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Radio Test report – Radio 4472HP B12A

Report ID
REP067256

Project ID
PRJ0067316

Applicant:
Ericsson AB

Product name:
Radio Unit

Model (PMN):
Radio 4472HP B12A

Part number:
KRC 161 4412/31

FCC Identifier
FCC ID: TA8AKRC1614412

ISED certification number:
IC: 287AB-AS1614412

HVIN:
AS1614412

Requirements/Summary:

Standard	Environmental phenomenon	Compliance
FCC 47 CFR Part 27	Miscellaneous wireless communications services (698-746 MHz band)	Yes
RSS-130 Issue 2, April 2019	Equipment Operating in the Frequency Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz	Yes

Date of issue: November 26, 2024

Andrey Adelberg, Senior EMC/Wireless Specialist
Tested by

Signature

David Duchesne, Senior EMC/Wireless Specialist
Reviewed by

Signature

Two test locations

Company name	Nemko Canada Inc.	
Address	303 River Road	349 Terry Fox
City	Ottawa	Ottawa
Province	Ontario	Ontario
Postal code	K1V 1H2	K2K 2V6
Country	Canada	Canada
Telephone	+1 613 737 9680	+1 613 963 8000
Facsimile	+1 613 737 9691	
Toll free	+1 800 563 6336	
Website	www.nemko.com	
Site number	FCC test site registration number: CA2040, IC: 2040A-4 (3 m semi anechoic chamber)	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Section 1. Report summary

1.1 Applicant

Company name	Ericsson AB
Address	PEU Radio Torshamnsgatan 23, Stockholm, Sweden 164 80

1.2 Manufacturer

Company name	Ericsson AB
Address	PEU Radio Torshamnsgatan 23, Stockholm, Sweden 164 80

1.3 Test specifications

FCC 47 CFR Part 2	Frequency Allocations and Radio Treaty Maters; General Rules and Regulations
FCC 47 CFR Part 27	Miscellaneous wireless communications services (698-746 MHz band)
RSS-130 Issue 2, April 2019	Equipment Operating in the Frequency Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz
SRSP-518, Issue 2, February 2019	Technical Requirements in the Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz
RSS-Gen, Issue 5, April 2018	General Requirements for Compliance of Radio Apparatus

1.4 Test method

ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 662911 D01	Multiple Transmitter Output v02r01
KDB 662911 D02	MIMO with Cross-Polarized Antennas v01

1.5 Statement of compliance

In the configurations tested, the EUT was found compliant. Testing was completed against customer test plan. Results obtained indicate that the product under test complies in full with the requirements tested.

This test report (**REP067256**) applies to the *Radio 4472HP B12A* with part number *KRC 161 4412/31*. See "Summary of test results" for full details.

EUT Configuration(s) SRO/MRO: refer to Section 3.

1.6 Test report revision history

Table 1.6-1: *Test report revision history*

Report ID	Date of issue	Details of changes made to test report
REP067256	November 26, 2024	Original report issued

Section 2. Summary of test results

2.1 Testing location

Test location (s)	Ottawa

2.2 Testing period

Test start date	October 29, 2024	Test end date	November 7, 2024

2.3 Sample information

Receipt date	October 29, 2024	Nemko sample ID number	PRJ00672560001

2.4 FCC Part 27 test results

Table 2.4-1: *FCC results summary*

Part	Test description	Verdict
§27.5(c)	Frequencies (698-746 MHz band)	Pass
§27.50(c)	Maximum output power at RF antenna connector	Pass
§27.53(g)	Spurious emissions at RF antenna connector	Pass
§27.53(g)	Radiated spurious emissions	Pass
§27.54	Frequency stability	Pass
§2.1049	Occupied bandwidth	Pass

Notes: None

2.5 RSS-130/Gen test results

Table 2.5-1: *ISED results summary*

Section	Test description	Verdict
RSS-130, 4.2	Types of modulation	Pass[1]
RSS-130, 4.3	Frequency block	Pass[2]
RSS-130, 4.4	Interoperability requirement for Mobile and portable stations in the bands 617-652 MHz and 663-698 MHz	Not applicable[3]
RSS-130, 4.5	Transmitter frequency stability	Pass
RSS-130, 4.6	Transmitter output power and effective radiated power (e.r.p.)	Pass
RSS-130, 4.7.1	Transmitter unwanted emissions	Pass
RSS-Gen, 6.7	Occupied bandwidth	Pass

Notes: [1]EUT employs digital modulation (QPSK)
[2]EUT transmits within 698-756 MHz frequency range
[3]The EUT is a fixed base station.

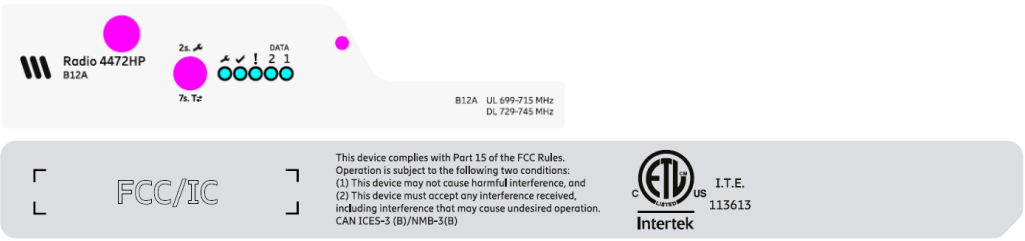
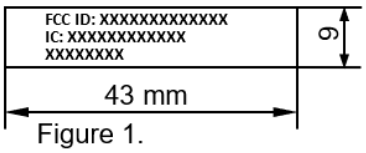
Section 3. Equipment under test (EUT) details

3.1 EUT information

Product name	Radio Unit
Model	Radio 4472HP B12A
Part number	KRC 161 4412/3
Revision	R1A
Serial number	E23F913661, E23F913657 (for radiated spurious emissions)
Antenna ports	4 TX/RX
RF BW / IBW	16 MHz
FDD	30 MHz
Frequency	TX (DL): 729 – 745 MHz RX (UL): 699 – 715 MHz
Nominal O/P per Antenna port	60 W
Accuracy (nominal)	±0.1 ppm
Nominal voltage	-48 VDC (-36 to -58.5 VDC)
RAT	LTE, NR, NB-IoT (IB, GB, SA): SC, MC, MIMO, CA, ESS
Modulation	LTE: QPSK, 16 QAM, 64 QAM, 256 QAM NR: QPSK, 16 QAM, 64 QAM, 256 QAM
Channel bandwidth	LTE: 5, 10, 15 MHz NR: 5, 10, 15 MHz NB-IoT (IB, GB): 200 kHz NB-IoT (SA): 400 kHz
Maximum combined OBW per port	16 MHz
CPRI	2.5 – 24.3 Gbps (Data 1, 2)
Channel raster	LTE: 100 kHz NR: 100 kHz
Regulatory requirements	Radio: FCC Part 2, 27, RSS-Gen, RSS-130
	EMC: FCC Part 15, ICES-003
Emission Designator	LTE: 5M00W7D, 10M0W7D, 15M0W7D NR: 5M00W7D, 10M0W7D, 15M0W7D NB-IoT SA: 400KW7D
Supported Configurations	Single Antenna, TX Diversity, MIMO, Carrier Aggregation, Ericsson Spectral Sharing (ESS)
Operating temperature	−40 °C to +55 °C
Max RF Power	240 W total / radio (= 4 ports x 60W)
Supported carriers /band/ port SRO/MRO	Up to 4 carriers /band/port (MRO) Max 3 LTE carriers/band/port Max 3 NR carriers/band/port Max 1 ESS/NB-Iot SA carriers/band/port
Carrier Configuration:	SRO: LTE, NR, NB-IoT (SA) MRO: Combinations of LTE, NR and NB-IoT (SA)
RAT SC Carrier Power (max)	LTE/NR 5 MHz: 40 W
	LTE/NR 10, 15 MHz: 60 W
	NB-IoT SA: 20 W

3.2 Product description and theory of operation

EUT description of the methods used to exercise the EUT and all relevant ports:

Description/theory of operation	Radio 4472HP B12A is a multi-standard remote Single Band radio forming part of the Ericsson RBS (Radio Base Station) equipment. Radio 4472HP provides radio access for mobile and fixed devices and is designed for the outdoor environment. Radio 4472HP operates over the band 12A via 4 TX/RX ports connected to the Remote Radio Unit (RRU) antennas. Radio 4472HP transmits and receive on all 4 ports. Radio unit installation is designed for pole, wall or rail mount options. A fiber optic interface (2) provides the RRU/RBS control and digital interface between the Radio and the RBS. Radio 4472HP product is convection cooled and can be mounted either vertically or horizontally. Output RF Power is rated at 4 x 60 W. Altitude during operation: Below 4000 m. Radio 4472HP is a synthesized Transceiver designed for use in the 3GPP (Third Generation Partnership Project) for LTE (Long Term Evolution) - E-UTRA Base Station, and NR (New Radio). Radio product is KRC 161 4412/31 which is a SW locked customer deliverable. Tests were executed on the KRC 161 4412/3 which is a SW unlocked variant of the KRC 161 4412/31 radio to enable efficient testing for compliance. Both variants are electrically identical.
Ports/Interface	**Port** / **Description** A, B, C, D — RF Ports Data 1, 2 — Optical Interface Alarm / Fan — Alarm / Fan Control AISG — AISG communition port -48VDC — DC Input
Physical	**Dimensions** — 419mm x 269mm x 151mm **Weight** — 13.90 kg without fan **Operating Temperature** — −40 °C to +55 °C **Mounting** — Rail, wall and pole Vertical: portrait and bookshelf mounting are supported Horizontal: supported **Cooling** — Natural convection; optional fan unit
Software details	CXP2021137/1_R59G03
Product Identification / Markings and Labels	  Figure 1. FCC ID: TA8AKRC1614412 IC: 287AB-AS1614412 AS1614412

3.3 EUT test details

EUT setup/configuration rationale for Down link:

RAT	Modulation	Test Model / Configuration
LTE	QPSK	TM1.1
LTE	16QAM	TM3.2
LTE	64QAM	TM3.1
LTE	256QAM	TM3.1a
NR	QPSK	TM1.1
NR	16QAM	TM3.2
NR	64QAM	TM3.1
NR	256QAM	TM3.1a

LTE Test Configurations:

Config	BW (MHz)	Bottom (MHz)	Mid1 (MHz)	Mid2 (MHz)	Top (MHz)
LTE 1C	5	731.5	736.5	737.5	742.5
	10	734	735	739	740
	15	736.5	n/a	n/a	737.5
LTE 1C IB	5	731.5	736.5	737.5	742.5
LTE 1C GB	10	734	735	739	740
LTE 2C [IB]	5	731.5+736.5	732.5+737.5	736.5+741.5	737.5+742.5
LTE 3C [IB]	5	731.5+736.5+741.5	n/a	n/a	732.5+737.5+742.5
LTE Non-contig 2C [IB]	5	731.5_742.5			

NR Test Configurations:

Config	BW (MHz)	Bottom (MHz)	Mid1 (MHz)	Mid2 (MHz)	Top (MHz)
NR 1C	5	731.5	736.5	737.5	742.5
	10	734	735	739	740
	15	736.5	n/a	n/a	737.5
NR 2C	5	731.5+736.5	732.5+737.5	736.5+741.5	737.5+742.5
NR 3C	5	731.5+736.5+741.5	n/a	n/a	732.5+737.5+742.5
NR Non-contig 2C	5	731.5_742.5			

NB-IoT SA Test Configurations:

Config	BW (MHz)	Bottom (MHz)	Mid1 (MHz)	Mid2 (MHz)	Mid3 (MHz)	Mid4 (MHz)	Top (MHz)
NB-IoT SA	0.4	729.2	733.8	734.2	739.8	740.2	744.8

Multi-RAT Test Configurations:

Config	Bottom (MHz)	Mid1 (MHz)	Mid2 (MHz)	Top (MHz)
1N5+1L5IB	731.5+736.5	732.5+737.5	736.5+741.5	737.5+742.5
1N5+1SA	731.5+734.2	736.5+739.2	737.1+739.8	742.1+744.8
1SA+1L5	729.2+731.9	734.2+736.9	734.8+737.5	739.8+742.5
1N5+1L5IB Non-contig	731.5_742.5			
1N5+1SA Non-contig	731.5_744.8			
1SA+1L5 Non-contig	729.2_742.5			
1N5+1SA+1L5 Non-contig	731.5_737_742.5			

Radiated Emissions Test Configurations:

	Config	Frequency (MHz)
1	1C LTE10 GB Top	740
2	1C NR10 Top	740
3	MC LTE5 IB+LTE5 Mid2	736.5+741.5
4	MR NR5+LTE5 IB Bottom	731.5+736.5
5	MR Non-contig NR5+SA+LTE5	731.5_737_742.5

3.4 EUT setup diagram

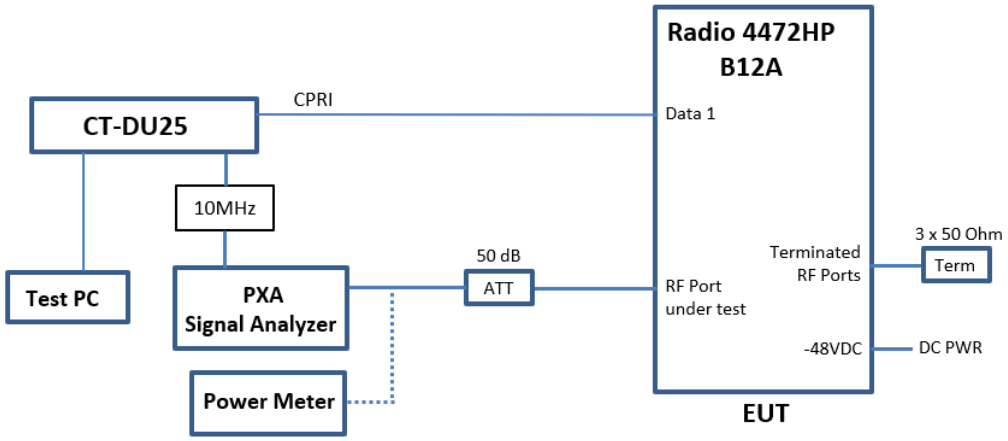


Figure 3.4-1: *Setup diagram – Radio Compliance*

3.5 Setup photographs

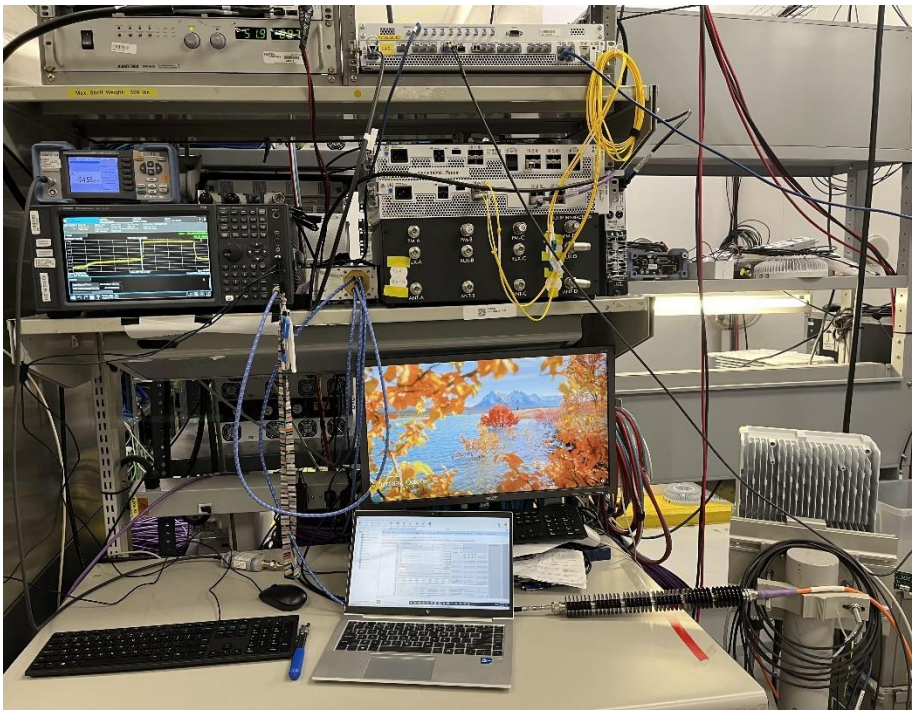


Figure 3.5-1: *Set up photo for Radio Compliance Testing*

Setup photographs, continued

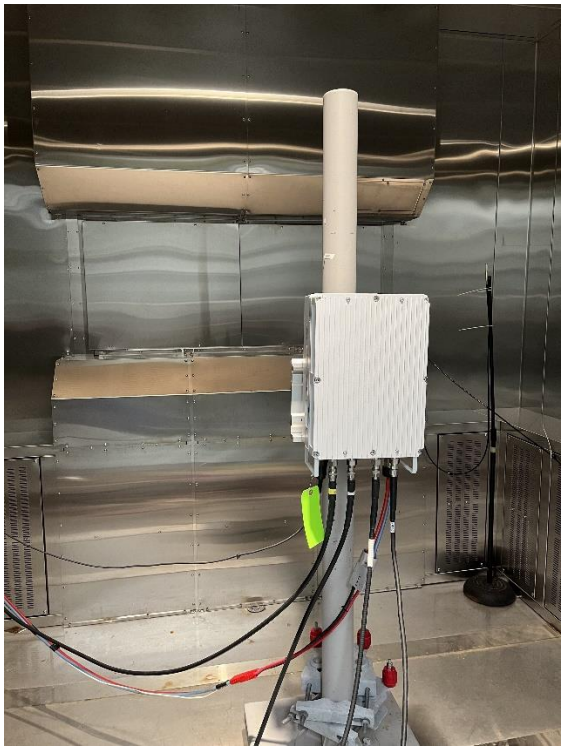
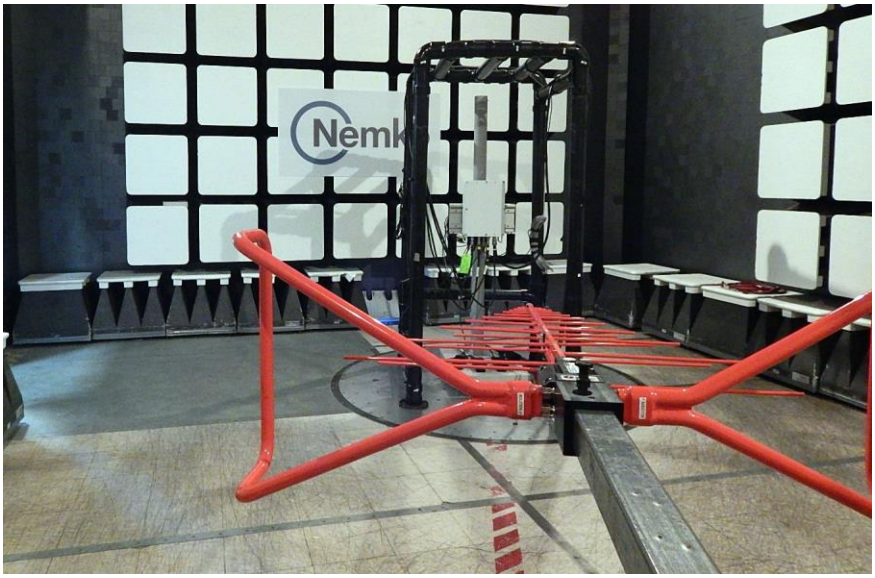


Figure 3.5-2: *EUT Set-up photo for Thermal Radio Compliance Testing*

Setup photographs, continued



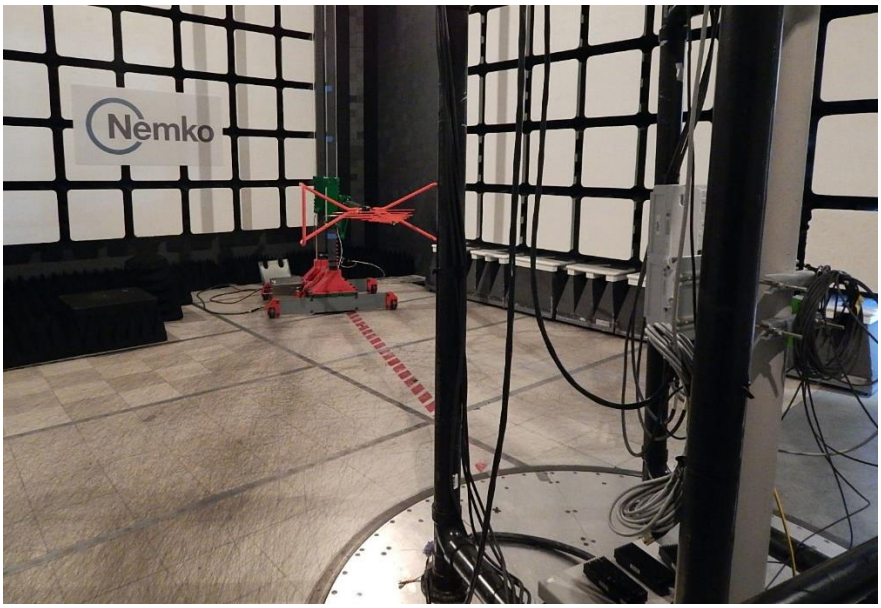
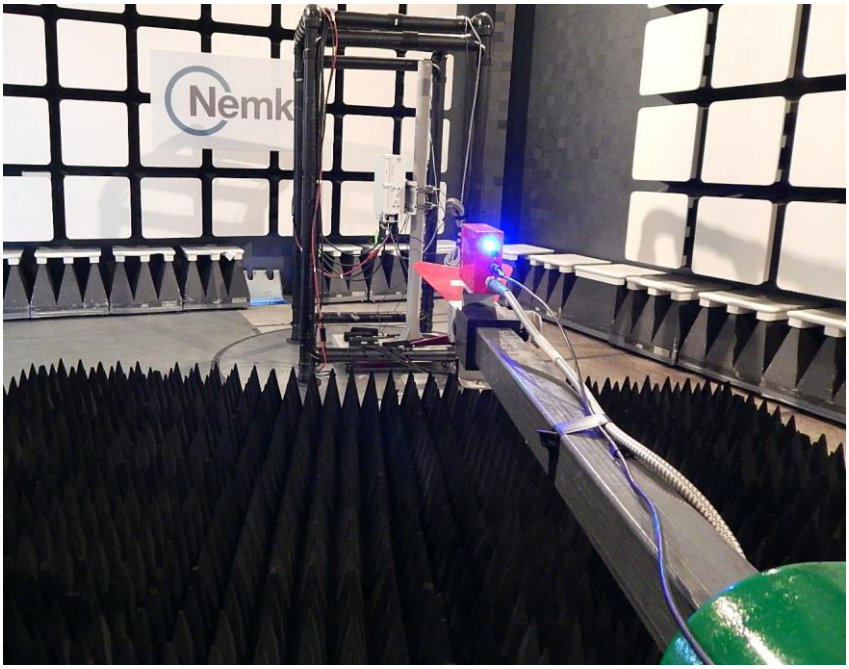


Figure 3.5-3: *EUT Set-up photos for Cabinet Radiated Emissions below 1 GHz*

Setup photographs, continued



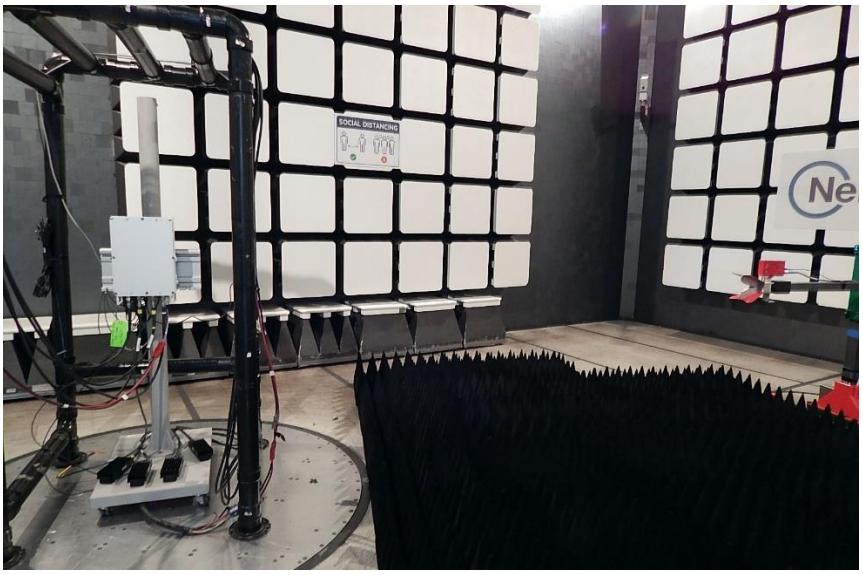


Figure 3.5-4: *EUT Set-up photos for Cabinet Radiated Emissions above 1 GHz*

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Measurement	**Measurement uncertainty, ±dB**
Radiated spurious emissions (30 MHz to 1 GHz)	5.8
Radiated spurious emissions (1 GHz to 6 GHz)	4.7
Radiated spurious emissions (6 GHz to 18 GHz)	5.0
Radiated spurious emissions (18 GHz to 26 GHz)	5.0
Radiated spurious emissions (18 GHz to 40 GHz)	5.2
RF Output power measurement using Spectrum Analyzer[1]	0.71
RF Output power measurement using Power Meter	0.54
Conducted spurious emissions	0.90
Other antenna port measurements	0.81

Notes: UKAS Lab 34, TIA-603 and ETSI TR 100 028-1&2 have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA002047	1 year	January 18, 2025
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
DC Power source	Ametek	SGA80X125C-0AAA	FA002737	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	March 7, 2025
Horn (1–18 GHz)	ETS Lindgren	3117	FA002840	1 year	March 8, 2025
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002877	1 year	November 24, 2024
Pre-amplifier (18–26 GHz)	Narda	BBS-1826N612	FA001550	1 year	February 9, 2025
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	March 27, 2025
50 Ω coax cable	Carlisle	WHU18-1818-072	FA002391	1 year	October 18, 2025
50 Ω coax cable	Huber+Suhner	104B11NX2/11000	FA003441	1 year	October 18, 2025
PXA Signal Analyzer	Keysight	N9030B	MY57144347	1 year	April 3, 2025
Power Meter	Rohde & Schwarz	NRP2	101814	2 years	March 21, 2025
Power Sensor	Rohde & Schwarz	NRP-Z11	100070	2 years	March 31, 2025
30 dB Attenuator	Weinschel Associates	WA66-30-33	1001278743	—	VOU
10 dB Attenuator (x2)	Mini-Circuits	BW-K10-2W44+	—	—	VOU
CT-DU25*	Ericsson	LPC 102 500/1	T01G525053	—	NCR
ENA Network Analyzer	Keysight	E5080B	MY59202549	1 year	April 4, 2025
DC Power Supply	Xantrex	XKW 60-50	E00109863	—	VOU

Notes: NCR - no calibration required, VOU - verify on use.

* CT-DU25 is the test equipment that drives the radios traffic.

Section 8. Testing data

8.1 Maximum output power at RF antenna connector

8.1.1 Definitions and limits

FCC §27.50(c) The following power and antenna height requirements apply to stations transmitting in the 600 MHz band and the 698-746 MHz band:

(1) Fixed and base stations transmitting a signal with an emission bandwidth of 1 MHz or less must not exceed an effective radiated power (ERP) of 1000 watts and an antenna height of 305 m height above average terrain (HAAT), except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts ERP in accordance with Table 1 of this section;

RSS-130, Section 4.6: Transmitter output power and effective radiated power (e.r.p.)

The transmitter output power shall be measured in terms of average power. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

4.6.3 Frequency bands 698-756 MHz and 777-787 MHz
For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

SRSP-518, Section 5: Technical Criteria

5.1 Radiated power and antenna height limits for fixed and base stations

21. For fixed and base stations transmitting in accordance with section 4, the maximum permissible equivalent isotropically radiated power (e.i.r.p.) is 1640 watts and 1640 watts/MHz for a channel bandwidth less than or equal to 1 MHz and greater than 1 MHz, respectively. These e.i.r.p. limits apply for stations with an antenna height above average terrain (HAAT)Footnote2 up to 305 metres.

5.4 Stations with multiple antennas using multiple-input, multiple-output (MIMO) technology
29. If a fixed or base station is equipped with multiple antennas, the following rules regarding e.i.r.p. and antenna height shall apply.

5.4.1 E.i.r.p. for correlated transmission

30. When multiple antennas are used at a station to transmit the same digital data in a given symbol period (even with different coding or phase shifts) for transmit diversity or to steer signal energy towards a particular direction for enhanced directional gain (i.e. beamforming) or to devise any other transmission mode where signals from different antennas are correlated, the e.i.r.p. shall be calculated based on the aggregate power conducted across all antennas and resulting directional gain of 10 log10(N) + Gmax(dBi). Here, N is the number of antennas and Gmax is the highest gain in dBi among all antennas.

5.4.2 E.i.r.p. for uncorrelated transmission

31. When multiple antennas are used at a station in which each antenna transmits different digital data during any given symbol period (i.e. space-time block codes) or independent parallel data stream over the same frequency bandwidth in order to increase data rates (i.e. spatial multiplexing), or forms any other transmission mode where signals from different antennas are completely uncorrelated, the e.i.r.p. shall be calculated based on the aggregate power conducted across all antennas and maximum antenna gain Gmax.

5.4.3 Antenna height

32. The HAAT of a fixed or a base station with multiple antennas shall be calculated with reference to the highest antenna.

8.1.2 Test summary

Test date	October 29, 2024
Test engineer	Andrey Adelberg

8.1.3 Observations, settings, and special notes

Output power was measured with RMS power meter per ANSI C63.26 Paragraph 5.2.4.2 method. PSD was measured using method described in paragraph 5.2.4.4.

- Sample Selection: A random sample of devices was selected for testing to ensure representative results.
- Antenna Port Selection: The device under test (EUT) has four antenna ports. Port D was identified as the port with the highest transmit power and was selected for all subsequent measurements.
- Modulation Selection: The EUT supports multiple Quadrature Amplitude Modulation (QAM) schemes. QPSK was chosen as the worst-case modulation due to its higher power output.
- MIMO Power Calculation:
  - For New Radio (NR) and Long-Term Evolution (LTE) modes, the Total MIMO Power Spectral Density (PSD) was calculated by adding 6.02 dB to the PSD of a single antenna port to account for the 4×4 MIMO configuration.
  - For IoT SA mode, the Total MIMO PSD was calculated by adding 3.01 dB to the PSD of a single antenna port to account for the 2×2 MIMO configuration.
- Radio Base Station (RBS) EIRP Limits: RBS EIRP limits vary depending on deployment scenarios. To ensure compliance with regulatory limits, specific RBS setups and carrier configurations are considered during site commissioning.
- Test Conditions: The EUT was tested under maximum rated output power conditions to assess worst-case emission levels.
- Antenna and Deployment Considerations: The EUT was tested without an antenna. Licensees are responsible for evaluating installation and deployment factors, including maximum power settings, antenna gain, and feeder loss, to ensure compliance with Equivalent Isotropically Radiated Power (EIRP) limits as defined by the FCC and ISED regulations.
- EIRP Calculation Example: For Radio 4472HP B12A, EIRP was calculated using an antenna gain of 15.7 dBi and a feeder loss of 2.5 dB. Power settings and carrier configurations will be adjusted as necessary to meet regulatory requirements based on specific deployment scenarios.
- The FCC and ISED regulatory limits for Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) are 1000 W (60 dBm) and 1640 W (62.15 dBm), respectively. As EIRP is calculated as ERP + 2.15 dB, compliance with either limit ensures compliance with the other. The tables below present measurement results evaluated against the EIRP limit, with the margin of compliance being identical for both ERP and EIRP.

Observations, settings, and special notes, continued

Spectrum analyzer settings for PSD:

Detector mode	RMS
Resolution bandwidth	1 MHz
Video bandwidth	>RBW
Trace mode	Averaging
Measurement time	Auto

8.1.4 Test data

Table 8.1-1: *EIRP calculation based on the* ***worst-case PSD measurement***

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 (LTE)	40.921	46.94	2.5	15.7	60.14	62.15	2.01
733.8 (IoT SA)	43.299	46.31	2.5	15.7	59.51	62.15	2.64

Table 8.1-2: *RF power density measurement results of a single-carrier operation for NR on 5 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5	40.585	46.61	2.5	15.7	59.81	62.15	2.34
736.5	40.406	46.43	2.5	15.7	59.63	62.15	2.52
737.5	40.402	46.42	2.5	15.7	59.62	62.15	2.53
742.5	40.265	46.29	2.5	15.7	59.49	62.15	2.66

Table 8.1-3: *RF power density measurement results of a single-carrier operation for NR on 10 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
734.0	38.580	44.60	2.5	15.7	57.80	62.15	4.35
735.0	38.740	44.76	2.5	15.7	57.96	62.15	4.19
739.0	38.725	44.75	2.5	15.7	57.95	62.15	4.20
740.0	38.765	44.79	2.5	15.7	57.99	62.15	4.16

Table 8.1-4: *RF power density measurement results of a single-carrier operation for NR on 15 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
736.5	36.681	42.70	2.5	15.7	55.90	62.15	6.25
737.5	36.836	42.86	2.5	15.7	56.06	62.15	6.09

Table 8.1-5: *RF power density measurement results of a single-carrier operation for LTE on 5 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5	40.074	46.09	2.5	15.7	59.29	62.15	2.86
736.5	40.150	46.17	2.5	15.7	59.37	62.15	2.78
737.5	40.279	46.30	2.5	15.7	59.50	62.15	2.65
742.5	39.913	45.93	2.5	15.7	59.13	62.15	3.02

Test data, continued

Table 8.1-6: *RF power density measurement results of a single-carrier operation for LTE on 10 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
734.0	38.901	44.92	2.5	15.7	58.12	62.15	4.03
735.0	38.792	44.81	2.5	15.7	58.01	62.15	4.14
739.0	38.767	44.79	2.5	15.7	57.99	62.15	4.16
740.0	38.714	44.73	2.5	15.7	57.93	62.15	4.22

Table 8.1-7: *RF power density measurement results of a single-carrier operation for LTE on 15 MHz channel*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
736.5	37.216	43.24	2.5	15.7	56.44	62.15	5.71
737.5	37.185	43.21	2.5	15.7	56.41	62.15	5.74

Table 8.1-8: *RF power density measurement results of a single-carrier operation for LTE on 5 MHz channel with IB*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5	40.921	46.94	2.5	15.7	60.14	62.15	2.01
736.5	40.783	46.80	2.5	15.7	60.00	62.15	2.15
737.5	40.741	46.76	2.5	15.7	59.96	62.15	2.19
742.5	40.870	46.89	2.5	15.7	60.09	62.15	2.06

Table 8.1-9: *RF power density measurement results of a single-carrier operation for LTE on 10 MHz channel with GB*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
734.0	38.895	44.92	2.5	15.7	58.12	62.15	4.03
735.0	38.906	44.93	2.5	15.7	58.13	62.15	4.02
739.0	38.749	44.77	2.5	15.7	57.97	62.15	4.18
740.0	38.911	44.93	2.5	15.7	58.13	62.15	4.02

Table 8.1-10: *RF power density measurement results of a single-carrier operation for IoT SA (Stand Alone)*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
729.2	42.880	45.89	2.5	15.7	59.09	62.15	3.06
733.8	43.299	46.31	2.5	15.7	59.51	62.15	2.64
734.2	42.957	45.97	2.5	15.7	59.17	62.15	2.98
739.8	42.614	45.62	2.5	15.7	58.82	62.15	3.33
740.2	42.627	45.64	2.5	15.7	58.84	62.15	3.31
744.8	43.054	46.06	2.5	15.7	59.26	62.15	2.89

Table 8.1-11: *RF power density measurement results of a multi-carrier operation for NR on 5 MHz channel (2C)*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 + 736.5	38.708	44.73	2.5	15.7	57.93	62.15	4.22
732.5 + 737.5	38.828	44.85	2.5	15.7	58.05	62.15	4.10
736.5 + 741.0	38.728	44.75	2.5	15.7	57.95	62.15	4.20
737.5 + 742.5	38.699	44.72	2.5	15.7	57.92	62.15	4.23
731.5 + 742.5	38.749	44.77	2.5	15.7	57.97	62.15	4.18

Test data, continued

Table 8.1-12: *RF power density measurement results of a multi-carrier operation for NR on 5 MHz channel (3C)*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5+736.5+741.5	36.858	42.88	2.5	15.7	56.08	62.15	6.07
732.5+737.5+742.5	36.870	42.89	2.5	15.7	56.09	62.15	6.06

Table 8.1-13: *RF power density measurement results of a multi-carrier operation for LTE on 5 MHz channel (2C)*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 + 736.5	39.394	45.41	2.5	15.7	58.61	62.15	3.54
732.5 + 737.5	39.336	45.36	2.5	15.7	58.56	62.15	3.59
736.5 + 741.0	39.787	45.81	2.5	15.7	59.01	62.15	3.14
737.5 + 742.5	39.623	45.64	2.5	15.7	58.84	62.15	3.31
731.5 + 742.5	39.526	45.55	2.5	15.7	58.75	62.15	3.40

Table 8.1-14: *RF power density measurement results of a multi-carrier operation for LTE on 5 MHz channel (3C)*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 + 736.5 + 741.5	37.845	43.87	2.5	15.7	57.07	62.15	5.08
732.5 + 737.5 + 742.5	37.331	43.35	2.5	15.7	56.55	62.15	5.60

Table 8.1-15: *RF power density measurement results of a multi-RAT operation for 1) NR 5 MHz, IoT SA and LTE 5 MHz; 2) NR 5 MHz and LTE 5 MHz*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 + 737 + 742.5	42.442	45.45	2.5	15.7	58.65	62.15	3.50
731.5 + 742.5	39.525	45.55	2.5	15.7	58.75	62.15	3.40
731.5 + 736.5	39.829	45.85	2.5	15.7	59.05	62.15	3.10
732.5 + 737.5	39.479	45.50	2.5	15.7	58.70	62.15	3.45
736.5 + 741.5	39.659	45.68	2.5	15.7	58.88	62.15	3.27
737.5 + 742.5	39.788	45.81	2.5	15.7	59.01	62.15	3.14

Table 8.1-16: *RF power density measurement results of a multi-RAT operation for IoT SA and LTE 5 MHz*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
729.2 + 731.9	42.135	45.15	2.5	15.7	58.35	62.15	3.80
734.2 + 736.9	42.836	45.85	2.5	15.7	59.05	62.15	3.10
734.8 + 737.5	42.779	45.79	2.5	15.7	58.99	62.15	3.16
739.8 + 742.5	42.812	45.82	2.5	15.7	59.02	62.15	3.13
729.2 + 742.5	42.350	45.36	2.5	15.7	58.56	62.15	3.59

Table 8.1-17: *RF power density measurement results of a multi-RAT operation for NR 5 MHz and IoT SA*

Frequency, MHz	RF power density, dBm/MHz	Total MIMO PSD, dBm/MHz	Cable loss, dB	Antenna gain, dBi	EIRP PSD, dBm/MHz	EIRP limit, dBm/MHz	Margin, dB
731.5 + 734.2	42.702	45.71	2.5	15.7	58.91	62.15	3.24
736.5 + 739.2	42.451	45.46	2.5	15.7	58.66	62.15	3.49
737.1 + 739.8	42.540	45.55	2.5	15.7	58.75	62.15	3.40
742.1 + 744.8	42.254	45.26	2.5	15.7	58.46	62.15	3.69
731.5 + 744.8	42.234	45.24	2.5	15.7	58.44	62.15	3.71

Test data, continued

Table 8.1-18: *RF total channel power measurement results for NR*

Channel size, notes	Frequency, MHz	Transmit power, dBm	Transmit power, W
5 MHz, 1C	731.5	45.73	37.411
5 MHz, 1C	736.5	45.75	37.584
5 MHz, 1C	737.5	45.72	37.325
5 MHz, 1C	742.5	45.63	36.559
10 MHz, 1C	734.0	47.39	54.828
10 MHz, 1C	735.0	47.39	54.828
10 MHz, 1C	739.0	47.41	55.081
10 MHz, 1C	740.0	47.32	53.951
15 MHz, 1C	736.5	47.34	54.200
15 MHz, 1C	737.5	47.31	53.827
5 MHz, 2C	731.5 + 736.5	47.34	54.200
5 MHz, 2C	732.5 + 737.5	47.38	54.702
5 MHz, 2C	736.5 + 741.5	47.32	53.951
5 MHz, 2C	737.5 + 742.5	47.31	53.827
5 MHz, 2C non-contiguous	731.5+742.5	47.23	52.845
5 MHz, 3C	731.5+736.5+741.5	47.32	53.951
5 MHz, 3C	732.5+737.5+742.5	47.31	53.827

Table 8.1-19: *RF total channel power measurement results for LTE*

Channel size, notes	Frequency, MHz	Transmit power, dBm	Transmit power, W
5 MHz, 1C	731.5	45.76	37.670
5 MHz, 1C	736.5	45.74	37.497
5 MHz, 1C	737.5	45.72	37.325
5 MHz, 1C	742.5	45.65	36.728
10 MHz, 1C	734.0	47.38	54.702
10 MHz, 1C	735.0	47.39	54.828
10 MHz, 1C	739.0	47.37	54.576
10 MHz, 1C	740.0	47.36	54.450
15 MHz, 1C	736.5	47.34	54.200
15 MHz, 1C	737.5	47.36	54.450
5 MHz, SC with IB	731.5	45.74	37.497
5 MHz, SC with IB	736.5	45.74	37.497
5 MHz, SC with IB	737.5	45.75	37.584
5 MHz, SC with IB	742.5	45.62	36.475
10 MHz, SC with GB	734.0	47.26	53.211
10 MHz, SC with GB	735.0	47.30	53.703
10 MHz, SC with GB	739.0	47.27	53.333
10 MHz, SC with GB	740.0	47.21	52.602
5 MHz, 2C	731.5 + 736.5	47.38	54.702
5 MHz, 2C	732.5 + 737.5	47.39	54.828
5 MHz, 2C	736.5 + 741.5	47.38	54.702
5 MHz, 2C	737.5 + 742.5	47.34	54.200
5 MHz, 2C non-contiguous	731.5+742.5	47.22	52.723
5 MHz, 3C	731.5+736.5+741.5	47.31	53.827
5 MHz, 3C	732.5+737.5+742.5	47.33	54.075

Test data, continued

Table 8.1-20: *RF total channel power measurement results for IoT SA*

Frequency, MHz	Transmit power, dBm	Transmit power, W
729.2	42.45	17.579
733.8	42.39	17.338
734.2	42.38	17.298
739.8	42.31	17.022
740.2	42.31	17.022
744.8	42.24	16.749

Table 8.1-21: *RF total channel power measurement results for multi-RAT operation*

Channel size, notes	Frequency, MHz	Transmit power, dBm	Transmit power, W
NR 5M + LTE 5M	731.5+736.5	47.34	54.200
NR 5M + LTE 5M	732.5+737.5	47.36	54.450
NR 5M + LTE 5M	736.5+741.5	47.39	54.828
NR 5M + LTE 5M	737.5+742.5	47.36	54.450
NR 5M + IoT SA	731.5+734.2	47.22	52.723
NR 5M + IoT SA	736.5+739.2	47.21	52.602
NR 5M + IoT SA	737.1+739.8	47.23	52.845
NR 5M + IoT SA	742.1+744.8	47.13	51.642
IoT SA + LTE 5M	731.5	47.13	51.642
IoT SA + LTE 5M	736.5	47.24	52.966
IoT SA + LTE 5M	737.5	47.24	52.966
IoT SA + LTE 5M	742.5	47.16	52.000
NR 5M + LTE 5M non-contiguous	731.5_742.5	47.26	53.211
NR 5M + IoT SA non-contiguous	731.5_744.8	47.12	51.523
IoT SA + LTE 5M non-contiguous	729.2_742.5	47.11	51.404
NR 5M + IoT SA + LTE 5M non-contiguous	731.5_737_742.5	47.18	52.240

Test data, continued

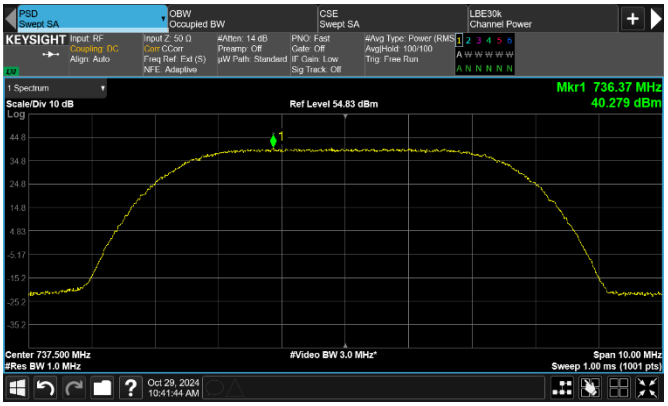


Figure 8.1-1: *PSD of LTE 5 MHz channel bandwidth, single carrier operation, sample plot*

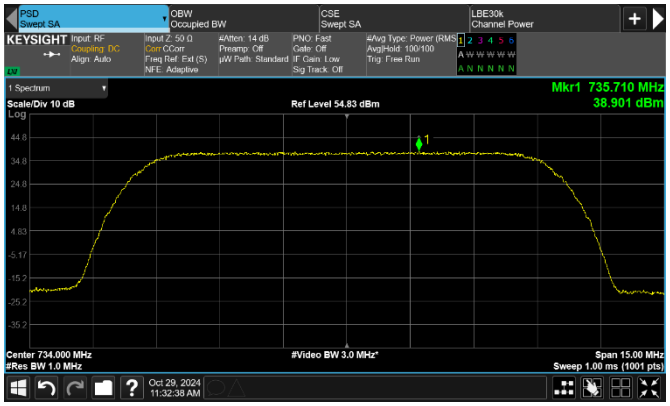


Figure 8.1-2: *PSD of LTE 10 MHz channel bandwidth, single carrier operation, sample plot*

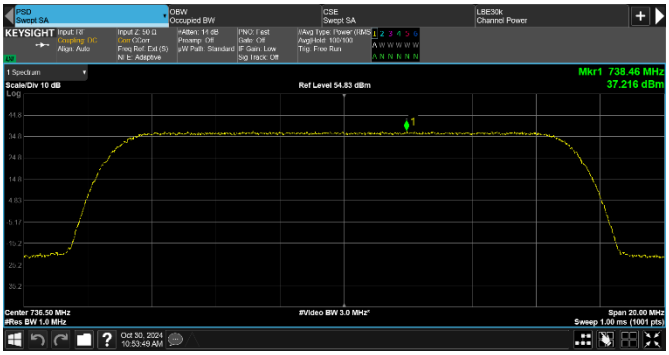


Figure 8.1-3: *PSD of LTE 15 MHz channel bandwidth, single carrier operation, sample plot.*

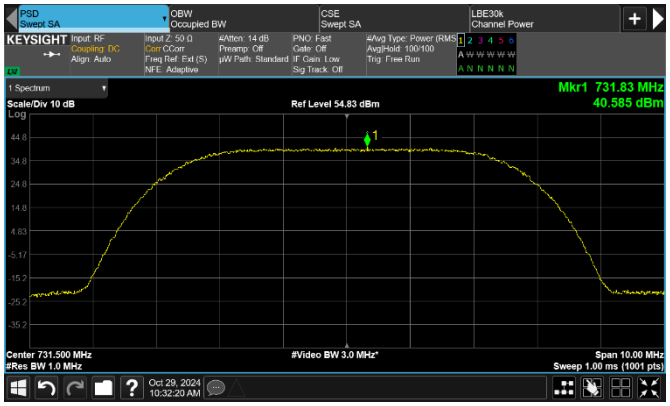


Figure 8.1-4: *PSD of NR 5 MHz channel bandwidth, single carrier operation, sample plot*

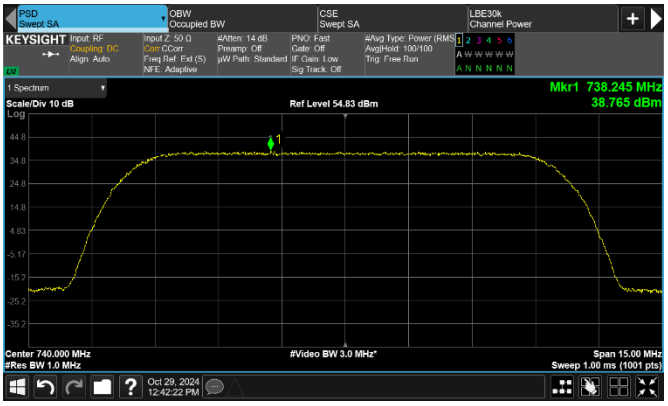


Figure 8.1-5: *PSD of NR 10 MHz channel bandwidth, single carrier operation, sample plot.*

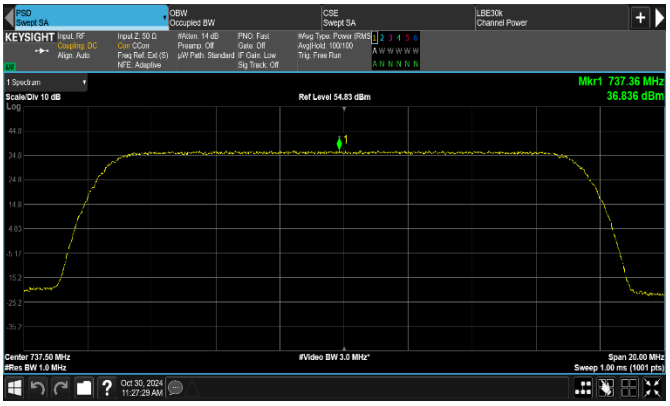


Figure 8.1-6: *PSD of NR 15 MHz channel bandwidth, single carrier operation, sample plot*

Test data, continued

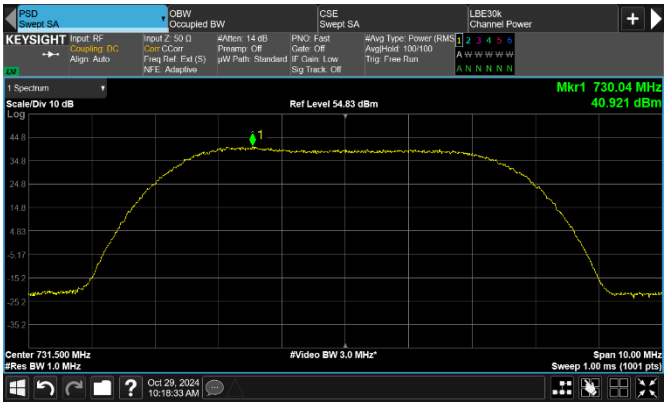


Figure 8.1-7: *PSD of LTE 5 MHz with IB channel bandwidth, single carrier operation, sample plot*

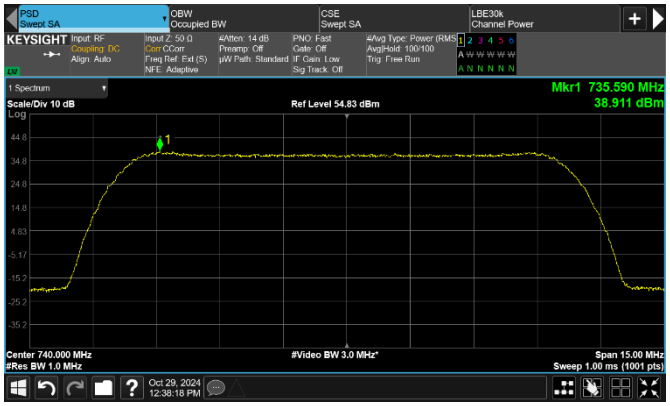


Figure 8.1-8: *PSD of LTE 10 MHz with GB channel bandwidth, single carrier operation, sample plot*

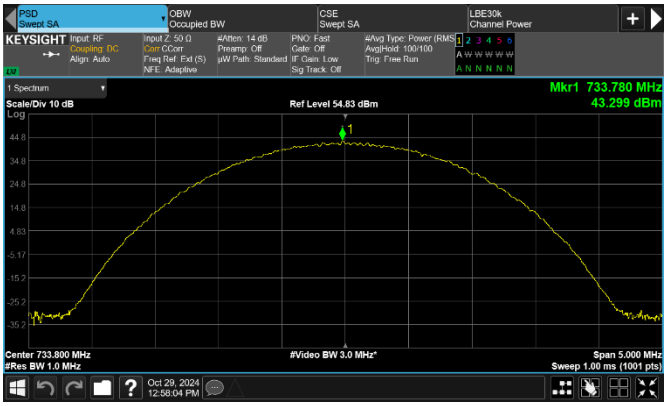


Figure 8.1-9: *PSD of IoT SA, single carrier operation, sample plot*

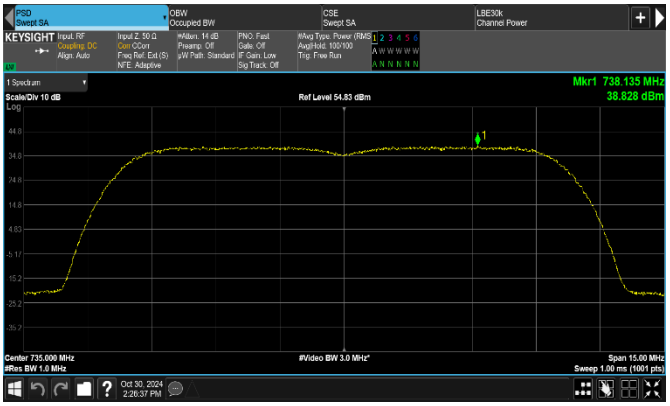


Figure 8.1-10: *PSD of NR 5 MHz channel bandwidth, 2-carrier operation, sample plot*

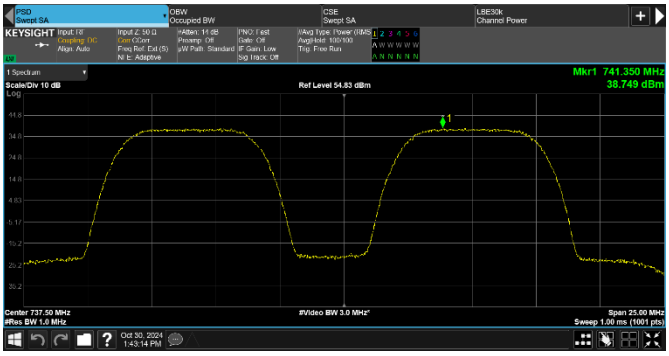


Figure 8.1-11: *PSD of NR 5 MHz channel bandwidth, 2-carrier non-contiguous operation, sample plot*

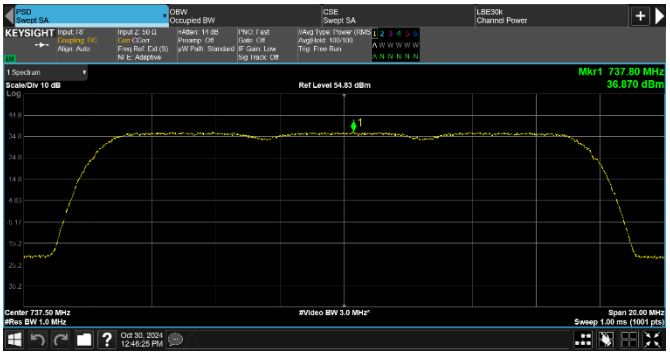


Figure 8.1-12: *PSD of NR 5 MHz channel bandwidth, 3-carrier operation, sample plot*

Test data, continued

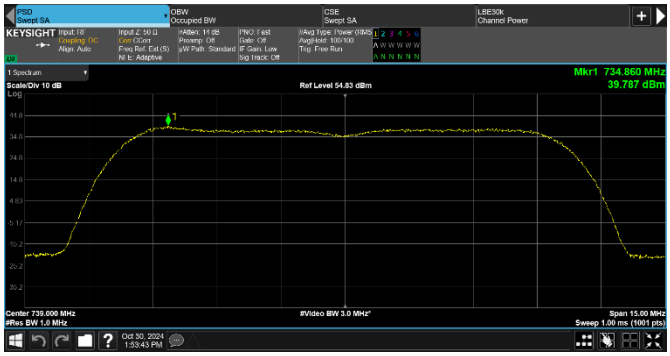


Figure 8.1-13: *PSD of LTE 5 MHz channel bandwidth, 2-carrier operation, sample plot*

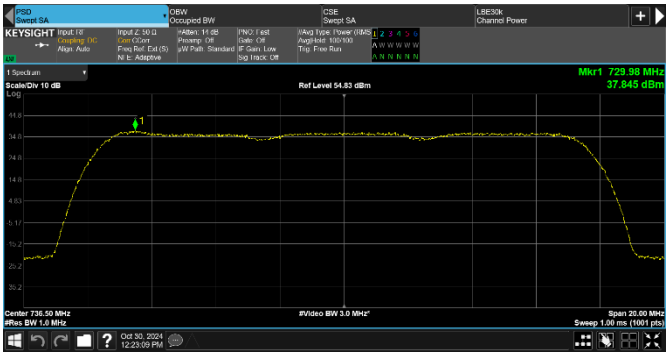


Figure 8.1-14: *PSD of LTE 5 MHz channel bandwidth, 3-carrier operation, sample plot*

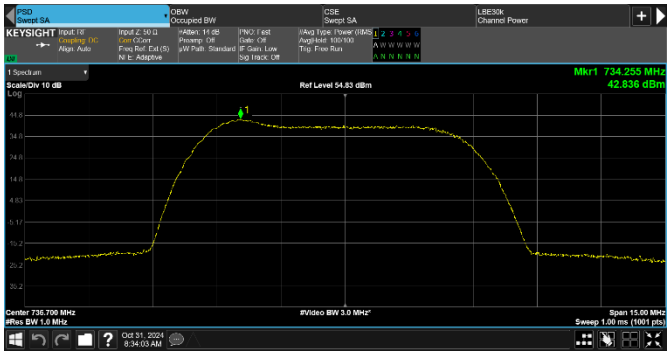


Figure 8.1-15: *PSD of IoT SA and LTE 5 MHz, 2-carrier operation, sample plot*

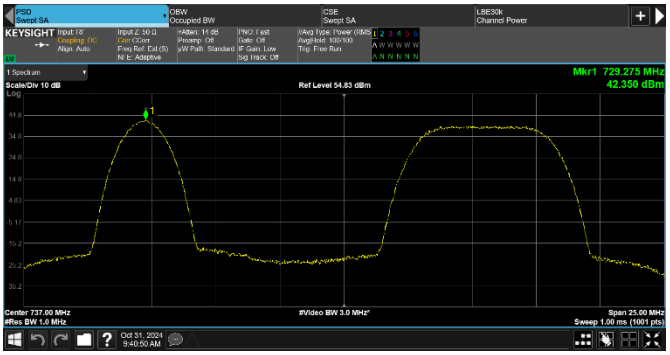


Figure 8.1-16: *PSD of IoT SA and LTE 5 MHz, 2-carrier non-contiguous operation, sample plot*

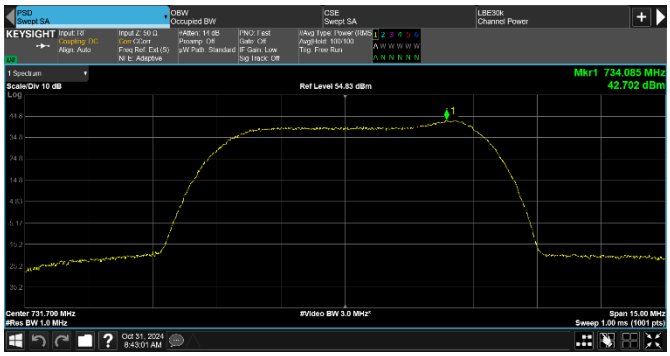


Figure 8.1-17: *PSD of NR 5 MHz and SA IoT, 2-carrier operation, sample plot*

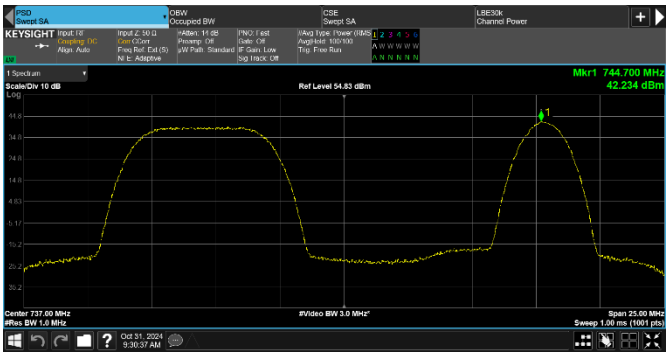


Figure 8.1-18: *PSD of of NR 5 MHz and SA IoT, 2-carrier non-contiguous operation, sample plot*

Test data, continued

Table 8.1-22: *Complementary Cumulative Distribution Function (CCDF) of the PAPR reduction measurement results for single carrier operation for LTE*

Channel size, notes	Frequency, MHz	0.1% CCDF, dB	PAPR reduction limit, dB	Margin, dB
5 MHz	731.5	8.10	13.00	4.90
5 MHz	736.5	8.13	13.00	4.87
5 MHz	737.5	8.07	13.00	4.93
5 MHz	742.5	8.15	13.00	4.85
10 MHz	734.0	7.23	13.00	5.77
10 MHz	735.0	7.23	13.00	5.77
10 MHz	739.0	7.21	13.00	5.79
10 MHz	740.0	7.21	13.00	5.79
15 MHz	736.5	7.26	13.00	5.74
15 MHz	737.5	7.23	13.00	5.77
5 MHz, IB	731.5	8.02	13.00	4.98
5 MHz, IB	736.5	8.10	13.00	4.90
5 MHz, IB	737.5	8.16	13.00	4.84
5 MHz, IB	742.5	8.00	13.00	5.00
10 MHz, GB	734.0	7.36	13.00	5.64
10 MHz, GB	735.0	7.34	13.00	5.66
10 MHz, GB	739.0	7.31	13.00	5.69
10 MHz, GB	740.0	7.32	13.00	5.68

Table 8.1-23: *Complementary Cumulative Distribution Function (CCDF) of the PAPR reduction measurement results for single carrier operation for NR*

Channel size, notes	Frequency, MHz	0.1% CCDF, dB	PAPR reduction limit, dB	Margin, dB
5 MHz	731.5	8.13	13.00	4.87
5 MHz	736.5	8.03	13.00	4.97
5 MHz	737.5	8.04	13.00	4.96
5 MHz	742.5	8.14	13.00	4.86
10 MHz	734.0	7.23	13.00	5.77
10 MHz	735.0	7.24	13.00	5.76
10 MHz	739.0	7.22	13.00	5.78
10 MHz	740.0	7.21	13.00	5.79
15 MHz	736.5	7.27	13.00	5.73
15 MHz	737.5	7.25	13.00	5.75

Table 8.1-24: *Complementary Cumulative Distribution Function (CCDF) of the PAPR reduction measurement results for single carrier operation for IoT SA*

Frequency, MHz	0.1% CCDF, dB	PAPR reduction limit, dB	Margin, dB
729.2	4.60	13.00	8.40
733.8	4.57	13.00	8.43
734.2	4.60	13.00	8.40
739.8	4.57	13.00	8.43
740.2	4.60	13.00	8.40
744.8	4.62	13.00	8.38

Test data, continued

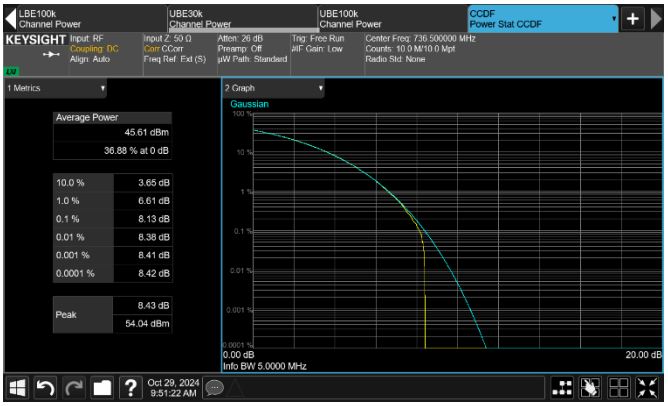


Figure 8.1-19: *CCDF sample plot, LTE 5 MHz*

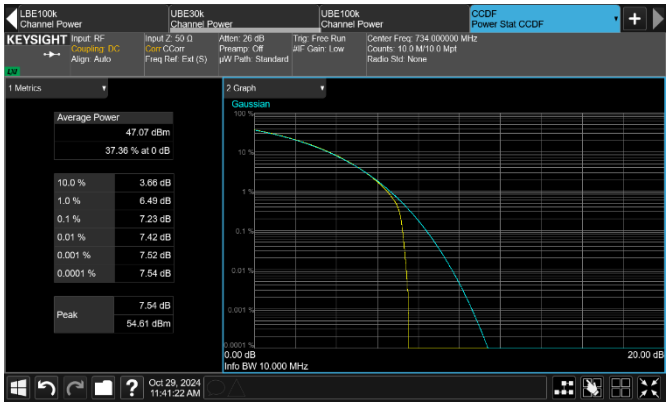


Figure 8.1-20: *CCDF sample plot, LTE 10 MHz*

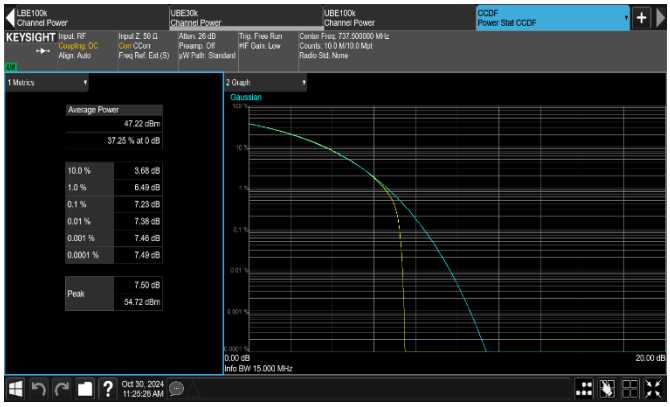


Figure 8.1-21: *CCDF sample plot, LTE 15 MHz*

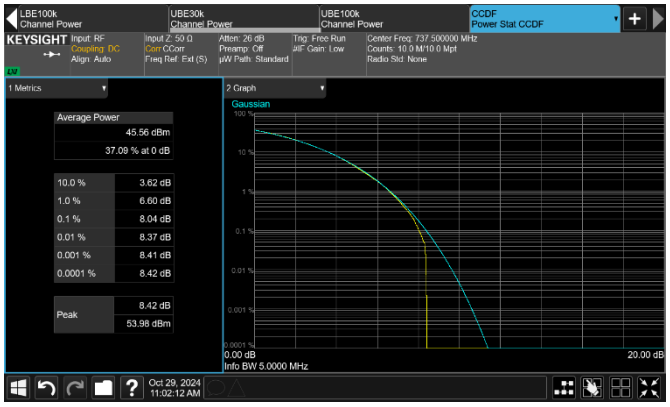


Figure 8.1-22: *CCDF sample plot, NR 5 MHz*

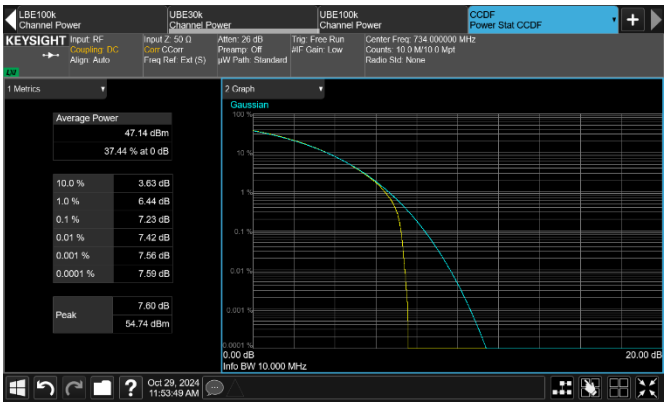


Figure 8.1-23: *CCDF sample plot, NR 10 MHz*

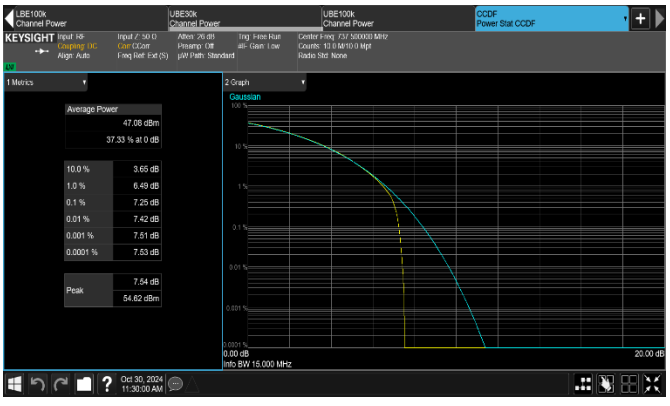


Figure 8.1-24: *CCDF sample plot, NR 15 MHz*

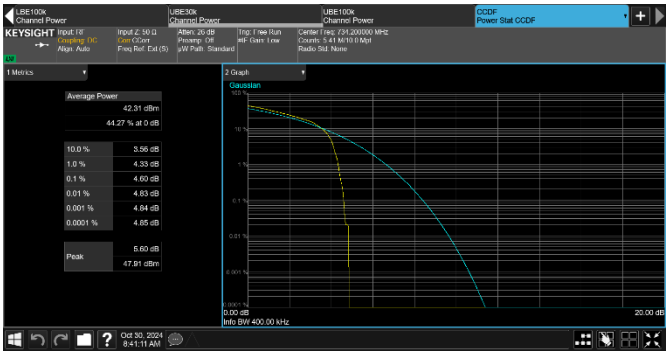


Figure 8.1-25: *CCDF sample plot, IoT SA*

8.2 Spurious emissions at RF antenna connector

8.2.1 Definitions and limits

FCC §27.53: Emission limits

(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

RSS-130, Section 4.7.1: Transmitter Unwanted Emissions

The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 $\log_{10}$ p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

8.2.2 Test summary

Test date	October 29, 2024
Test engineer	Andrey Adelberg

8.2.3 Observations, settings and special notes

The spectrum was analyzed from 30 MHz to the 10th harmonic. All measurements were conducted using an average (RMS) detector in accordance with ANSI C63.26 Paragraph 5.7.2.
All NR and LTE limit lines were adjusted for MIMO operation by 6 dB, for example: -13 dBm – 6 dB = -19 dBm.
MIMO correction factor for 4 antenna ports: 10 × Log10(4) = 6 dB.

All IoT SA limit lines were adjusted for MIMO operation by 3 dB, for example: -13 dBm – 3 dB = -16 dBm.
MIMO correction factor for 2 antenna ports: 10 × Log10(2) = 3 dB.

For general scan, the RBW was set to 1 MHz, with the VBW set wider than the RBW.
Band edges were tested using the channel power function of the spectrum analyzer, which calculates the total power within a specific band. This method is correlated with the resolution bandwidths specified in the regulations.

8.2.4 Test data

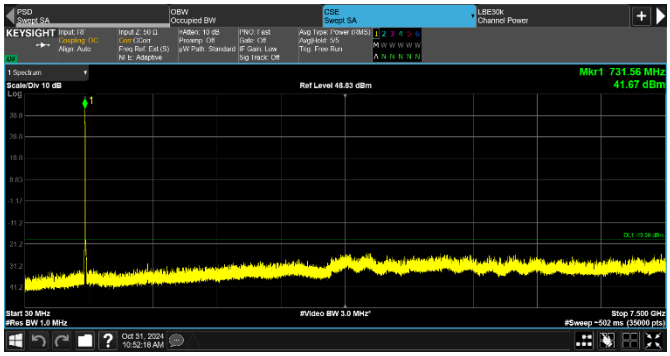


Figure 8.2-1: *Conducted spurious emissions of LTE 5 MHz low channel, single carrier operation*

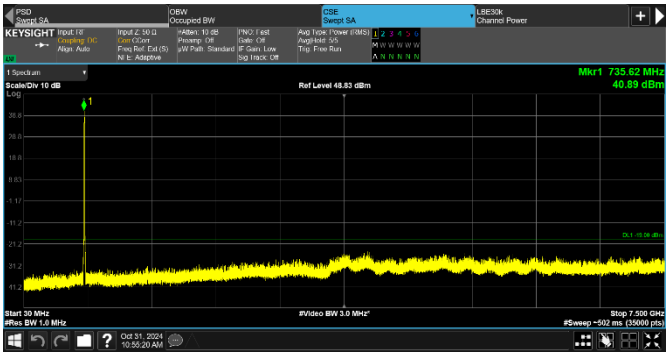


Figure 8.2-2: *Conducted spurious emissions of LTE 5 MHz mid1 channel, single carrier operation*

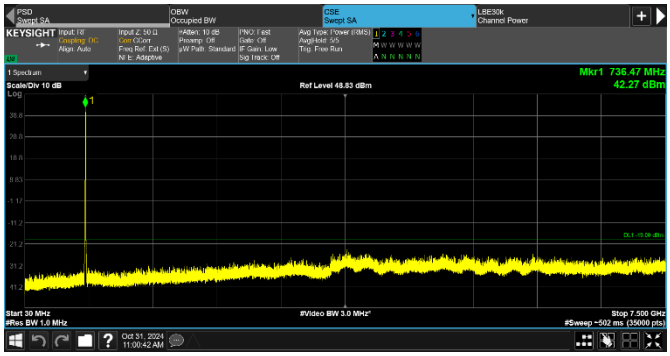


Figure 8.2-3: *Conducted spurious emissions of LTE 5 MHz mid2 channel, single carrier operation*

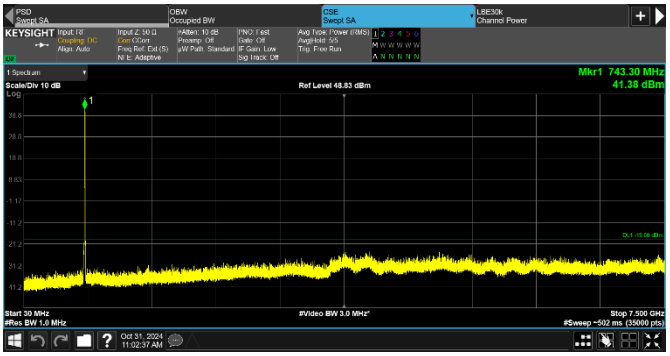


Figure 8.2-4: *Conducted spurious emissions of LTE 5 MHz top channel, single carrier operation*

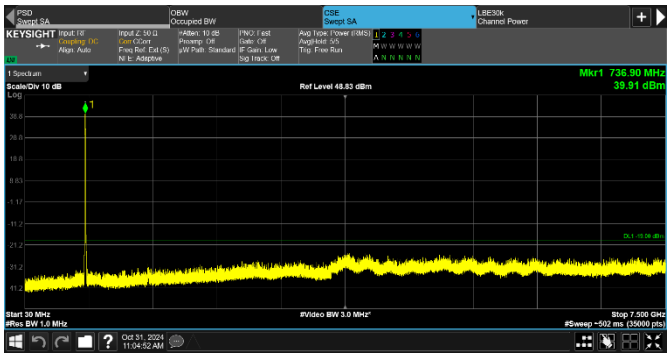


Figure 8.2-5: *Conducted spurious emissions of LTE 10 MHz low channel, single carrier operation*

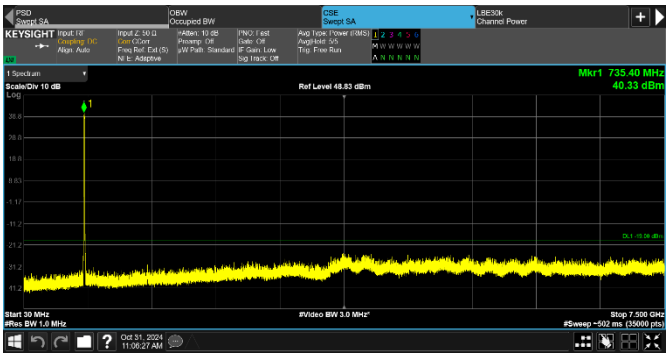


Figure 8.2-6: *Conducted spurious emissions of LTE 10 MHz mid1 channel, single carrier operation*

Test data, continued

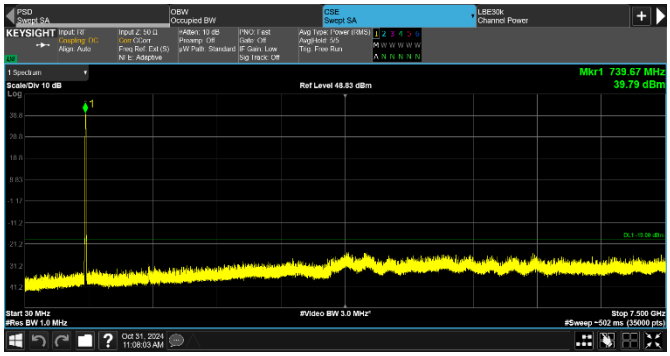


Figure 8.2-7: *Conducted spurious emissions of LTE 10 MHz mid2 channel, single carrier operation*

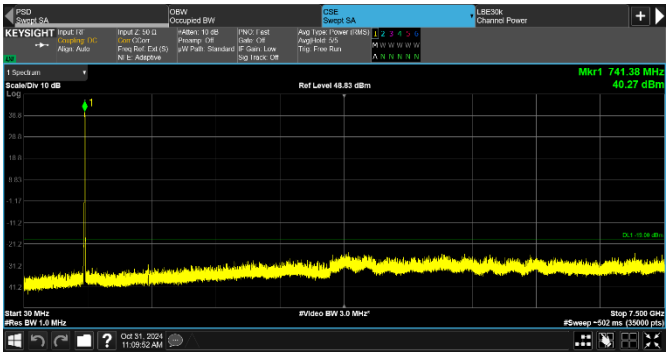


Figure 8.2-8: *Conducted spurious emissions of LTE 10 MHz top channel, single carrier operation*

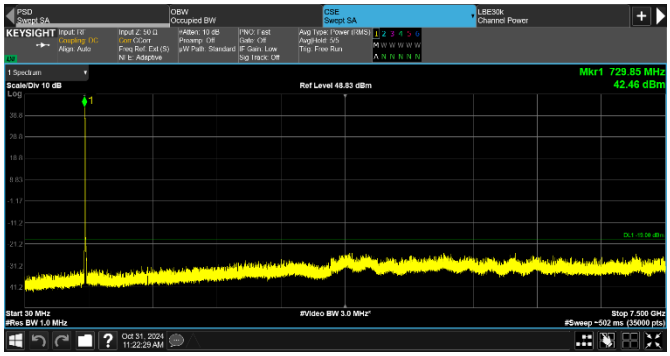


Figure 8.2-9: *Conducted spurious emissions of LTE 5 MHz with IB low channel, single carrier operation*

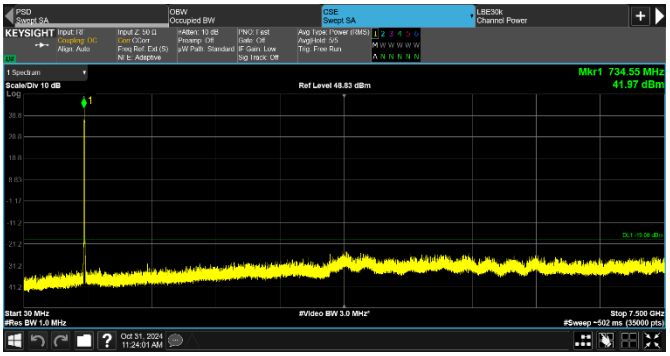


Figure 8.2-10: *Conducted spurious emissions of LTE 5 MHz with IB mid1 channel, single carrier operation*

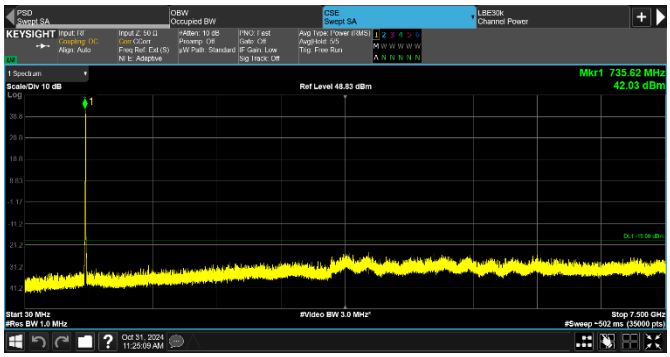


Figure 8.2-11: *Conducted spurious emissions of LTE 5 MHz with IB mid2 channel, single carrier operation*

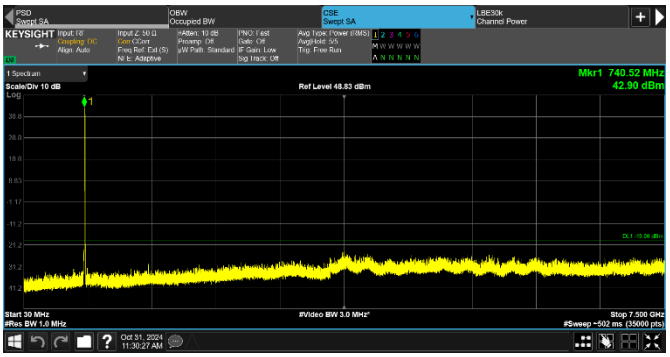


Figure 8.2-12: *Conducted spurious emissions of LTE 5 MHz with IB top channel, single carrier operation*

Test data, continued

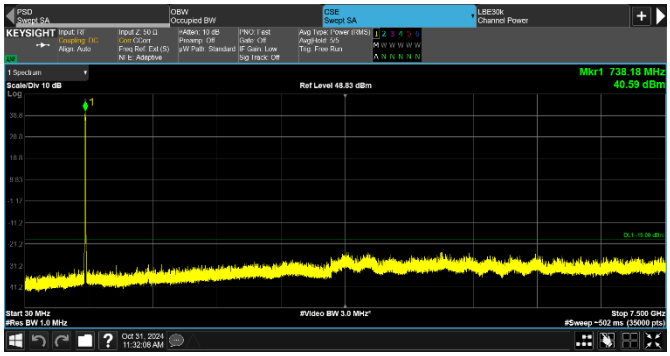


Figure 8.2-13: *Conducted spurious emissions of LTE 10 MHz with GB low channel, single carrier operation*

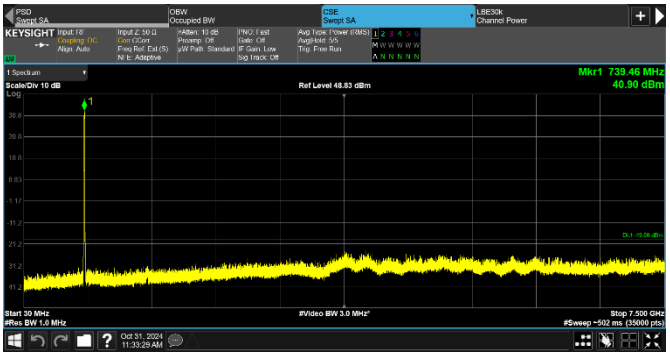


Figure 8.2-14: *Conducted spurious emissions of LTE 10 MHz with GB mid1 channel, single carrier operation*

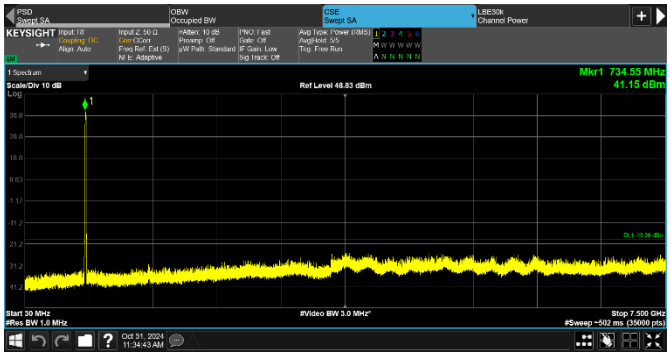


Figure 8.2-15: *Conducted spurious emissions of LTE 10 MHz with GB mid2 channel, single carrier operation*

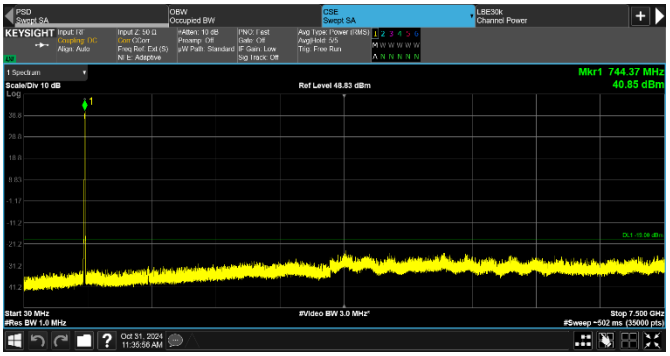


Figure 8.2-16: *Conducted spurious emissions of LTE 10 MHz with GB top channel, single carrier operation*

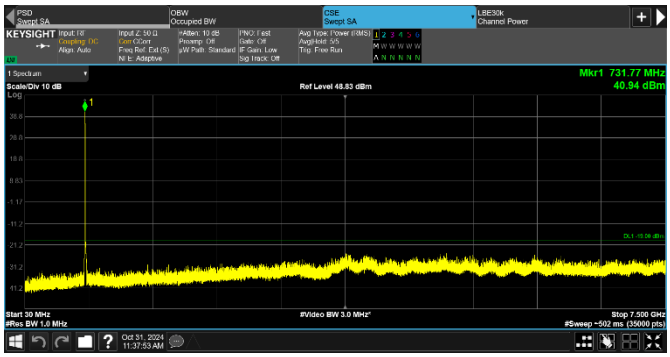


Figure 8.2-17: *Conducted spurious emissions of NR 5 MHz low channel, single carrier operation*

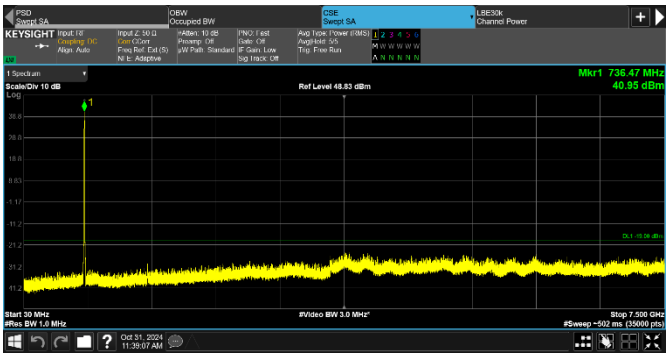


Figure 8.2-18: *Conducted spurious emissions of NR 5 MHz mid1 channel, single carrier operation*

Test data, continued

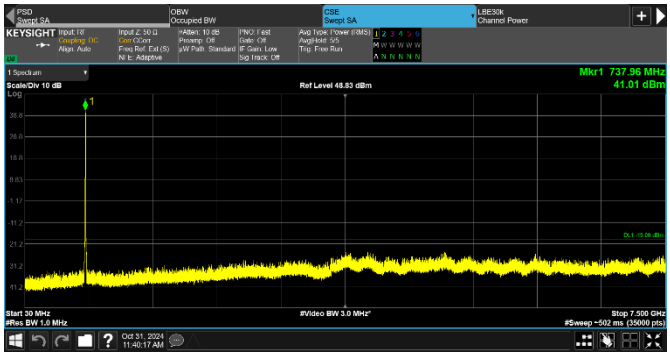


Figure 8.2-19: *Conducted spurious emissions of NR 5 MHz mid2 channel, single carrier operation*

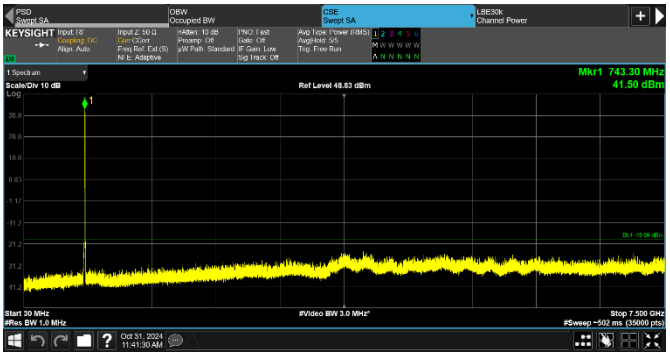


Figure 8.2-20: *Conducted spurious emissions of NR 5 MHz top channel, single carrier operation*

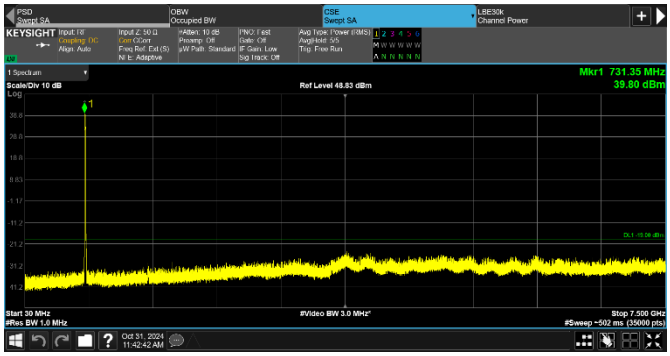


Figure 8.2-21: *Conducted spurious emissions of NR 10 MHz low channel, single carrier operation*

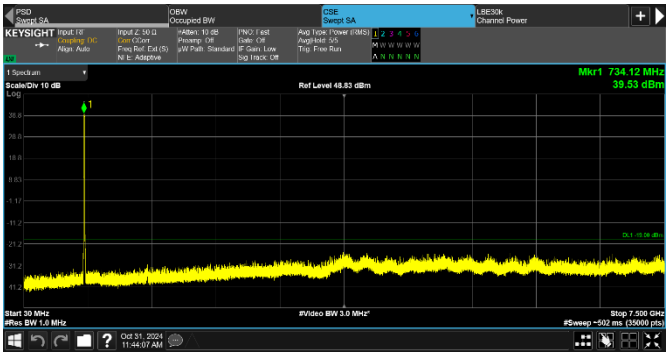


Figure 8.2-22: *Conducted spurious emissions of NR 10 MHz mid1 channel, single carrier operation*

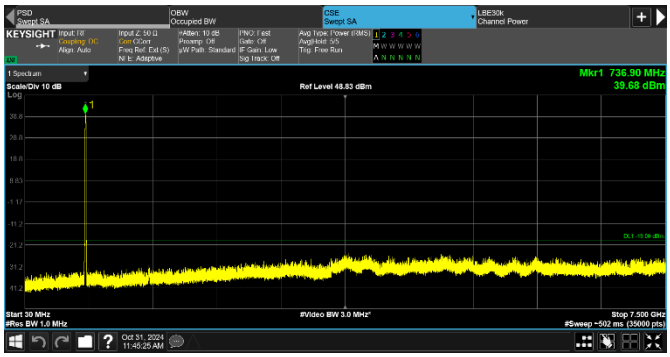


Figure 8.2-23: *Conducted spurious emissions of NR 10 MHz mid2 channel, single carrier operation*

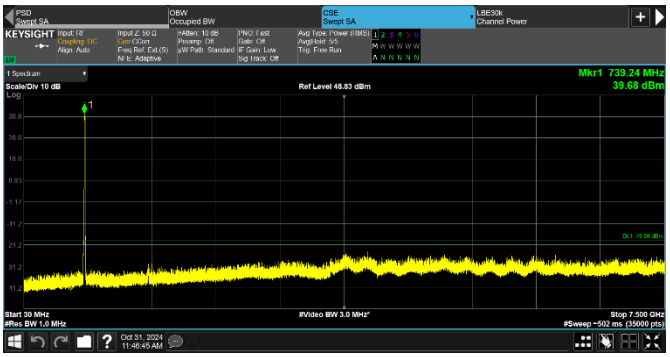


Figure 8.2-24: *Conducted spurious emissions of NR 10 MHz top channel, single carrier operation*

Test data, continued

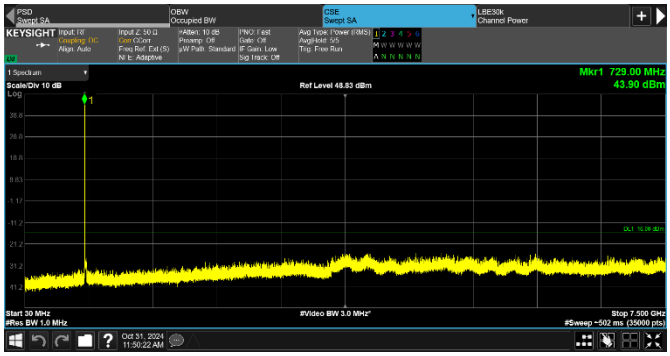


Figure 8.2-25: *Conducted spurious emissions of IoT SA at 729.2 MHz, single carrier operation*

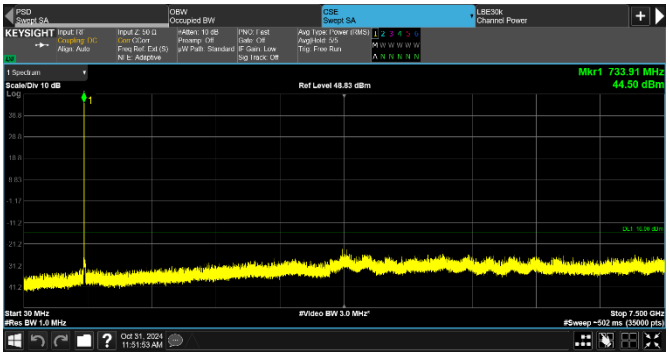


Figure 8.2-26: *Conducted spurious emissions of IoT SA at 733.8 MHz, single carrier operation*

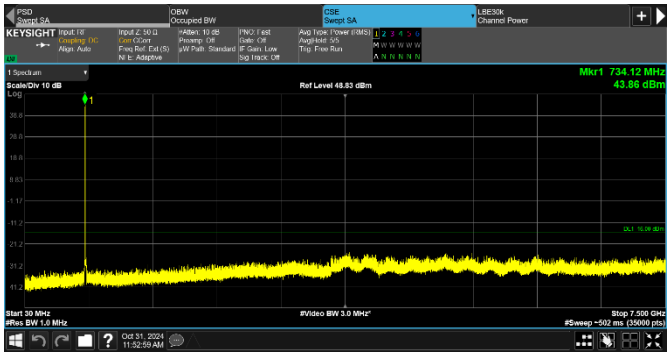


Figure 8.2-27: *Conducted spurious emissions of IoT SA at 734.2 MHz, single carrier operation*

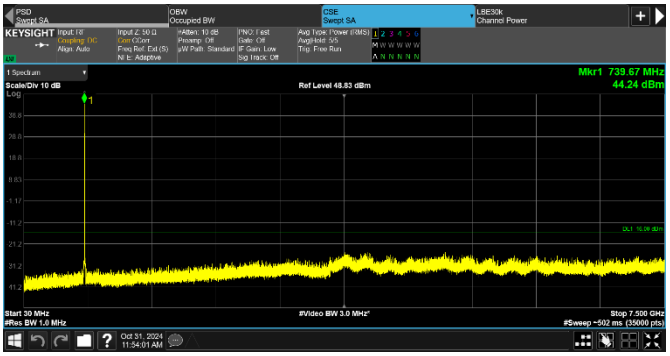


Figure 8.2-28: *Conducted spurious emissions of IoT SA at 739.8 MHz, single carrier operation*

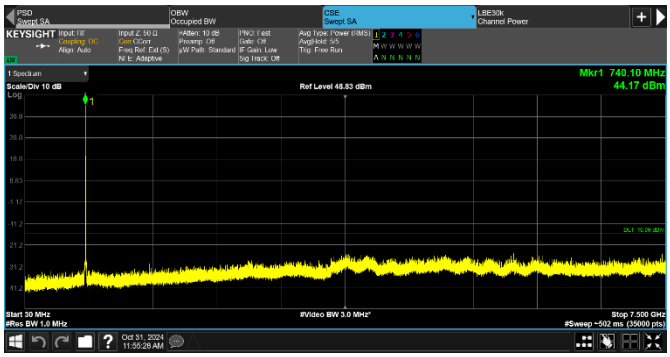


Figure 8.2-29: *Conducted spurious emissions of IoT SA at 740.2 MHz, single carrier operation*

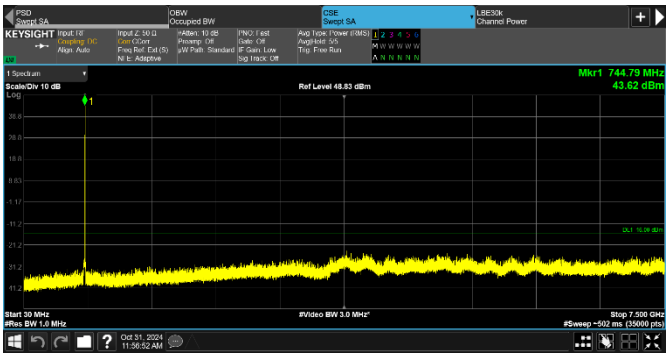


Figure 8.2-30: *Conducted spurious emissions of IoT SA at 744.8 MHz, single carrier operation*

Test data, continued

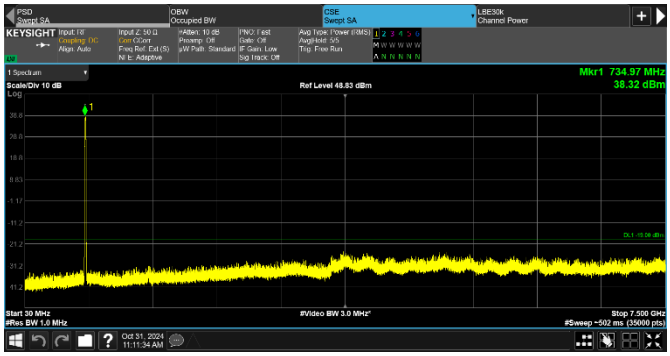


Figure 8.2-31: *Conducted spurious emissions of LTE 15 MHz at lower channel, single carrier operation*

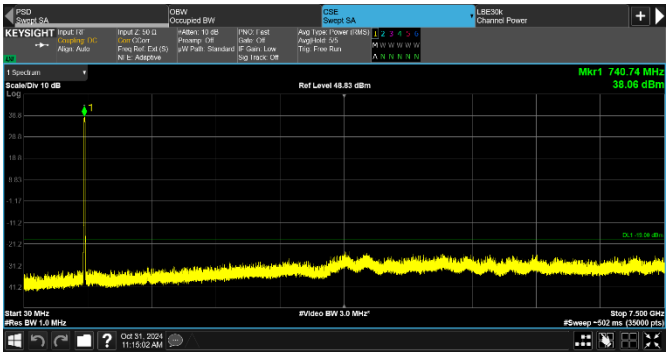


Figure 8.2-32: *Conducted spurious emissions of LTE 15 MHz at top channel, single carrier operation*

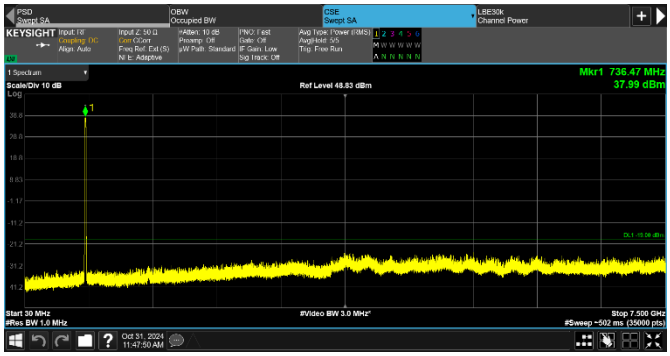


Figure 8.2-33: *Conducted spurious emissions of NR 15 MHz at lower channel, single carrier operation*

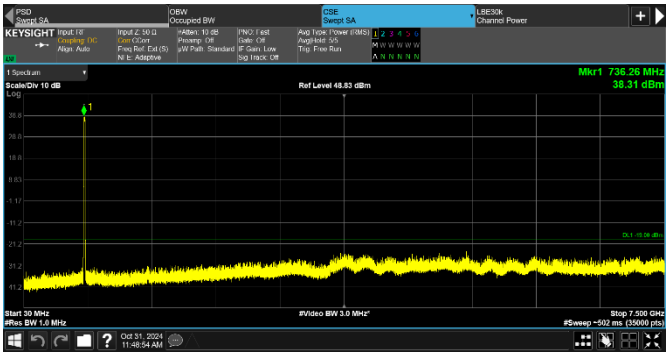


Figure 8.2-34: *Conducted spurious emissions of NR 15 MHz at top channel, single carrier operation*

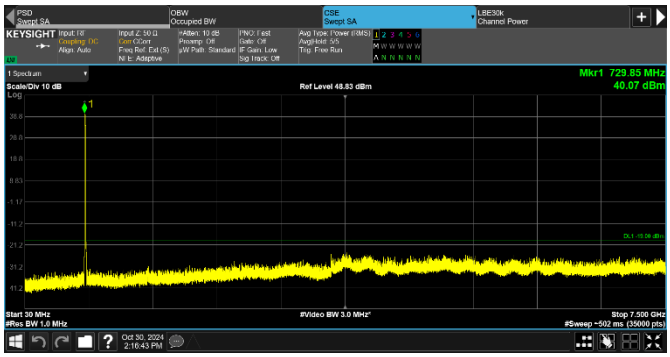


Figure 8.2-35: *Conducted spurious emissions of LTE 5 MHz at lower channels, 2-carrier operation*

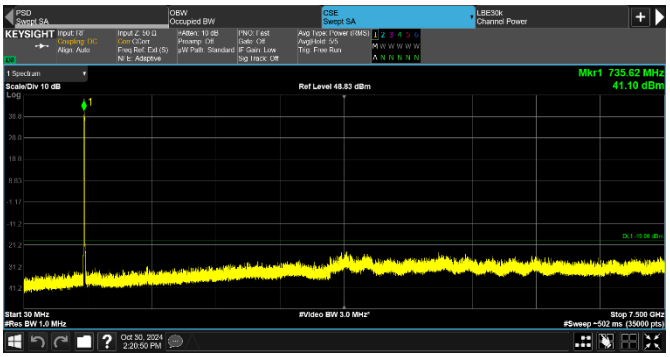


Figure 8.2-36: *Conducted spurious emissions of LTE 5 MHz at mid1 channels, 2-carrier operation*

Test data, continued

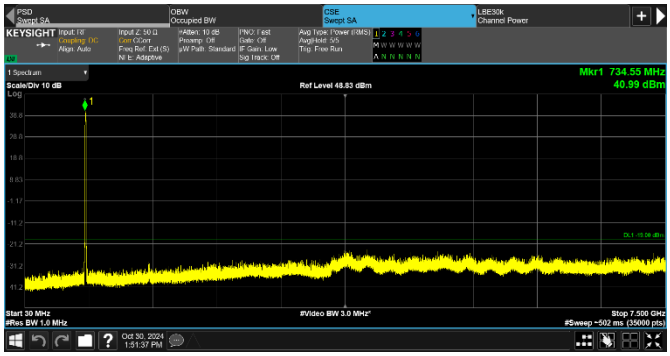


Figure 8.2-37: *Conducted spurious emissions of LTE 5 MHz at mid2 channels, 2-carrier operation*

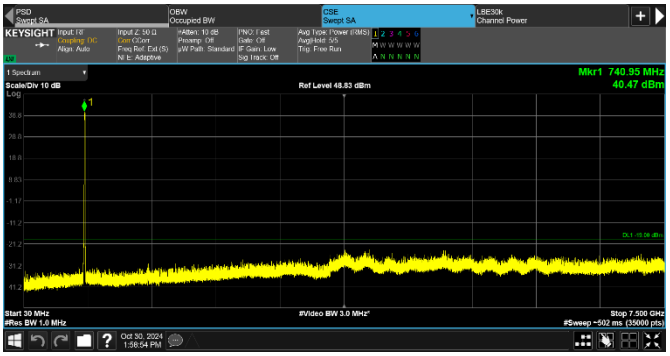


Figure 8.2-38: *Conducted spurious emissions of LTE 5 MHz at top channels, 2-carrier operation*

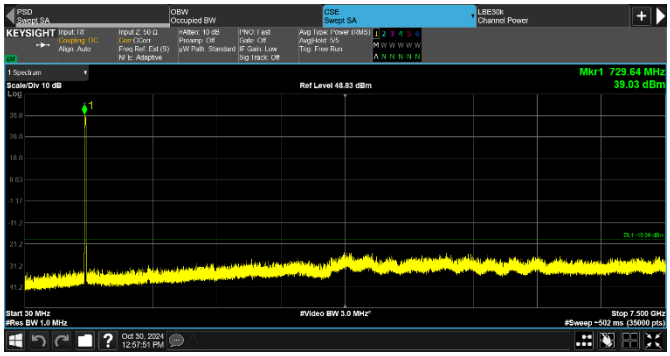


Figure 8.2-39: *Conducted spurious emissions of LTE 5 MHz at lower channels, 3-carrier operation*

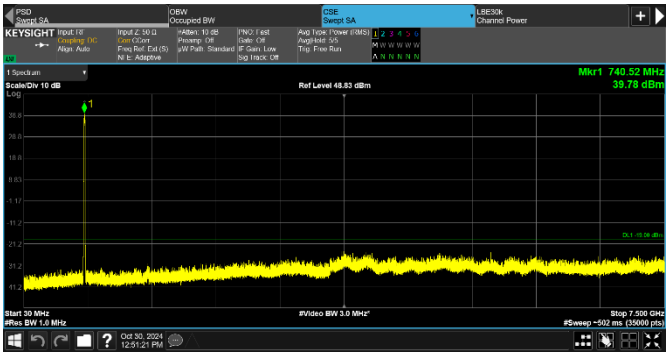


Figure 8.2-40: *Conducted spurious emissions of LTE 5 MHz at top channels, 3-carrier operation*

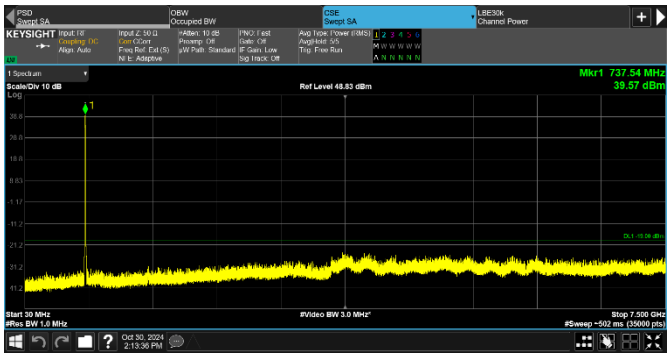


Figure 8.2-41: *Conducted spurious emissions of NR 5 MHz at lower channels, 2-carrier operation*

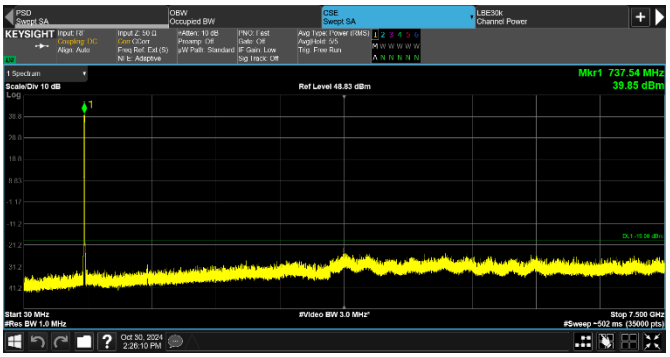


Figure 8.2-42: *Conducted spurious emissions of NR 5 MHz at mid1 channels, 2-carrier operation*

Test data, continued

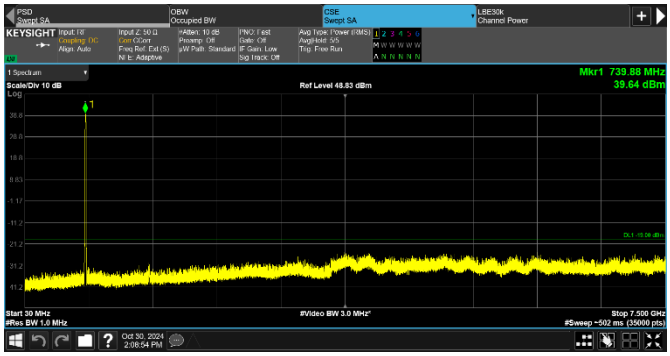


Figure 8.2-43: *Conducted spurious emissions of NR 5 MHz at mid2 channels, 2-carrier operation*

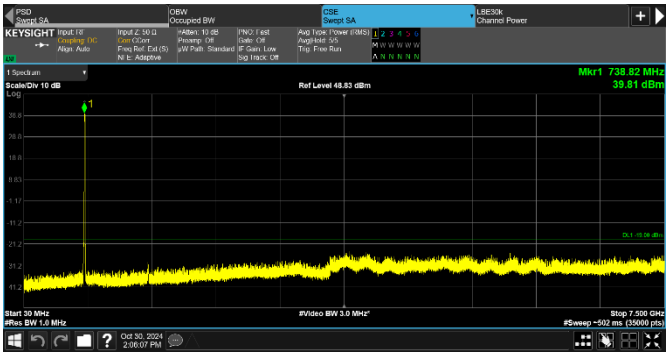


Figure 8.2-44: *Conducted spurious emissions of NR 5 MHz at top channels, 2-carrier operation*

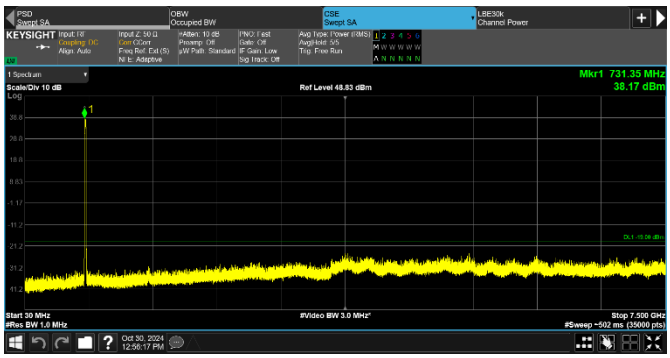


Figure 8.2-45: *Conducted spurious emissions of NR 5 MHz at low channels, 3-carrier operation*

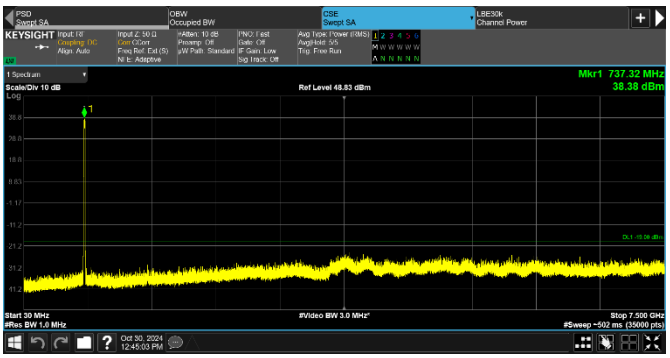


Figure 8.2-46: *Conducted spurious emissions of NR 5 MHz at top channels, 3-carrier operation*

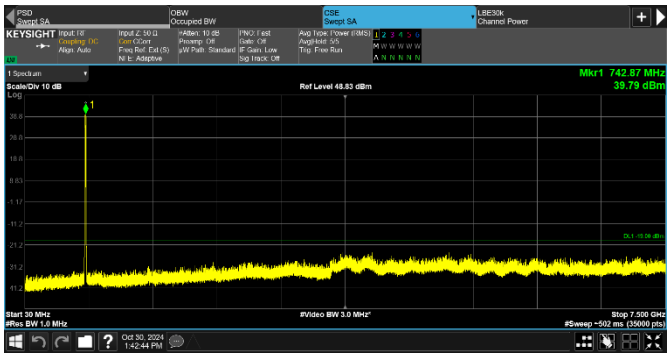


Figure 8.2-47: *Conducted spurious emissions of LTE 5 MHz non-contiguous, 2-carrier operation*

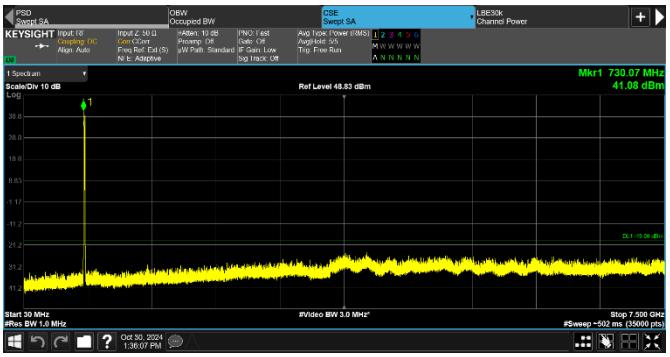


Figure 8.2-48: *Conducted spurious emissions of NR 5 MHz non-contiguous, 2-carrier operation*

Test data, continued

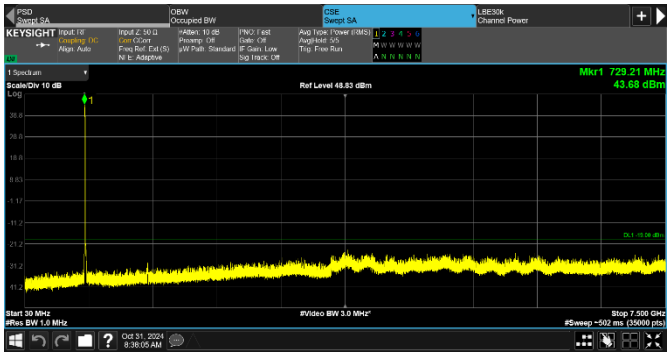


Figure 8.2-49: *Conducted spurious emissions of IoT SA and LTE 5 MHz low channels, 2-carrier operation*

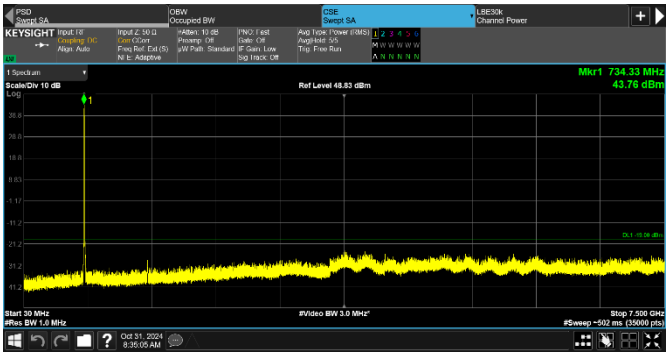


Figure 8.2-50: *Conducted spurious emissions of IoT SA and LTE 5 MHz mid1 channels, 2-carrier operation*

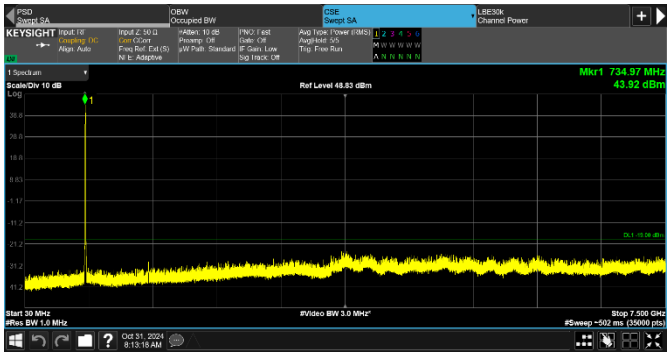


Figure 8.2-51: *Conducted spurious emissions of IoT SA and LTE 5 MHz mid2 channels, 2-carrier operation*

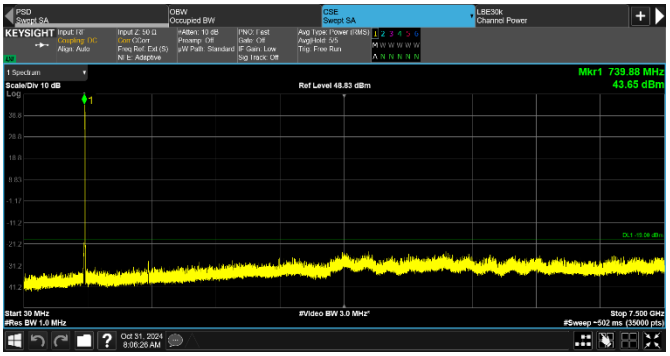


Figure 8.2-52: *Conducted spurious emissions of IoT SA and LTE 5 MHz top channels, 2-carrier operation*

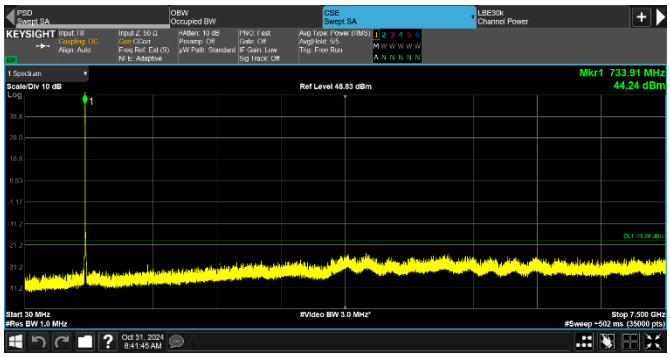


Figure 8.2-53: *Conducted spurious emissions of NR 5 MHz and IoT SA at low channels, 2-carrier operation*

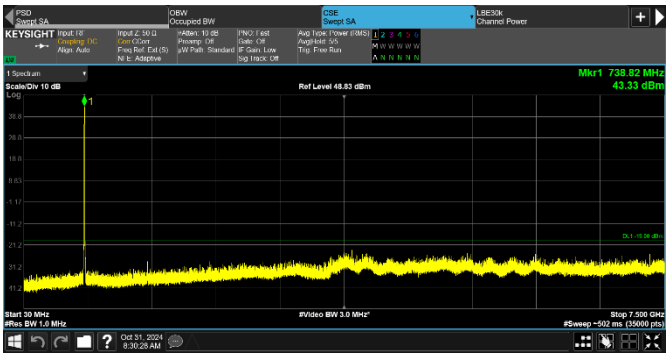


Figure 8.2-54: *Conducted spurious emissions of NR 5 MHz and IoT SA at mid1 channels, 2-carrier operation*

Test data, continued

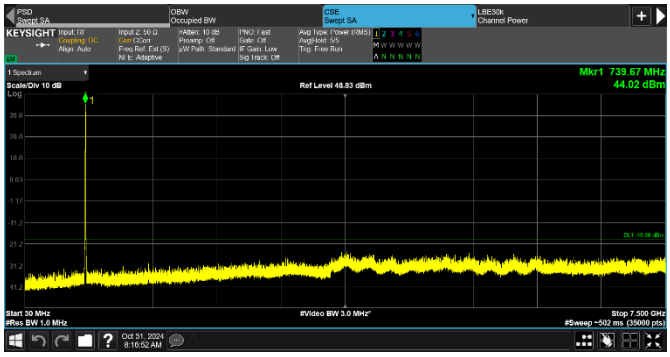


Figure 8.2-55: *Conducted spurious emissions of NR 5 MHz and IoT SA at mid2 channels, 2-carrier operation*

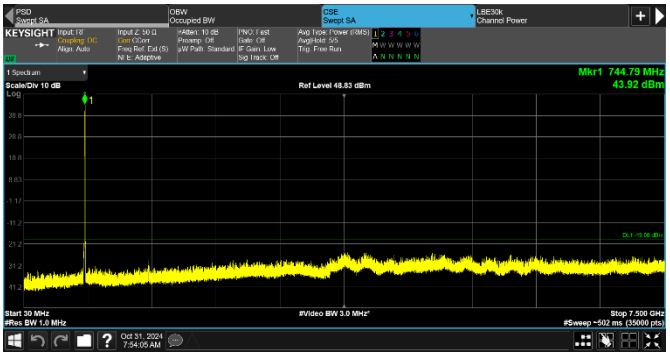


Figure 8.2-56: *Conducted spurious emissions of NR 5 MHz and IoT SA at top channels, 2-carrier operation*

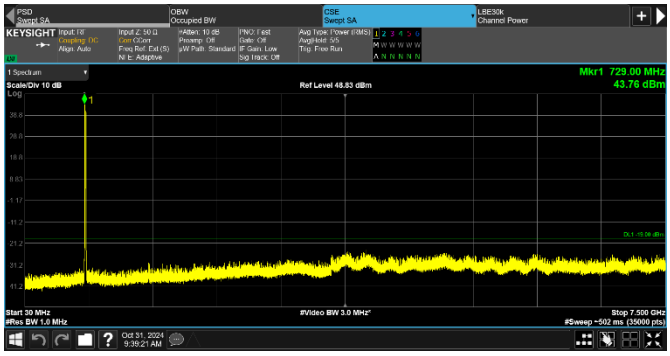


Figure 8.2-57: *Conducted spurious emissions of IoT SA and LTE 5 MHz non-contiguous channels, 2-carrier operation*

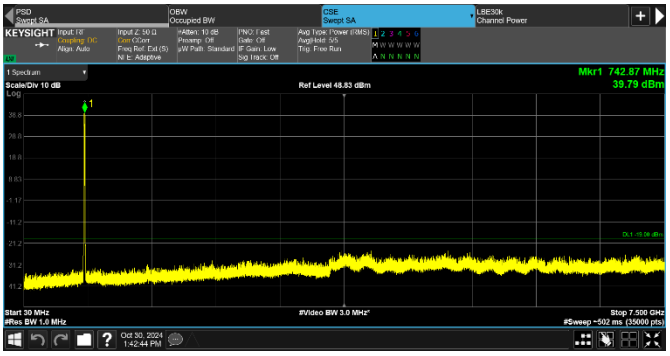


Figure 8.2-58: *Conducted spurious emissions of NR 5 MHz and IoT SA non-contiguous channels, 2-carrier operation*

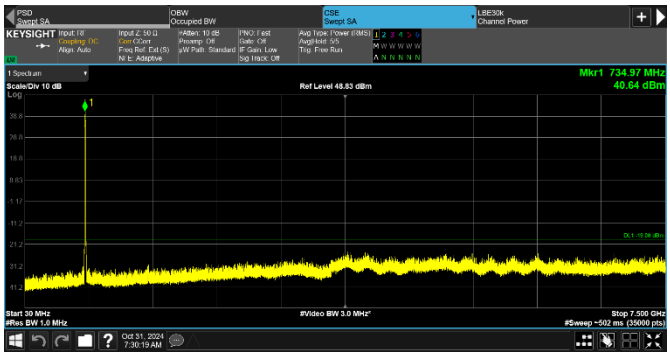


Figure 8.2-59: *Conducted spurious emissions of NR 5 MHz and LTE 5 MHz low channels, 2-carrier operation*

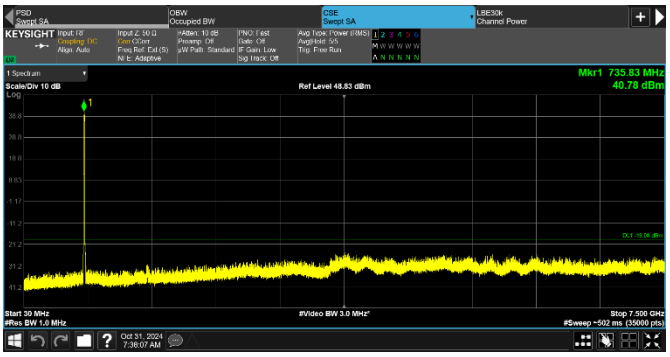


Figure 8.2-60: *Conducted spurious emissions of NR 5 MHz and LTE 5 MHz mid1 channels, 2-carrier operation*

Test data, continued

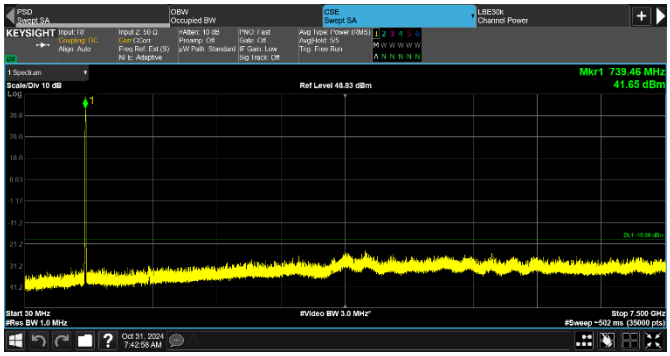


Figure 8.2-61: *Conducted spurious emissions of NR 5 MHz and LTE 5 MHz mid2 channels, 2-carrier operation*

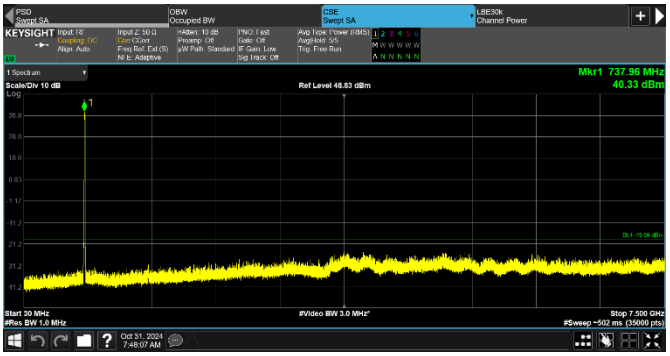


Figure 8.2-62: *Conducted spurious emissions of NR 5 MHz and LTE 5 MHz top channels, 2-carrier operation*

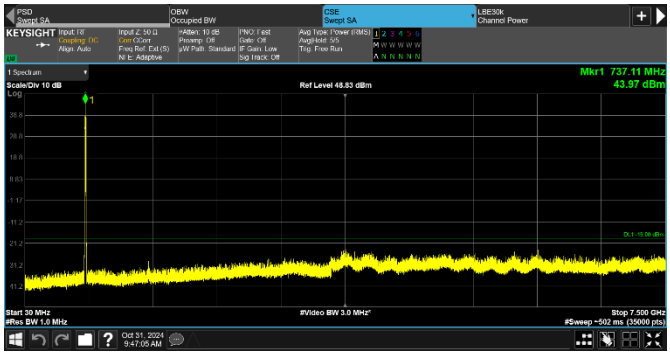


Figure 8.2-63: *Conducted spurious emissions of NR 5 MHz, IoT SA and LTE 5 MHz channels, 3-carrier operation*

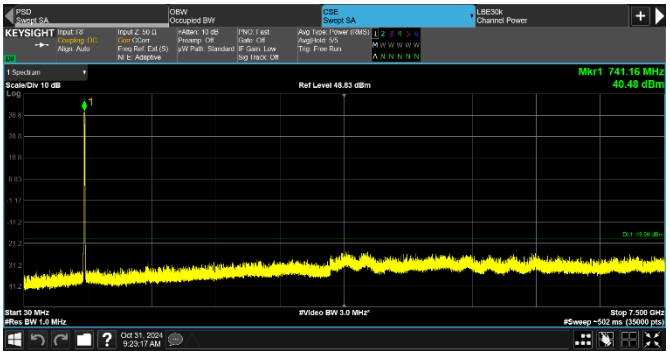


Figure 8.2-64: *Conducted spurious emissions of NR 5 MHz and LTE 5 MHz non-contiguous channels, 2-carrier operation*