Choose Scandinavian trust

RADIO TEST REPORT – 425119-1TRFWL

Type of assessment:

Final product testing

Applicant:

Blinq Wireless, Inc

Product:

Base station

Model:

FW300i-B48-46-HP-NA

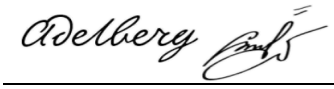
FCC ID:

ROR0010

Specification:

FCC 47 CFR Part 96

Date of issue: May 19, 2021

Fahar Abdul Sukkoor, Wireless/EMC Specialist	
Tested by	Signature
Andrey Adelberg, Senior EMC/RF Specialist	
Reviewed by	Signature

Lab locations

Company name	Nemko Canada Inc.			
Facilities	*Ottawa site:* 303 River Road Ottawa, Ontario Canada K1V 1H2 Tel: +1 613 737 9680 Fax: +1 613 737 9691	*Montréal site:* 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8 Tel: +1 514 694 2684 Fax: +1 514 694 3528	***Cambridge site:*** **1-130 Saltsman Drive** **Cambridge, Ontario** **Canada** **N3E 0B2** **Tel: +1 519 650 4811**	*Almonte site:* 1500 Peter Robinson Road West Carleton, Ontario Canada K0A 1L0 Tel: +1 613 256-9117

Test site identifier	**Organization**	**Ottawa/Almonte**	**Montreal**	**Cambridge**
	FCC:	CA2040	CA2041	CA0101
	ISED:	2040A-4	2040G-5	24676
Website	www.nemko.com			

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 contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of contents

Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Blinq Wireless, Inc.
Address	140 Renfrew Drive Suite 205
City	Markham
Province/State	ON
Postal/Zip code	L3R 6B3
Country	Canada

1.2 Test specifications

FCC 47 CFR Part 96	Citizens Broadband Radio Service

1.3 Test method

ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
940660 D01 Part 96 CBRS Eqpt v01	Certification and test procedures for citizens broadband radio service devices authorized under Part 96
662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

This test report covers only general requirements of Part 96. For SAS and functionality please refer to the WINNF test report.

1.6 Test report revision history

Revision #	Date of issue	Details of changes made to test report
TRF	May 19, 2021	Original report issued

Section 2. Summary of test results

2.1 FCC Part 96 test results

Part	Test description	Verdict
§96.41(e)(3)	Emission and occupied bandwidth	Pass
§96.41(b)	Power limits	Pass
§96.41(e)(1)	3.5 GHz Emissions and Interference Limits	Pass
§96.41(e)(2)	Additional protection levels	Pass
§96.41(g)	The peak-to-average power ratio (PAPR)	Pass
§2.1055	Frequency stability	Pass

Notes: None

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	February 22, 2021
Nemko sample ID number	1

3.2 EUT information

Product name	Base station
Model	FW300i-B48-46-HP-NA
Serial number	60101C5-20350046
Revision number	N/A
Software details	Version 2.1.5_4339003

3.3 Technical information

Operating band	3550–3700 MHz
Operating frequencies	3550–3700 MHz 10 MHz channels: 3555–3695 MHz 20 MHz channels: 3560–3690 MHz 40 MHz channels: 3570–3680 MHz
Modulation type	OFDM using QPSK up to 64 QAM
Channel bandwidth	10 MHz, 20 MHz, 40 MHz
Occupied bandwidth (99 %)	8.97 MHz, 18.87 MHz, 37.68 MHz
Emission designator	W7D
Power requirements	48 V_{DC} via 120 V_{AC} power adaptor
MIMO type	2×2 with completely uncorrelated type of signal
Antenna information	Antenna gain: 17 dBi, BLiNQ Antenna All antenna models are cross polarized

3.4 Product description and theory of operation

The BLiNQ FW-300i Dual Band system is a one sector, dual band Long-Term Evolution (LTE) Evolved Node B (eNB) with the ability to operate in the following bands: 46 (5 GHz up to 6 Ghz) and 48 (Citizens Broadband Radio Service (CBRS)). This dual band wireless radio system has 3 Component Carriers (CC) capabilities when using both bands and up to 2CC when using one band.
With a distinctive feature set and integration level, the FW-300i Dual Band brings an ideal solution to an “install anywhere” micro-base transceiver station (micro-BTS) that fully serves private networks, fixed wireless access and mobility use cases

3.5 EUT exercise details

Methods used to exercise the EUT and all relevant ports:
The EUT was controlled from laptop via ethernet using ssh application.

Carrier Configuration		1CC		2CC	
BW (MHz)		10	20	10	20
Aggregated BW (MHz)		10	20	20	40
Carrier 1	Power set per BW	30 dBm	33 dBm	30 dBm	30 dBm
	Power per 10MHz	30 dBm	30 dBm	30 dBm	27 dBm

Note: For 2CC operations power levels above is per carrier values. Power settings referred to each MIMO channel.

3.6 EUT setup diagram

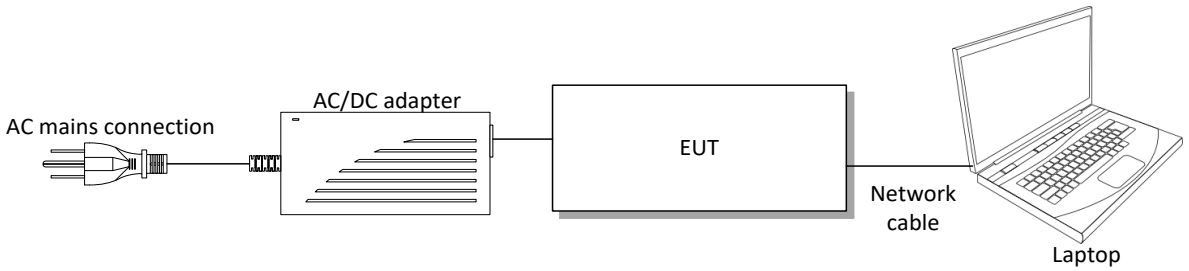


Figure 3.6-1: Setup diagram

3.7 EUT support equipment

Table 3.7-1: EUT support equipment

Description	Brand name	Model/Part number	Serial number
Power adaptor	Mean Well	HLG-600H-48	RB99055874
Laptop	Dell Latitude	E6440	FA002914

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

Test data in this report is retrieved from report 376463-1R1TRFWL (Model: FW-300i FCC ID: ROR00000006).As per manufacturer declaration the output performance of unit is exact same as FW-300i.

EUT will have output only from sector 1. EUT can work only in 1CC and 2CC mode. Data for 1CC mode retrieved from report whereas 2CC configuration mode is tested as EUT circuit vary from FW-300i for this mode.

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 uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78

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	FA003012	1 year	Oct 10/21
Flush mount turntable	SUNAR	FM2022	FA003006	—	NCR
Controller	SUNAR	SC110V	FA002976	—	NCR
Antenna mast	SUNAR	TLT2	FA003007	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESR26	FA002969	1 year	Nov 12/21
Spectrum analyzer	Rohde & Schwarz	FSW43	FA002971	1 year	Nov 13/21
Power sensor	Rohde & Schwarz	NRP-6A	FA002963	1 year	Nov 12/21
Temperature chamber	Espec	EPX-4H	FA003033	1 year	VOU
Radiated Emissions cable set	Huber + Suhner Inc	—	FA003047	—	NCR
Radiated Emissions cable set	Huber + Suhner Inc	—	FA003044	—	NCR
Preamp (1–18 GHz)	ETS-Lindgren	124334	FA002956	1 year	Mar 18/21
Bilog antenna (20–2000 MHz)	Sun AR	JB1	FA003009	1 year	Sep 17/21
Horn antenna (1–18 GHz)	Electro-Metrics	3115	FA000649	1 year	Sep 11/21
Horn antenna (18–40 GHz)	ETS Lindgren	3116	FA002948	1 year	Jan 22/22

Note: NCR - no calibration required

Section 8. Testing data

8.1 FCC 96.41(b) Output power and PSD

8.1.1 Definitions and limits

Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the following table below

Table 8.1-1: Output power and PSD limits

Device	Maximum EIRP, dBm/10 MHz	Maximum PSD, dBm/MHz
End User Device	23	N/A
Category A CBSD	30	20
Category B CBSD	47	37

8.1.2 Test summary

Test date	February 22, 2021

8.1.3 Observations, settings and special notes

The test was performed using RMS detector of the spectrum analyzer with RBW of 1 MHz and VBW of 10 MHz and 10 MHz RBW and 10 MHz VBW.
Total transmission power measurement results (in dBm units), provided below in the first two tables, are for the information purposes only. These measurements were performed using RMS power meter.The values don't have limit in the section §96.41, since all the limits in the standard are expressed in dBm/10 MHz or dBm/MHz units.
Test results are taken with QPSK modulation as considering worst case scenario.
Power tables for 1CC and 2CC mode are shown below.

8.1.4 Test data

Table 8.1-2: Maximum total channel transmission power and EIRP result for 1CC sector 1 MIMO operation of CBRS Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	Tx power, dBm	Antenna gain, dBi	EIRP, dBm
3555	10(low)	0	27.74	17.0	44.74
		1	27.95	17.0	44.95
3625	10(mid)	0	28.66	17.0	45.66
		1	28.83	17.0	45.83
3695	10(high)	0	28.30	17.0	45.30
		1	27.23	17.0	44.23
3560	20(low)	0	31.28	17.0	48.28
		1	32.24	17.0	49.24
3625	20(mid)	0	32.04	17.0	49.04
		1	31.93	17.0	48.93
3690	20(high)	0	31.80	17.0	48.80
		1	30.96	17.0	47.96

Test data continued

Table 8.1-3: Maximum total channel transmission power and EIRP result for 2CC sector 1 MIMO operation of CBRS Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	Tx power, dBm	Antenna gain, dBi	EIRP, dBm
3560	20(low)	0	30.85	17.0	47.85
		1	29.95	17.0	46.95
3630	20(mid)	0	30.28	17.0	47.28
		1	28.73	17.0	45.73
3690	20(high)	0	30.85	17.0	47.85
		1	29.55	17.0	46.55
3570	40(low)	0	30.89	17.0	47.89
		1	30.06	17.0	47.06
3625	40(mid)	0	30.82	17.0	47.82
		1	29.48	17.0	46.48
3680	40(high)	0	30.36	17.0	47.36
		1	29.16	17.0	46.16

Table 8.1-4: EIRP in 10 MHz measurement result for 1CC sector 1 MIMO operation of CBRS Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	Output power, dBm/10 MHz	Antenna gain, dBi	EIRP, dBm / 10 MHz	Limit, , dBm / 10 MHz	Margin, dB
3555	10(low)	0	26.90	17.00	43.90	47.00	3.10
		1	27.95	17.00	44.95	47.00	2.05
3625	10(mid)	0	28.02	17.00	45.02	47.00	1.98
		1	28.24	17.00	45.24	47.00	1.76
3695	10(high)	0	27.91	17.00	44.91	47.00	2.09
		1	26.78	17.00	43.78	47.00	3.22
3560	20(low)	0	29.09	17.00	46.09	47.00	0.91
		1	29.77	17.00	46.77	47.00	0.23
3625	20(mid)	0	29.75	17.00	46.75	47.00	0.25
		1	29.76	17.00	46.76	47.00	0.24
3690	20(high)	0	29.46	17.00	46.46	47.00	0.54
		1	28.75	17.00	45.75	47.00	1.25

Table 8.1-5: EIRP in 10 MHz measurement result for 2CC sector 1 MIMO operation of CBRS Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	Output power, dBm/10 MHz	Antenna gain, dBi	EIRP, dBm / 10 MHz	Limit, , dBm / 10 MHz	Margin, dB
3560	20(low)	0	27.40	17.00	44.40	47.00	2.60
		1	26.24	17.00	43.24	47.00	3.76
3630	20(mid)	0	27.56	17.00	44.56	47.00	2.44
		1	26.16	17.00	43.16	47.00	3.84
3690	20(high)	0	28.18	17.00	45.18	47.00	1.82
		1	27.61	17.00	44.61	47.00	2.39
3560	40(low)	0	26.90	17.00	43.90	47.00	3.10
		1	26.18	17.00	43.18	47.00	3.82
3625	40(mid)	0	26.03	17.00	43.03	47.00	3.97
		1	24.17	17.00	41.17	47.00	5.83
3690	40(high)	0	25.62	17.00	42.62	47.00	4.38
		1	24.94	17.00	41.94	47.00	5.06

Test data continued

Table 8.1-6: PSD in 1 MHz measurement result for 1CC sector 1 CBSD Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	PSD, dBm/MHz	Antenna gain, dBi	EIRP PSD dBm/MHz	PSD Limit, dBm/MHz	Margin, dB
3555	10(low)	0	19.22	17.00	36.22	37.00	0.78
		1	19.74	17.00	36.74	37.00	0.26
3625	10(mid)	0	19.17	17.00	36.17	37.00	0.83
		1	19.34	17.00	36.34	37.00	0.66
3695	10(high)	0	18.75	17.00	35.75	37.00	1.25
		1	19.37	17.00	36.37	37.00	0.63
3560	20(low)	0	19.47	17.00	36.47	37.00	0.53
		1	19.94	17.00	36.94	37.00	0.06
3625	20(mid)	0	19.91	17.00	36.91	37.00	0.09
		1	19.48	17.00	36.48	37.00	0.52
3690	20(high)	0	19.74	17.00	36.74	37.00	0.26
		1	19.29	17.00	36.29	37.00	0.71

Table 8.1-7: PSD in 1 MHz measurement result for 2CC sector 1 CBSD Category B

Frequency, MHz	Bandwidth, MHz	Ch 0/1	PSD, dBm/MHz	Antenna gain, dBi	EIRP PSD dBm/MHz	PSD Limit, dBm/MHz	Margin, dB
3560	20(low)	0	18.32	17.00	35.32	37.00	1.68
		1	17.16	17.00	34.16	37.00	2.84
3630	20(mid)	0	18.42	17.00	35.42	37.00	1.58
		1	16.96	17.00	33.96	37.00	3.04
3690	20(high)	0	19.32	17.00	36.32	37.00	0.68
		1	19.54	17.00	36.54	37.00	0.46
3560	40(low)	0	17.21	17.00	34.21	37.00	2.79
		1	16.67	17.00	33.67	37.00	3.33
3625	40(mid)	0	15.75	17.00	32.75	37.00	4.25
		1	14.36	17.00	31.36	37.00	5.64
3690	40(high)	0	15.49	17.00	32.49	37.00	4.51
		1	15.67	17.00	32.67	37.00	4.33

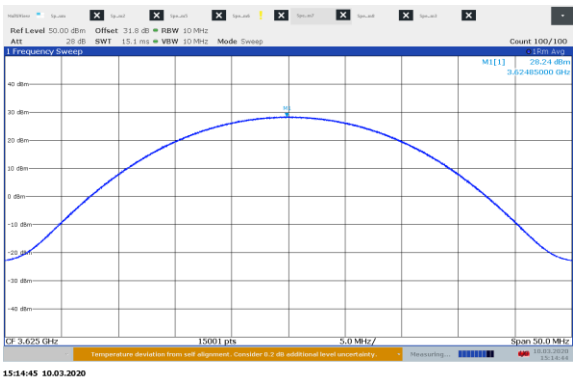


Figure 8.1-1: *Ouput power sample plot, 1cc 10 MHz channel*

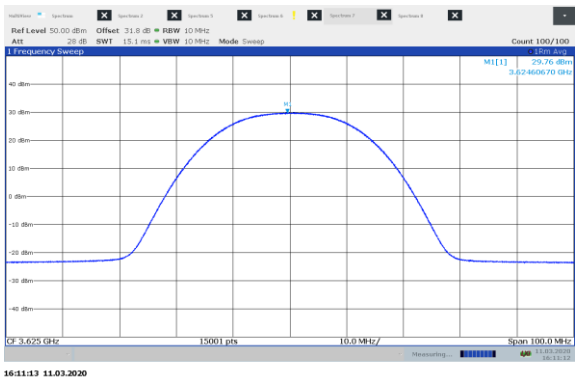


Figure 8.1-2: *Ouput power sample plot, 1cc 20 MHz channel*

Test data continued

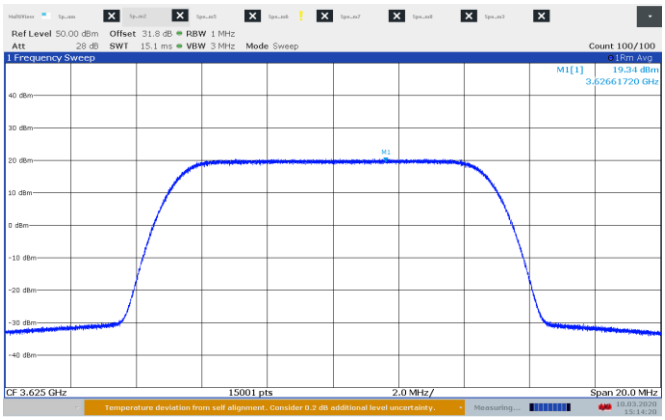


Figure 8.1-3: *Power spectral density sample plot, 1cc 10 MHz channel*

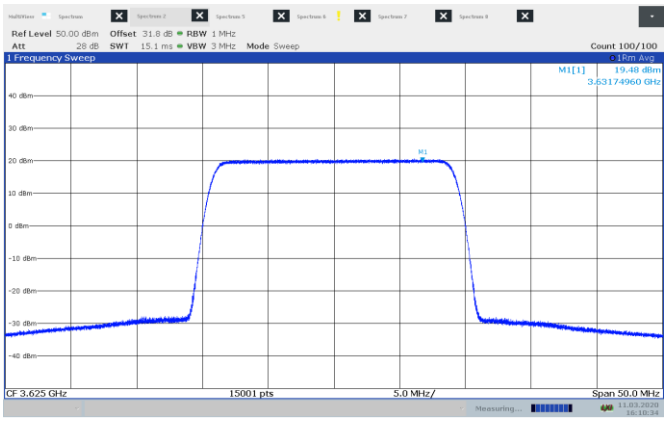


Figure 8.1-4: *Power spectral density sample plot, 1cc 20 MHz channel*

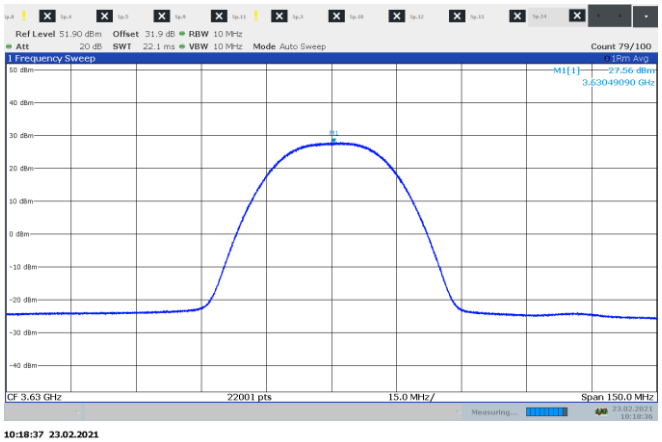


Figure 8.1-5: *Ouput power sample plot, 2cc 10 MHz channel*

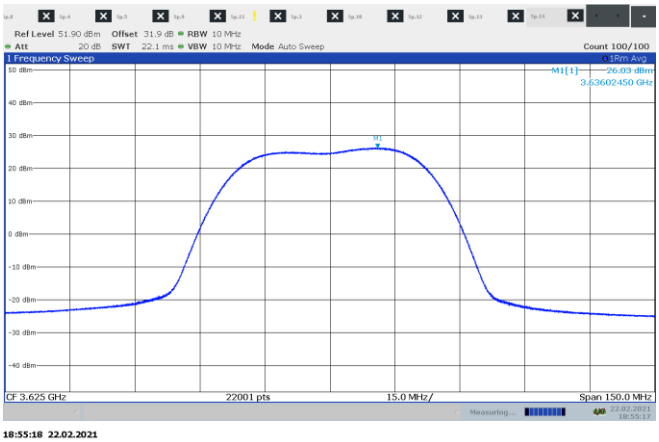


Figure 8.1-6: *Ouput power sample plot, 2cc 20 MHz channel*

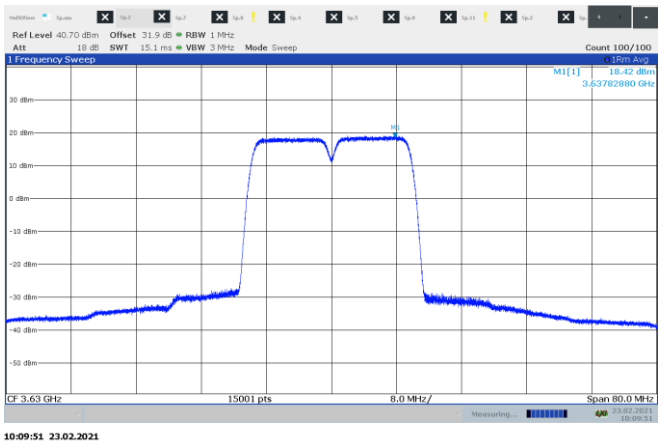


Figure 8.1-7: *Power spectral density sample plot,2cc 10 MHz channel*

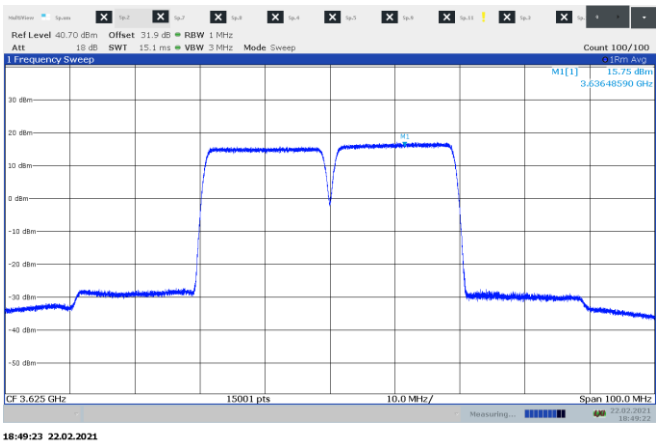


Figure 8.1-8: *Power spectral density sample plot2cc, 20 MHz channel*

8.2 FCC 96.41(g) The peak-to-average power ratio (PAPR)

8.2.1 Definitions and limits

The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

8.2.2 Test summary

Test date	February 22, 2021

8.2.3 Observations, settings and special notes

The test was performed using spectrum analyzer signal statistics' Complimentary Cumulative Distribution Function.
Results shown below are from old report 376463-1R1TRFWL for 1CC mode and test being performed for 2CC mode are shown below.

8.2.4 Test data

Table 8.2-1: PAPR measurement results sector 1

Channel BW, MHz	No. of carriers	Antenna port	Frequency, MHz	CCDF at 0.1%, dB	Limit, dB	Margin, dB
10(low)	1	0	3555	8.16	13.00	4.84
10(mid)	1	0	3625	8.16	13.00	4.84
10(high)	1	0	3695	8.16	13.00	4.84
10(low)	1	1	3555	8.20	13.00	4.80
10(mid)	1	1	3625	8.10	13.00	4.90
10(high)	1	1	3695	8.14	13.00	4.86
20(low)	1	0	3560	8.38	13.00	4.62
20(mid)	1	0	3625	8.36	13.00	4.64
20(high)	1	0	3690	8.41	13.00	4.59
20(low)	1	1	3560	8.34	13.00	4.66
20(mid)	1	1	3625	8.40	13.00	4.60
20(high)	1	1	3690	8.32	13.00	4.68
20(low)	2	0	3560	8.80	13.00	4.20
20(mid)	2	0	3630	8.80	13.00	4.20
20(high)	2	0	3690	8.72	13.00	4.28
20(low)	2	1	3560	8.84	13.00	4.16
20(mid)	2	1	3630	8.82	13.00	4.18
20(high)	2	1	3690	8.70	13.00	4.30
40(low)	2	0	3570	8.38	13.00	4.62
40(mid)	2	0	3625	8.56	13.00	4.44
40(high)	2	0	3680	8.34	13.00	4.66
40(low)	2	1	3570	8.40	13.00	4.60
40(mid)	2	1	3625	8.54	13.00	4.46
40(high)	2	1	3680	8.54	13.00	4.46

Test data continued

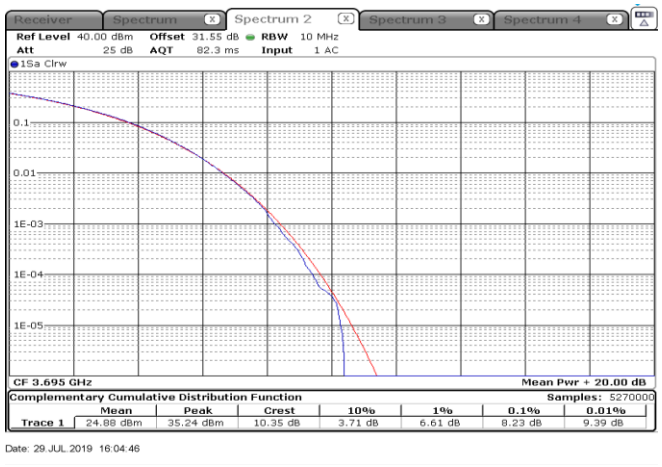


Figure 8.2-1: *CCDF sample plot, 1cc 10 MHz channel*

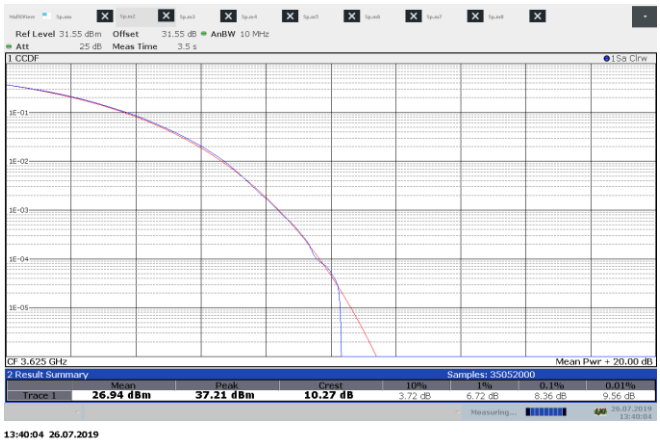


Figure 8.2-2: *CCDF sample plot, 1cc 20 MHz channel*

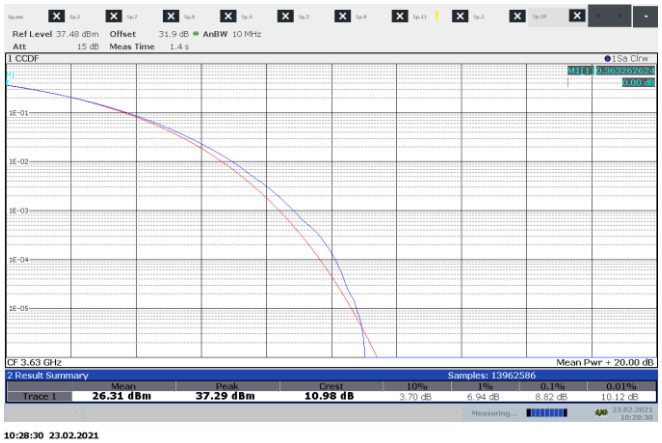


Figure 8.2-3: *CCDF sample plot, 2cc 10 MHz channel*

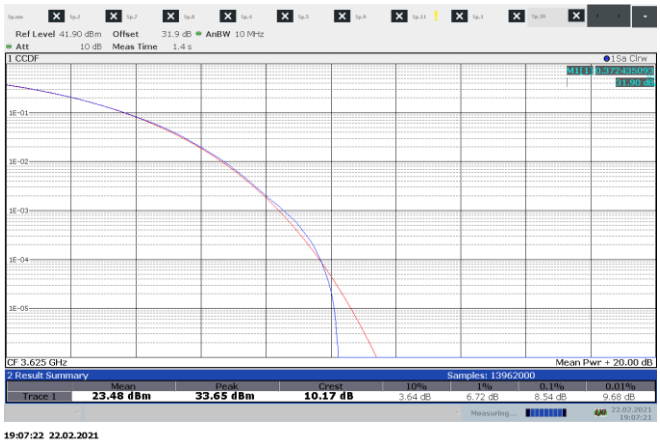


Figure 8.2-4: *CCDF sample plot, 2cc 20 MHz channel*

8.3 FCC 96.41(e)(3) Emission bandwidth and occupied bandwidth

8.3.1 Definitions and limits

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
FCC 2.1049 The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

8.3.2 Test summary

Test date	August 23, 2019

8.3.3 Observations, settings and special notes

Spectrum analyser settings for OBW measurements:

Resolution bandwidth	1% of bandwidth
Video bandwidth	3 x RBW
Detector mode	Peak
Trace mode	Max Hold

Results shown are from old report 376463-1R1TRFWL for 1CC mode. Tests are being performed for 2CC mode and data is shown below.

8.3.4 Test data

Table 8.3-1: Occupied bandwidth measurement results for sector 1

Bandwidth, MHz	No of carriers	Antenna, Port	Frequency, MHz	99% OBW, MHz	26 dB BW, MHz
10(low)	1	0	3555	8.97	9.75
10(mid)	1	0	3625	8.97	9.78
10(high)	1	0	3695	8.97	9.81
10(low)	1	1	3555	8.94	9.81
10(mid)	1	1	3625	8.97	9.78
10(high)	1	1	3695	8.97	9.78
20(low)	1	0	3560	17.89	19.36
20(mid)	1	0	3625	17.89	19.27
20(high)	1	0	3690	17.89	19.28
20(low)	1	1	3560	17.89	19.28
20(mid)	1	1	3625	17.89	19.36
20(high)	1	1	3690	17.89	19.36
20(low)	2	0	3560	18.87	19.99
20(mid)	2	0	3630	18.86	20.02
20(high)	2	0	3690	18.88	20.00
20(low)	2	1	3560	18.86	19.96
20(mid)	2	1	3630	18.87	20.00
20(high)	2	1	3690	18.84	20.02
40(low)	2	0	3570	37.51	39.81
40(mid)	2	0	3625	37.67	39.79
40(high)	2	0	3680	37.61	39.95
40(low)	2	1	3570	37.54	39.97
40(mid)	2	1	3625	37.68	39.87
40(high)	2	1	3680	37.63	39.92

Test data continued

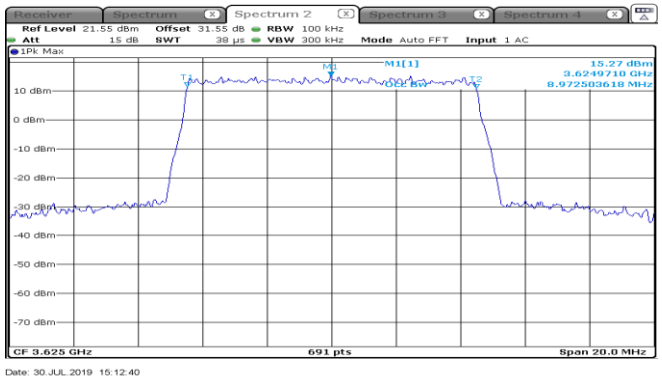


Figure 8.3-1: Occupied bandwidth sample plot for 1 CC 10 MHz channel

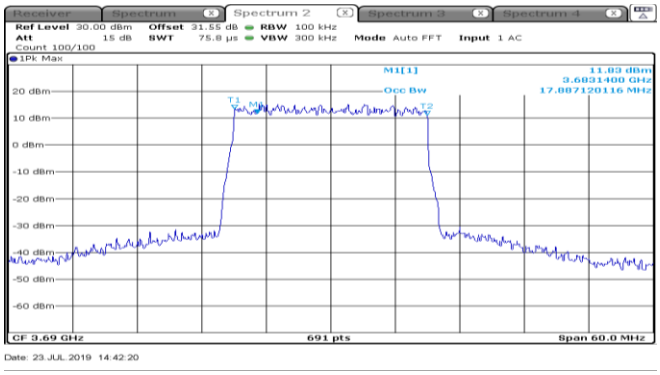


Figure 8.3-2: Occupied bandwidth sample plot for 1CC 20 MHz channel

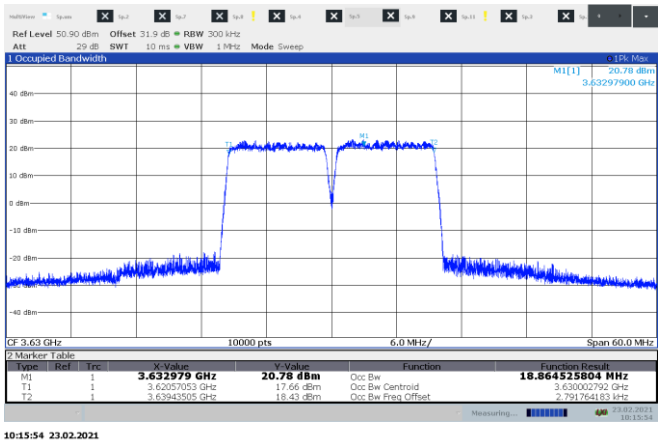


Figure 8.3-3: Occupied bandwidth sample plot for 2 CC 10 MHz channel

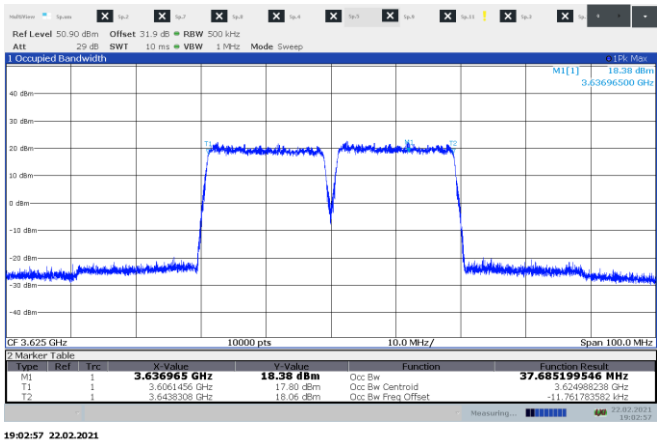


Figure 8.3-4: Occupied bandwidth sample plot for 2CC 20 MHz channel

Test data continued

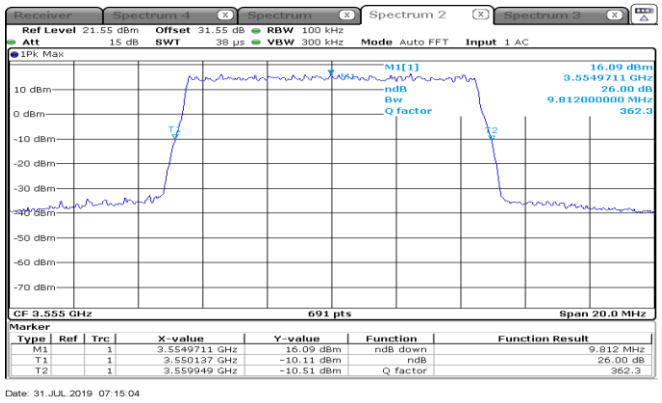


Figure 8.3-5: 26 dB bandwidth sample plot for 1 CC 10 MHz channel

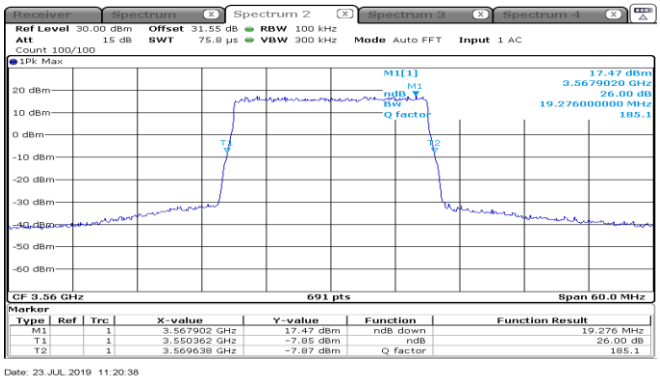


Figure 8.3-6: 26 dB bandwidth sample plot for 1CC 20 MHz channel

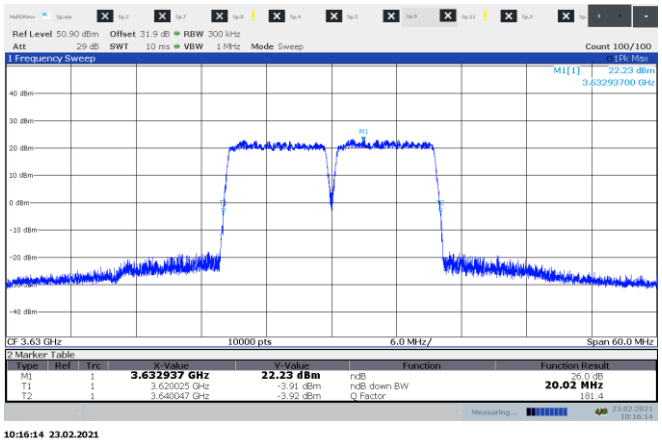


Figure 8.3-7: 26 dB bandwidth sample plot for 2 CC 10 MHz channel

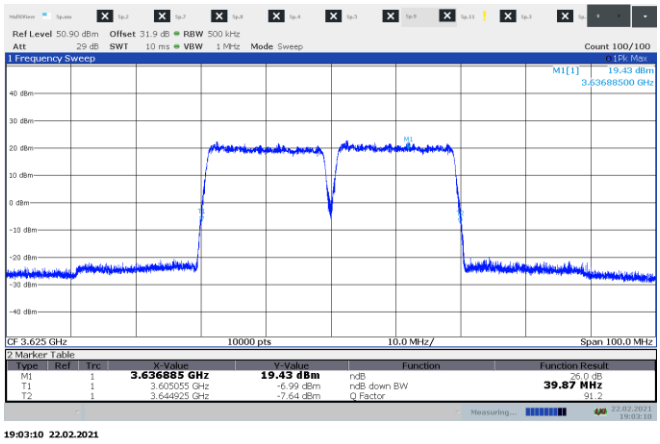


Figure 8.3-8: 26 dB bandwidth sample plot for 2CC 20 MHz channel

8.4 FCC 96.41(e)(1) 3.5 GHz emissions and interference limits

8.4.1 Definitions and limits

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

(3) Measurement procedure. (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

8.4.2 Test summary

Test date	February 22, 2021

8.4.3 Observations, settings and special notes

This test was performed at the antenna ports and radiated with both antennas terminated with 50 Ohm load.
EUT was transmitting from both antenna connectors at the maximum power settings.
Emission results for both QPSK and 64 QAM modulation are shown in table below.
Spectrum analyser settings for measurements within 1 MHz from the SAS assigned channel edges:

Resolution bandwidth	1 % of occupied Bandwidth
Video bandwidth	3 × RBW
Detector mode	RMS
Trace mode	Power averaging

Spectrum analyser settings for measurements outside 1 MHz from the SAS assigned channel edges:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	RMS
Trace mode	Power averaging

8.4.4 Test data

Table 8.4-1: Emission mask measurements for sector 1 QPSK modulation 1CC results

Antenna port	No of carriers	Channel & Bandwidth,MHz	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit[1], dBm	Margin, dB
0	1	10(low)	>10	3540	-47.81	-28.00	19.81
1	1	10(low)	>10	3540	-45.18	-28.00	17.18
0	1	10(low)	0-1	3550	-34.74	-16.00	18.74
1	1	10(low)	0-1	3550	-34.62	-16.00	18.62
0	1	10(low)	0-1	3560	-33.89	-16.00	17.89
1	1	10(low)	0-1	3560	-30.87	-16.00	14.87
0	1	10(low)	>10	3570	-45.91	-28.00	17.91
1	1	10(low)	>10	3570	-43.31	-28.00	15.31
0	1	10(mid)	>10	3610	-46.66	-28.00	18.66
1	1	10(mid)	>10	3610	-43.83	-28.00	15.83
0	1	10(mid)	0-1	3620	-34.05	-16.00	18.05
1	1	10(mid)	0-1	3620	-32.70	-16.00	16.70
0	1	10(mid)	0-1	3630	-32.88	-16.00	16.88
1	1	10(mid)	0-1	3630	-28.64	-16.00	12.64
0	1	10(mid)	>10	3640	-46.48	-28.00	18.48
1	1	10(mid)	>10	3640	-43.20	-28.00	15.20
0	1	10(high)	>10	3680	-43.83	-28.00	15.83
1	1	10(high)	>10	3680	-43.78	-28.00	15.78
0	1	10(high)	0-1	3690	-29.60	-16.00	13.60
1	1	10(high)	0-1	3690	-30.34	-16.00	14.34
0	1	10(high)	0-1	3700	-25.82	-16.00	9.82
1	1	10(high)	0-1	3700	-28.87	-16.00	12.87
0	1	10(high)	>10	3710	-44.62	-28.00	16.62
1	1	10(high)	>10	3710	-45.27	-28.00	17.27
0	1	20(low)	>10	3540	-36.68	-28.00	8.68
1	1	20(low)	>10	3540	-39.33	-28.00	11.33
0	1	20(low)	0-1	3550	-24.96	-16.00	8.96
1	1	20(low)	0-1	3550	-37.68	-16.00	21.68
0	1	20(low)	0-1	3570	-38.16	-16.00	22.16
1	1	20(low)	0-1	3570	-38.39	-16.00	22.39
0	1	20(low)	>10	3580	-38.75	-28.00	10.75
1	1	20(low)	>10	3580	-39.71	-28.00	11.71
0	1	20(mid)	>10	3605	-47.31	-28.00	19.31
1	1	20(mid)	>10	3605	-32.00	-28.00	4.00
0	1	20(mid)	0-1	3615	-39.82	-16.00	23.82
1	1	20(mid)	0-1	3615	-35.56	-16.00	19.56
0	1	20(mid)	0-1	3635	-40.43	-16.00	24.43
1	1	20(mid)	0-1	3635	-40.43	-16.00	24.43
0	1	20(mid)	>10	3645	-41.89	-28.00	13.89
1	1	20(mid)	>10	3645	-39.86	-28.00	11.86
0	1	20(high)	>10	3670	-33.72	-28.00	5.72
1	1	20(high)	>10	3670	-34.05	-28.00	6.05
0	1	20(high)	0-1	3680	-25.68	-16.00	9.68
1	1	20(high)	0-1	3680	-28.03	-16.00	12.03
0	1	20(high)	0-1	3700	-37.52	-16.00	21.52
1	1	20(high)	0-1	3700	-40.26	-16.00	24.26
0	1	20(high)	>10	3710	-40.70	-28.00	12.70
1	1	20(high)	>10	3710	-44.33	-28.00	16.33

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above

Test data continued

Table 8.4-2: Emission mask measurements for sector 1 QPSK modulation 2CC results

Antenna port	No of carriers	Channel & Bandwidth,MHz	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit[1], dBm	Margin, dB
0	2	20(low)	>10	3540	-35.66	-28.00	7.66
1	2	20(low)	>10	3540	-36.26	-28.00	8.26
0	2	20(low)	0-1	3550	-33.25	-16.00	17.25
1	2	20(low)	0-1	3550	-34.92	-16.00	18.92
0	2	20(low)	0-1	3570	-31.51	-16.00	15.51
1	2	20(low)	0-1	3570	-32.67	-16.00	16.67
0	2	20(low)	>10	3580	-33.54	-28.00	5.54
1	2	20(low)	>10	3580	-34.85	-28.00	6.85
0	2	20(mid)	>10	3610	-33.70	-28.00	5.70
1	2	20(mid)	>10	3610	-36.26	-28.00	8.26
0	2	20(mid)	0-1	3620	-33.00	-16.00	17.0
1	2	20(mid)	0-1	3620	-34.38	-16.00	18.38
0	2	20(mid)	0-1	3640	-30.87	-16.00	14.87
1	2	20(mid)	0-1	3640	-33.61	-16.00	17.61
0	2	20(mid)	>10	3650	-33.78	-28.00	5.78
1	2	20(mid)	>10	3650	-35.73	-28.00	7.73
0	2	20(high)	>10	3670	-29.62	-28.00	1.62
1	2	20(high)	>10	3670	-35.62	-28.00	7.62
0	2	20(high)	0-1	3680	-30.15	-16.00	14.15
1	2	20(high)	0-1	3680	-34.45	-16.00	18.45
0	2	20(high)	0-1	3700	-30.54	-16.00	14.54
1	2	20(high)	0-1	3700	-32.54	-16.00	16.54
0	2	20(high)	>10	3710	-35.43	-28.00	7.43
1	2	20(high)	>10	3710	-36.95	-28.00	8.95
0	2	40(low)	>10	3540	-30.41	-28.00	2.41
1	2	40(low)	>10	3540	-34.62	-28.00	6.62
0	2	40(low)	0-1	3550	-32.55	-16.00	16.55
1	2	40(low)	0-1	3550	-33.49	-16.00	17.49
0	2	40(low)	0-1	3590	-32.12	-16.00	16.12
1	2	40(low)	0-1	3590	-33.95	-16.00	17.95
0	2	40(low)	>10	3600	-30.92	-28.00	2.92
1	2	40(low)	>10	3600	-34.07	-28.00	6.07
0	2	40(mid)	>10	3595	-28.94	-28.00	0.94
1	2	40(mid)	>10	3595	-31.51	-28.00	3.51
0	2	40(mid)	0-1	3605	-31.69	-16.00	15.69
1	2	40(mid)	0-1	3605	-33.21	-16.00	17.21
0	2	40(mid)	0-1	3645	-31.75	-16.00	15.75
1	2	40(mid)	0-1	3645	-34.35	-16.00	18.35
0	2	40(mid)	>10	3655	-29.97	-28.00	1.97
1	2	40(mid)	>10	3655	-32.65	-28.00	4.65
0	2	40(high)	>10	3650	-28.40	-28.00	0.40
1	2	40(high)	>10	3650	-31.65	-28.00	3.65
0	2	40(high)	0-1	3660	-30.69	-16.00	14.69
1	2	40(high)	0-1	3660	-32.97	-16.00	16.97
0	2	40(high)	0-1	3700	-34.53	-16.00	18.53
1	2	40(high)	0-1	3700	-35.62	-16.00	19.62
0	2	40(high)	>10	3710	-33.97	-28.00	5.97
1	2	40(high)	>10	3710	-36.80	-28.00	8.80

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above

Test data continued

Table 8.4-3: Emission mask measurements for sector 1 64 QAM modulation 1CC results

Antenna port	No of carriers	Channel & Bandwidth,MHz	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit[1], dBm	Margin, dB
0	1	10(low)	>10	3540	-45.03	-28.00	17.03
1	1	10(low)	>10	3540	-44.53	-28.00	16.53
0	1	10(low)	0-1	3550	-29.09	-16.00	13.09
1	1	10(low)	0-1	3550	-27.98	-16.00	11.98
0	1	10(low)	0-1	3560	-34.08	-16.00	18.08
1	1	10(low)	0-1	3560	-30.35	-16.00	14.35
0	1	10(low)	>10	3570	-43.92	-28.00	15.92
1	1	10(low)	>10	3570	-43.47	-28.00	15.47
0	1	10(mid)	>10	3610	-43.36	-28.00	15.36
1	1	10(mid)	>10	3610	-43.40	-28.00	15.4
0	1	10(mid)	0-1	3620	-28.42	-16.00	12.42
1	1	10(mid)	0-1	3620	-28.15	-16.00	12.15
0	1	10(mid)	0-1	3630	-32.60	-16.00	16.6
1	1	10(mid)	0-1	3630	-31.33	-16.00	15.33
0	1	10(mid)	>10	3640	-44.12	-28.00	16.12
1	1	10(mid)	>10	3640	-43.20	-28.00	15.2
0	1	10(high)	>10	3680	-43.69	-28.00	15.69
1	1	10(high)	>10	3680	-44.19	-28.00	16.19
0	1	10(high)	0-1	3690	-26.55	-16.00	10.55
1	1	10(high)	0-1	3690	-27.34	-16.00	11.34
0	1	10(high)	0-1	3700	-33.92	-16.00	17.92
1	1	10(high)	0-1	3700	-34.88	-16.00	18.88
0	1	10(high)	>10	3710	-44.87	-28.00	16.87
1	1	10(high)	>10	3710	-45.36	-28.00	17.36
0	1	20(low)	>10	3540	-39.03	-28.00	11.03
1	1	20(low)	>10	3540	-38.73	-28.00	10.73
0	1	20(low)	0-1	3550	-31.83	-16.00	15.83
1	1	20(low)	0-1	3550	-33.91	-16.00	17.91
0	1	20(low)	0-1	3570	-33.43	-16.00	17.43
1	1	20(low)	0-1	3570	-29.83	-16.00	13.83
0	1	20(low)	>10	3580	-39.71	-28.00	11.71
1	1	20(low)	>10	3580	-38.36	-28.00	10.36
0	1	20(mid)	>10	3605	-36.07	-28.00	8.07
1	1	20(mid)	>10	3605	-36.01	-28.00	8.01
0	1	20(mid)	0-1	3615	-31.70	-16.00	15.7
1	1	20(mid)	0-1	3615	-29.39	-16.00	13.39
0	1	20(mid)	0-1	3635	-32.09	-16.00	16.09
1	1	20(mid)	0-1	3635	-30.68	-16.00	14.68
0	1	20(mid)	>10	3645	-38.18	-28.00	10.18
1	1	20(mid)	>10	3645	-37.68	-28.00	9.68
0	1	20(high)	>10	3670	-34.39	-28.00	6.39
1	1	20(high)	>10	3670	-35.23	-28.00	7.23
0	1	20(high)	0-1	3680	-29.09	-16.00	13.09
1	1	20(high)	0-1	3680	-29.54	-16.00	13.54
0	1	20(high)	0-1	3700	-31.42	-16.00	15.42
1	1	20(high)	0-1	3700	-31.28	-16.00	15.28
0	1	20(high)	>10	3710	-37.67	-28.00	9.67
1	1	20(high)	>10	3710	-38.29	-28.00	10.29

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above

Test data continued

Table 8.4-4: Emission mask measurements for sector 1 64 QAM modulation 2CC results

Antenna port	No of carriers	Channel & Bandwidth,MHz	Offset from the SAS assigned channel edges, MHz	Frequency of max emission, MHz	Emission level, dBm	Limit[1], dBm	Margin, dB
0	2	20(low)	>10	3540	-33.38	-28.00	5.38
1	2	20(low)	>10	3540	-36.89	-28.00	8.89
0	2	20(low)	0-1	3550	-31.57	-16.00	15.57
1	2	20(low)	0-1	3550	-32.98	-16.00	16.98
0	2	20(low)	0-1	3570	-31.03	-16.00	15.03
1	2	20(low)	0-1	3570	-31.74	-16.00	15.74
0	2	20(low)	>10	3580	-35.86	-28.00	7.86
1	2	20(low)	>10	3580	-34.58	-28.00	6.58
0	2	20(mid)	>10	3610	-33.69	-28.00	5.69
1	2	20(mid)	>10	3610	-35.40	-28.00	7.40
0	2	20(mid)	0-1	3620	-30.69	-16.00	14.69
1	2	20(mid)	0-1	3620	-31.92	-16.00	15.92
0	2	20(mid)	0-1	3640	-30.57	-16.00	14.57
1	2	20(mid)	0-1	3640	-29.69	-16.00	13.69
0	2	20(mid)	>10	3650	-32.81	-28.00	4.81
1	2	20(mid)	>10	3650	-35.24	-28.00	7.24
0	2	20(high)	>10	3670	-29.88	-28.00	1.88
1	2	20(high)	>10	3670	-35.22	-28.00	7.22
0	2	20(high)	0-1	3680	-28.09	-16.00	12.09
1	2	20(high)	0-1	3680	-35.62	-16.00	19.62
0	2	20(high)	0-1	3700	-30.44	-16.00	14.44
1	2	20(high)	0-1	3700	-31.08	-16.00	15.08
0	2	20(high)	>10	3710	-33.65	-28.00	5.65
1	2	20(high)	>10	3710	-36.45	-28.00	8.45
0	2	40(low)	>10	3540	-31.05	-28.00	3.05
1	2	40(low)	>10	3540	-34.59	-28.00	6.59
0	2	40(low)	0-1	3550	-33.78	-16.00	17.78
1	2	40(low)	0-1	3550	-33.51	-16.00	17.51
0	2	40(low)	0-1	3590	-31.85	-16.00	15.85
1	2	40(low)	0-1	3590	-32.13	-16.00	16.13
0	2	40(low)	>10	3600	-33.12	-28.00	5.12
1	2	40(low)	>10	3600	-30.62	-28.00	2.62
0	2	40(mid)	>10	3595	-28.83	-28.00	0.83
1	2	40(mid)	>10	3595	-31.70	-28.00	3.70
0	2	40(mid)	0-1	3605	-32.75	-16.00	16.75
1	2	40(mid)	0-1	3605	-33.94	-16.00	17.94
0	2	40(mid)	0-1	3645	-33.26	-16.00	17.26
1	2	40(mid)	0-1	3645	-34.17	-16.00	18.17
0	2	40(mid)	>10	3655	-31.16	-28.00	3.16
1	2	40(mid)	>10	3655	-33.23	-28.00	5.23
0	2	40(high)	>10	3650	-28.19	-28.00	0.19
1	2	40(high)	>10	3650	-30.78	-28.00	2.78
0	2	40(high)	0-1	3660	-31.05	-16.00	15.05
1	2	40(high)	0-1	3660	-33.29	-16.00	17.29
0	2	40(high)	0-1	3700	-34.70	-16.00	18.70
1	2	40(high)	0-1	3700	-34.84	-16.00	18.84
0	2	40(high)	>10	3710	-34.75	-28.00	6.75
1	2	40(high)	>10	3710	-35.61	-28.00	7.61

Note: [1] For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above

Test data continued

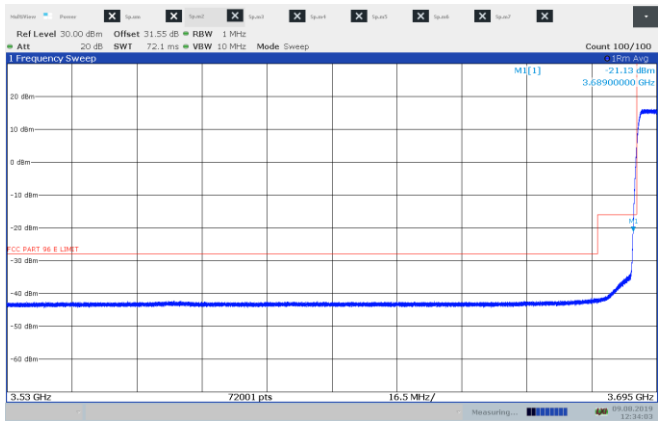


Figure 8.4-1: Emission measurement outside 10 MHz and within 1-10 MHz low end from the SAS assigned channel edge, sample plot for 1CC 10 MHz channel

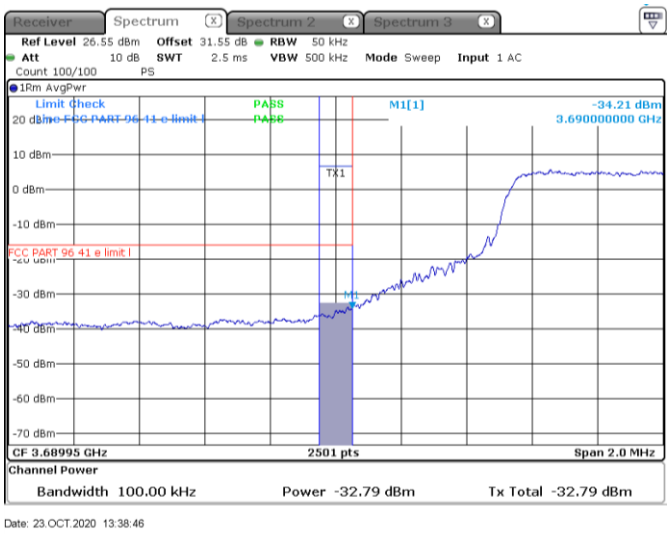


Figure 8.4-2: Emission measurement within 0-1 MHz low end from the SAS assigned channel edge, sample plot for 1CC 10 MHz channel

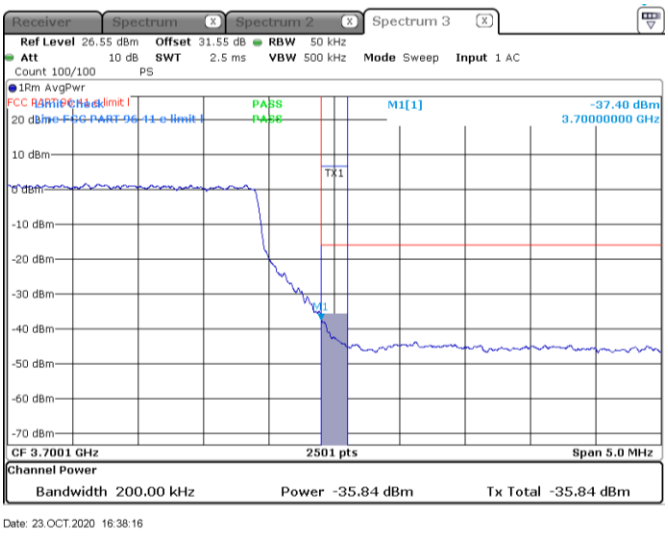


Figure 8.4-3: Emission measurement within 0-1 MHz high end from the SAS assigned channel edge, sample plot for 1 CC 10 MHz channel

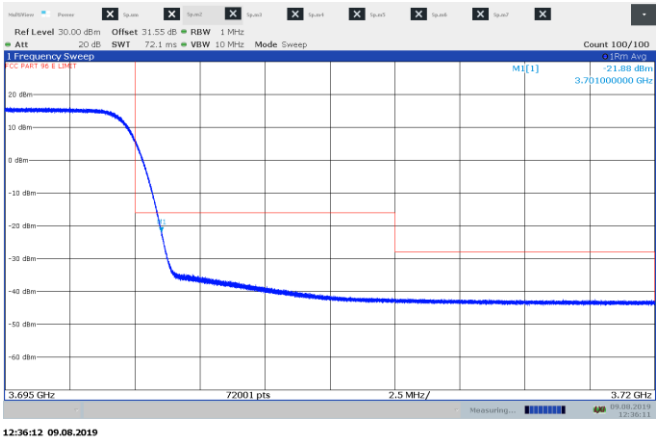


Figure 8.4-4: Emission measurement within 1–10 MHz and outside 10 MHz high end from the SAS assigned channel edge, sample plot for 1CC 10 MHz channel

Test data continued

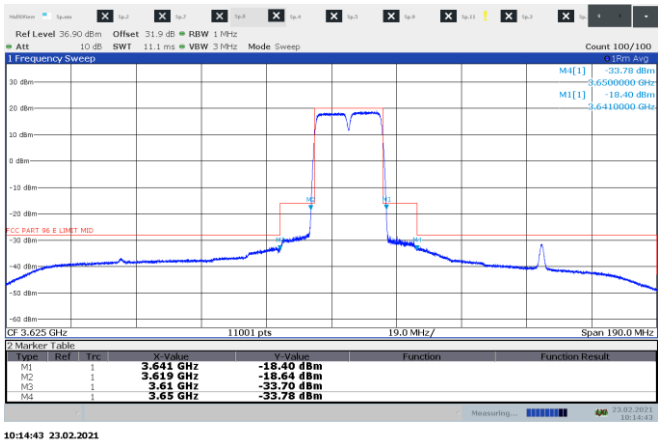


Figure 8.4-5: Emission measurement outside 10 MHz and within 1-10 MHz from the SAS assigned channel edge, sample plot for 2CC 10 MHz channel

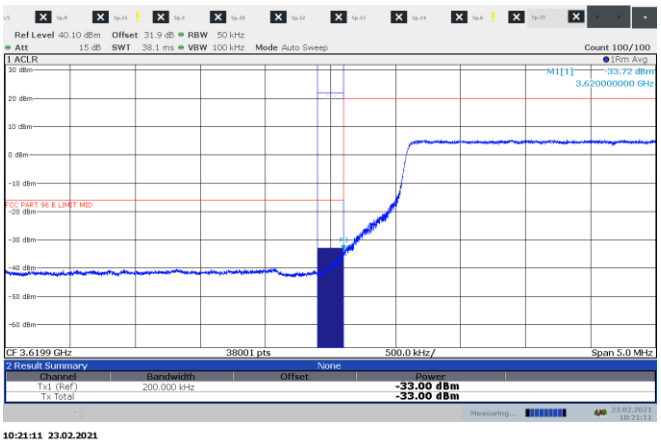


Figure 8.4-6: Emission measurement within 0-1 MHz low end from the SAS assigned channel edge, sample plot for 2CC 10 MHz channel

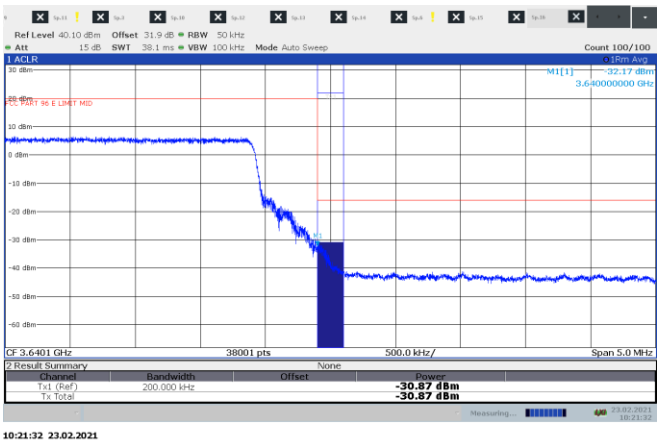


Figure 8.4-7: Emission measurement within 0-1 MHz high end from the SAS assigned channel edge, sample plot for 2CC 10 MHz channel

Test data continued

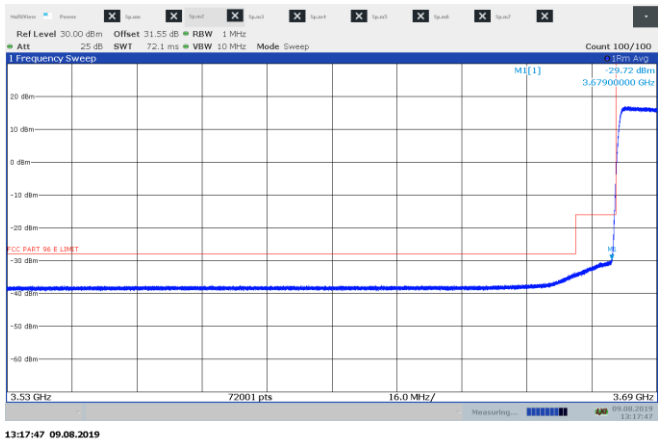


Figure 8.4-8: Emission measurement outside 10 MHz and within 1-10 MHz low end from the SAS assigned channel edge, sample plot for 1CC 20 MHz channel

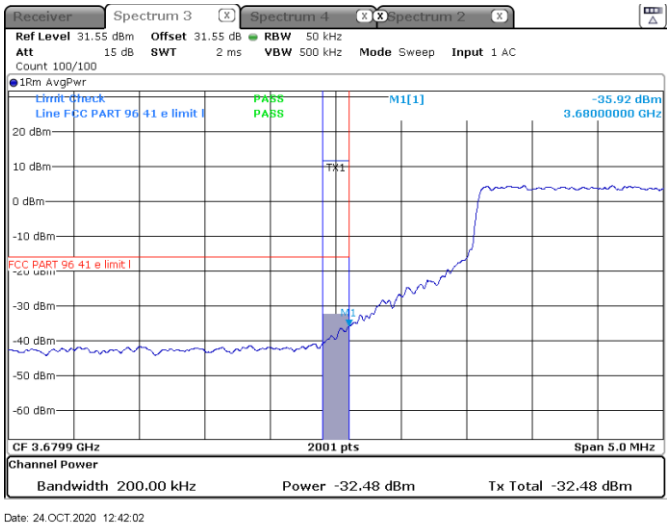


Figure 8.4-9: Emission measurement within 0-1 MHz low end from the SAS assigned channel edge, sample plot for 1CC 20 MHz channel

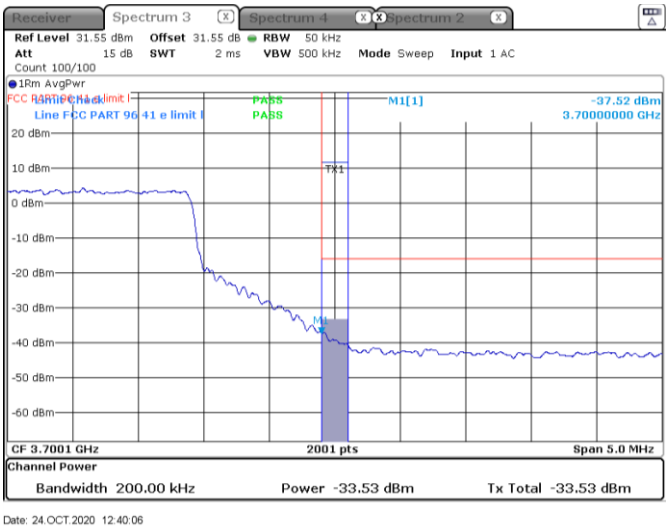


Figure 8.4-10: Emission measurement within 0-1 MHz high end from the SAS assigned channel edge, sample plot for 1CC 20 MHz channel

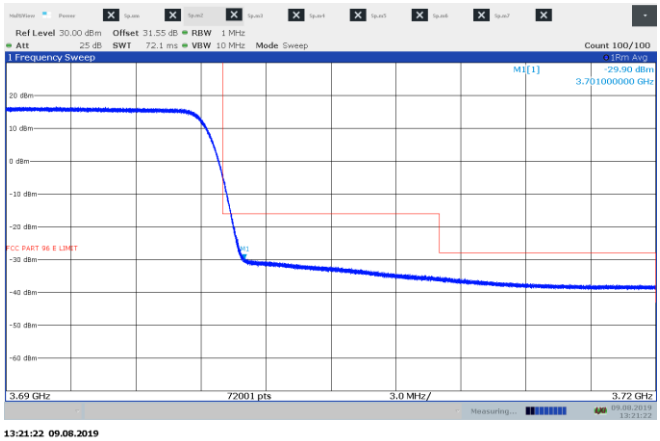


Figure 8.4-11: Emission measurement within 1–10 MHz and outside 10 MHz high end from the SAS assigned channel edge, sample plot for 1CC 20 MHz channel

Test data continued

Figure 8.4-12: Emission measurement outside 10 MHz and within 1-10 MHz from the SAS assigned channel edge, sample plot for 2CC 20 MHz channel

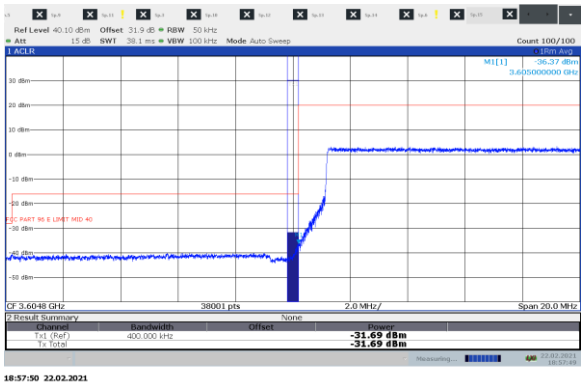


Figure 8.4-13: Emission measurement within 0-1 MHz low end from the SAS assigned channel edge, sample plot for 2CC 20 MHz channel

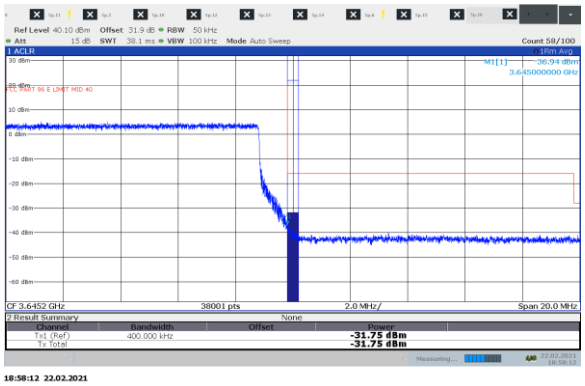


Figure 8.4-14: Emission measurement within 0-1 MHz high end from the SAS assigned channel edge, sample plot for 2CC 20 MHz channel

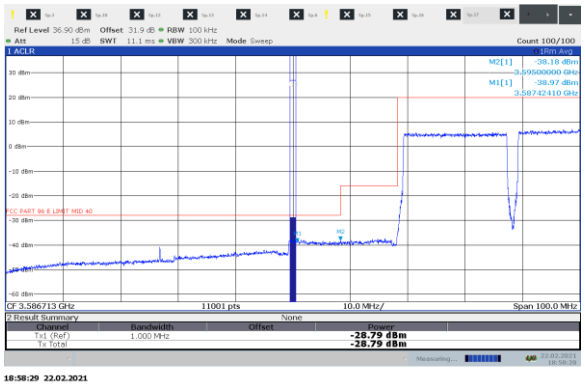


Figure 8.4-15: Emission measurement outside 10 MHz measurement low end from the SAS assigned channel edge, sample plot for 2CC 20 MHz channel

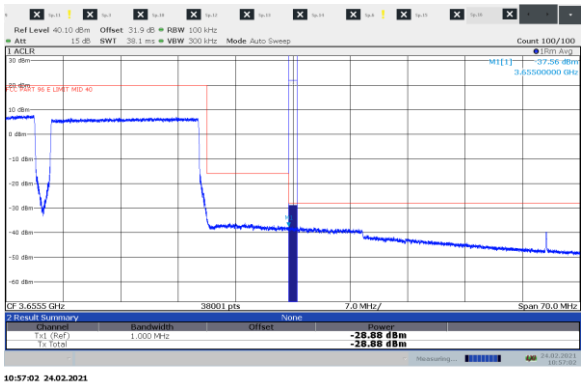


Figure 8.4-16: Emission measurement outside 10 MHz measurement high end from the SAS assigned channel edge, sample plot for 2CC 20 MHz channel

8.5 FCC 96.41(e)(2) Additional protection levels

8.5.1 Definitions and limits

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

8.5.2 Test summary

Test date	July 30, 2019

8.5.3 Observations, settings and special notes

The testing was performed conducted on each antenna port as well as radiated with both ports operating simultaeneously in MIMO mode and terminated with 50 Ohm loads.Spurious emissions were tested from 30 MHz to the 10th harmonic. Only critical plots provided in test data below. Spectrum analyser settings:
Paragraph (e) (1) of this section is followed in emission mask measurements for 3540 and 3710 MHz results. Tables for 3530 and 3720 MHz results are shown in tables below.

Resolution bandwidth	100 kHz (below 1 GHz), 1 MHz (conducted)
Video bandwidth	3 × RBW
Detector and trace mode	RMS Power averaging (conducted), Peak Max-hold (radiated)

8.5.4 Test data

Table 8.5-1: Additional emission measurements at 3530 and 3720 MHz sector 1 QPSK modulation 1CC results

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
0	1	10(low)	3530	-51.38	-43.00	8.38
1	1	10(low)	3530	-46.33	-43.00	3.33
0	1	10(high)	3720	-45.82	-43.00	2.82
1	1	10(high)	3720	-46.32	-43.00	3.32
0	1	20(low)	3530	-53.69	-43.00	10.69
1	1	20(low)	3530	-50.12	-43.00	7.12
0	1	20(high)	3720	-55.03	-43.00	12.03
1	1	20(high)	3720	-56.74	-43.00	13.74

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above.

Table 8.5-2: Additional emission measurements at 3530 and 3720 MHz sector 1 QPSK modulation 2CC results

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
0	2	20(low)	3530	-46.90	-43.00	3.90
1	2	20(low)	3530	-47.48	-43.00	4.48
0	2	20(high)	3720	-47.46	-43.00	4.46
1	2	20(high)	3720	-49.15	-43.00	6.15
0	2	40(low)	3530	-45.05	-43.00	2.05
1	2	40(low)	3530	-46.36	-43.00	3.36
0	2	40(high)	3720	-43.28	-43.00	0.28
1	2	40(high)	3720	-43.87	-43.00	0.87

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the siso limit in the table above.

Test data continued

Table 8.5-3: Additional emission measurements at 3530 and 3720 MHz sector 1 64 QAM modulation 1CC results

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
0	1	10(low)	3530	-46.93	-43.00	3.93
1	1	10(low)	3530	-46.69	-43.00	3.69
0	1	10(high)	3720	-46.66	-43.00	3.66
1	1	10(high)	3720	-46.40	-43.00	3.40
0	1	20(low)	3530	-46.37	-43.00	3.37
1	1	20(low)	3530	-46.02	-43.00	3.02
0	1	20(high)	3720	-46.46	-43.00	3.46
1	1	20(high)	3720	-46.63	-43.00	3.63

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above.

Table 8.5-4: Additional emission measurements at 3530 and 3720 MHz sector 1 64 QAM modulation 2CC results

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
0	2	20(low)	3530	-46.90	-43.00	3.90
1	2	20(low)	3530	-47.35	-43.00	4.35
0	2	20(high)	3720	-47.26	-43.00	4.26
1	2	20(high)	3720	-48.76	-43.00	5.76
0	2	40(low)	3530	-45.05	-43.00	2.05
1	2	40(low)	3530	-46.36	-43.00	3.36
0	2	40(high)	3720	-43.28	-43.00	0.28
1	2	40(high)	3720	-43.87	-43.00	0.87

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above.

Test data continued

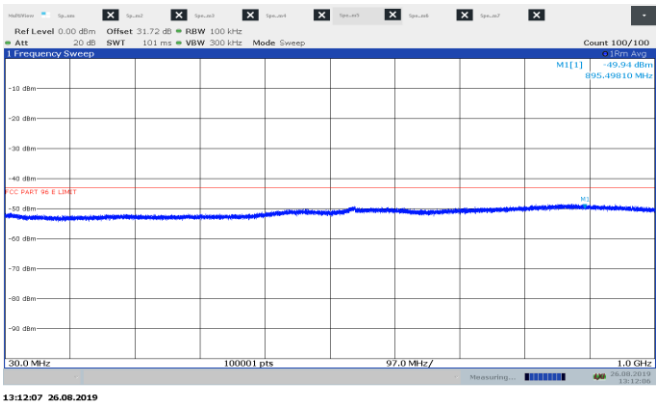


Figure 8.5-1: Conducted spurious emissions for 1CC 10 MHz channel sample plot 30 MHz – 1GHz

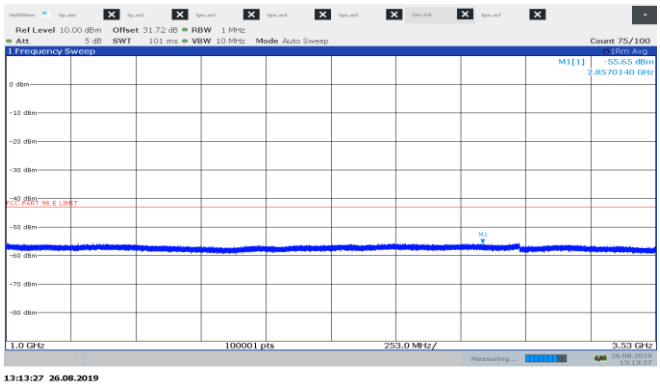


Figure 8.5-2: Conducted spurious emissions for 1CC 10 MHz channel sample plot 1 GHz – 3.53 GHz

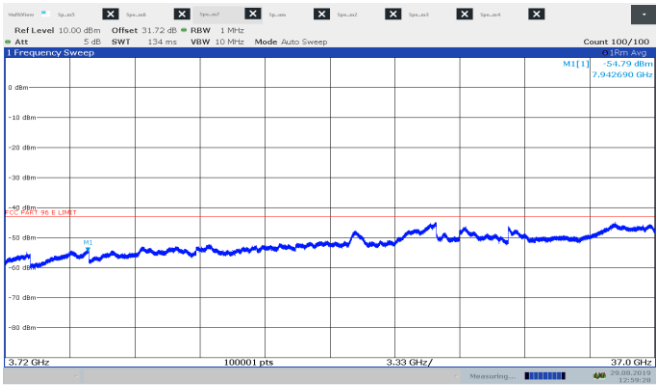


Figure 8.5-3: Conducted spurious emissions for 1CC 10 MHz channel sample plot 3.72 GHz – 37 GHz

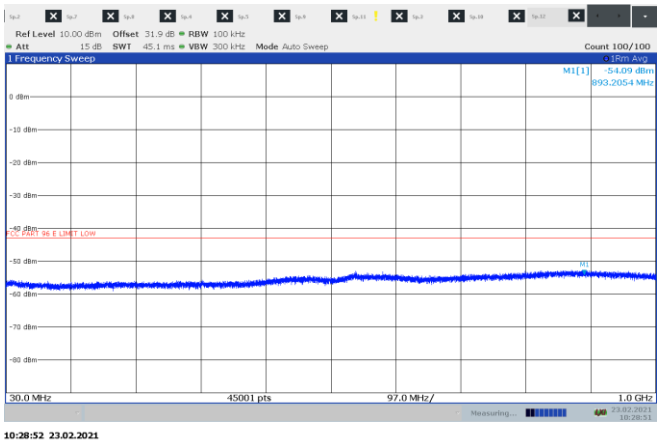


Figure 8.5-4: Conducted spurious emissions for 2CC 10 MHz channel sample plot 30 MHz – 1GHz

Test data continued

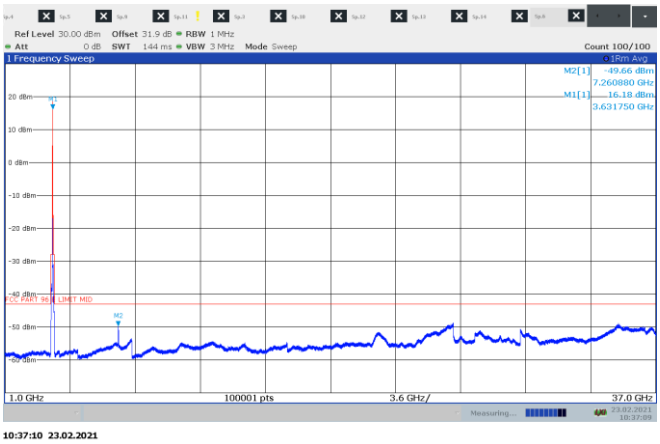


Figure 8.5-5: Conducted spurious emissions for 2CC 10 MHz channel sample plot 1 GHz – 37 GHz

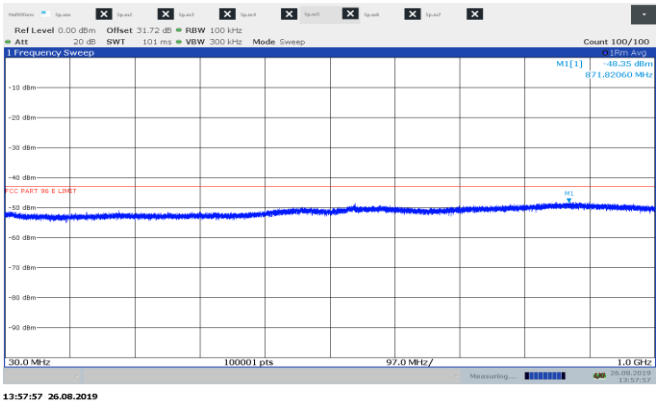


Figure 8.5-6: Conducted spurious emissions for 1CC 20 MHz channel sample plot 30 MHz – 1GHz

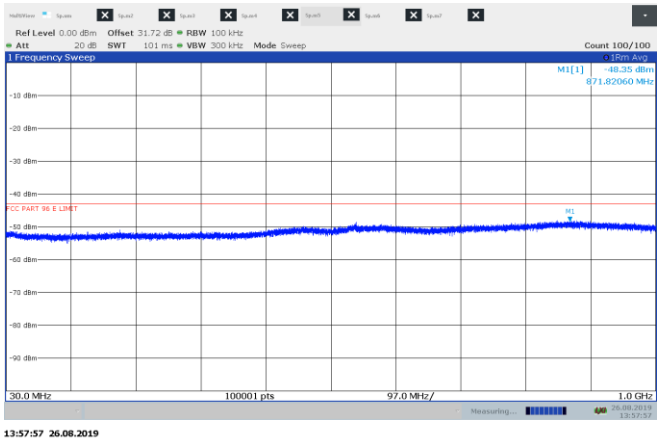


Figure 8.5-7: Conducted spurious emissions for 1CC 20 MHz channel sample plot 1 GHz – 3.53 GHz

Test data continued

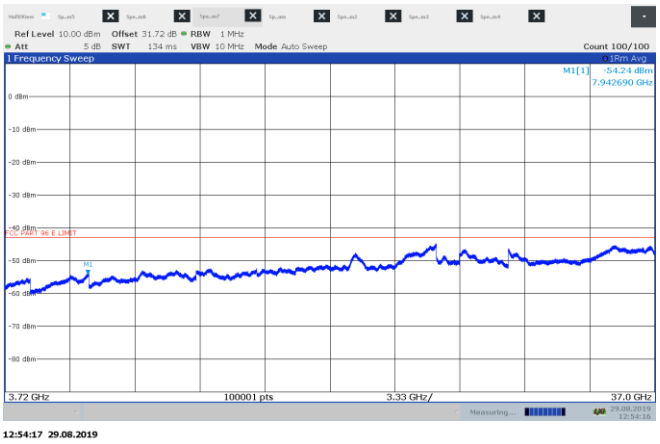


Figure 8.5-8: Conducted spurious emissions for 1CC 20 MHz channel sample plot 3.72 GHz – 37 GHz

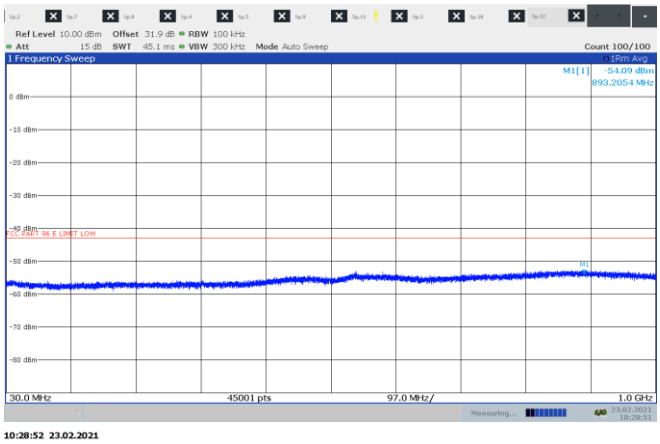


Figure 8.5-9: : Conducted spurious emissions for 2CC 20 MHz channel sample plot 30 MHz – 1GHz

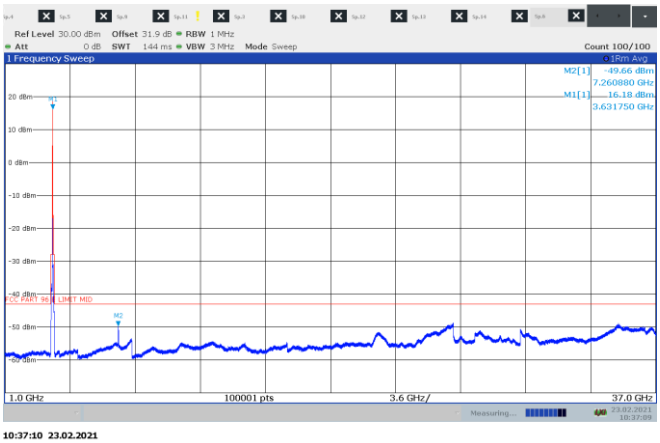


Figure 8.5-10: Conducted spurious emissions for 2CC 20 MHz channel sample plot 1 GHz – 37 GHz

Test data continued

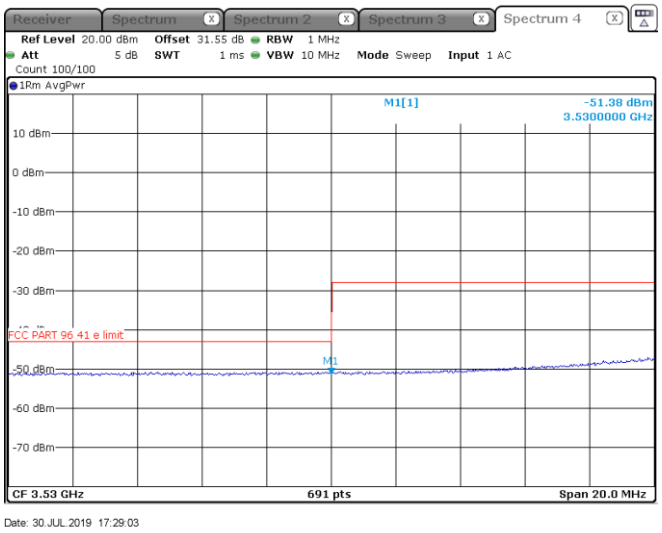


Figure 8.5-11: Emission measurement at 3530 MHz for 1CC 10 MHz sample plot

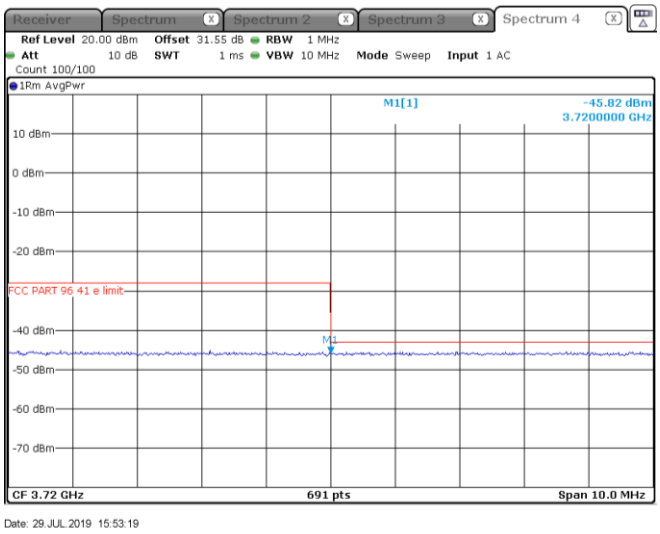


Figure 8.5-12: Emission measurement at 3720 MHz for 1CC 10 MHzsample plot

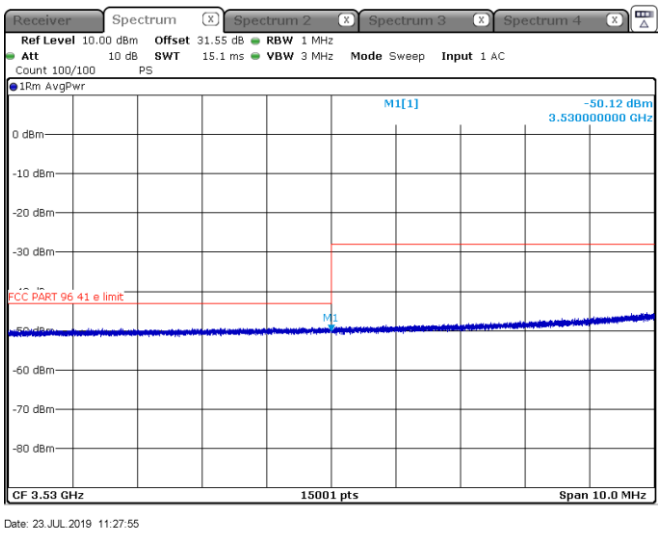


Figure 8.5-13: Emission measurement at 3530 MHz for 1CC 20 MHz sample plot

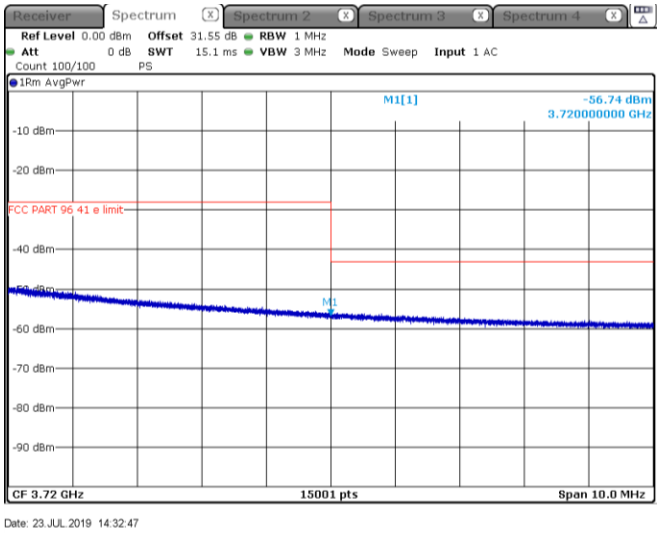


Figure 8.5-14: Emission measurement at 3720 MHz for 1CC 20 MHzsample plot

Test data continued

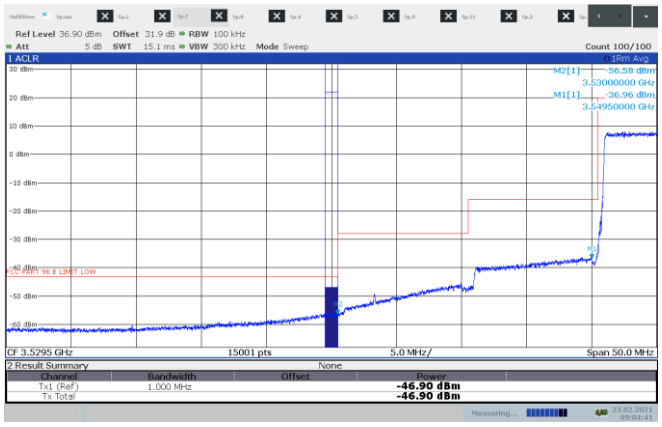


Figure 8.5-15: Emission measurement at 3530 MHz for 2CC 10 MHz sample plot

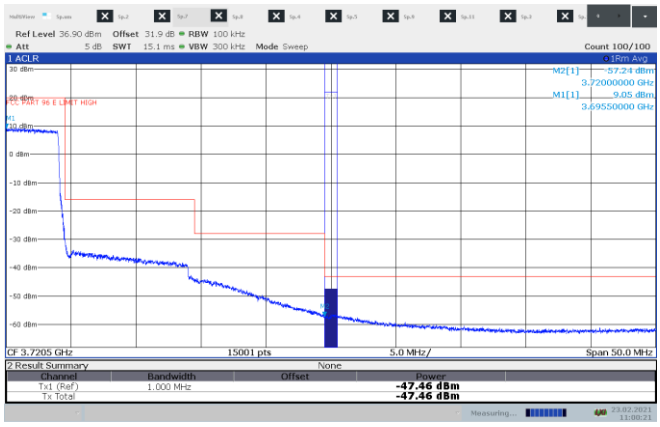


Figure 8.5-16: Emission measurement at 3720 MHz for 2CC 10 MHz sample plot

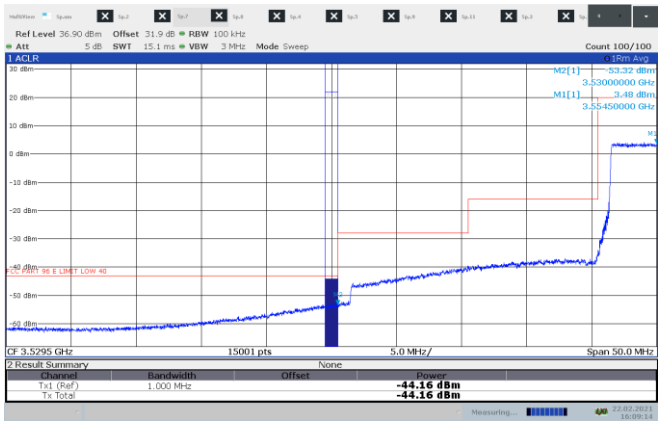


Figure 8.5-17: Emission measurement at 3530 MHz for 2CC 20 MHz sample plot

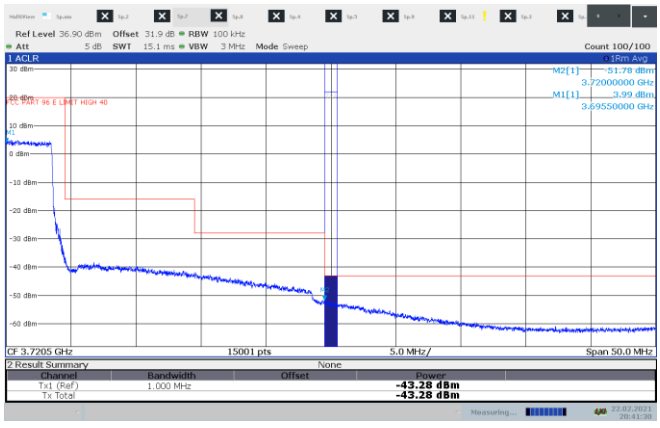
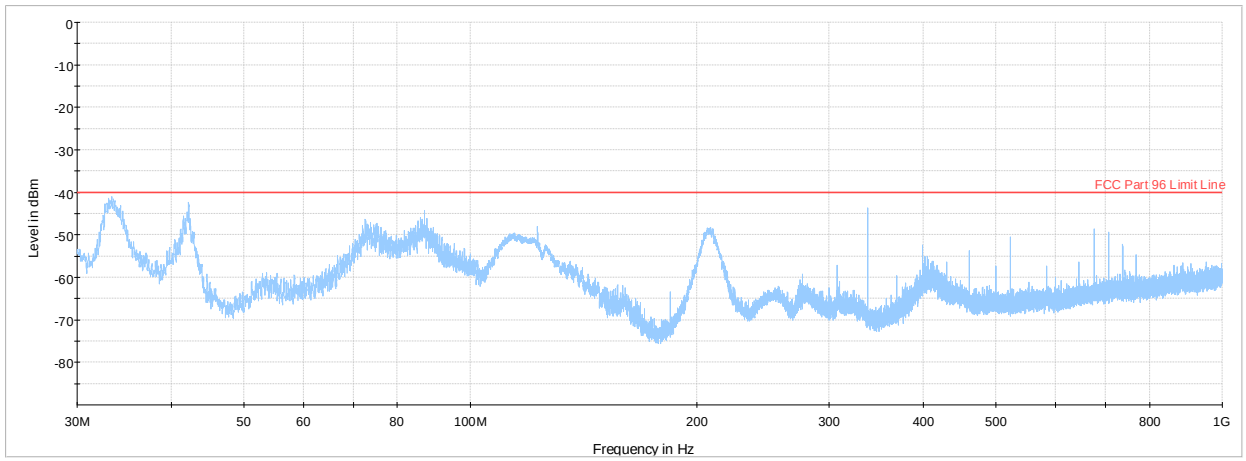


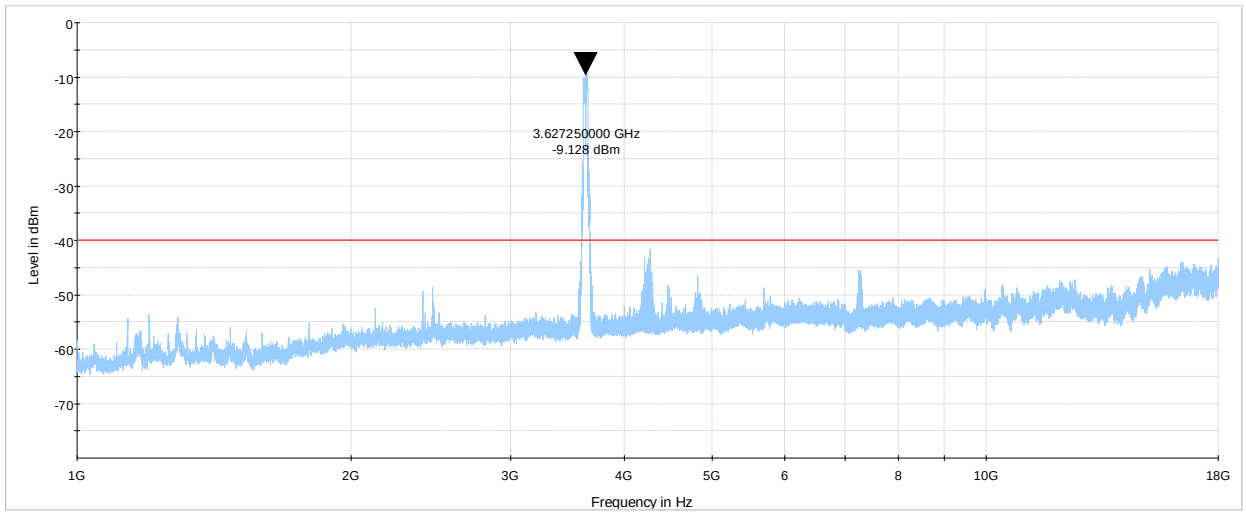
Figure 8.5-18: Emission measurement at 3720 MHz for 2CC 20 MHz sample plot

Test data continued



NEX-425119 Cabinet Spurious 30 MHz - 1 GHz
Preview Result 1-PK+
FCC Part 96 Limit Line

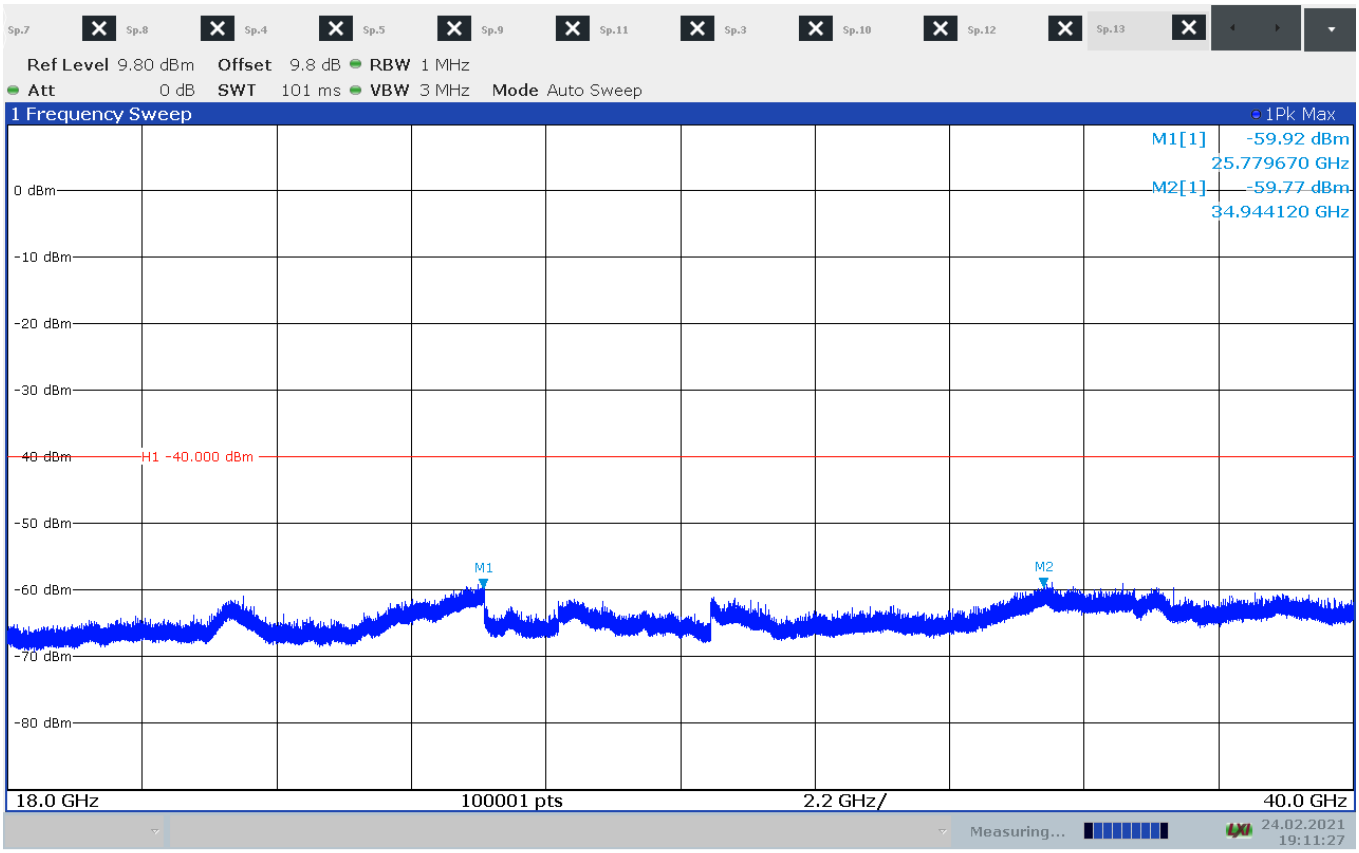
Figure 8.5-1: Cabinet spurious emissions sample plot (30 to 1000 MHz)



NEX-425119 Cabinet Spurious 1 - 18 GHz
Preview Result 1-PK+
FCC Part 96 Limit Line

Figure 8.5-2: Cabinet spurious emissions sample plot (1 to 18 GHz)

Test data continued



19:11:27 24.02.2021

Figure 8.5-3: Cabinet spurious emissions sample plot (18 - 40 GHz)

Test data continued

Table 8.5-5: *Conducted spurious emission measurement results QPSK modulation results*

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
1	1	10(mid)	3238	-46.45	-43.00	3.45
1	1	10(high)	16333	-48.35	-43.00	5.35
1	1	20(mid)	16349	-47.78	-43.00	4.78
0	2	20(low)	7119	-48.43	-43.00	5.43
0	2	20(mid)	7260	-47.67	-43.00	4.67
0	2	40(low)	7141	-48.16	-43.00	5.16

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above.

.

Table 8.5-6: *Conducted spurious emission measurement results 64 QAM modulation results*

Antenna port	No of carriers	Channel BW, MHz	Frequency of max emission, MHz	Emission level, dBm/MHz	Limit[1], dBm/MHz	Margin, dB
0	1	10(low)	14014	-53.44	-43.00	10.44
0	1	10(mid)	2479	-55.98	-43.00	12.98
0	1	10(mid)	14191	-52.74	-43.00	9.74
1	1	10(high)	15898	-53.31	-43.00	10.31
0	2	20(low)	7120	-48.14	-43.00	5.14
0	2	20(mid)	7260	-47.14	-43.00	4.14
0	2	40(low)	7160	-48.63	-43.00	5.63

Note: [1]For MIMO 2×2 operation 3 dB is subtracted from the SISO limit in the table above.

8.6 FCC 2.1055 Frequency stability

8.6.1 Definitions and limits

(a) The frequency stability shall be measured with variation of ambient temperature as follows:
(1) From −30°C to +50°C for all equipment except that specified in paragraphs (a)(2) and (3) of this section
(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° C through the range.
(d) The frequency stability shall be measured with variation of primary supply voltage as follows:
(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

8.6.2 Test summary

Test date:	August 22, 2019

8.6.3 Observations, settings and special notes

Spectrum analyser settings:

Resolution bandwidth	≥ 1 % of emission bandwidth
Video bandwidth	≥ 3 × RBW
Frequency span	Wider than emission bandwidth
Detector mode	Peak

8.6.4 Test data

Table 8.6-1: Frequency drift measurement results

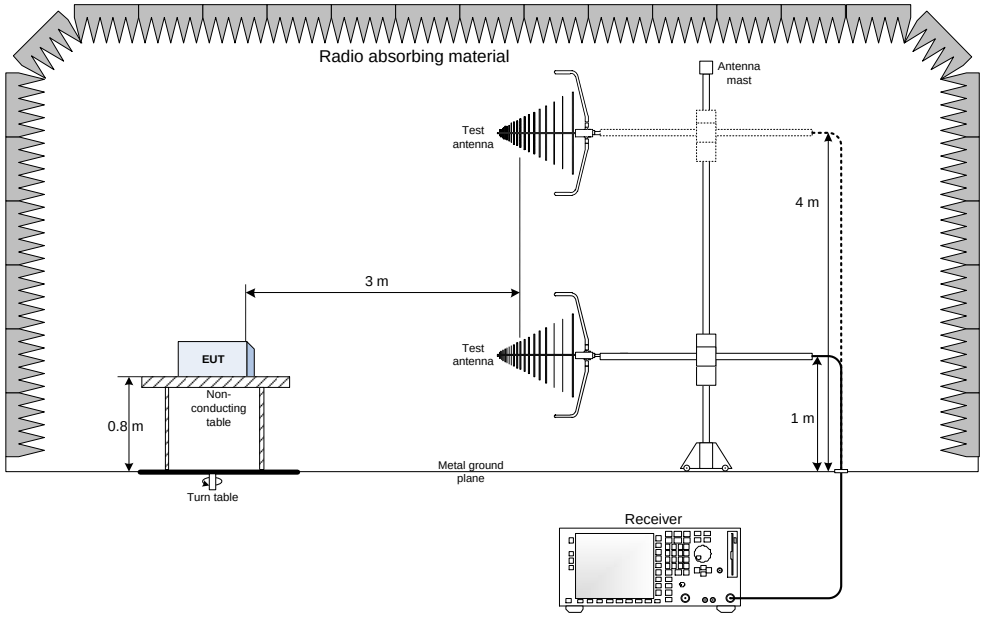
Test conditions	Frequency, Hz	Offset, ppm
+50 °C, Nominal	3624956537	-0.14
+40 °C, Nominal	3624957029	-0.01
+30 °C, Nominal	3624957056	0.00
+20 °C, +15 %	3624957704	0.18
+20 °C, Nominal	3624957061	Reference
+20 °C, -15 %	3624957456	0.11
+10 °C, Nominal	3624959224	0.60
0 °C, Nominal	3624964476	2.05
−10 °C, Nominal	3624964201	1.97
−20 °C, Nominal	3624965323	2.28
−30 °C, Nominal	3624964276	1.99

Note: Offset was calculated as per the following formula:

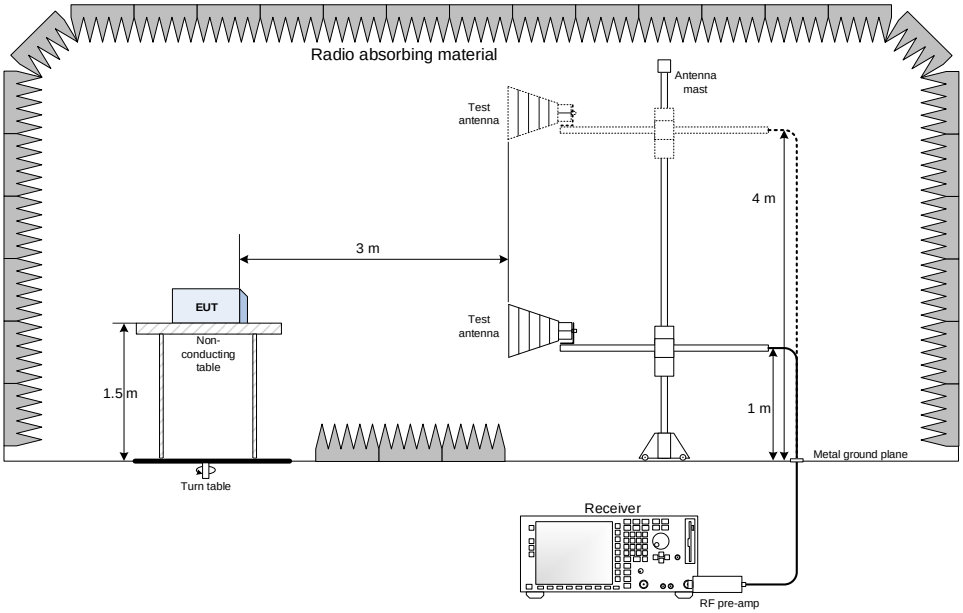
$$\frac{F_{Measured} - F_{reference}}{F_{reference}} \times 1 \cdot 10^{6}$$

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up for frequencies below 1 GHz



9.2 Radiated emissions set-up for frequencies above 1 GHz



9.3 Conducted emissions set-up