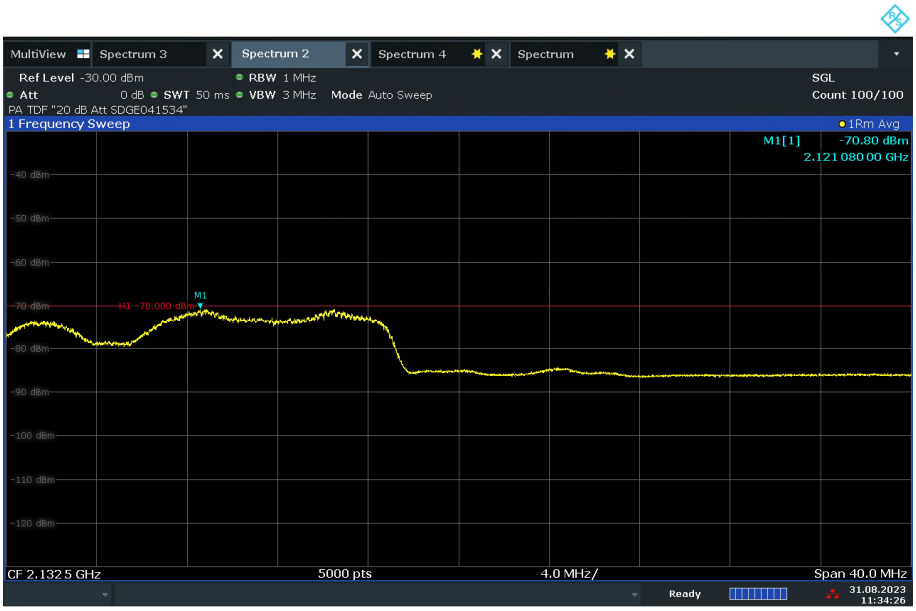
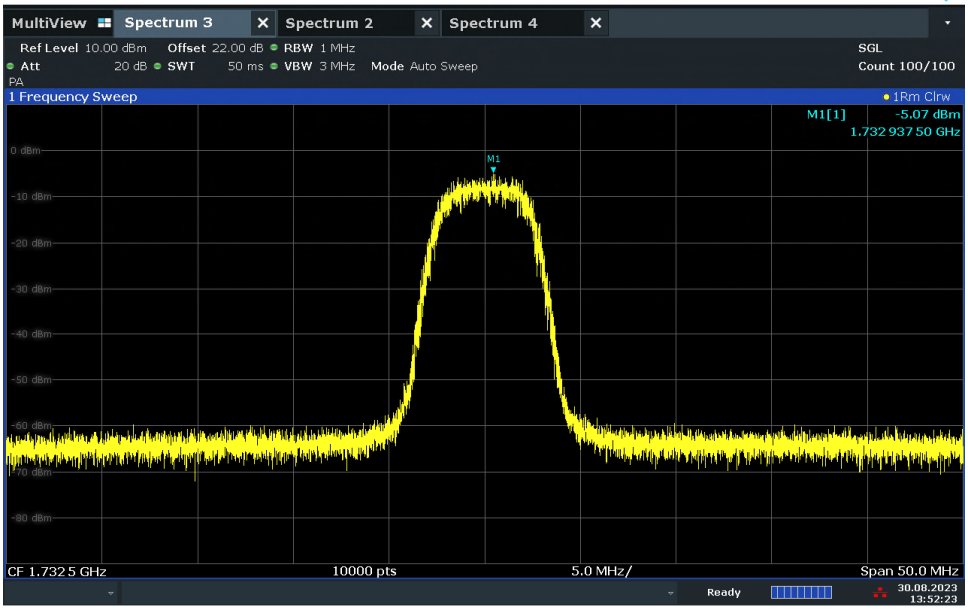


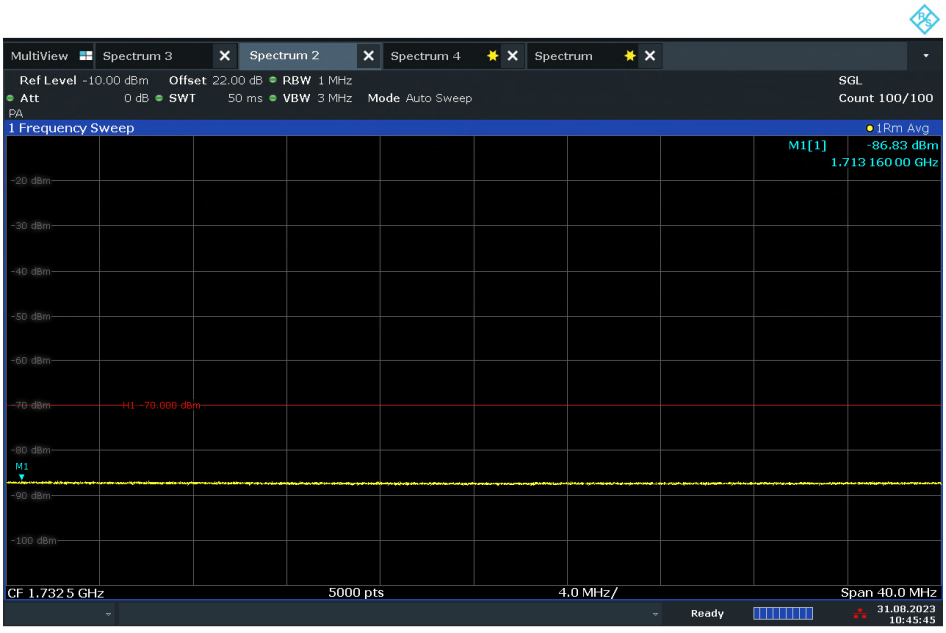
11:06:50 30.08.2023

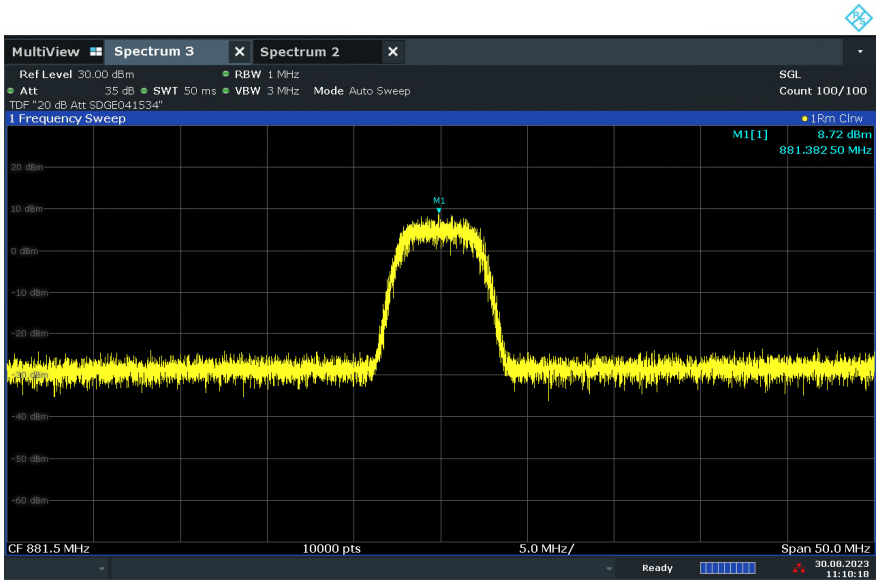
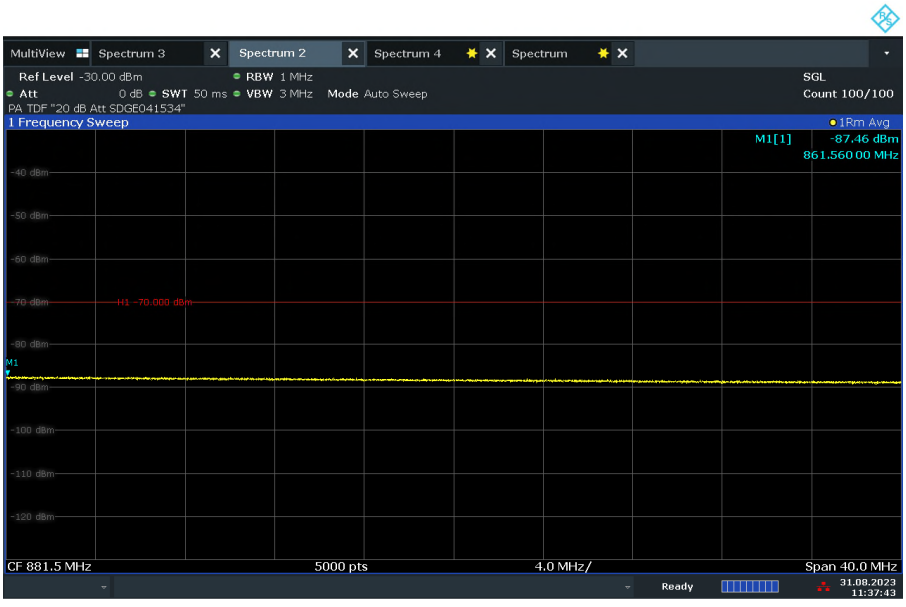
LTE Band 4 Downlink Authorized Frequency Range (2110 – 2155 MHz) (MCC/MNC: 123-619)



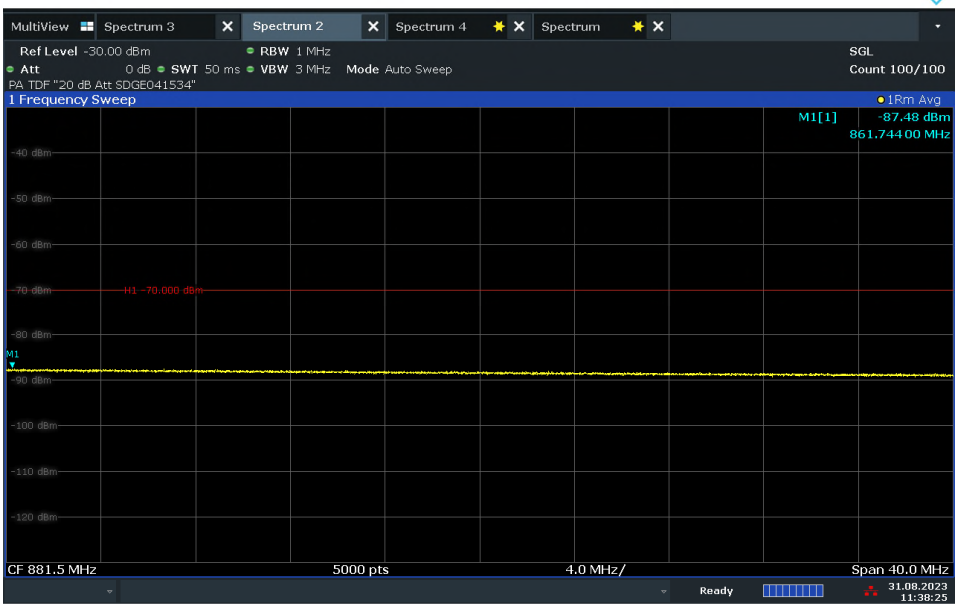
11:33:29 31.08.2023

LTE Band 4 Downlink Authorized Frequency Range (2110 – 2155 MHz) (MCC/MNC: 123-916)
 11:34:27 31.08.2023
LTE Band 4 Uplink Authorized Frequency Range (1710 – 1755 MHz) (MCC/MNC: 123-456)
 13:52:24 30.08.2023

LTE Band 4 Uplink Authorized Frequency Range (1710 – 1755 MHz) (MCC/MNC: 123-619)
 **10:44:27 31.08.2023**
LTE Band 4 Uplink Authorized Frequency Range (1710 – 1755 MHz) (MCC/MNC: 123-916)
 **10:45:45 31.08.2023**

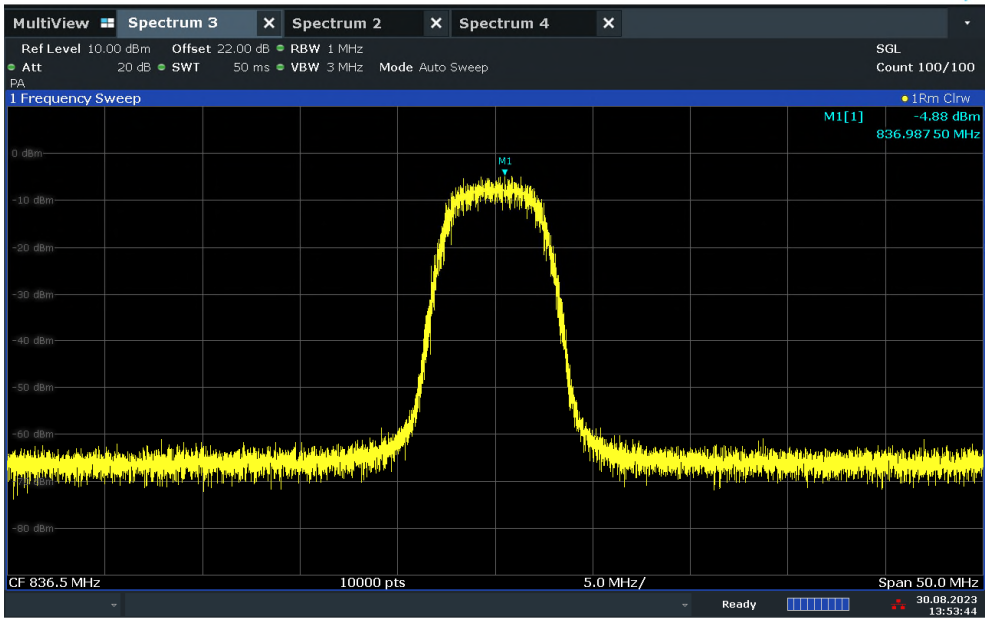
LTE Band 5 Downlink Authorized Frequency Range (869-894 MHz) (MCC/MNC: 123-456)
   11:10:18 30.08.2023
LTE Band 5 Downlink Authorized Frequency Range (869-894 MHz) (MCC/MNC: 123-619)
   11:37:44 31.08.2023

LTE Band 5 Downlink Authorized Frequency Range (869-894 MHz) (MCC/MNC: 123-916)



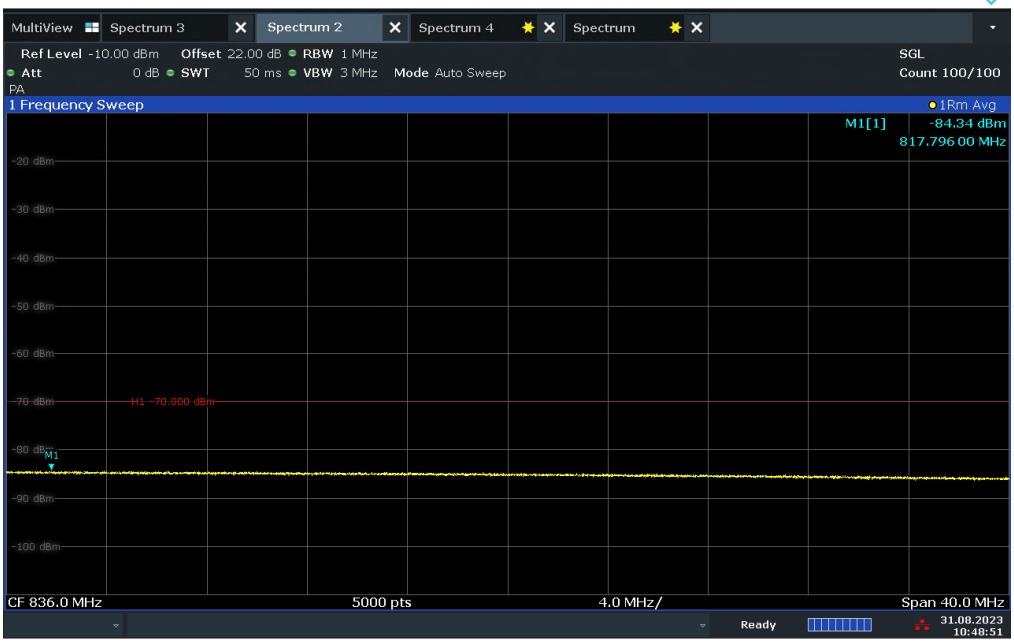
11:38:25 31.08.2023

LTE Band 5 Uplink Authorized Frequency Range (824-849 MHz) (MCC/MNC: 123-456)



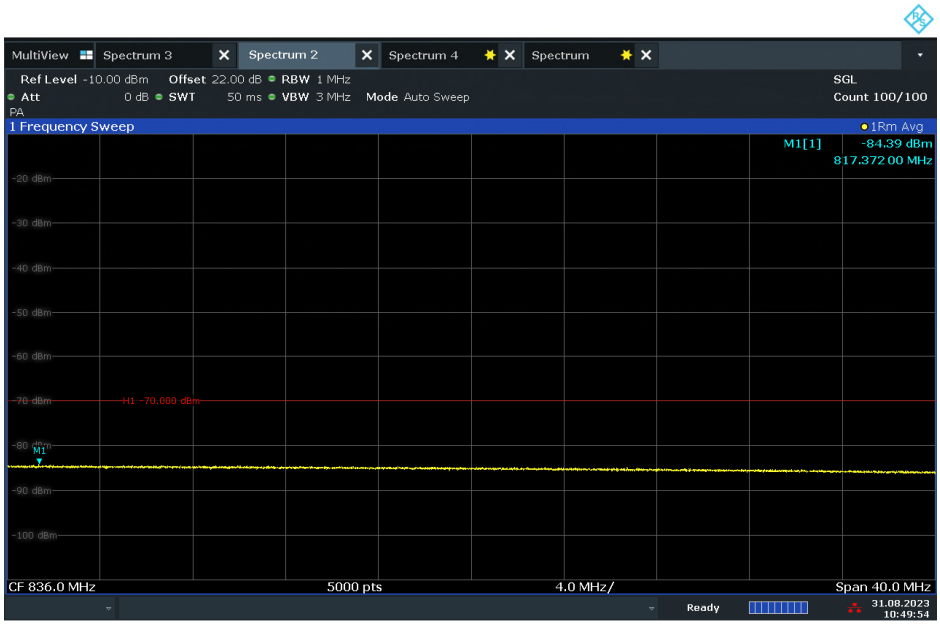
13:53:44 30.08.2023

LTE Band 5 Uplink Authorized Frequency Range (824-849 MHz) (MCC/MNC: 123-619)

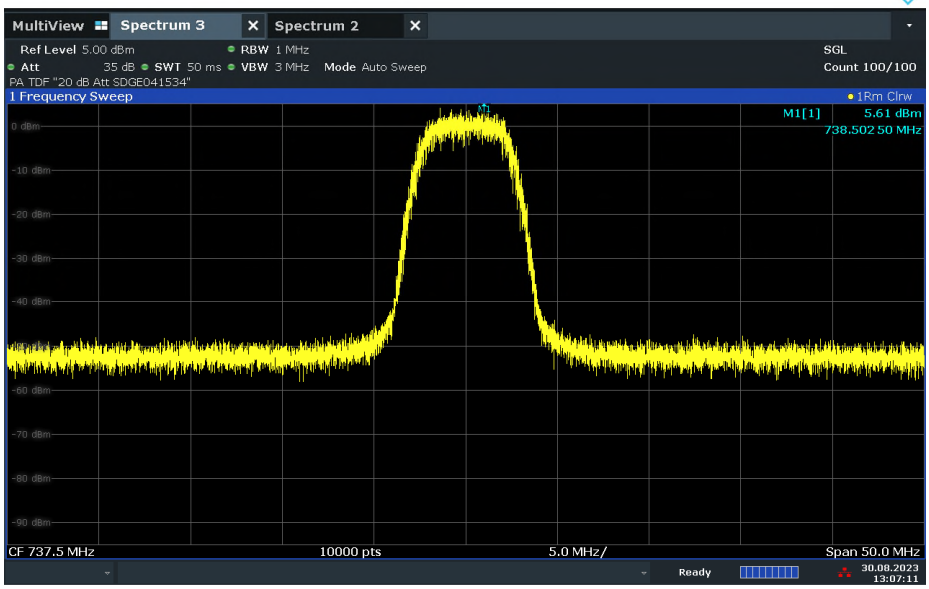
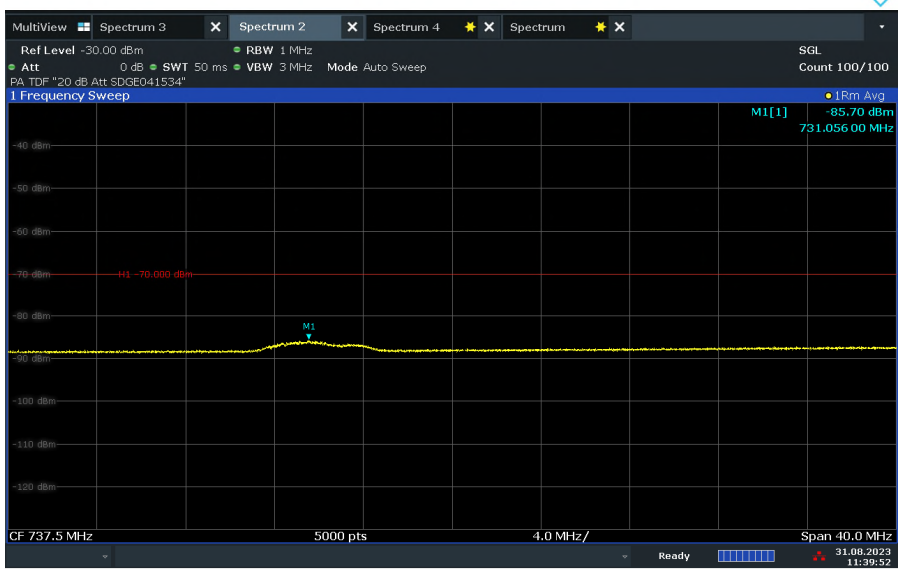


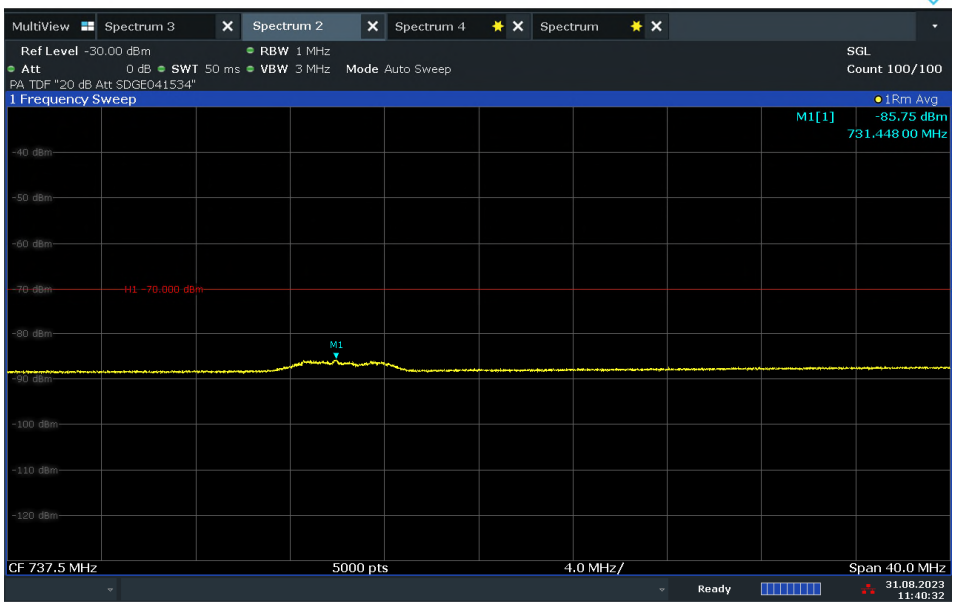
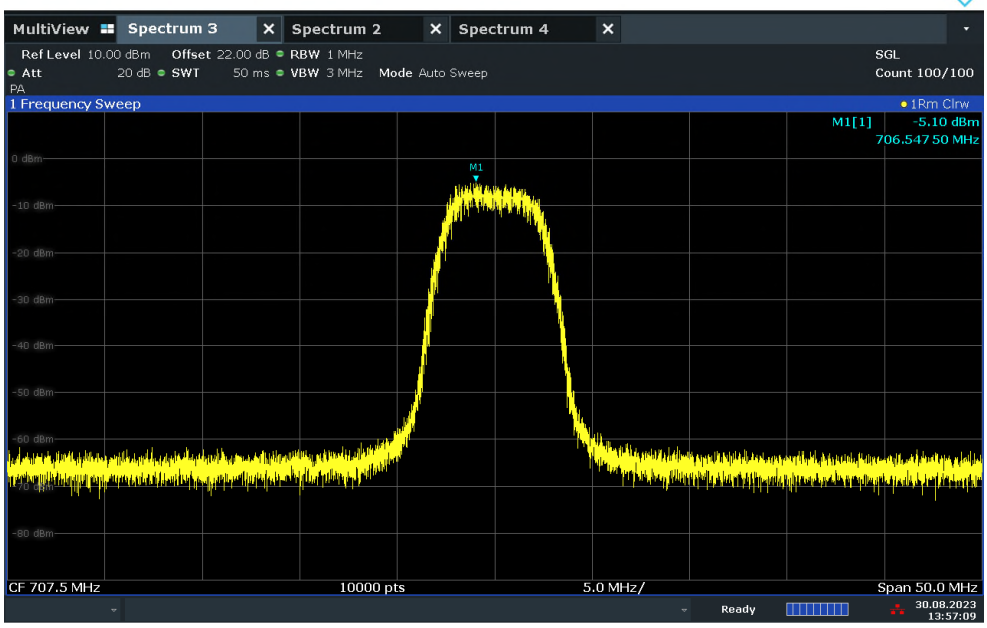
10:48:52 31.08.2023

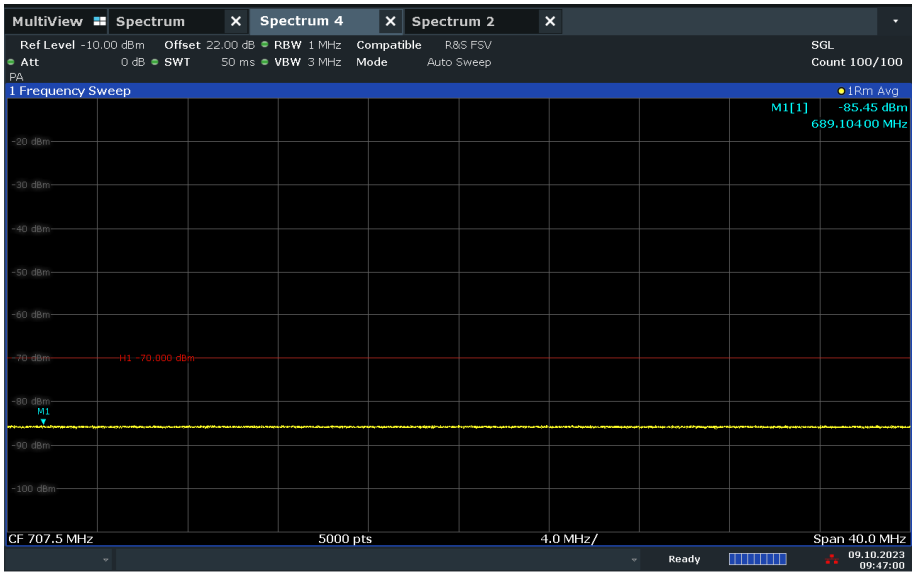
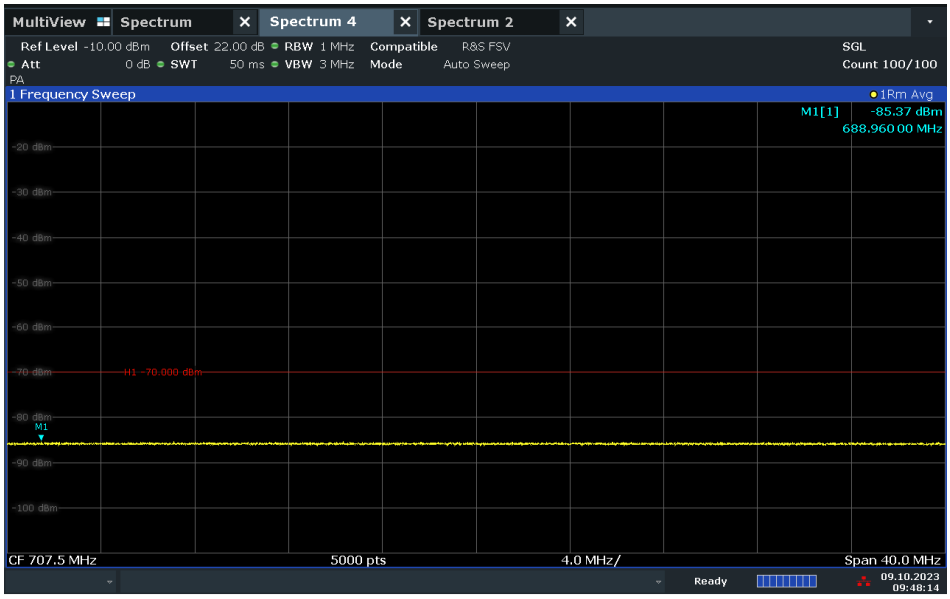
LTE Band 5 Uplink Authorized Frequency Range (824-849 MHz) (MCC/MNC: 123-916)

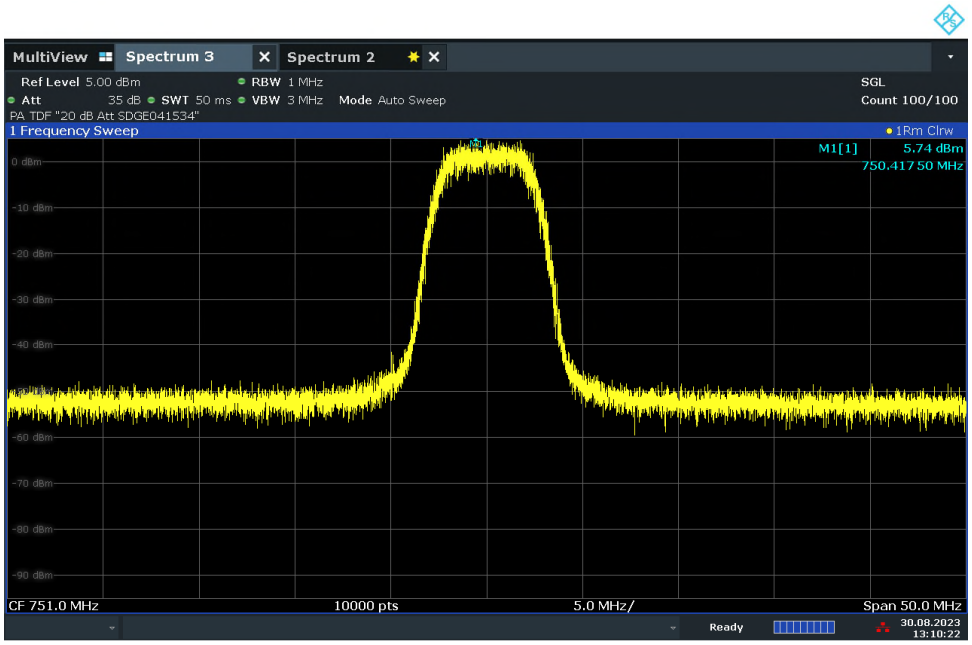
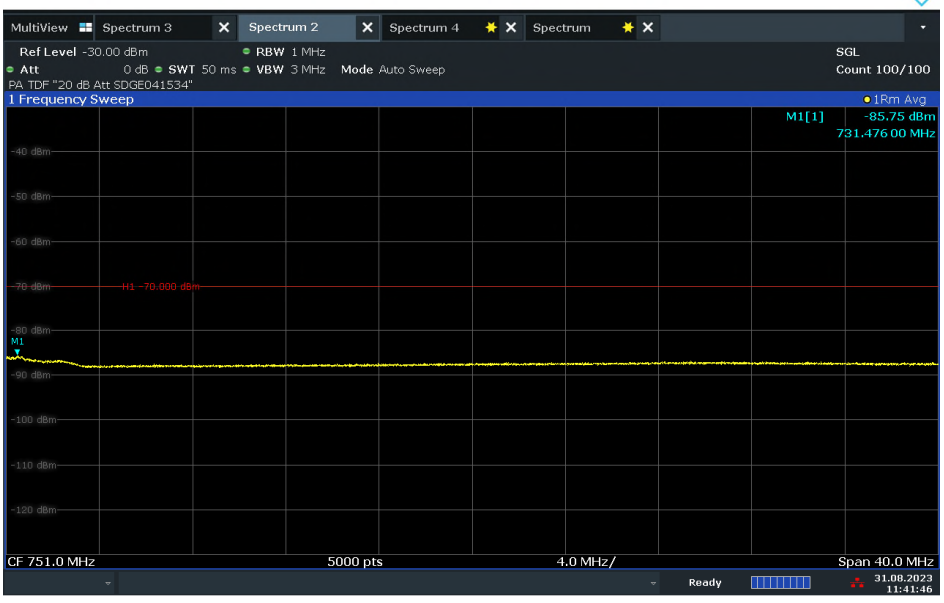


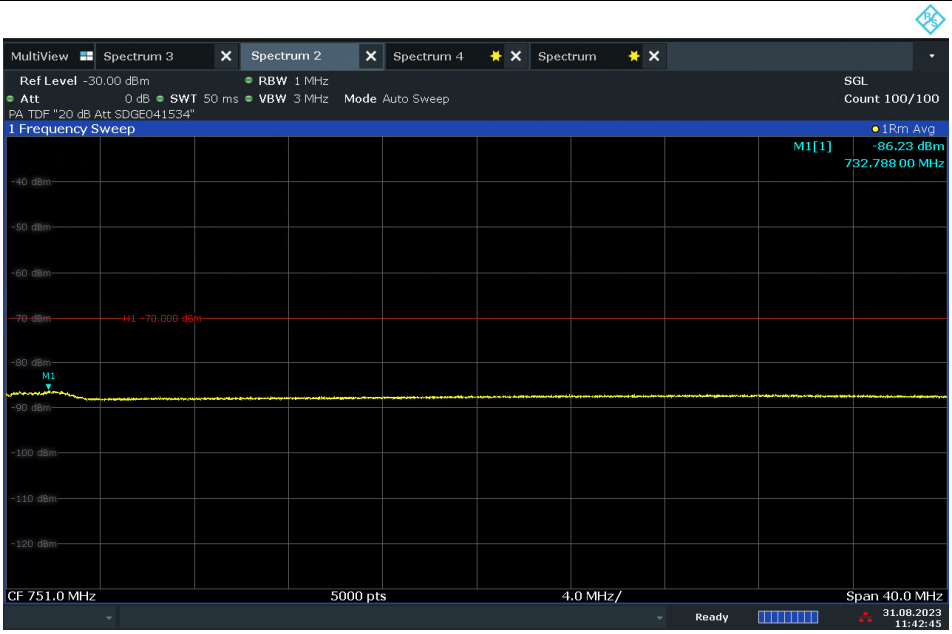
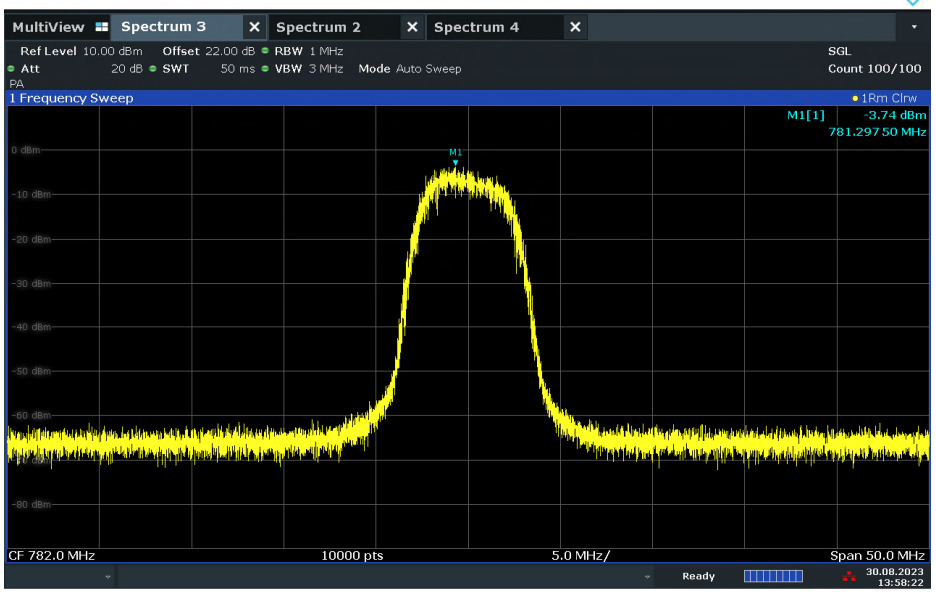
10:49:55 31.08.2023

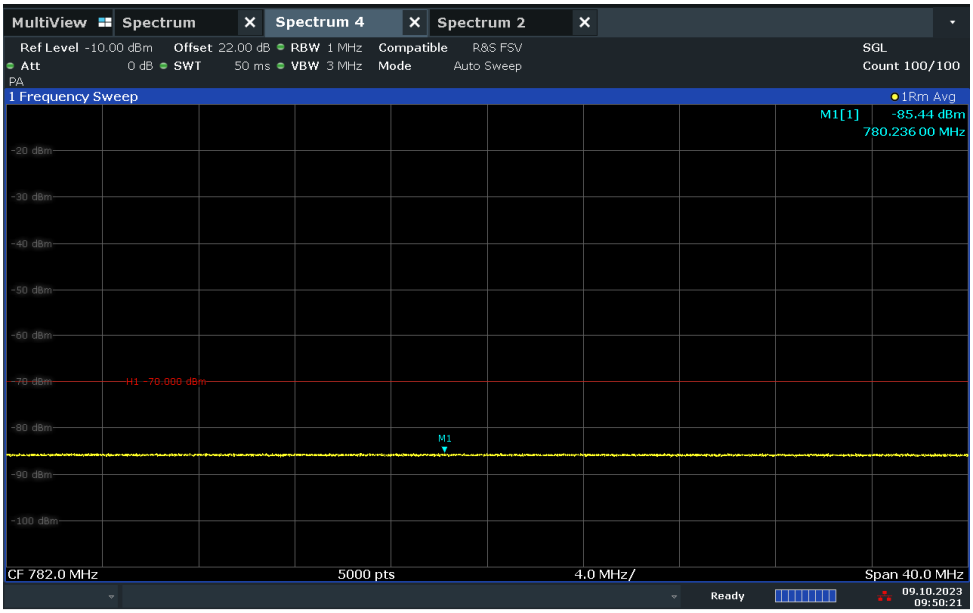
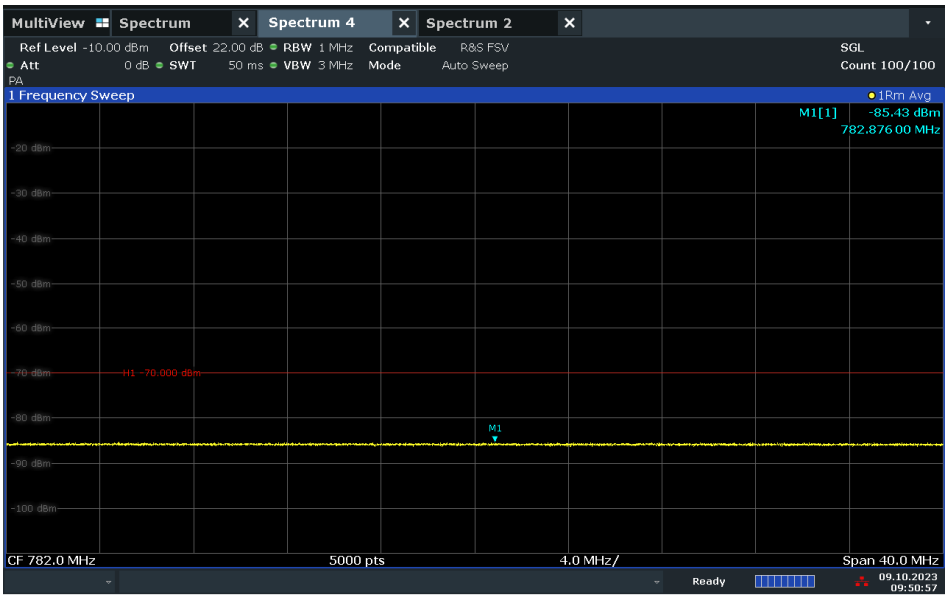
LTE Band 12 Downlink Authorized Frequency Range (729 – 746 MHz) (MCC/MNC: 123-456)
   13:07:12 30.08.2023
LTE Band 12 Downlink Authorized Frequency Range (729 – 746 MHz) (MCC/MNC: 123-619)
   11:39:52 31.08.2023

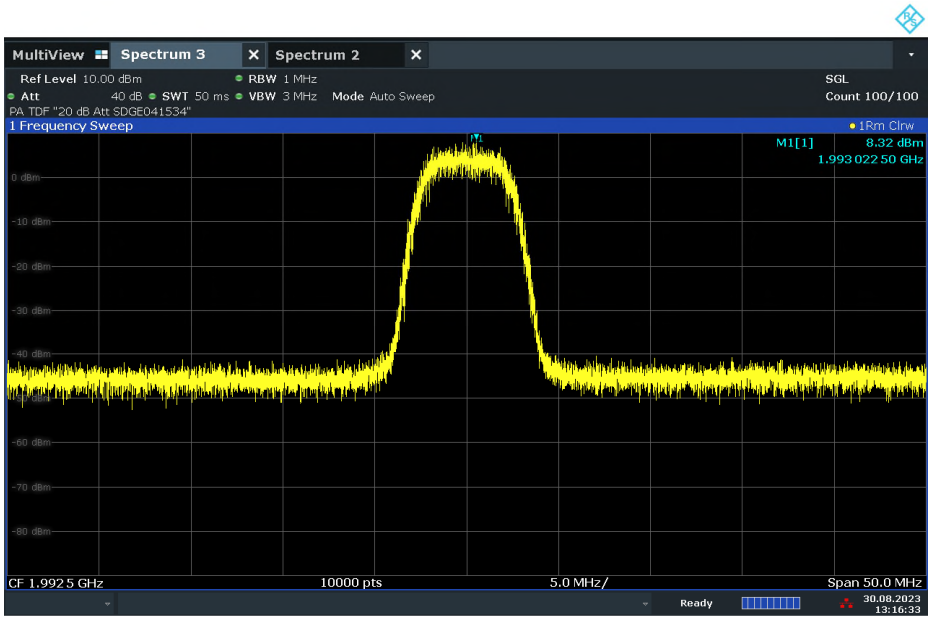
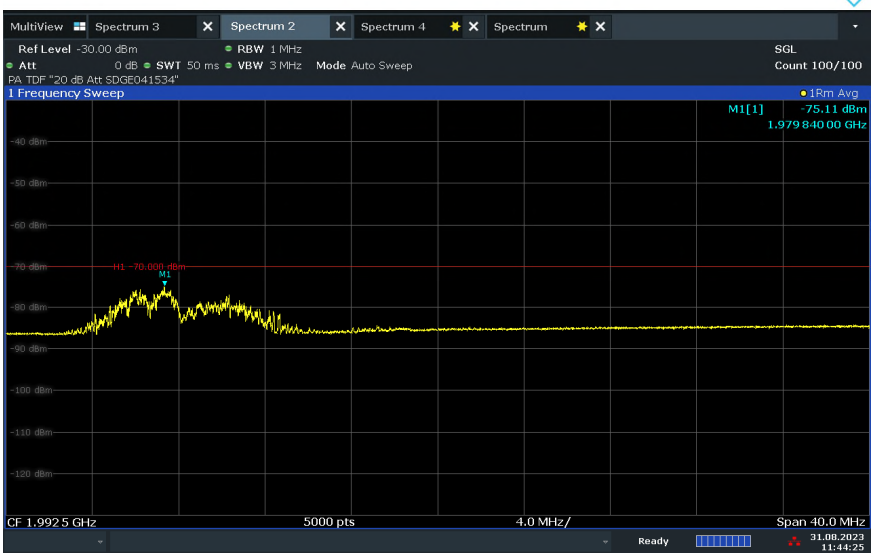
LTE Band 12 Downlink Authorized Frequency Range (729 – 746 MHz) (MCC/MNC: 123-916)
 11:40:33 31.08.2023
LTE Band 12 Uplink Authorized Frequency Range (699 – 716 MHz) (MCC/MNC: 123-456)
 13:57:09 30.08.2023

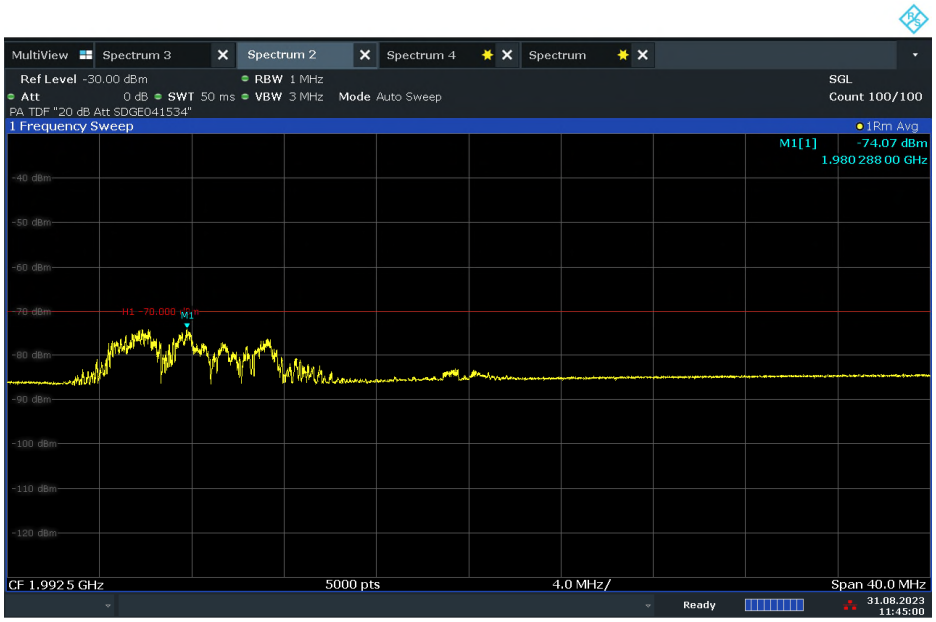
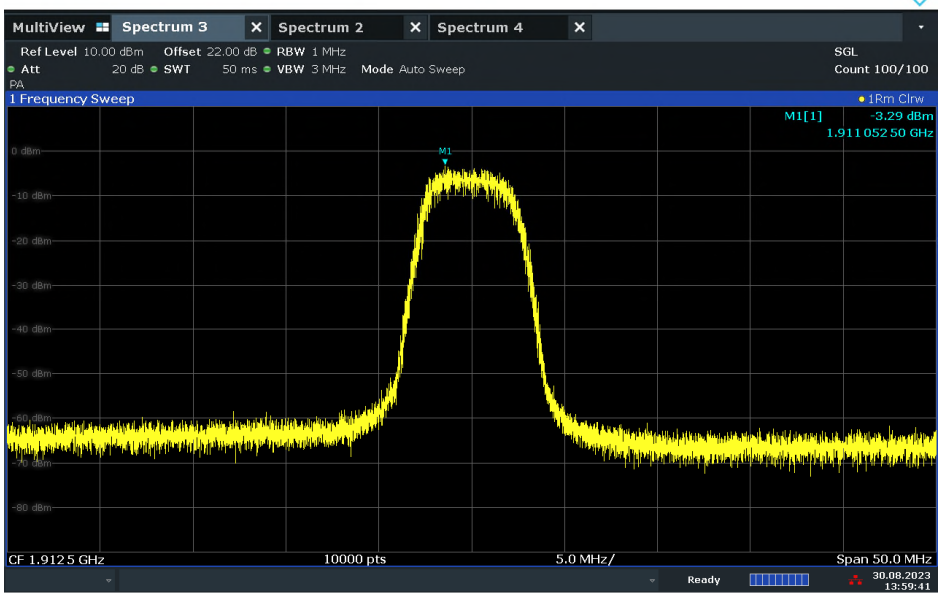
LTE Band 12 Uplink Authorized Frequency Range (699 – 716 MHz) (MCC/MNC: 123-619)
 09:47:00 09.10.2023
LTE Band 12 Uplink Authorized Frequency Range (699 – 716 MHz) (MCC/MNC: 123-916)
 09:48:14 09.10.2023

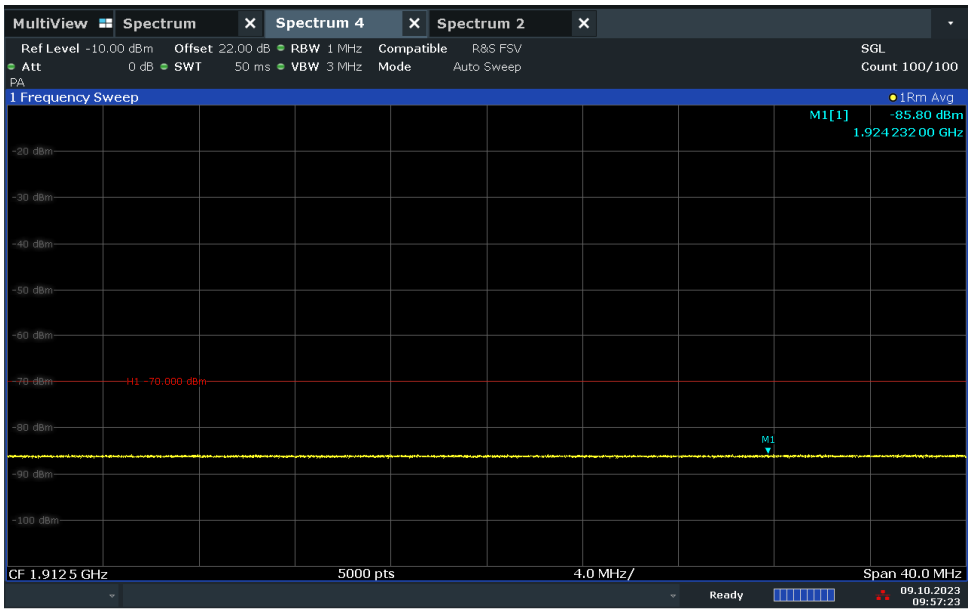
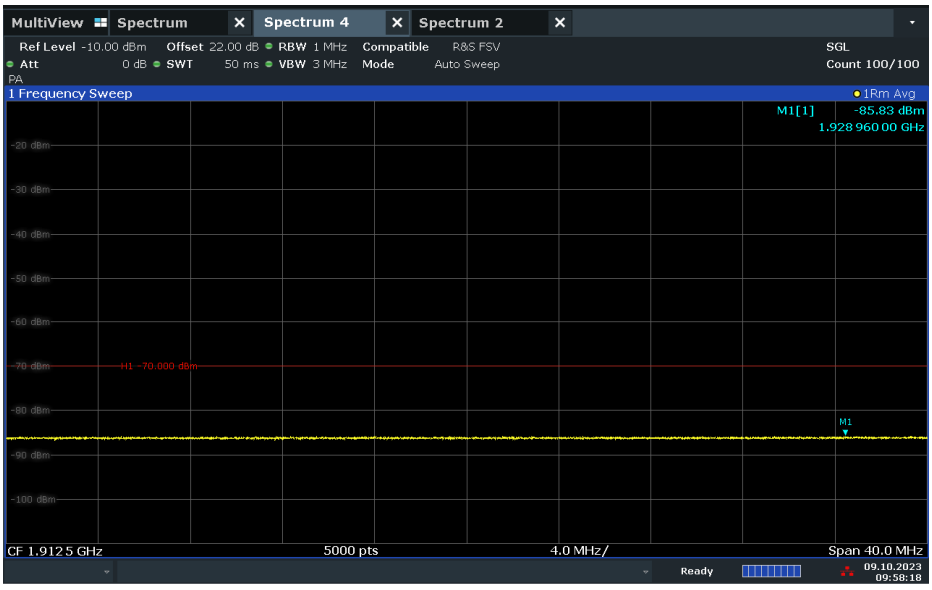
LTE Band 13 Downlink Authorized Frequency Range (746 – 756 MHz) (MCC/MNC: 123-456)
 13:10:22 30.08.2023
LTE Band 13 Downlink Authorized Frequency Range (746 – 756 MHz) (MCC/MNC: 123-619)
 11:41:47 31.08.2023

LTE Band 13 Downlink Authorized Frequency Range (746 – 756 MHz) (MCC/MNC: 123-916)
   11:42:46 31.08.2023
LTE Band 13 Uplink Authorized Frequency Range (777 – 787 MHz) (MCC/MNC: 123-456)
   13:58:23 30.08.2023

LTE Band 13 Uplink Authorized Frequency Range (777 – 787 MHz) (MCC/MNC: 123-619)
 09:50:21 09.10.2023
LTE Band 13 Uplink Authorized Frequency Range (777 – 787 MHz) (MCC/MNC: 123-916)
 09:50:58 09.10.2023

LTE Band 25 Downlink Authorized Frequency Range (1930 – 1995 MHz) (MCC/MNC: 123-456)
 13:16:34 30.08.2023
LTE Band 25 Downlink Authorized Frequency Range (1930 – 1995 MHz) (MCC/MNC: 123-619)
 11:44:26 31.08.2023

LTE Band 25 Downlink Authorized Frequency Range (1930 – 1995 MHz) (MCC/MNC: 123-916)
 11:45:01 31.08.2023
LTE Band 25 Uplink Authorized Frequency Range (1850 – 1915 MHz) (MCC/MNC: 123-456)
 13:59:42 30.08.2023

LTE Band 25 Uplink Authorized Frequency Range (1850 – 1915 MHz) (MCC/MNC: 123-619)
   09:57:24 09.10.2023
LTE Band 25 Uplink Authorized Frequency Range (1850 – 1915 MHz) (MCC/MNC: 123-916)
   09:58:19 09.10.2023

2.3 Maximum Power Measurement And Booster Gain Computation

2.3.1 Specification Reference

FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(D)
FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(B)
FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(C)(2)
KDB935210 D04, Clause 7.2
KDB935210 D04, Clause 7.33

2.3.2 Standard Applicable

FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(D) Power Limits:
A booster's uplink power must not exceed 1 watt composite conducted power and equivalent isotropic radiated power (EIRP) for each band of operation. Downlink power shall not exceed 0.05 watt (17dBm) composite and 10 dBm per channel conducted and EIRP for each band of operation. Compliance with power limits will use instrumentation calibrated in terms of RMS equivalent voltage.

FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(B) Bidirectional Capability:
Consumer Boosters must be able to provide equivalent (within 9dB as per ANSI ASC C63) uplink and downlink gain and conducted uplink power output that is at least 0.05 watts. One-way consumer boosters (i.e., uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering used must provide uplink filter attenuation not less than the downlink filter attenuation, and where RSSI is measured after spectrum block filtering is applied referenced to the booster's input port for each band of operation.

FCC 47 CFR Part 20, Clause 20.21(e)(9)(i)(C) Booster Gain Limits.
The gain of the frequency selective consumer booster shall meet the limits below.
(2) The uplink and downlink maximum gain of a frequency selective consumer booster referenced to its input and output ports shall not exceed 19.5 dB + 20 Log (Frequency), or 100 dB for systems having automatic gain adjustment based on isolation measurements between booster donor and server antennas.
Where, Frequency is the uplink midband frequency of the supported spectrum bands in MHz..

2.3.3 Equipment Under Test and Modification State

Serial No: 560311000026/ Test Configuration (N/A, calculation only)

Serial No: 560311000026 / Test Configuration A and B

2.3.4 Date of Test/Initial of test personnel who performed the test.

August 02, October 29, 2023 /MARG

2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	26.3° - 27.2C
Relative Humidity	53.3 - 58.4%
ATM Pressure	99.0 – 99.8kPa

2.3.7 Additional Observations

- This is conducted Test. Test procedure is per Section 7.2.2 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- Uplink Max System Gain calculations for EIRP were based on MPE limits
- The EUT operated in Test Mode, with the gain set to the maximum gain and a minimum bandwidth setting (5MHz).
- Setup the EUT according to Figure 2 or 3 of Section 6.3.3 of KDB935210 as appropriate.
- Maximum Gain of the booster was calculated.
- Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.
- Per Client request only High Channel was tested for Band 25
- Evaluations are conducted. The signal generator was set to transmit a 5MHz LTE signal.
- Only test plots for middle channel presented as the representative configuration except for Band 25.
- Uplink Power should be higher than 17 dBm.

2.3.8 Test Results Maximum Gain

Maximum Gain					
Band	**Frequency Range (MHz)**	**Gain (dB)**	**Gain Limit (dB)**	**UL vs DL Gain**	**UL vs DL Gain Limit (dB)**
LTE Band 2 Downlink	1930-1990	97.91	100	1.45	9.0
LTE Band 2 Uplink	1850-1910	99.36	100		
LTE Band 4 Downlink	2110 - 2155	98.65	100	0.97	9.0
LTE Band 4 Uplink	1710 - 1755	99.62	100		
LTE Band 5 Downlink	869 - 894	94.6	100	0.77	9.0
LTE Band 5 Uplink	824 - 849	95.37	100		
LTE Band 12 Downlink	729-746	94.68	100	0.73	9.0
LTE Band 12 Uplink	699-716	95.41	100		9.0
LTE Band 13 Downlink	746-756	93.91	100	1.37	9.0
LTE Band 13 Uplink	777-787	95.28	100		9.0

LTE Band 25 Downlink	1930-1995	96.39	100	2.71	9.0
LTE Band 25 Uplink	18850-1915	99.1	100		9.0

2.3.9 Test Results Power Output

Power Output (Conducted / EIRP) LTE Band 2 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	625	1932.5	9.83	20.67	**0.17**	10	20.84	10
	900	1960	9.31	19.89	0.69	10	20.58	10
	1175	1987.5	8.94	19.59	1.06	10	20.65	10
10	650	1935	12.37	23.5	4.63	17	28.13	17
	900	1960	12.46	23.79	4.54	17	28.33	17
	1150	1985	11.26	22.43	5.74	17	28.17	17
15	675	1937	14.05	26.35	2.95	17	29.3	17
	900	1960	14.46	26.7	2.54	17	29.24	17
	1125	1982.5	13.67	24.96	3.33	17	28.29	17
20	700	1940	**15.87**	**26.97**	1.13	17	28.1	17
	900	1960	15.41	27.52	1.59	17	29.11	17
	1100	1980	14.51	26.81	2.49	17	29.3	17

Power Output (Conducted / EIRP) LTE Band 2 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	18625	1852.5	21.79	31.69	8.21	30	39.9	30
	18925	1882.5	21.06	32.18	8.94	30	41.12	30
	1917	1907.5	21.43	32.23	8.57	30	40.8	30
10	18650	1855	21.69	31.58	8.31	30	39.89	30
	18900	1880	21.04	31.65	8.96	30	40.61	30
	19150	1905	**21.86**	**32.14**	**8.14**	30	40.28	30
15	18675	1857.5	21.72	32.51	8.28	30	40.79	30
	18900	1880	21.11	32.07	8.89	30	40.96	30
	19125	1902.5	21.06	31.95	8.94	30	40.89	30
20	18700	1860	21.61	31.96	8.39	30	40.35	30
	18900	1880	21.59	32.32	8.41	30	40.73	30
	19100	1900	21.62	32.14	8.38	30	40.52	30

Power Output (Conducted / EIRP) LTE Band 4 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	1975	2112.5	8.82	20.61	1.18	10	21.79	10
	2175	2132.5	9.14	21.11	0.86	10	21.97	10
	2375	2152.5	9.95	22.03	**0.05**	10	22.08	10
10	2000	2115	12.43	23.72	4.57	17	28.29	17
	2175	2132.5	12.28	23.56	4.72	17	28.28	17
	2350	2150	12.57	23.35	4.43	17	27.78	17
15	2025	2117.5	14.45	25.88	2.55	17	28.43	17
	2175	2132.5	14.45	25.85	2.55	17	28.4	17
	2325	2147.5	14.16	26.22	2.84	17	29.06	17
20	2050	2120	**15.59**	**27**	1.41	17	28.41	17
	2175	2132.5	15.4	26.23	1.6	17	27.83	17
	2300	2145	15.23	26.84	1.77	17	28.61	17

Power Output (Conducted / EIRP) LTE Band 4 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	19975	1712.5	21.32	31.18	8.68	30	39.86	30
	20175	1732.5	22.08	31.75	7.92	30	39.67	30
	20375	1752.5	21.96	32.36	8.04	30	40.4	30
10	20000	1715	22.20	31.61	7.8	30	39.41	30
	20175	1732.5	22.16	31.44	7.84	30	39.28	30
	20350	1750	22.16	32.00	7.84	30	39.84	30
15	20025	1717.5	22.15	32.31	7.85	30	40.16	30
	20175	1732.5	22.28	31.81	7.72	30	39.53	30
	20325	1747.5	**22.32**	**32.50**	**7.68**	30	40.18	30
20	20050	1720	21.99	31.74	8.01	30	39.75	30
	20175	1732.5	22.06	31.49	7.94	30	39.43	30
	20300	1745	22.09	31.93	7.91	30	39.84	30

Power Output (Conducted / EIRP) LTE Band 5 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	2425	871.5	9.03	19.44	0.97	10	20.41	10
	2525	881.5	9.64	20.52	0.36	10	20.88	10
	2625	891.5	9.92	21.39	**0.08**	10	21.47	10
10	2450	874	**12.10**	**23.30**	4.9	17	28.2	17
	2525	881.5	10.52	21.31	6.48	17	27.79	17
	2600	889	10.10	21.46	6.9	17	28.36	17

Power Output (Conducted / EIRP) LTE Band 5 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	20425	826.5	19.36	30.92	10.64	30	36.06	30
	20525	836.5	19.41	31.42	10.59	30	36.51	30
	20625	846.5	**19.66**	**31.71**	**10.34**	30	36.55	30
10	20450	829	19.51	30.91	10.49	30	35.9	30
	20525	836.5	19.57	31.14	10.43	30	36.07	30
	20600	844	19.34	30.75	10.66	30	35.91	30

Power Output (Conducted / EIRP) LTE Band 12 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	5035	731.5	9.73	21.34	**0.27**	10	21.61	10
	5095	737.5	9.29	19.58	0.71	10	20.29	10
	5155	743.5	9.1	19.92	0.9	10	20.82	10
10	5060	734	**12.70**	**23.48**	4.3	17	27.78	17
	5095	737.5	12.18	22.94	4.82	17	27.76	17
	5130	741	11.51	22.58	5.49	17	28.07	17

Power Output (Conducted / EIRP) LTE Band 12 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	23035	701.5	19.30*	28.29	10.7	30	38.99	30
	23095	707.5	19.43	28.62	10.57	30	39.19	30
	23155	713.5	19.56	28.63	10.44	30	39.07	30
10	23060	704	19.31	28.46	10.69	30	39.15	30
	23095	707.5	**19.81**	**29.04**	**10.19**	30	39.23	30
	23130	711	19.31	29.15	10.69	30	39.84	30

*: Lower UL Output Power = 19.30

Power Output (Conducted / EIRP) LTE Band 13 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	5205	748.5	9.24	21.51	0.76	10	22.27	10
	5230	751	9.42	20.09	0.58	10	20.67	10
	5255	753.5	9.95	20.59	**0.05**	10	20.64	10
10	---	---						
	5230	751	**11.41**	**22.50**	5.59	13	28.09	17
	---	---						

Power Output (Conducted / EIRP) LTE Band 13 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	23205	779.5	**19.78**	**30.21**	10.22	30	10.22	30
	23230	782	19.30	29.95	10.7	30	10.7	30
	23255	784.5	19.69	30.16	10.31	30	10.31	30
10	---	---						30
	23230	782	19.49	29.88	10.51	30	10.51	30
	---	---						30

Power Output (Conducted / EIRP) LTE Band 25 Downlink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	8665	1992.5	9.68	21.03	**0.32**	10	21.35	10
10	8640	1990	12.31	23.19	4.69	17	27.88	17
15	8615	1987.5	13.60	25.46	3.4	17	28.86	17
20	8590	1985	**13.89**	**26.19**	3.11	17	29.3	17

Power Output (Conducted / EIRP) LTE Band 25 Uplink								
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Peak Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)		Average EIRP FCC Part 20 Limit (dBm)
						Average	Peak	
5	26665	1912.5	20.84	30.96	9.45	30	41.33	30
10	26640	1910	20.79	31.79	9.21	30	41	30
15	26615	1907.5	20.95	32.12	9.05	30	41.17	30
20	26590	1905	**21.60**	**33.04**	8.4	30	41.44	30

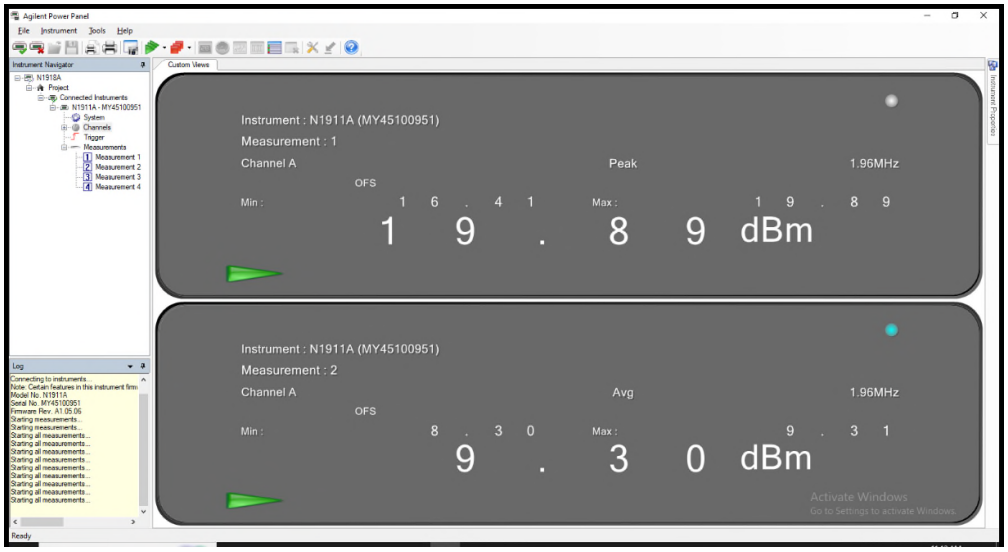
Power Output (Conducted) Downlink 10dBm/5MHz						
Bandwidth (MHz)	Channels	Frequency (MHz)	Average Power (dBm)	Maximum System Gain (Antenna + Cable) (dBi)	EIRP (dBm)	Average EIRP FCC Part 20 Limit (dBm)
					Average	
LTE Band 2						
10	900	1960	9.40	0.6	10	10
15	900	1960	9.42	0.58	10	10
20	900	1960	9.67	0.33	10	10
LTE Band 4						
10	2175	2132.5	9.13	0.87	10	10
15	2175	2132.5	9.32	0.68	10	10
20	2175	2132.5	9.63	0.37	10	10
LTE Band 5						
10	2525	881.5	9.27	0.73	10	10
LTE Band 12						
10	5095	737.5	9.28	0.72	10	10
LTE Band 13						
10	5230	751	9.53	0.47	10	10

LTE Band 25						
10	8640	1990	9.70	0.3	10	10
15	8615	1987.5	9.33	0.67	10	10
20	8590	1985	9.45	0.55	10	10

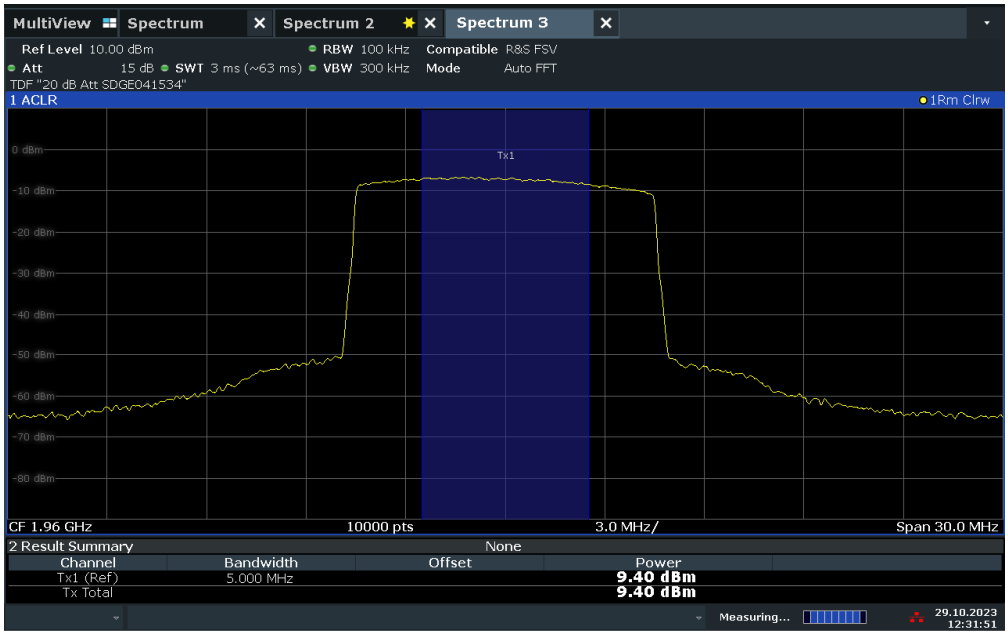
2 Bands/port worst case configuration (Downlink)				
Ant Port	**Band/Bandwidth/Channel**	**Frequency (MHz)**	**Average Power (dBm)**	**Peak Power (dBm)**
Server Port	LTE B2 Low Ch 20MHz & LTE B4 High Ch 20MHz	1940 + 2120	15.52	25.84
	LTE B2 Low Ch 20MHz & LTE B5 Low Ch 10MHz	1940 + 874	15.6	25.51
	LTE B2 Low Ch 20MHz & LTE B12 Low Ch 10MHz	1940 +734	15.5	25.57
	LTE B2 Low Ch 20MHz & LTE B13 Mid Ch 10MHz	1940 + 751	15.63	25.46
	LTE B4 High Ch 20MHz & LTE B5 Low Ch 10MHz	2120 + 874	**15.72**	**25.71**
	LTE B4 High Ch 20MHz & LTE B12 Low Ch 10MHz	2120 + 734	15.64	25.61
	LTE B4 High Ch 20MHz & LTE B13 Mid Ch 10MHz	2145 + 751	15.68	15.82
	LTE B5 Low Ch 10MHz & LTE B12 Low Ch 10MHz	874 + 734	14.08	24.61
	LTE B5 Low Ch 10MHz & LTE B13 Mid Ch 10MHz	874 + 751	14.9	24.64

2 Bands/port worst case configuration (Uplink)				
Ant Port	**Band/Bandwidth/Channel**	**Frequency (MHz)**	**Average Power (dBm)**	**Peak Power (dBm)**
Donnor Port	LTE B2 High Ch 10MHz & LTE B4 High Ch 15MHz	1905 + 1747.5	23.68	32.19
	LTE B2 High Ch 10MHz & LTE B5 High Ch 5MHz	1905 + 846.5	22.84	31.22
	LTE B2 High Ch 10MHz & LTE B12 Mid Ch 10MHz	1905 + 707.5	22.84	31.22
	LTE B2 High Ch 10MHz & LTE B13 Low Ch 5MHz	1905 + 779.5	22.84	31.22
	LTE B4 High Ch 15MHz & LTE B5 High Ch 5MHz	1747.5 + 846.5	**23.68**	**32.19**
	LTE B4 High Ch 15MHz & LTE B12 Mid Ch 10MHz	1747.5 + 707.5	23.68	32.19
	LTE B4 High Ch 15MHz & LTE B13 Low Ch 5MHz	1747.5 + 779.5	23.68	32.19
	LTE B5 High Ch 5MHz & LTE B12 Mid Ch 10MHz	846.5 + 707.5	21.41	30.70
	LTE B5 High Ch 5MHz & LTE B13 Low Ch 5MHz	846.5 + 779.5	21.30	30.56

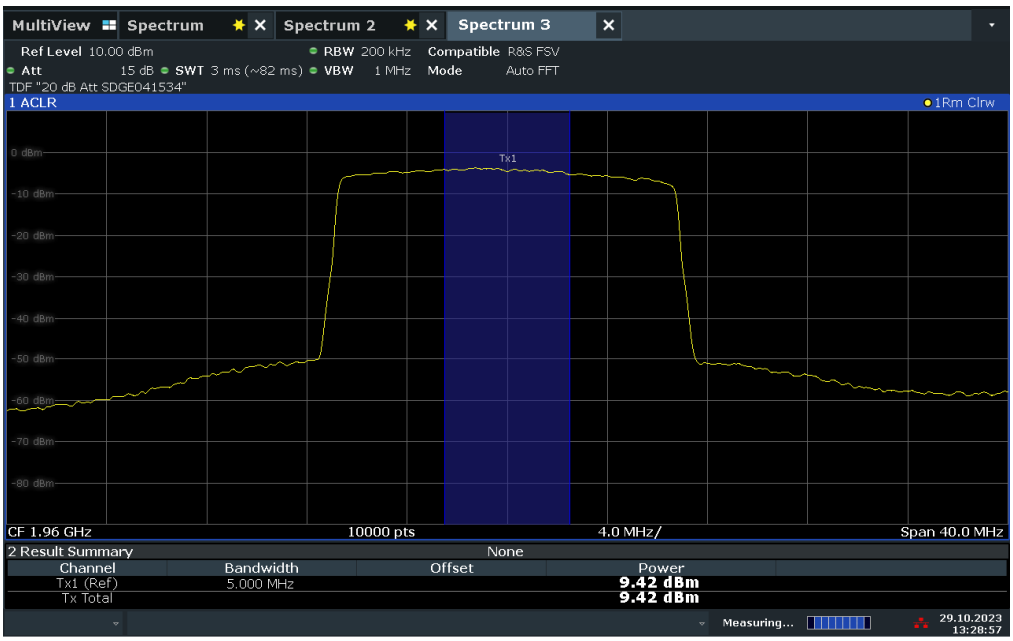
2.3.10 Test Results (Conducted Power)



LTE Band 2 Downlink 5 MHz Bandwidth Middle Channel

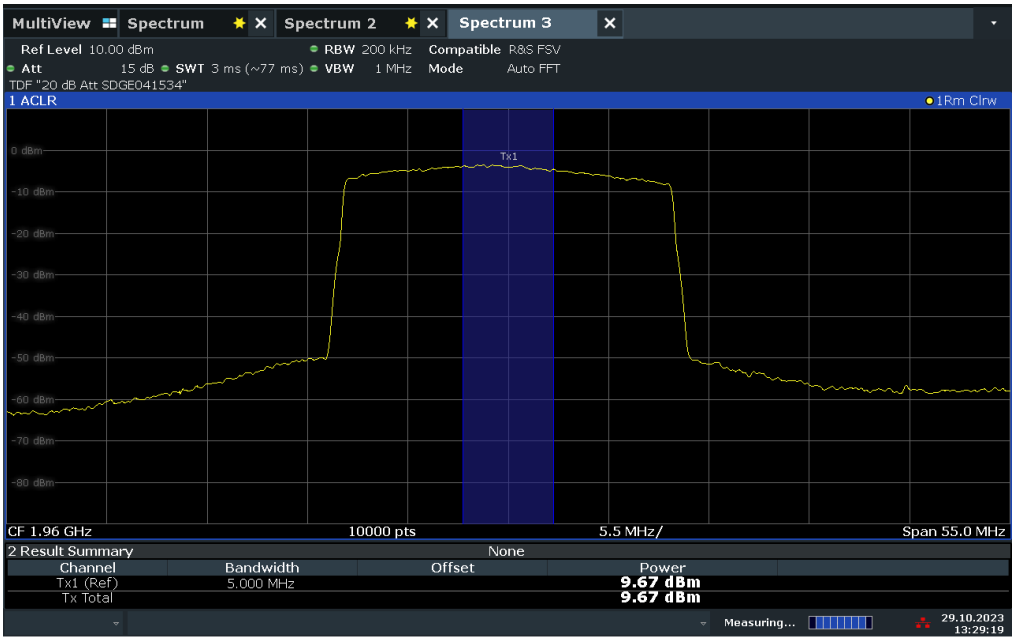


LTE Band 2 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel



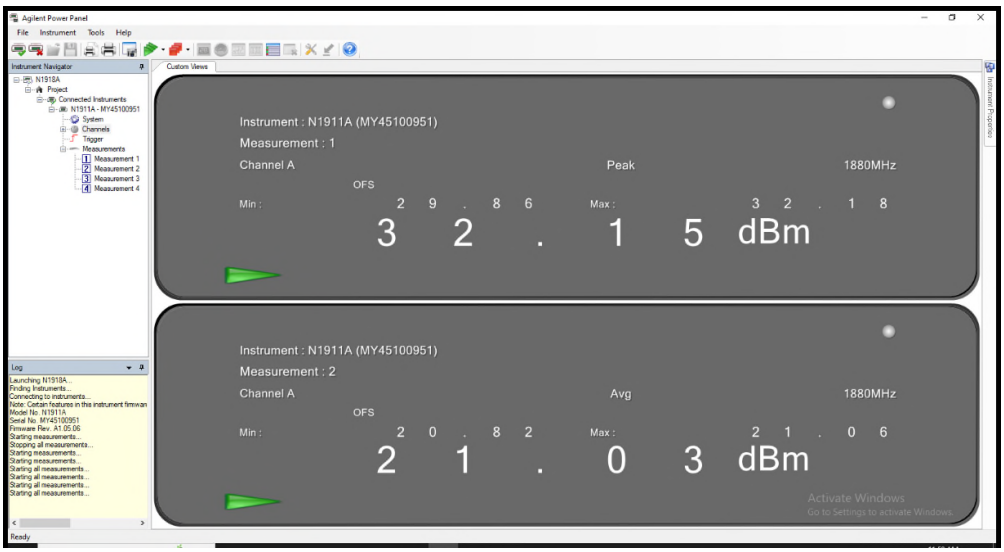
13:28:57 29.10.2023

LTE Band 2 Downlink 10dBm/5MHz 15 MHz Bandwidth Middle Channel

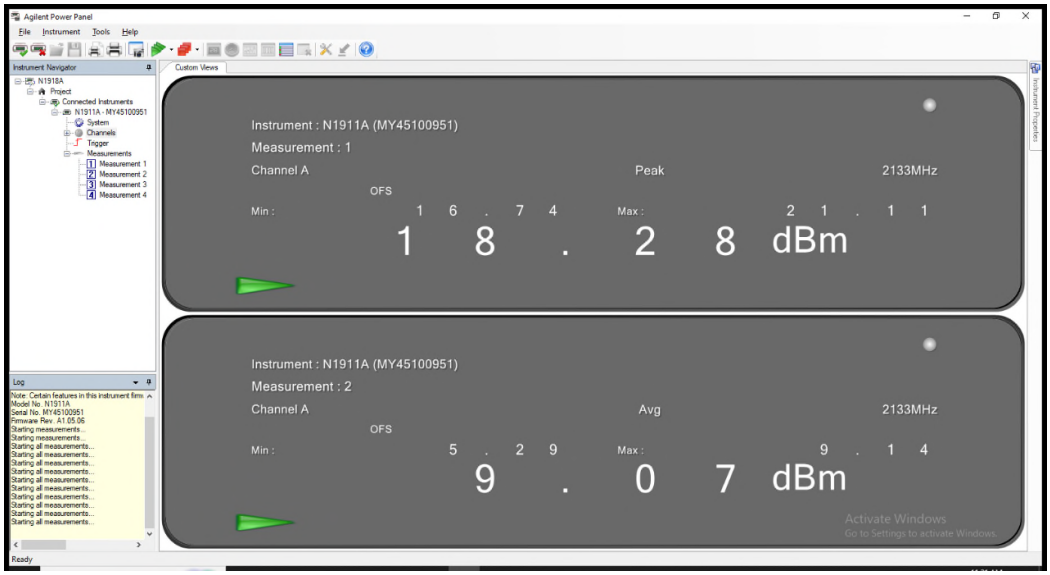


13:29:20 29.10.2023

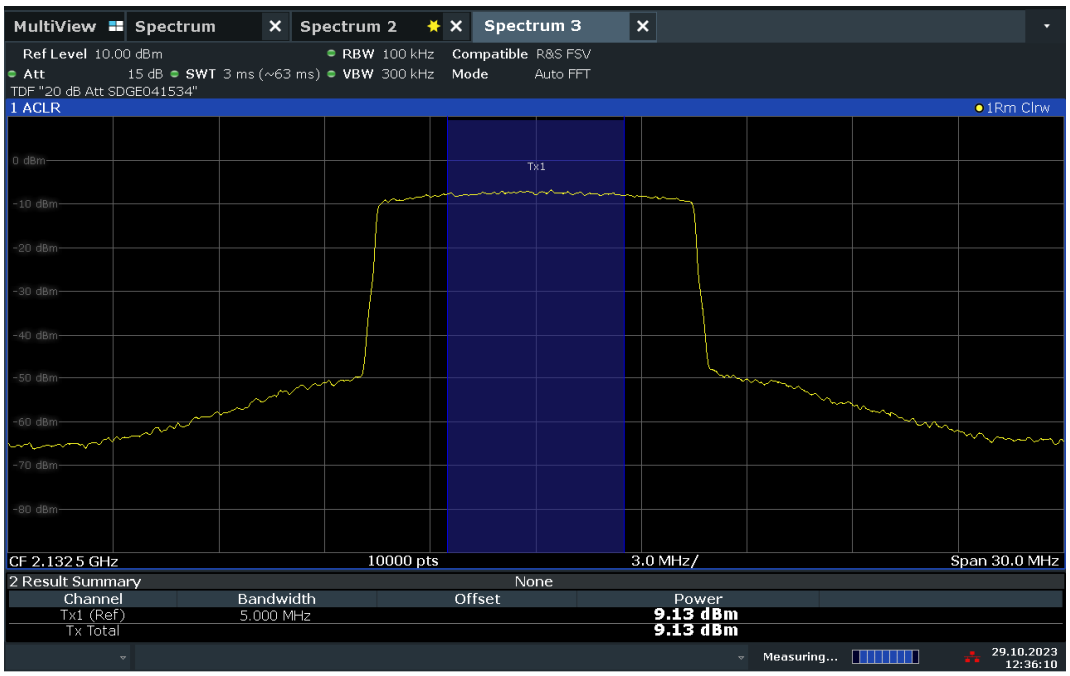
LTE Band 2 Downlink 10dBm/5MHz 20 MHz Bandwidth Middle Channel



LTE Band 2 Uplink 5 MHz Bandwidth Middle Channel

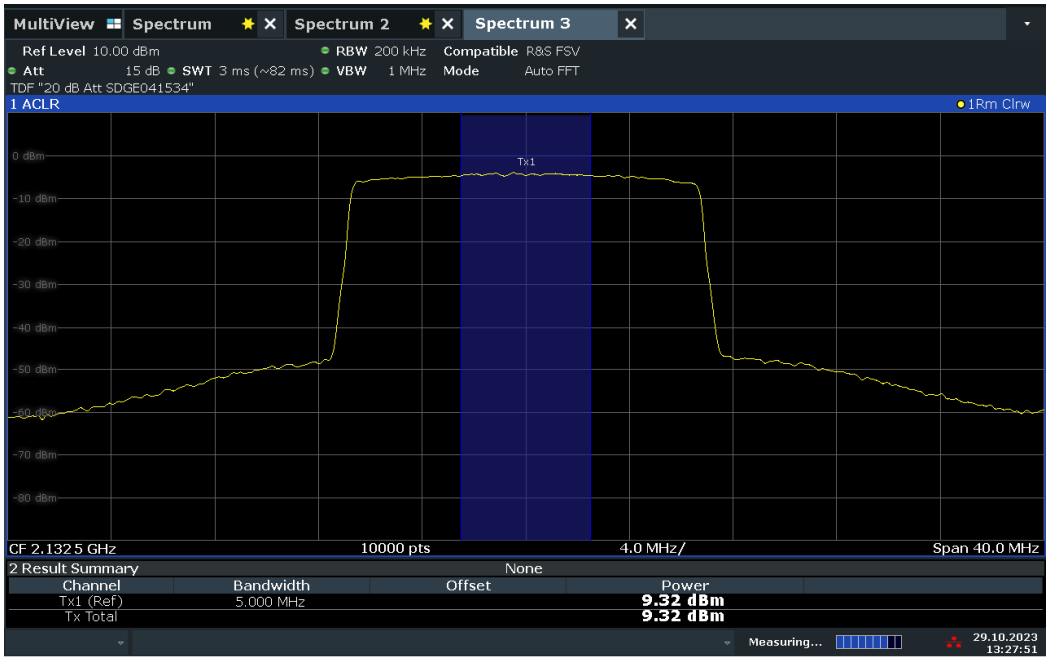


LTE Band 4 Downlink 5 MHz Bandwidth Middle Channel



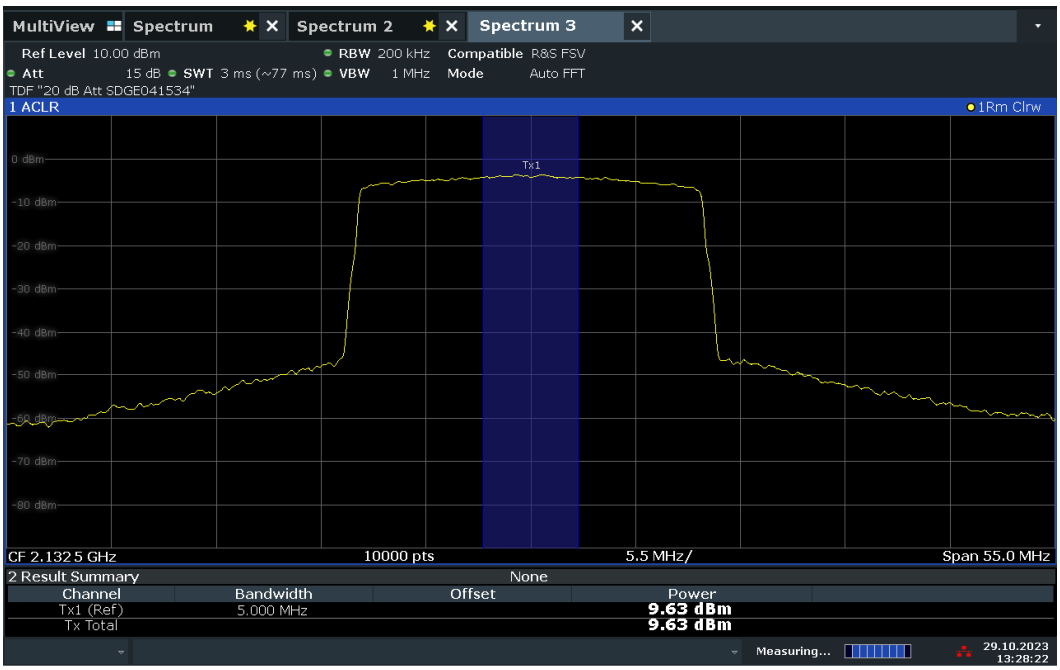
12:36:11 29.10.2023

LTE Band 4 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel



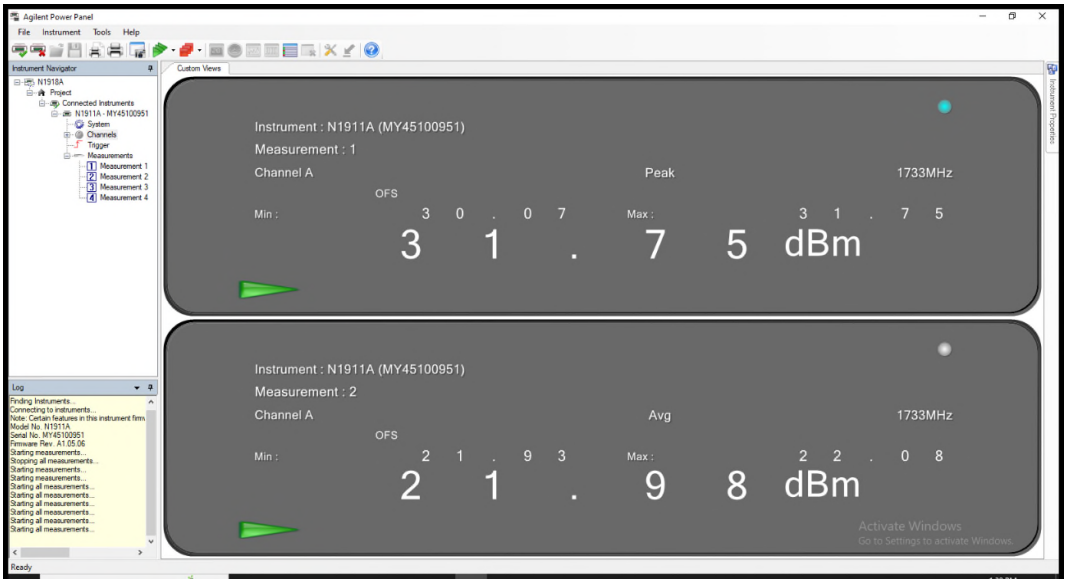
13:27:52 29.10.2023

LTE Band 4 Downlink 10dBm/5MHz 15 MHz Bandwidth Middle Channel

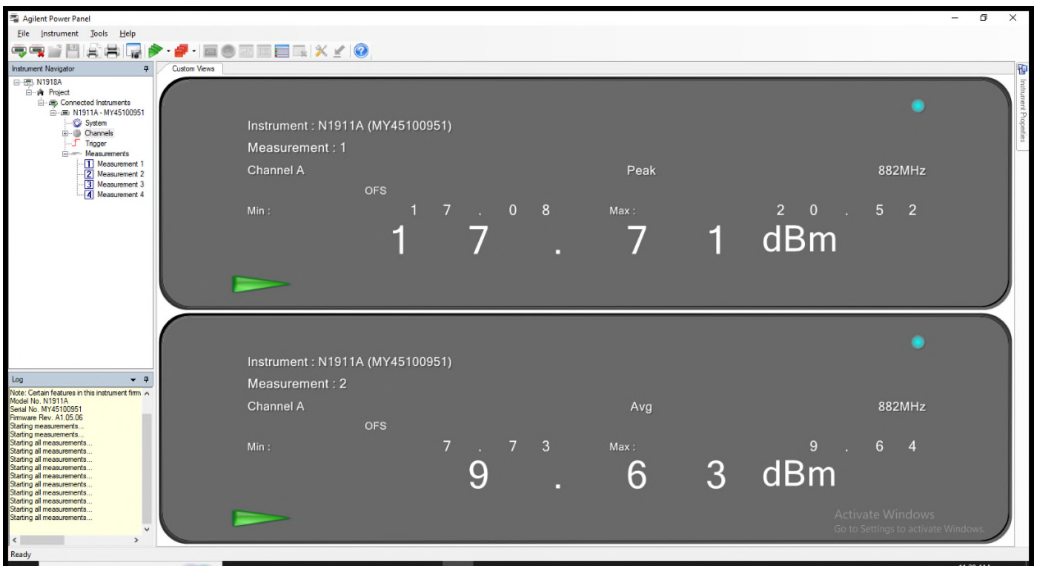


13:28:23 29.10.2023

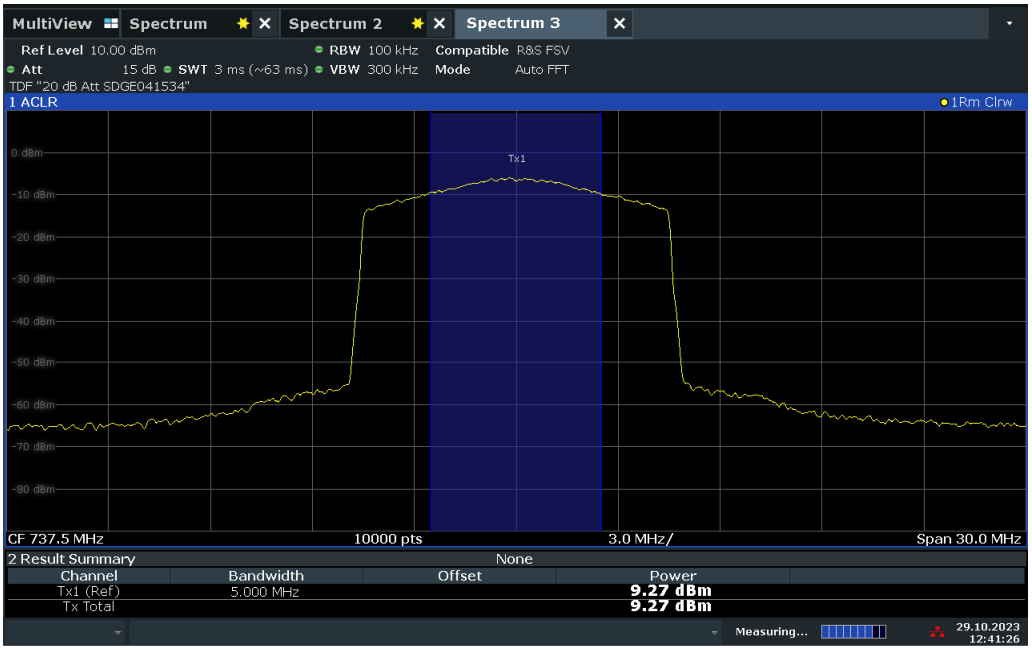
LTE Band 4 Downlink 10dBm/5MHz 20 MHz Bandwidth Middle Channel



LTE Band 4 Uplink 5 MHz Bandwidth Middle Channel

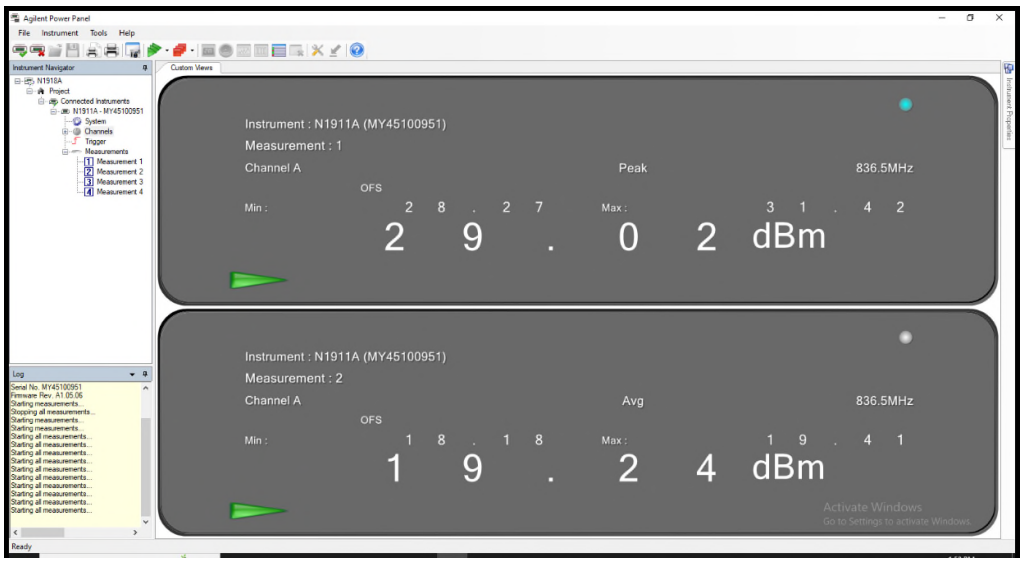


LTE Band 5 Downlink 5 MHz Bandwidth Middle Channel

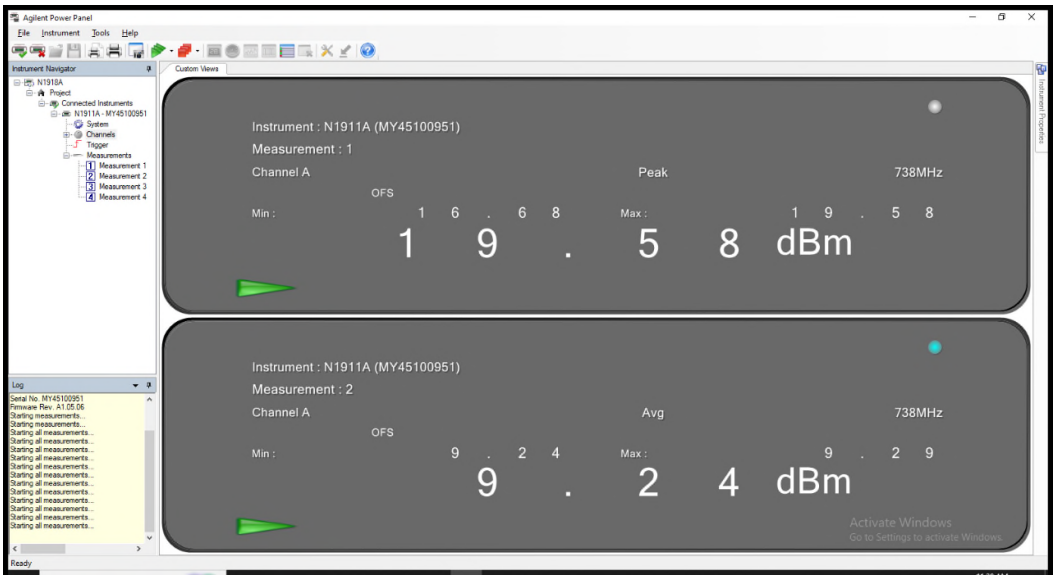


12:41:27 29.10.2023

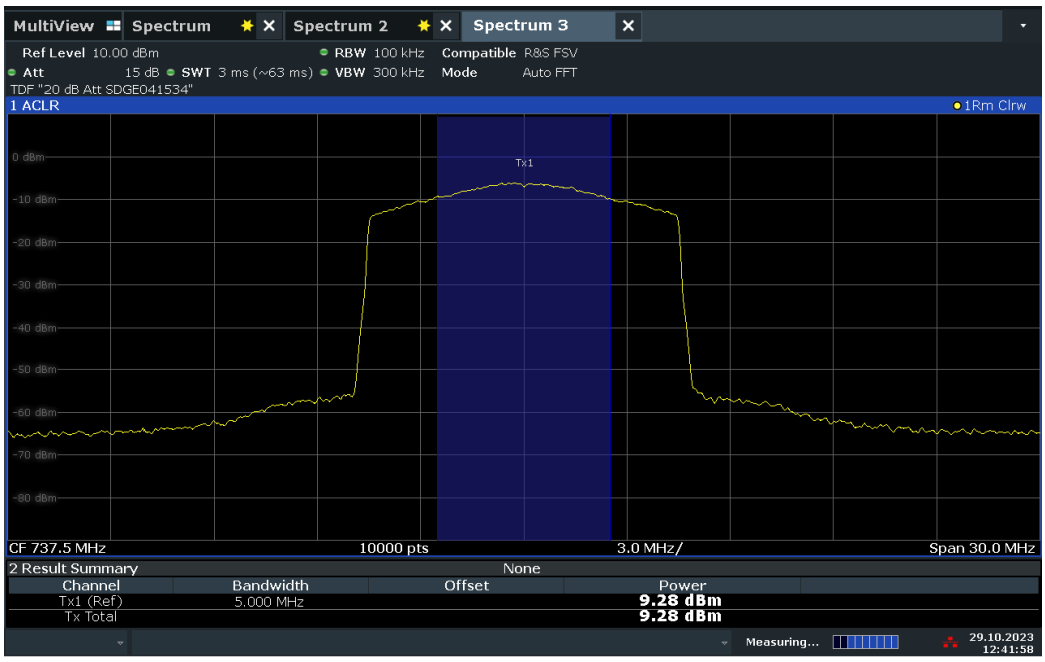
LTE Band 5 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel



LTE Band 5 Uplink 5 MHz Bandwidth Middle Channel

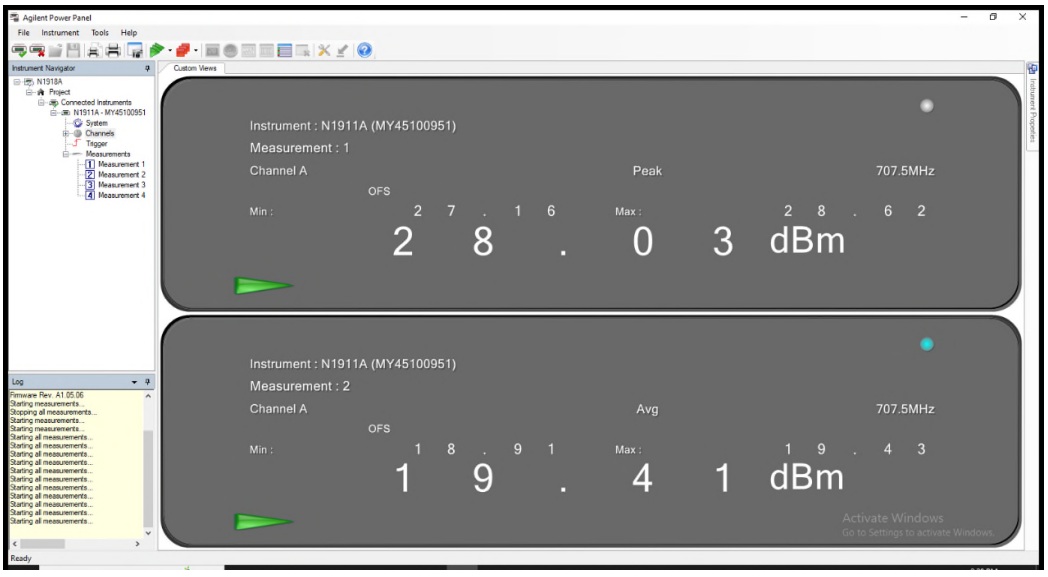


LTE Band 12 Downlink 5 MHz Bandwidth Middle Channel

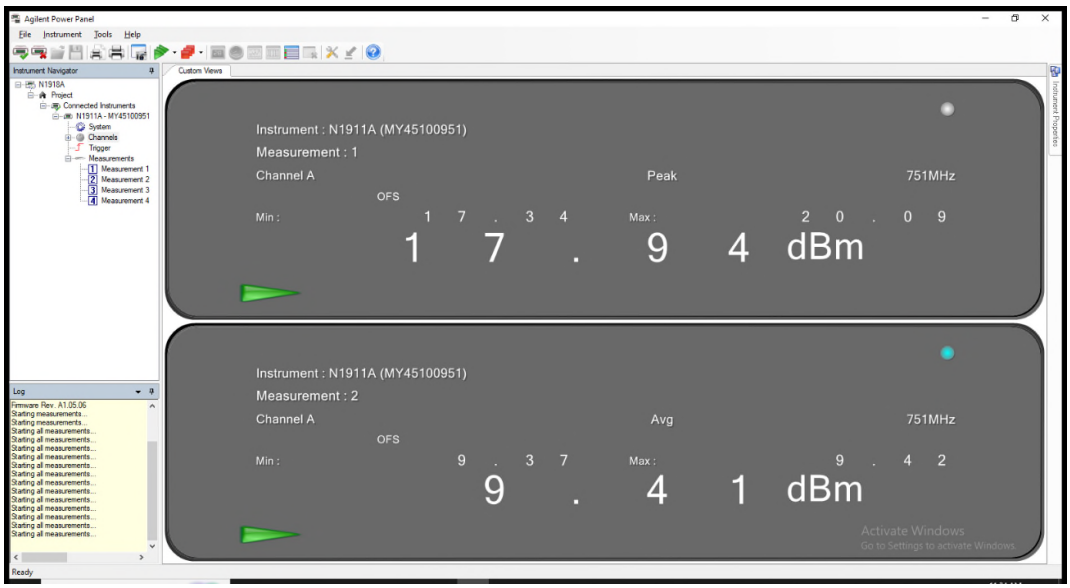


12:41:58 29.10.2023

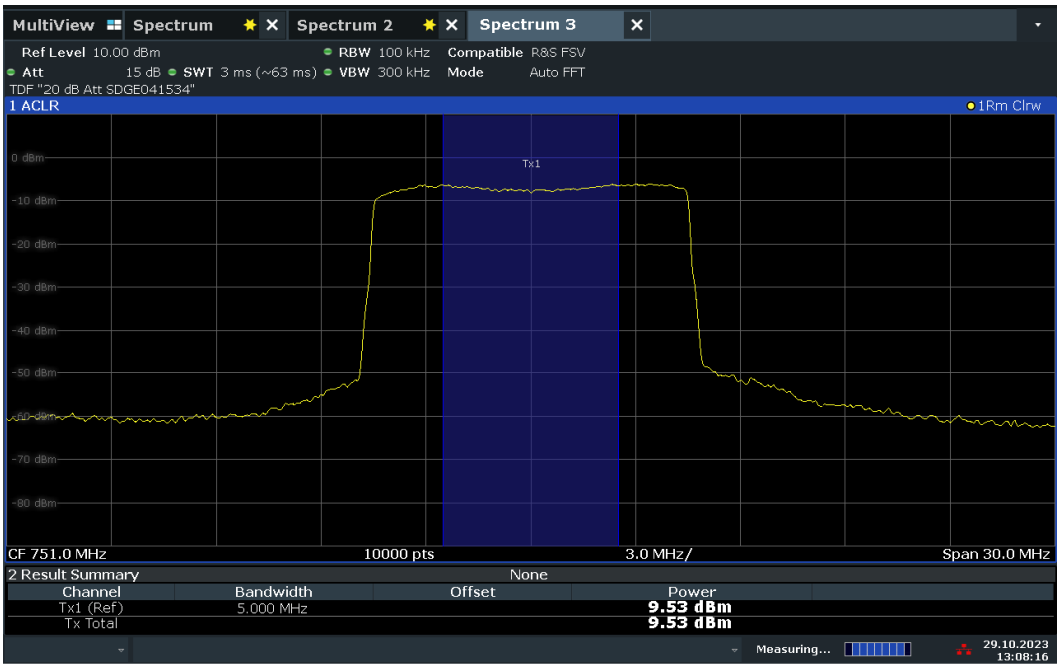
LTE Band 12 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel



LTE Band 12 Uplink 5 MHz Bandwidth Middle Channel



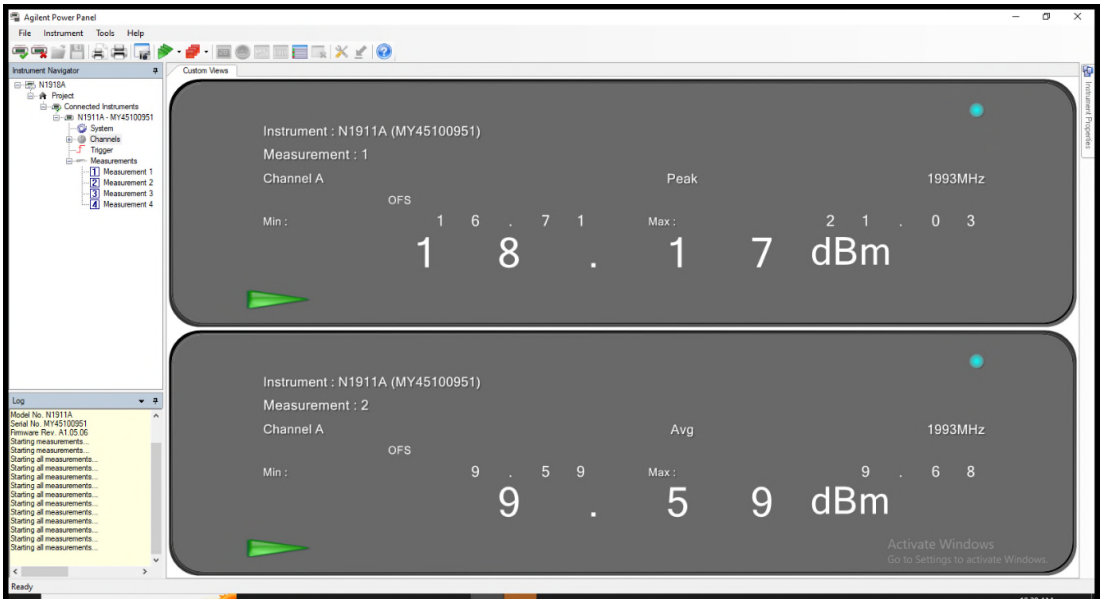
LTE Band 13 Downlink 5 MHz Bandwidth Middle Channel



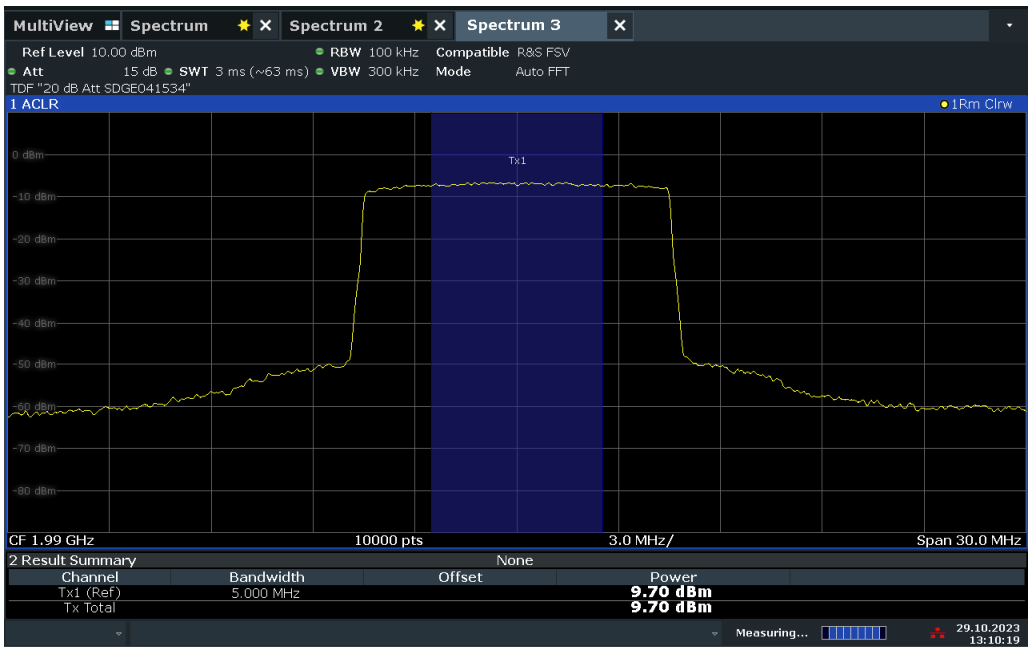
13:08:17 29.10.2023

LTE Band 13 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel

LTE Band 13 Uplink 5 MHz Bandwidth Middle Channel

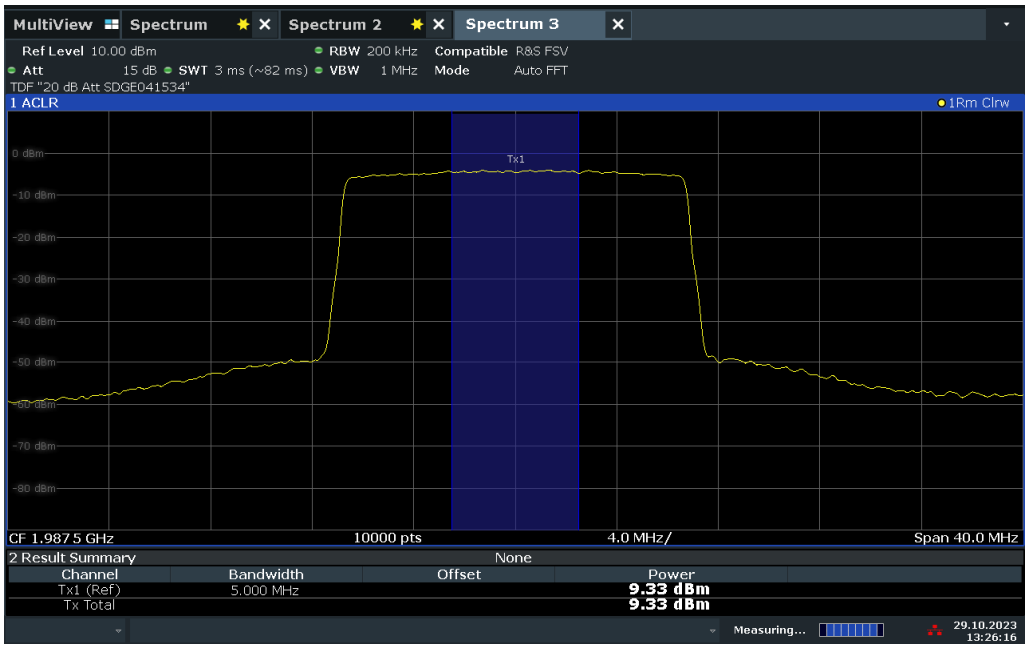


LTE Band 25 Downlink 5 MHz Bandwidth High Channel



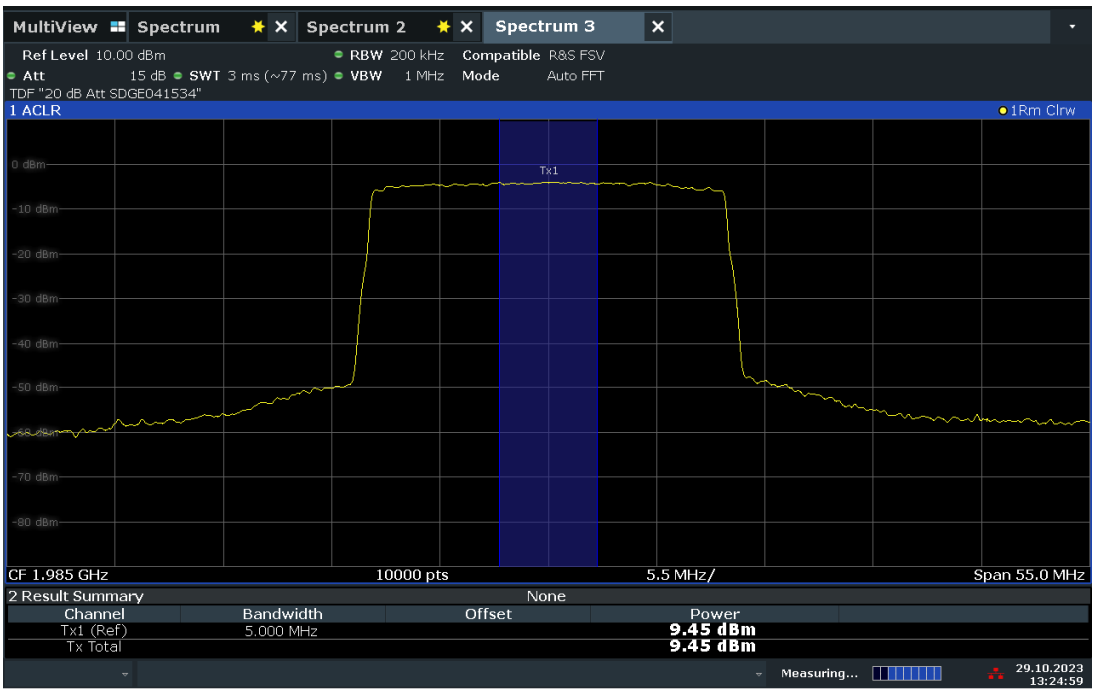
13:10:19 29.10.2023

LTE Band 25 Downlink 10dBm/5MHz 10 MHz Bandwidth Middle Channel



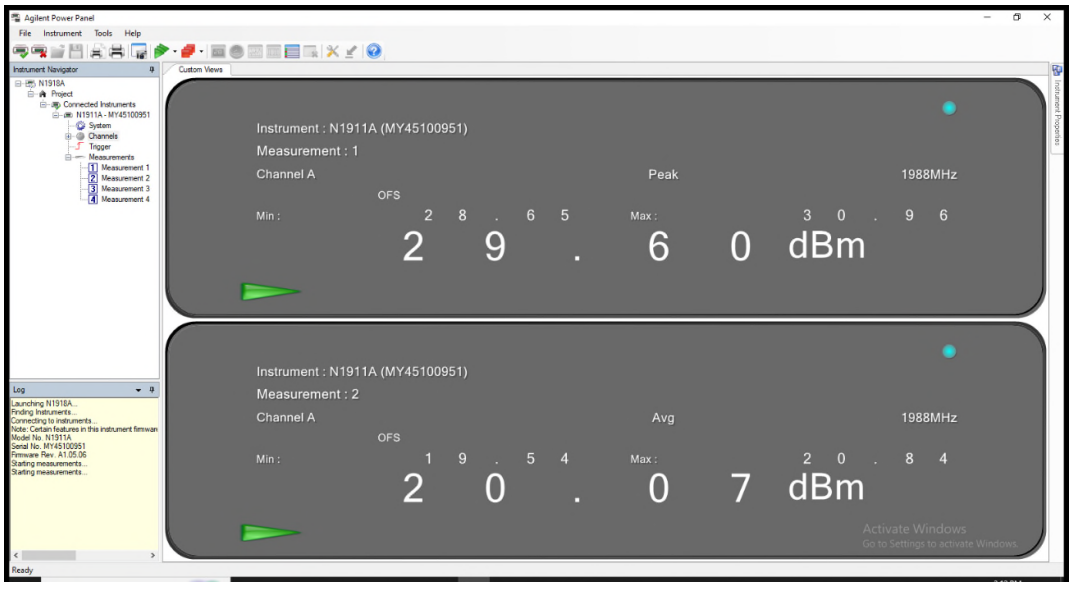
13:26:17 29.10.2023

LTE Band 25 Downlink 10dBm/5MHz 15 MHz Bandwidth Middle Channel



13:25:00 29.10.2023

LTE Band 25 Downlink 10dBm/5MHz 20 MHz Bandwidth Middle Channel



LTE Band 25 Uplink 5 MHz Bandwidth High Channel

2.4 Intermodulation Product

2.4.1 Specification Reference

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(G)
KDB935210 D04, Clause 7.4

2.4.2 Standard Applicable

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(G) Intermodulation Limits:

The transmitted intermodulation products of a consumer booster at its uplink and downlink ports shall not exceed the power level of -19 dBm for the supported bands of operation. Compliance with intermodulation limits will use boosters operating at maximum gain and maximum rated output power, with two continuous wave (CW) input signals spaced 600 kHz apart and centered in the pass band of the booster, and with a 3 kHz measurement bandwidth..

2.4.3 Equipment Under Test and Modification State

Serial No: 560311000026/ Test Configuration A and B

2.4.4 Date of Test/Initial of test personnel who performed the test

August 04, 2023/ MARG

2.4.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

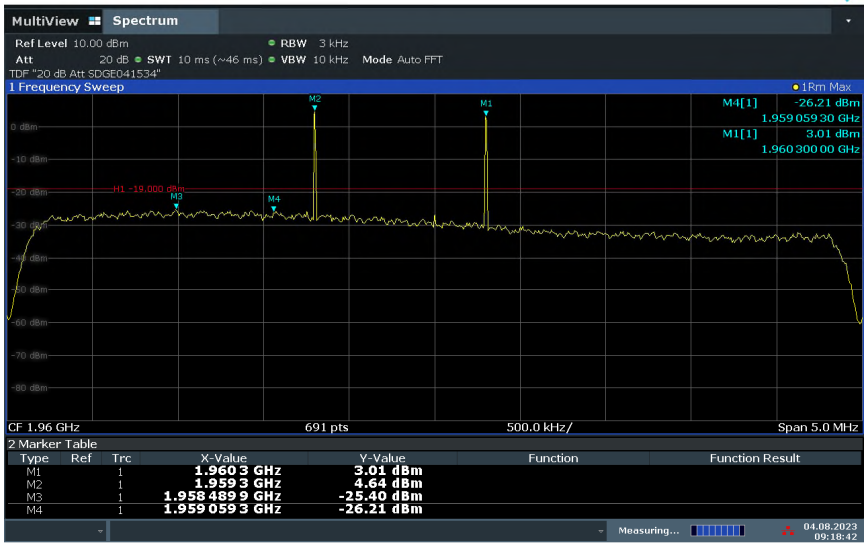
Ambient Temperature	26.3°C
Relative Humidity	53.3%
ATM Pressure	99.0kPa

2.4.7 Additional Observations

- This is conducted Test. Test procedure is per Section 7.4 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The EUT operated in Test Mode with the gain set to the maximum gain and a minimum bandwidth setting (5MHz).
- The transducer factor (TDF) used is from the external attenuators and cables used.
- Setup the EUT according to Figure 5 of Section 7.4 of KDB935210.
- Evaluations are conducted at antenna ports.
- Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.
- Per Client request only High Channel was tested for Band 25
- Only test plots for middle channel presented as the representative configuration except for Band 25.

2.4.8 Test Results

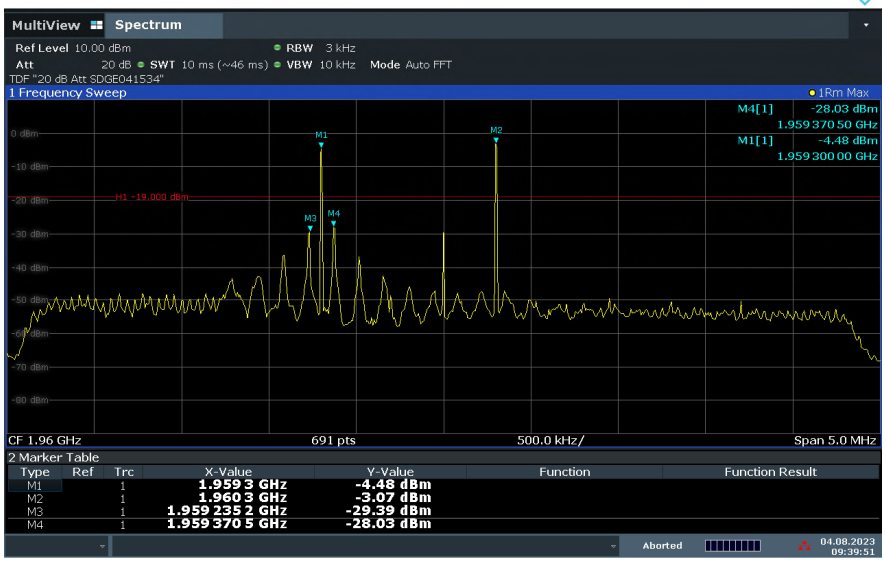
LTE Band 2 Downlink (-82.5)



09:18:43 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

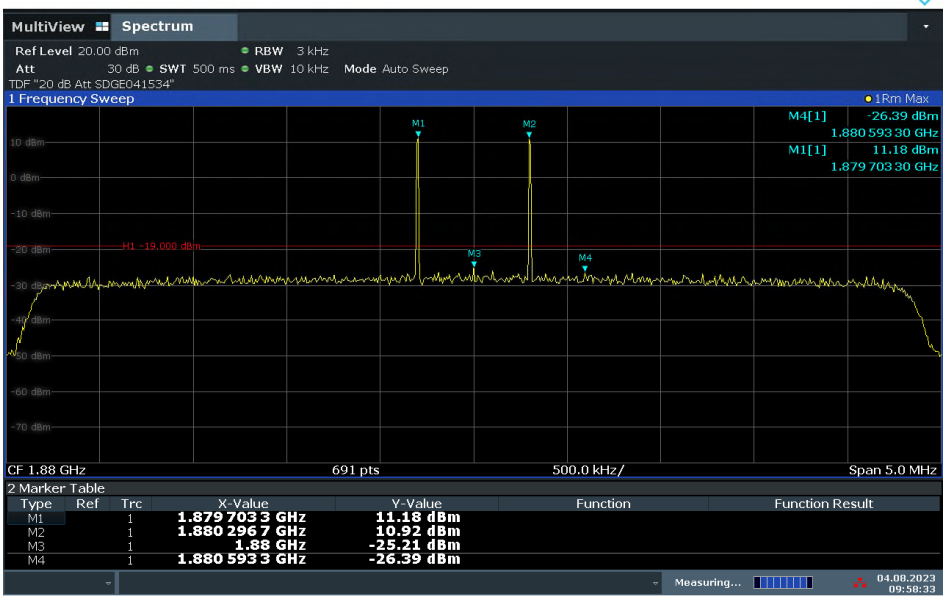
LTE Band 2 Downlink (-72.5 dBm)



09:39:51 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

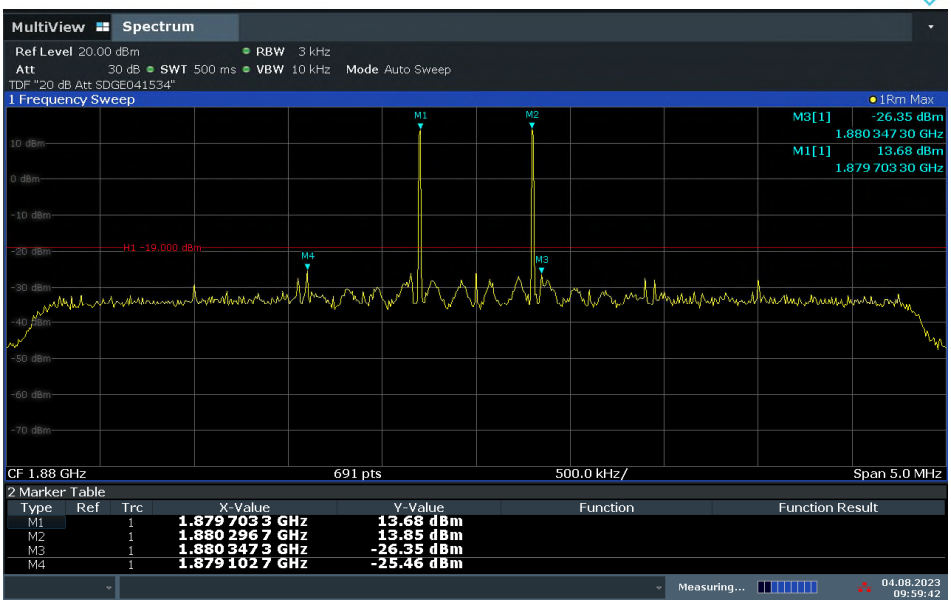
LTE Band 2 Uplink (-77.5 dBm)



09:58:34 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

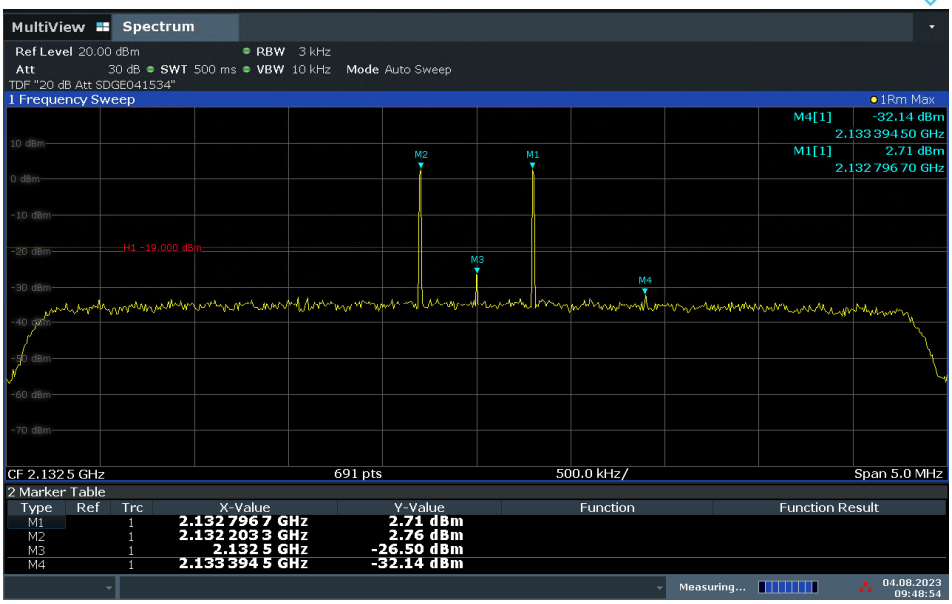
LTE Band 2 Uplink (-67.5 dBm)



09:59:42 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

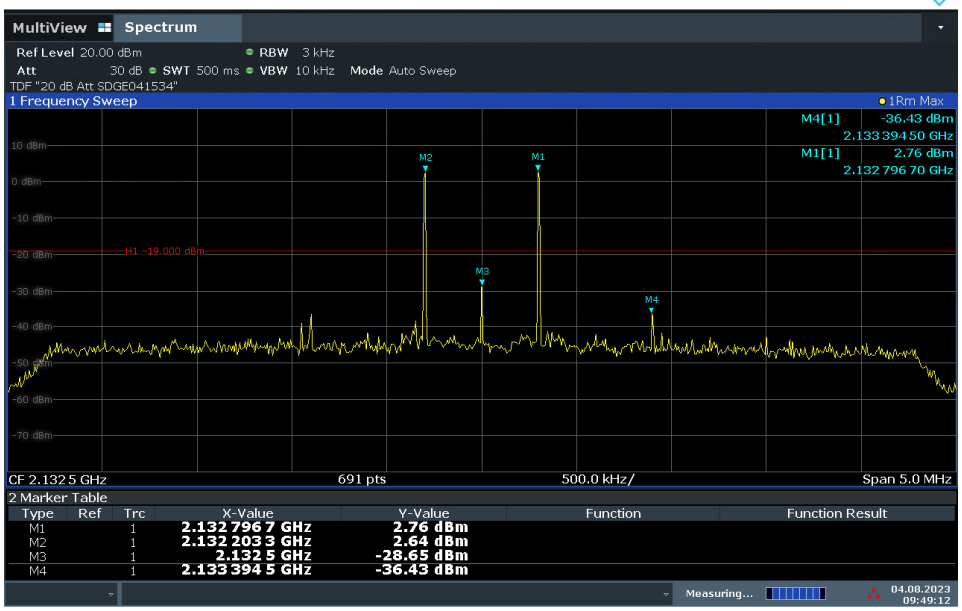
LTE Band 4 Downlink (-82.5dBm)



09:48:55 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

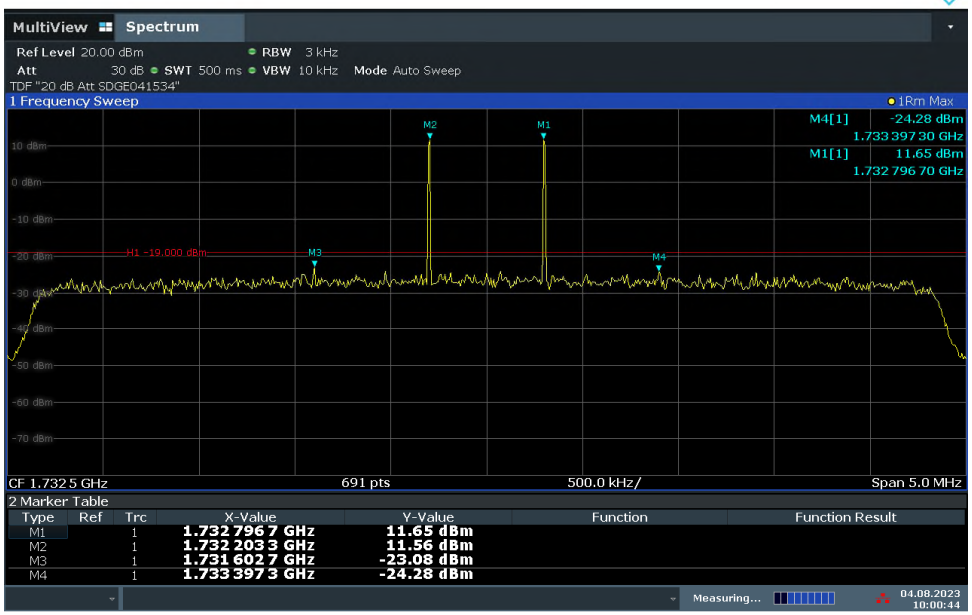
LTE Band 4 Downlink (-72.5dBm)



09:49:13 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

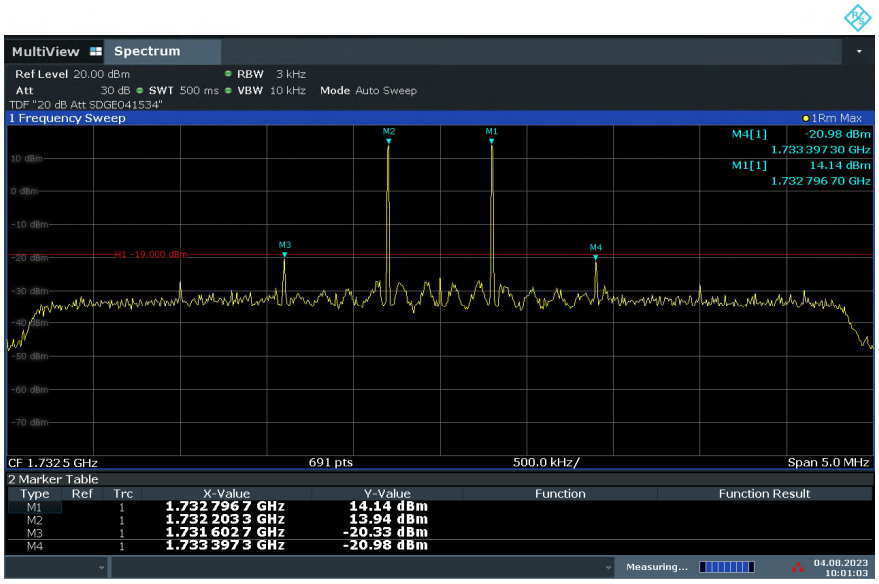
LTE Band 4 Uplink (-77.3 dBm)



10:00:45 04.08.2023

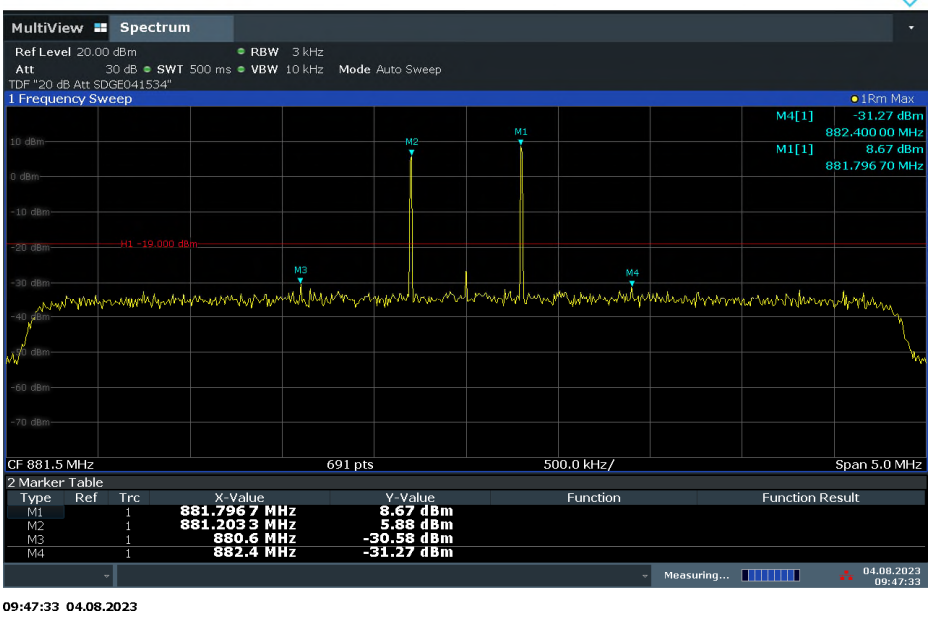
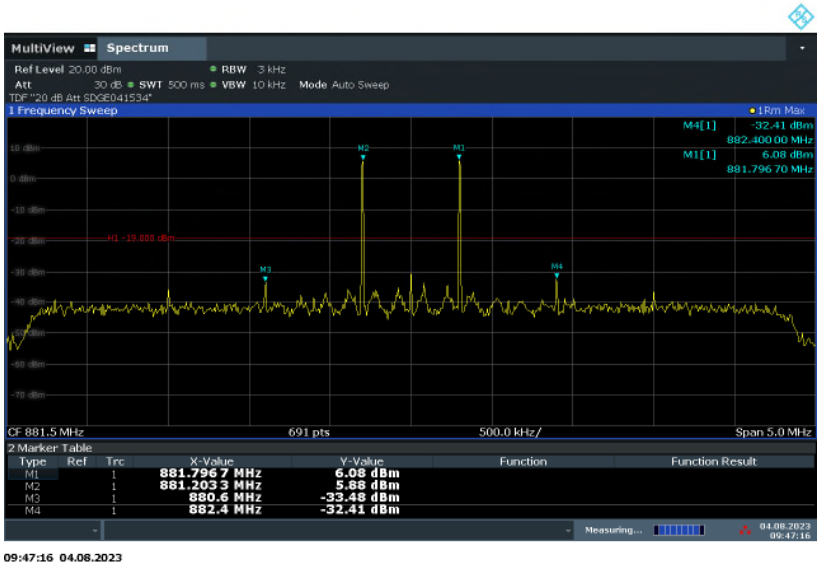
Note: The spurious above the limit are the injected CW signals, not inter-modulation products

LTE Band 4 Uplink (-67.3 dBm)

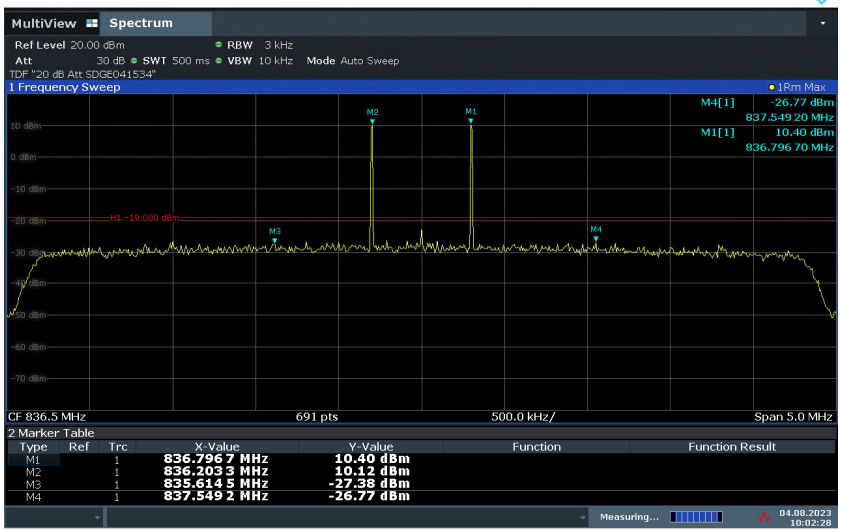


10:01:04 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

LTE Band 5 Downlink (-82.4 dBm)
 Note: The spurious above the limit are the injected CW signals, not inter-modulation products.
LTE Band 5 Downlink (-72.4 dBm)
 Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

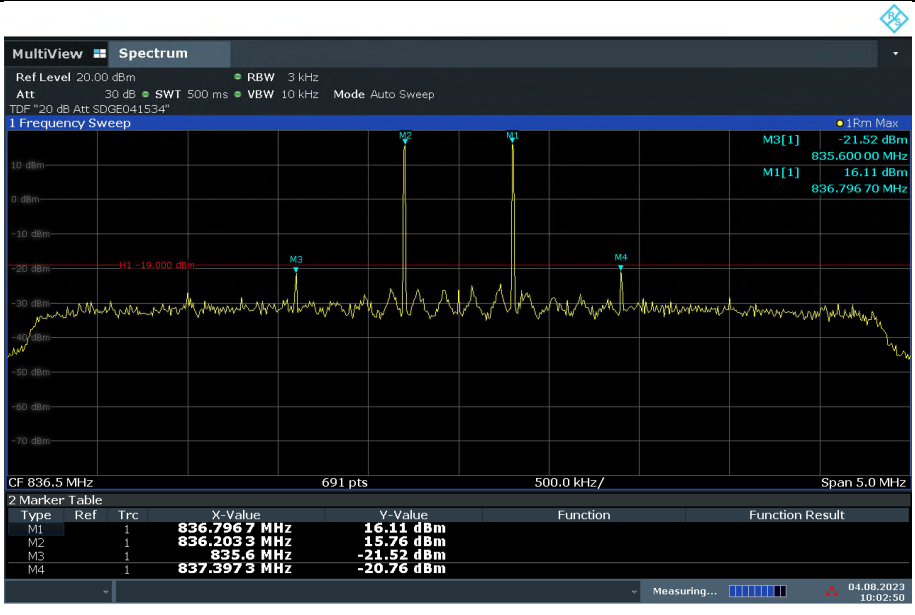
LTE Band 5 Uplink (-75.8 dBm)



10:02:29 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

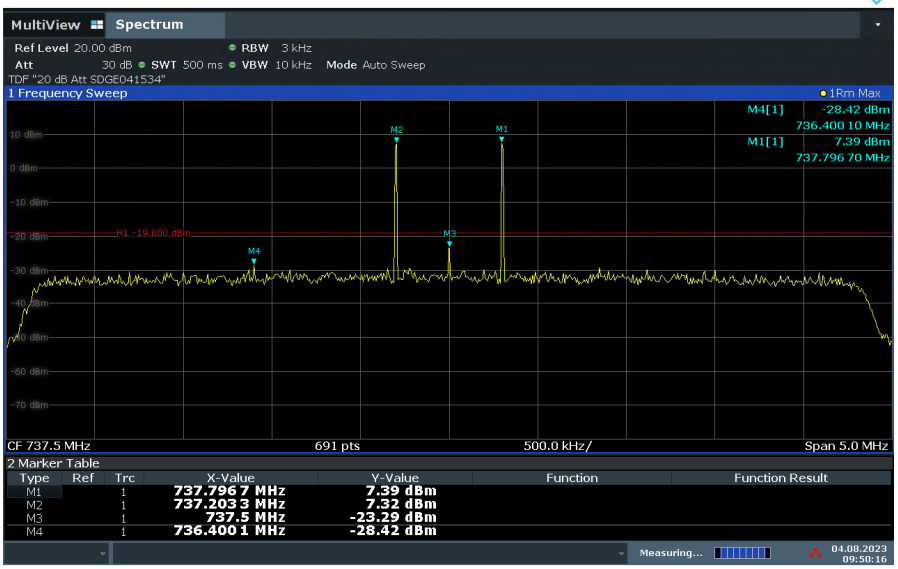
LTE Band 5 Uplink (-65.8 dBm)



10:02:50 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

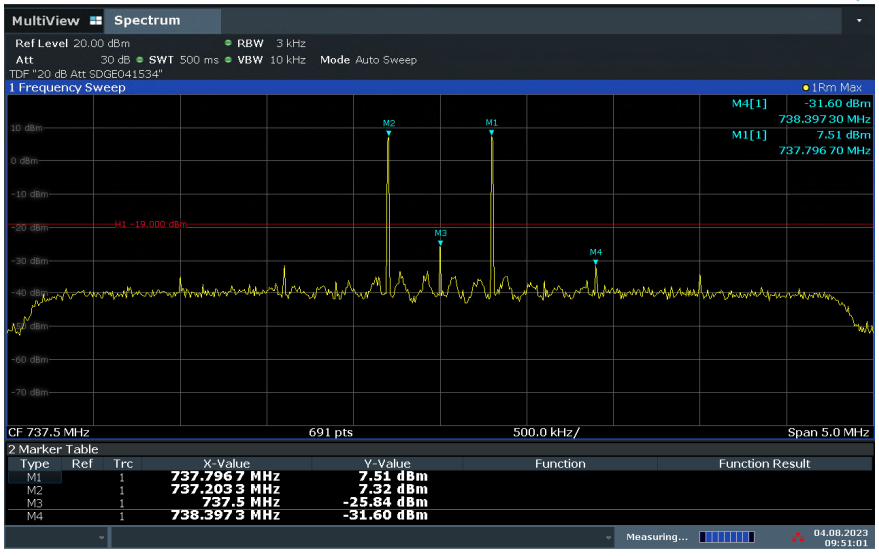
LTE Band 12 Downlink (-82.2 dBm)



09:50:17 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

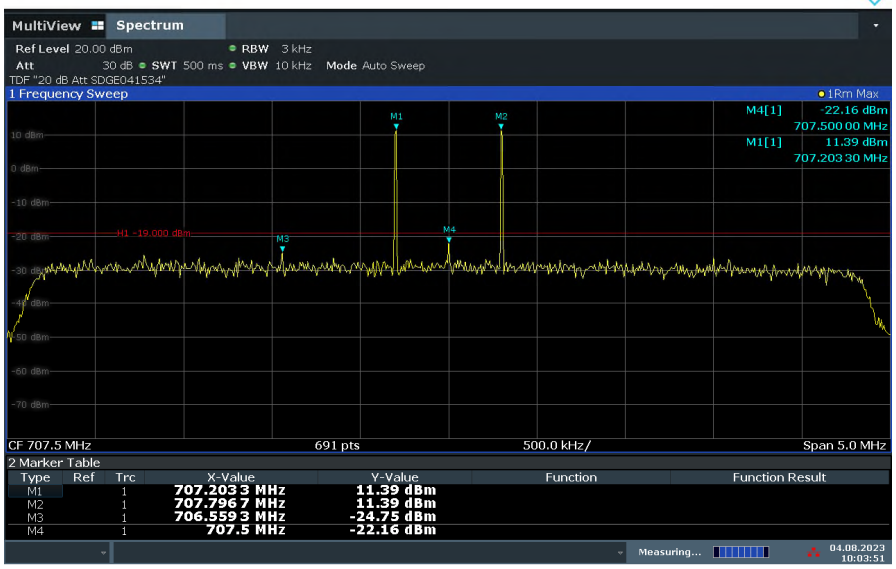
LTE Band 12 Downlink (-72.2 dBm)



09:51:02 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

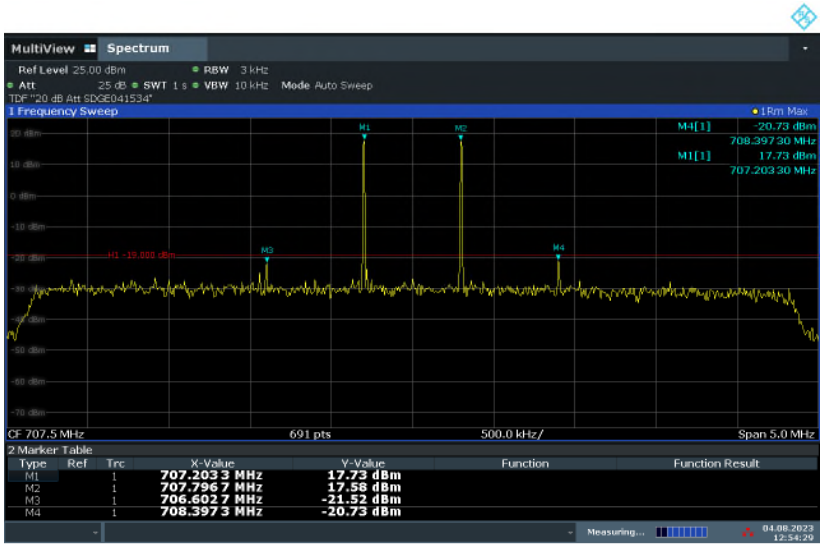
LTE Band 12 Uplink (-75.6 dBm)



10:03:52 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

LTE Band 12 Uplink (-65.6 dBm)

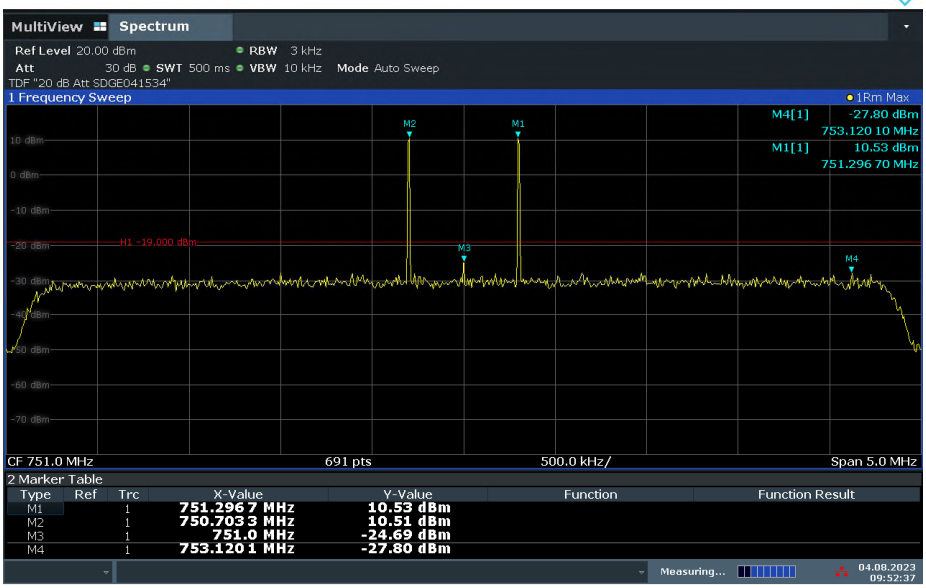


12:54:29 04.08.2023

\

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

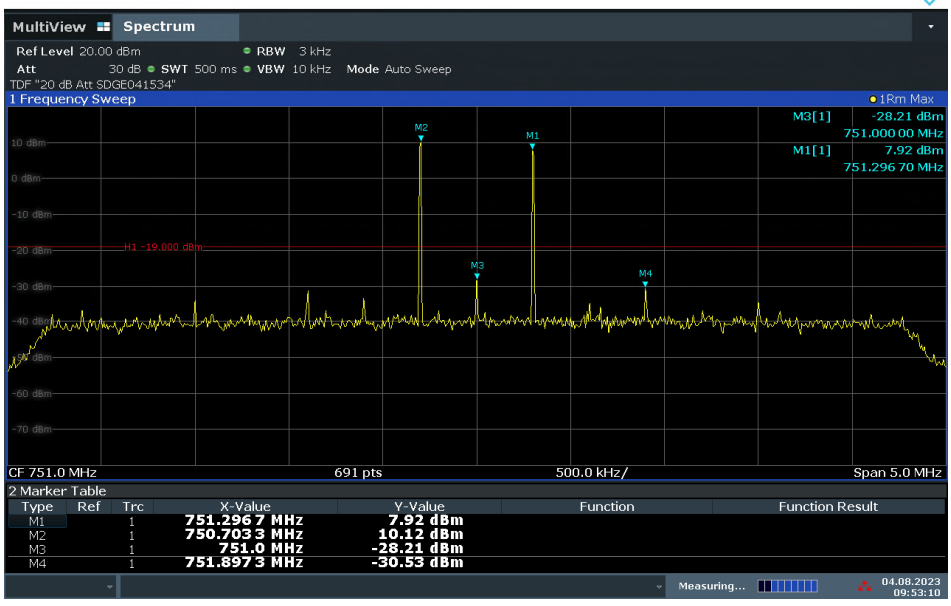
LTE Band 13 Downlink (-82.3dBm)



09:52:38 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

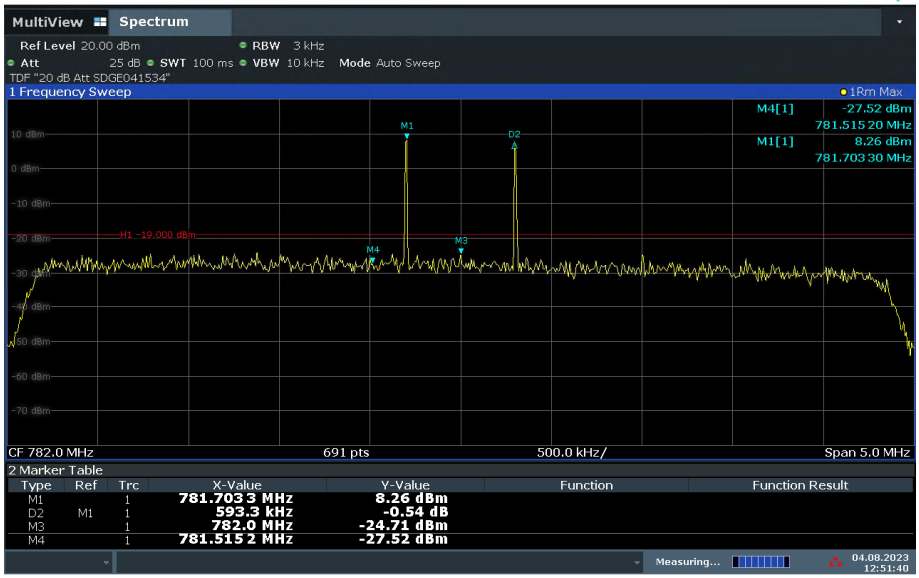
LTE Band 13 Downlink (-72.3dBm)



09:53:11 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

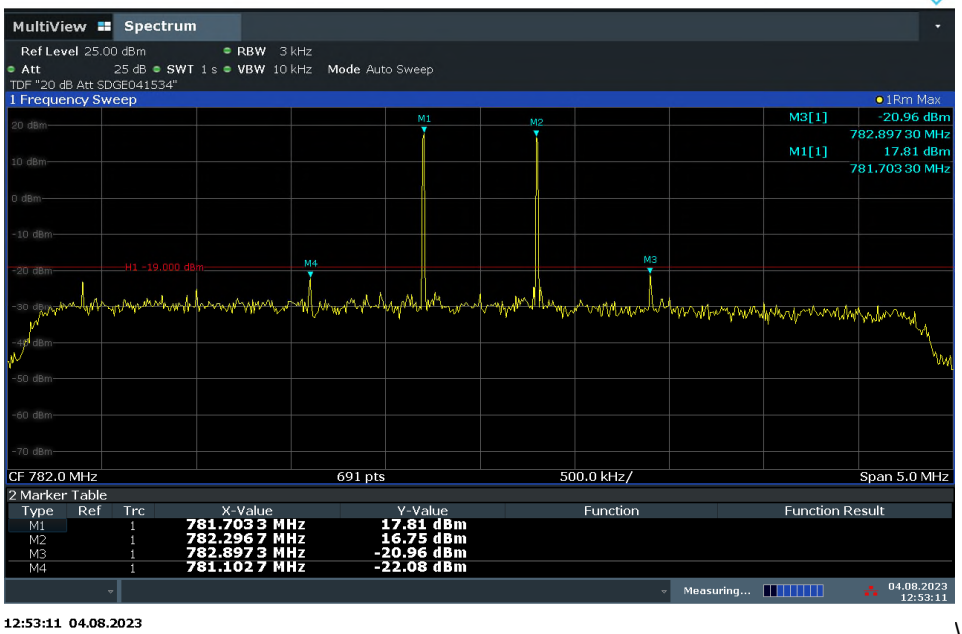
LTE Band 13 Uplink (-75.5 dBm)



12:51:41 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

LTE Band 13 Uplink (-65.5 dBm)

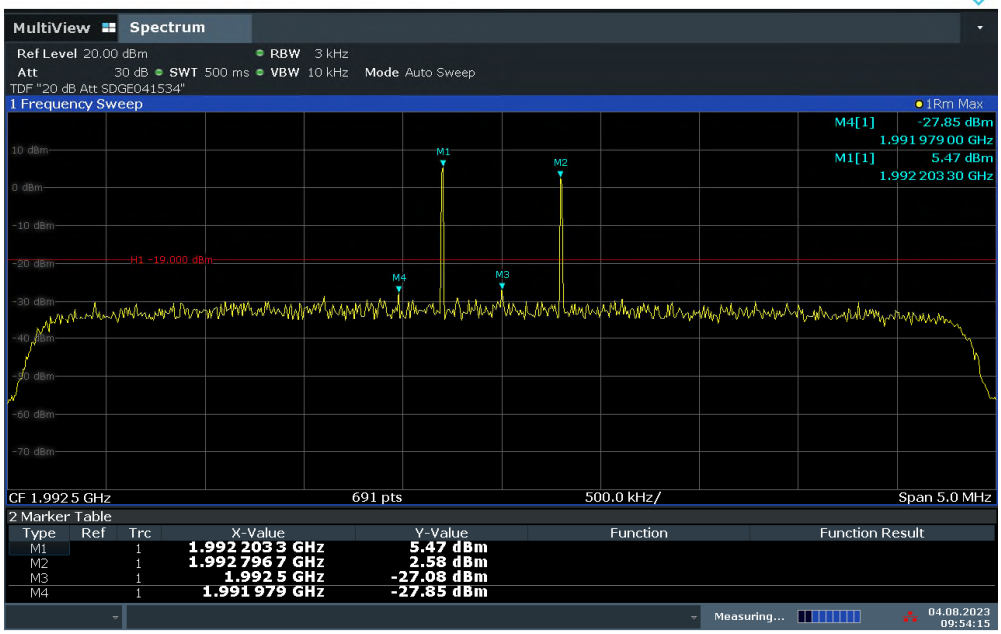


12:53:11 04.08.2023

\

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

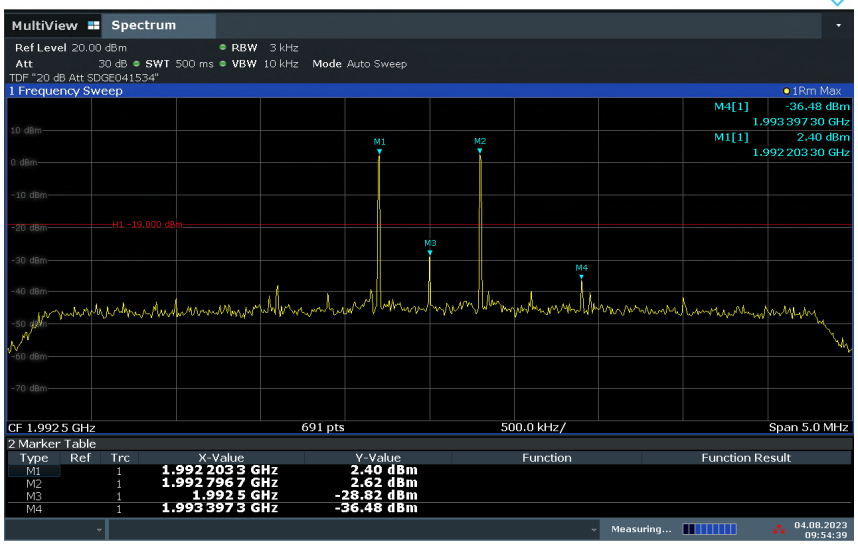
LTE Band 25 Downlink (-82.5 dBm)



09:54:16 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products.

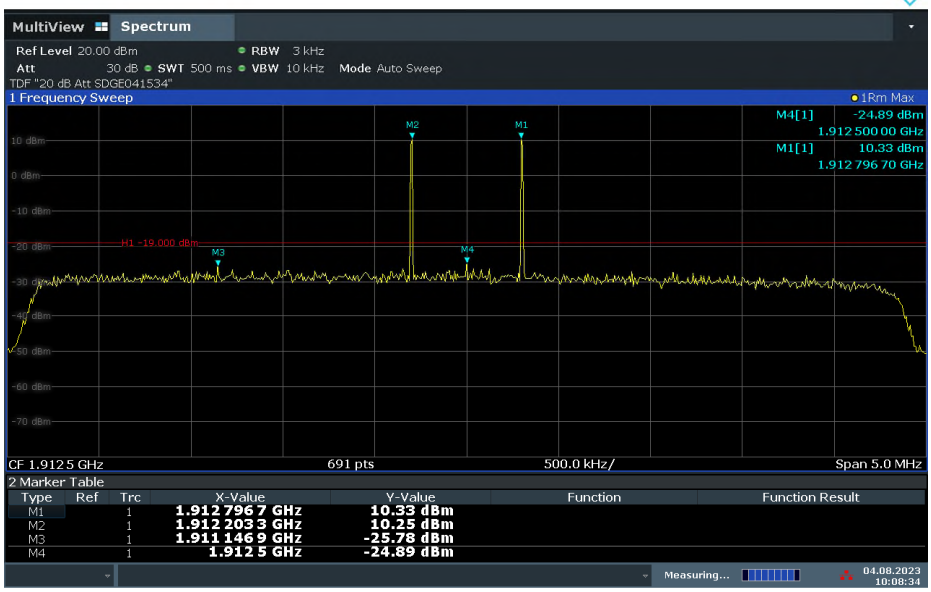
LTE Band 25 Downlink (-72.5 dBm)



09:54:39 04.08.2023

Note: The spurious 3above the limit are the injected CW signals, not inter-modulation products.

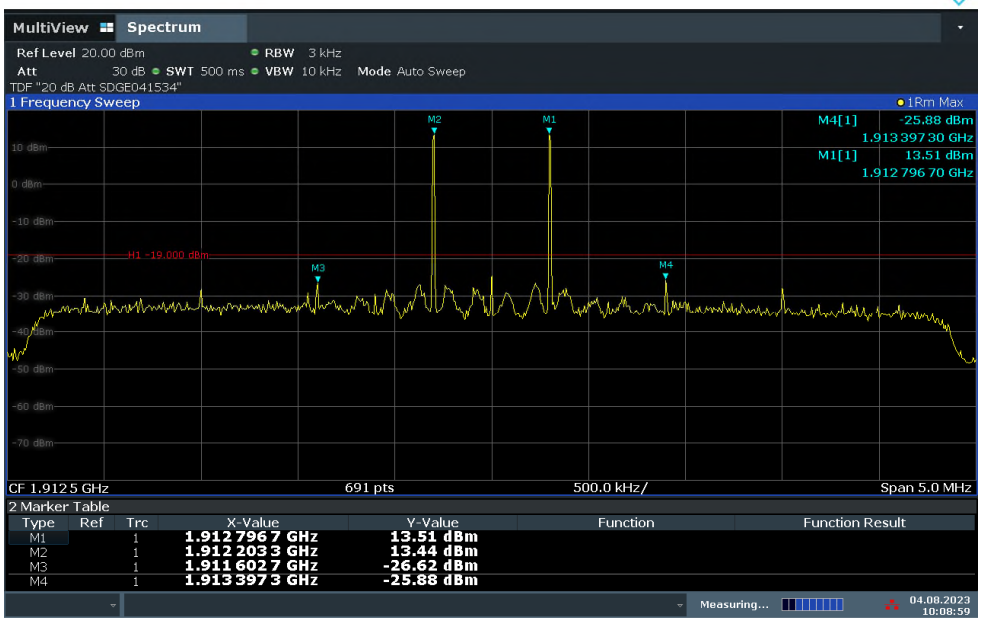
LTE Band 25 Uplink (-77.5 dBm)



10:08:35 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

LTE Band 25 Uplink (-65.5 dBm)



10:09:00 04.08.2023

Note: The spurious above the limit are the injected CW signals, not inter-modulation products

2.5 Out Of Band Emissions

2.5.1 Specification Reference

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(F)
RSS 131 8.5
KDB935210 D04, Clause 7.5

2.5.2 Standard Applicable

FCC 47 CFR Part 20. Clause 20.21(e)(9)(i)(F) Out of Band Emissions Limits:

Booster out of band emissions (OOBE) shall meet the FCC's mobile emission limits for the supported bands of operation. Compliance to OOBE limits will utilize high peak-to-average CMRS signal types.

2.5.3 Equipment Under Test and Modification State

Serial No: 560311000026/ Test Configuration A and B

2.5.4 Date of Test/Initial of test personnel who performed the test

August 10, 2023/MARG

2.5.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility.

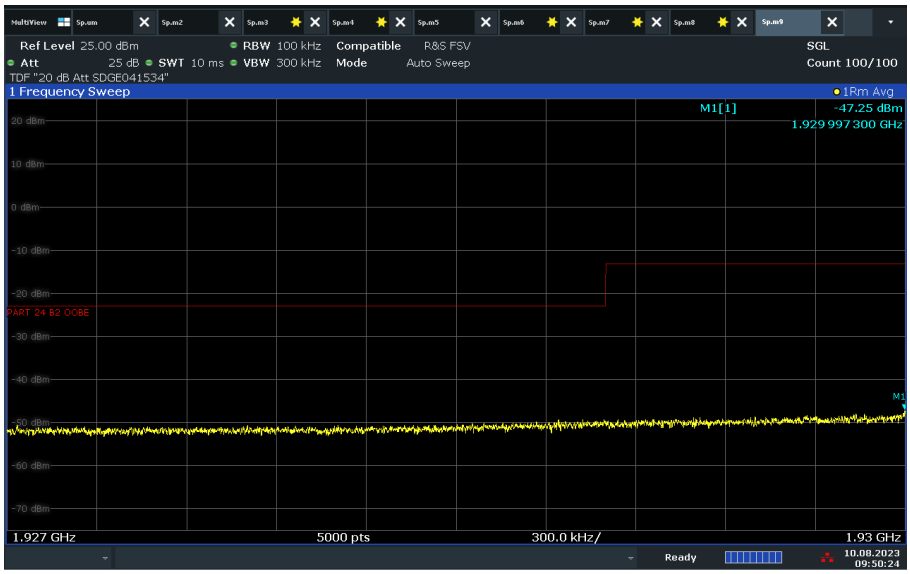
Ambient Temperature	26.0°C
Relative Humidity	53.3%
ATM Pressure	99.0kPa

2.5.7 Additional Observations

- This is conducted Test.
- Test procedure is per Section 7.5 of KDB935210 (D04 Provider Specific Booster Measurements v02r03). Appropriate offset (line losses) applied.
- The EUT operated in Test Mode, with the gain set to the maximum and a 5MHz bandwidth setting.
- The out of band emissions with Maximum Transmitter complies at 10 dB above AGC.
- Evaluations are conducted at antenna ports.
- The transducer factor (TDF) used is from the external attenuators and cables used.
- Per Client request only High Channel was tested for Band 25
- Operational uplink and downlink bands for LTE Band 2, 4, 5, 12, 13, 25 were tested.
- Signal: 5MHz LTE.

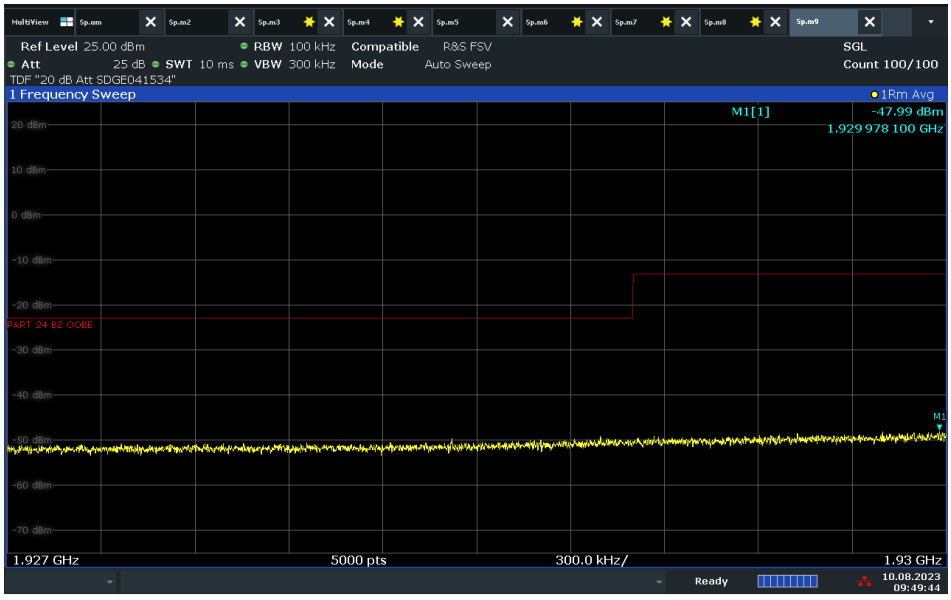
2.5.8 Test Results

LTE Band 2 Downlink 5MHz Bandwidth Low Channel (-82.5 dBm)

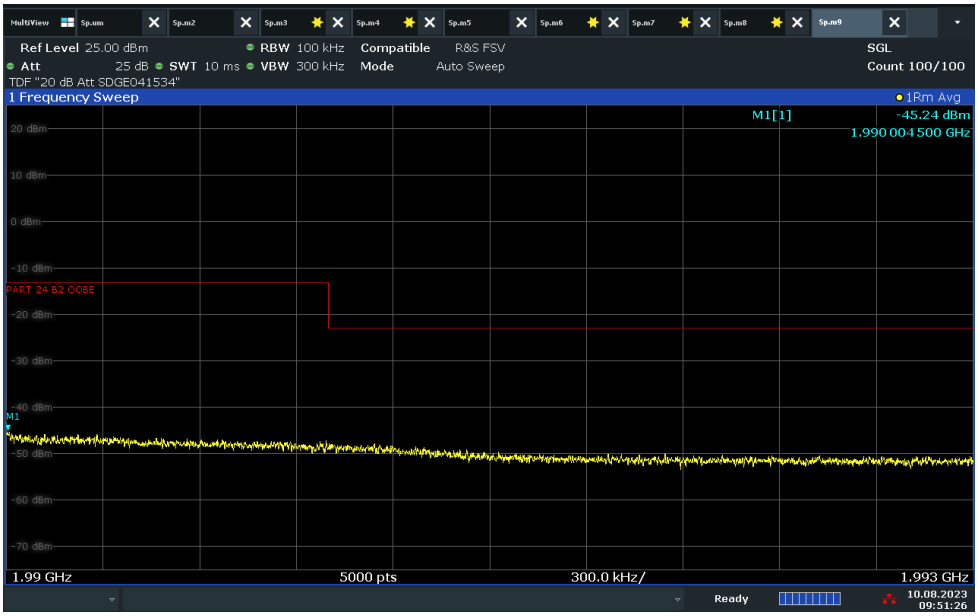
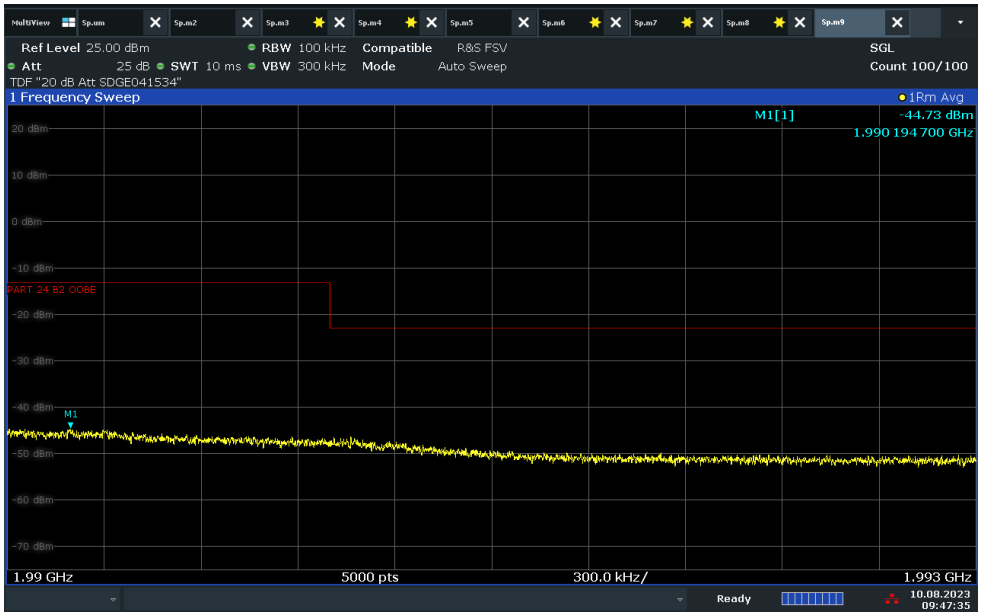


09:50:24 10.08.2023

LTE Band 2 Downlink 5MHz Bandwidth Low Channel 10 dB Above AGC



09:49:45 10.08.2023

LTE Band 2 Downlink 5MHz Bandwidth High Channel (-82.5 dBm)
 09:51:26 10.08.2023
LTE Band 2 Downlink 5MHz Bandwidth High Channel 10 dB Above AGC
 09:47:36 10.08.2023