

Report on the Radio Testing
For
Cambium Networks Ltd
on
3GHz PMP 450m
Report no. TRA-053965-47-00A
30 July 2021



Report Number: TRA-053965-47-00A
Issue: A

REPORT ON THE RADIO TESTING OF A
Cambium Networks Ltd
3GHz PMP 450m
WITH RESPECT TO SPECIFICATION
FCC Part 96

TEST DATE: 1st June - 29th June 2021

Written by:

D Garvey
D Winstanley
Radio Test Engineer

Approved by:

J Charters
Laboratory Manager

Date: 30 July 2021

Disclaimers:

- [1] THIS DOCUMENT MAY BE REPRODUCED ONLY IN ITS ENTIRETY AND WITHOUT CHANGE
[2] THE RESULTS CONTAINED IN THIS DOCUMENT RELATE ONLY TO THE ITEM(S) TESTED

1 Revision Record

<i>Issue Number</i>	<i>Issue Date</i>	<i>Revision History</i>
A	30 July 2021	Original

2 Summary

TEST REPORT NUMBER: TRA-053965-47-00A

WORKS ORDER NUMBER: TRA-053965-00

PURPOSE OF TEST: Class II Permissive Change

TEST SPECIFICATION(S): Part 96

EQUIPMENT UNDER TEST (EUT): 3GHz PMP 450m

FCC IDENTIFIER: QWP-30450M

MAC ADDRESS: 0a-00-3e-60-92-1a & 0a-00-3e-60-92-24

MANUFACTURER/AGENT: Cambium Networks Ltd

ADDRESS: Unit B2
Linhay Business Park
Eastern Road
Ashburton
Devon
TQ13 7UP
United Kingdom

CLIENT CONTACT: Don Reid
☎ 01364 655667
✉ Don.Reid@Cambiumnetworks.com

TEST DATE: 1st June - 29th June 2021

TESTED BY: D Garvey
D Winstanley
Element

2.1 Test Summary

<i>Test Method and Description</i>	<i>Requirement Clause Part 96</i>	<i>Applicable to this equipment</i>	<i>Result / Note</i>
Transmitter Unwanted Emissions	96.41 (e)	☒	<i>Pass</i>
Emission Mask	96.41 (e)	☒	<i>Pass</i>
Peak-to-average power ratio (PAPR)	96.41 (g)	☒	<i>Pass</i>
Peak EIRP Density and Equivalent Isotropically Radiated Power (e.i.r.p)	96.41 (b)	☒	<i>Pass</i>
Occupied bandwidth	2.1049	☒	<i>Pass</i>
Frequency Stability	2.1055	☒	<i>Pass</i>

Notes:

The results contained in this report relate only to the items tested, in the condition at time of test, and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

The apparatus was set up and exercised using the configurations, modes of operation and arrangements defined in this report only. Any modifications made are identified in Section 8 of this report.

Particular operating modes, apparatus monitoring methods and performance criteria required by the standards tested to have been performed except where identified in Section 5.2 of this test report (Deviations from Test Standards).

3 Contents

1	Revision Record	3
2	Summary	4
2.1	Test Summary	5
3	Contents	6
4	Introduction	8
5	Test Specifications	9
5.1	Normative References	9
5.2	Deviations from Test Standards	9
5.3	Minimisation of reflections	9
5.4	Open area test site information	10
6	Glossary of Terms	11
7	Equipment Under Test	12
7.1	EUT Identification	12
7.2	System Equipment	12
7.3	EUT Mode of Operation	12
7.3.1	Transmission	12
7.4	EUT Radio Parameters	13
7.4.1	General	13
7.4.2	Antennas	13
7.4.3	Product specific declarations	13
7.5	EUT Description	13
8	Modifications	14
9	EUT Test Setup	14
9.1	Block Diagram	14
9.2	General Set-up Photograph	15
10	General Technical Parameters	16
10.1	Normal Conditions	16
10.2	Varying Test Conditions	16
11	Transmitter Unwanted Emissions	17
11.1	Definitions	17
11.2	Test Parameters	17
11.3	Test Limit	17
11.4	Test Method	18
11.5	Test Set-up Photograph	19
11.6	Test Equipment	19
11.7	Test Results	20
12	Emission Mask	26
12.1	Definition	26
12.2	Test Parameters	26
12.3	Test Limit	26
12.4	Test Method	27
12.5	Test Equipment	27
12.6	Test Results	28
13	Peak-to-average power ratio (PAPR)	118
13.1	Definition	118
13.2	Test Parameters	118
13.3	Test Limit	118
13.4	Test Method	118
13.5	Test Equipment	119
13.6	Test Results	120
14	Peak EIRP Density and Equivalent Isotropically Radiated Power (EIRP)	129
14.1	Definition	129
14.2	Test Parameters	129
14.3	Test Limit	129
14.4	Test Method	130
14.5	Test Equipment	130
14.6	Test Results – Peak EIRP Density	131
14.7	Test Results – Equivalent Isotropic Radiated Power (EIRP)	134
15	Occupied Bandwidth	158
15.1	Definition	158
15.2	Test Parameters	158
15.3	Test Method	158
15.4	Test Equipment	158
15.5	Test Results	159
16	Frequency stability	177
16.1	Definition	177

16.2 Test Parameters 177

16.3 Test Method..... 178

16.4 Test Equipment 178

16.5 Test Results..... 179

17 Measurement Uncertainty..... 180

4 Introduction

This report TRA-053965-47-00A presents the results of the Radio testing on a Cambium Networks Ltd, 3GHz PMP 450m to specification Part 96—Citizens Broadband Radio Service.

The testing was carried out for Cambium Networks Ltd by Element, at the addresses detailed below.

☒	30 Meter Open Area Test Site Persore Airfield, Long Lane, Throckmorton, Worcs, WR10 2JH UK	☒	Element Skelmersdale Unit 1 Pendle Place Skelmersdale West Lancashire WN8 9PN UK
-------------------------------------	--	-------------------------------------	--

This report details the configuration of the equipment, the test methods used and any relevant modifications where appropriate.

All test and measurement equipment under the control of the laboratory and requiring calibration is subject to an established programme and procedures to control and maintain measurement standards. The quality management system meets the principles of ISO 9001, and has quality control procedures for monitoring the validity of tests undertaken. Records and sufficient detail are retained to establish an audit trail of calibration records relating to its test results for a defined period. Under control of the established calibration programme, key quantities or values of the test & measurement instrumentation are within specification and comply with the relevant traceable internationally recognised and appropriate standard specifications, which are UKAS calibrated as such where these properties have a significant effect on results. Participation in inter-laboratory comparisons and proficiency testing ensures satisfactory correlation of results conform to Elements own procedures, as well as statistical techniques for analysis of test data providing the appropriate confidence in measurements.

Throughout this report EUT denotes equipment under test.

FCC Site Listing:

The test laboratory is accredited for the above sites under the US-UK MRA,

Designation number(s):

Element Hull UK2007

Element Skelmersdale UK2020

The test site requirements of ANSI C63.4-2014 are met up to 1GHz.

The test site SVSWR requirements of CISPR 16-1-4:2010 are met over the frequency range 1 GHz

5 Test Specifications

5.1 Normative References

- FCC 47 CFR Ch. I – Part 96 – Citizens Broadband Radio Service
- ANSI C63.26-2015 – American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.
- ANSI C63.4-2014 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

5.2 Deviations from Test Standards

Maximum conducted output power

Due to the nature of the equipment it is not possible to measure the power conducted so a radiated measurement was performed. This measurement was performed at 30m to ensure the measurement was made in the antenna far field.

Spectral Power Density

Due to the nature of the equipment it is not possible to measure the power conducted so a radiated measurement was performed. This measurement was performed at 30m to ensure the measurement was made in the antenna far field.

5.3 Minimisation of reflections

Due to the use of a 30 meter open area test site with no RF absorbing material for the measurement of the fundamental attempts were made to minimise the influence of reflections.

To minimise the reflections the following precautions were taken.

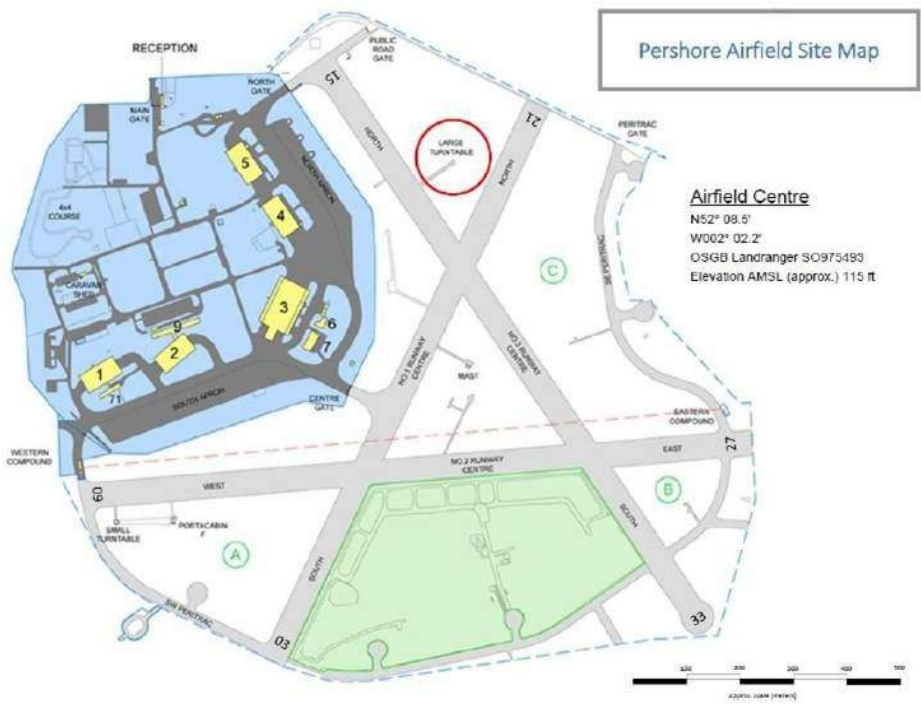
Test performed over a grassed area to try and ensure no sub surface artefacts produce reflections.

The EUT was raised to a height of 4 meters above the ground plane to help reduce the effects of any reflected paths at 30 meters

The EUTs antennas are set with a 2 degree down tilt, and an 8 degree beam width, to negate this down tilt the EUT was rotated 180 degrees though the vertical plane (i.e. turned upside down to normal operation) and the EUT was angled so the bore sight was parallel to the grassed area.

Due to the increased height of the EUT the measurement antenna was varied between 1 and 6 meters to encompass the height of the EUT and its potential bandwidth

5.4 Open area test site information



6 Glossary of Terms

§	denotes a section reference from the standard, not this document
AC	Alternating Current
ANSI	American National Standards Institute
BW	bandwidth
C	Celsius
CFR	Code of Federal Regulations
CW	Continuous Wave
dB	decibel
dBm	dB relative to 1 milliwatt
DC	Direct Current
DSSS	Direct Sequence Spread Spectrum
EIRP	Equivalent Isotropically Radiated Power
ERP	Effective Radiated Power
EUT	Equipment Under Test
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
Hz	hertz
IC	Industry Canada
ITU	International Telecommunication Union
LBT	Listen Before Talk
m	metre
max	maximum
MIMO	Multiple Input and Multiple Output
min	minimum
MRA	Mutual Recognition Agreement
N/A	Not Applicable
PCB	Printed Circuit Board
PDF	Portable Document Format
Pt-mpt	Point-to-multipoint
Pt-pt	Point-to-point
RF	Radio Frequency
RH	Relative Humidity
RMS	Root Mean Square
Rx	receiver
s	second
SVSWR	Site Voltage Standing Wave Ratio
Tx	transmitter
UKAS	United Kingdom Accreditation Service
V	volt
W	watt
Ω	ohm

7 Equipment Under Test

7.1 EUT Identification

- Name: 3GHz PMP 450m
- MAC Address: 0a-00-3e-60-92-1a & 0a-00-3e-60-92-24
- Model Number: 30383JH
- Software Revision: Canopy 20.3 (Build ATM1) AP
- Build Level / Revision Number: Not Applicable

7.2 System Equipment

Equipment listed below forms part of the overall test setup and is required for equipment functionality and/or monitoring during testing. The compliance levels achieved in this report relate only to the EUT and not items given in the following list.

- Name: Netgear 5 port 10/100/1000M switch
- Serial Number: 2N211B3D00F3C
- Model Number: GS605 v4
- Name: Dell Latitude Laptop PC
- Serial Number:
- Model Number: E6440

7.3 EUT Mode of Operation

7.3.1 Transmission

The mode of operation for Transmit tests was as follows:

The unit was transmitting modulated or unmodulated signals with 100 % duty cycle.

Operating Frequencies

Operating frequency band tested 3550 MHz -3700 MHz.

Operating modes

There are three unique operating modes. These only affect the antenna radiation pattern.

Sector Mode

This mode produces a broad antenna radiation beam.

Beamforming Mode

This produces a narrow, focused antenna beam.

MU-MIMO mode

This produces several narrow, focused antenna beams.

Modulation Modes

Supported modulation modes are QPSK, 16QAM, 64QAM and 256QAM. Each of these four modulation mode can be configured to be MIMO A or MIMO B. The differences between these MIMO modes are described below.

MIMO A

The data streams transmitted in both horizontal and vertical antenna polarisations are identical.

MIMO B

The data streams transmitted in the horizontal and vertical polarisations are independent.

7.4 EUT Radio Parameters

7.4.1 General

Frequency of operation:	3.55 GHz – 3.70 GHz band
Modulation type(s):	QPSK; 16QAM; 64QAM and 256QAM
Occupied channel bandwidth(s):	5 MHz; 20 MHz and 40 MHz
Channel spacing:	5 MHz; 20 MHz and 40 MHz
Declared output power(s):	47dBm/10MHz (e.i.r.p)
Nominal Supply Voltage:	48 V dc
Location of notice for license exempt use:	Not applicable, license device
Method of prevention of use on non-US / non-Canadian frequencies:	Not stated
Duty cycle:	100 % for testing only

7.4.2 Antennas

Type:	Integral antenna
Frequency range:	3.55 GHz – 3.70 GHz
Impedance:	50 Ω
Gain:	22 dBi - Beamforming 16 dBi – Sector and MU-MIMO
Connector type:	Not applicable, integral antenna
Length:	500 × 650 × 120
Weight:	20 kg
Mounting:	Professionally installed

7.4.3 Product specific declarations

Multiple antenna configuration(s), e.g. MIMO:	Sector, Beamforming and MU-MIMO
Fixed pt-pt operations (yes/no):	No, Fixed pt-mpt operation only
Installation manual advice on pt-pt operational restrictions (yes/no):	N/A Professionally installed
Fixed pt-mpt operations (yes/no):	Yes
Simultaneous tx (yes/no):	Yes

7.5 EUT Description

The EUT is a point-to-multipoint (PMP) wireless broadband platform working in the band 3.55 GHz – 3.70 GHz.

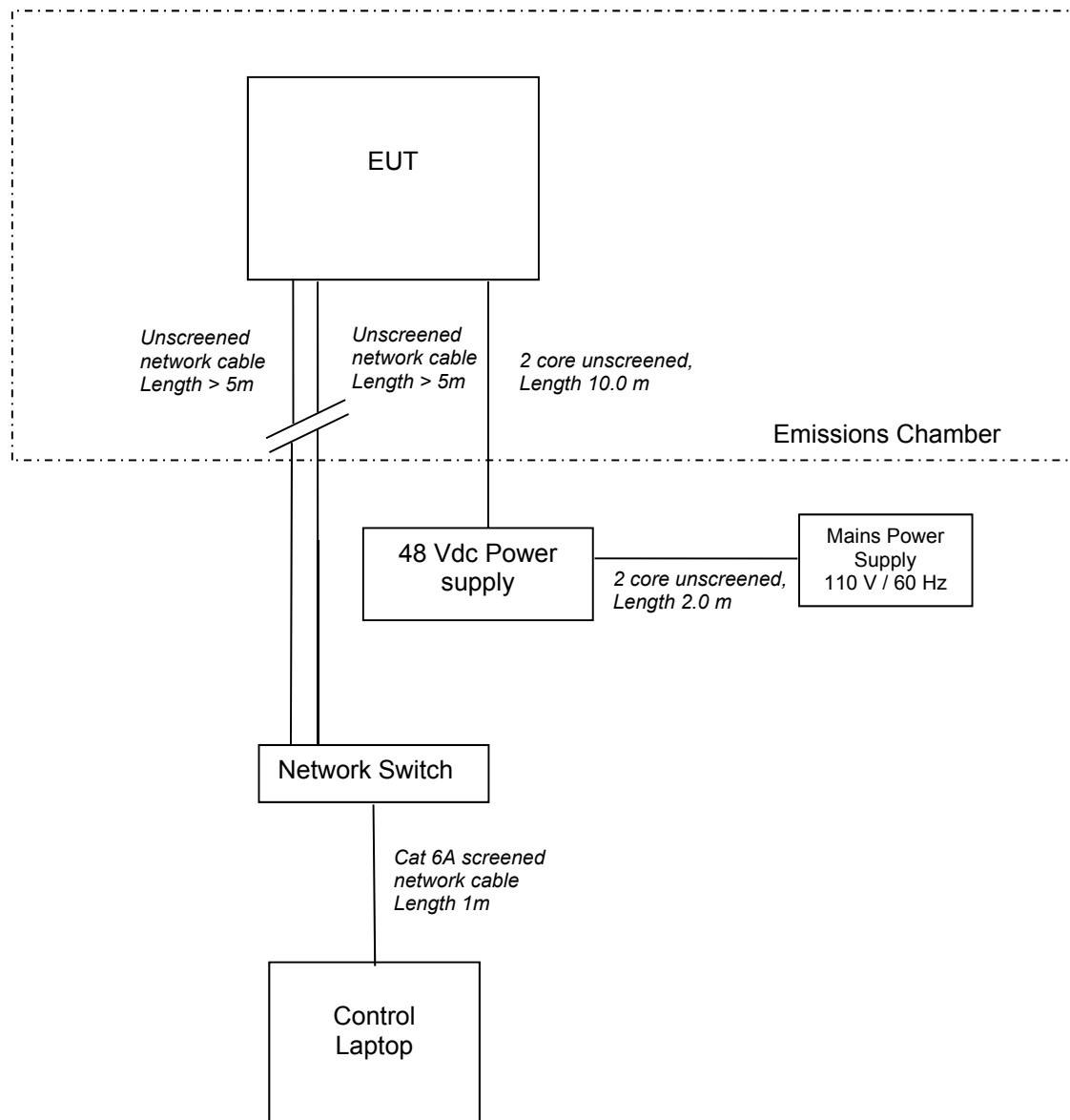
8 Modifications

No modifications were performed during this assessment.

9 EUT Test Setup

9.1 Block Diagram

The following diagram shows basic EUT interconnections with cable type and cable lengths identified:



9.2 General Set-up Photograph

The following photograph shows basic EUT set-up:



10 General Technical Parameters

10.1 Normal Conditions

The E U T was tested under the normal environmental conditions of the test laboratory, except where otherwise stated. The normal power source applied was 48 V dc from the adaptor.

10.2 Varying Test Conditions

There are no specific frequency stability requirements for the type of device. The results contained in this report demonstrate that the occupied bandwidth is contained within the authorised band and the manufacturer has declared sufficient frequency stability (refer to section 7.4).

Variation of supply voltage is required to ensure stability of the declared output power. During carrier power testing the following variations were made:

	Category	Nominal	Variation
☐	Mains	110 V ac +/-2 %	85 % and 115 %
☐	Battery	New battery	N/A
☒	Power supply	48 V dc	85 % and 115 %

11 Transmitter Unwanted Emissions

11.1 Definitions

Spurious emissions

Emissions on a frequency or frequencies, which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

11.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	Part 96.41 (e)
EUT Frequencies Measured:	3552.5 MHz, 3625 MHz and 3697.5 MHz
EUT Channel Bandwidths:	5 MHz
Deviations From Standard:	None
Measurement BW:	30 MHz to 1 GHz: 120 kHz; Above 1 GHz: 1 MHz
Measurement Detector:	Up to 1 GHz: Peak; Above 1 GHz: Peak

Environmental Conditions (Normal Environment)

Temperature: 24 °C	+15 °C to +35 °C (as declared)
Humidity: 60 % RH	20 % RH to 75 % RH (as declared)
Supply: 48 V dc	48 V dc (as declared)

11.3 Test Limit

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 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed –25 dBm/MHz.

Additional protection levels. The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed –40 dBm/MHz.

11.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure i, the emissions from the EUT were measured on a spectrum analyzer / EMI receiver.

Radiated electromagnetic emissions from the EUT are checked first by preview scans. Preview scans for all spectrum and modulation characteristics are checked, using a peak detector and where applicable worst-case determined for function, operation, orientation, etc. for both vertical and horizontal polarisations. Pre-scan plots are shown with a peak detector and 100 kHz RBW.

If the EUT connects to auxiliary equipment and is table or floor standing, the configurations prescribed in ANSI C63.26 are followed. Alternatively, a layout closest to normal use (as declared by the provider) is employed, (see EUT setup photographs for more detail).

Emissions between 30 MHz and 1 GHz are measured using calibrated broadband antennas. Emissions above 1 GHz are characterized using standard gain horn antennas. Pre-amplifiers and filters are used where required. Care is taken to ensure that test receiver resolution bandwidth, video bandwidth and detector type(s) meet the regulatory requirements.

For both horizontal and vertical polarizations, the EUT is then rotated through 360 degrees in azimuth until the highest emission is detected. At the previously determined azimuth the test antenna is raised and lowered from 1 to 4 m in height until a maximum emission level is detected, this maximum value is recorded.

Power values measured on the test receiver / analyzer are converted to field strength, FS, in dBμV/m at the regulatory distance, using:

$$FS = PR + CL + AF - PA + DC - CF$$

Where,

PR is the power recorded on the receiver / spectrum analyzer in dBμV;

CL is the cable loss in dB;

AF is the test antenna factor in dB/m;

PA is the pre-amplifier gain in dB (where used);

DC is the duty correction factor in dB (where used, e.g. harmonics of pulsed fundamental);

CF is the distance factor in dB (where measurement distance different to limit distance);

This field strength value is then compared with the regulatory limit.

Specification limits are defined in terms of conducted levels

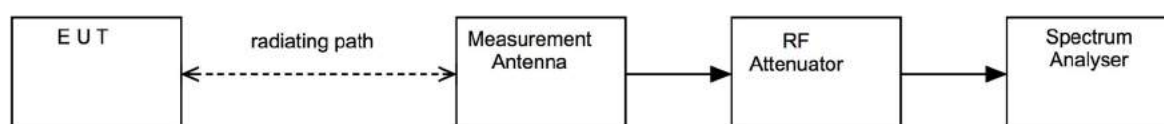
It is not possible to take a conducted measurement on this equipment due to the antenna configuration

Antenna gain is taken into account as an offset on the spectrum analyser to relate back to a conducted measurement

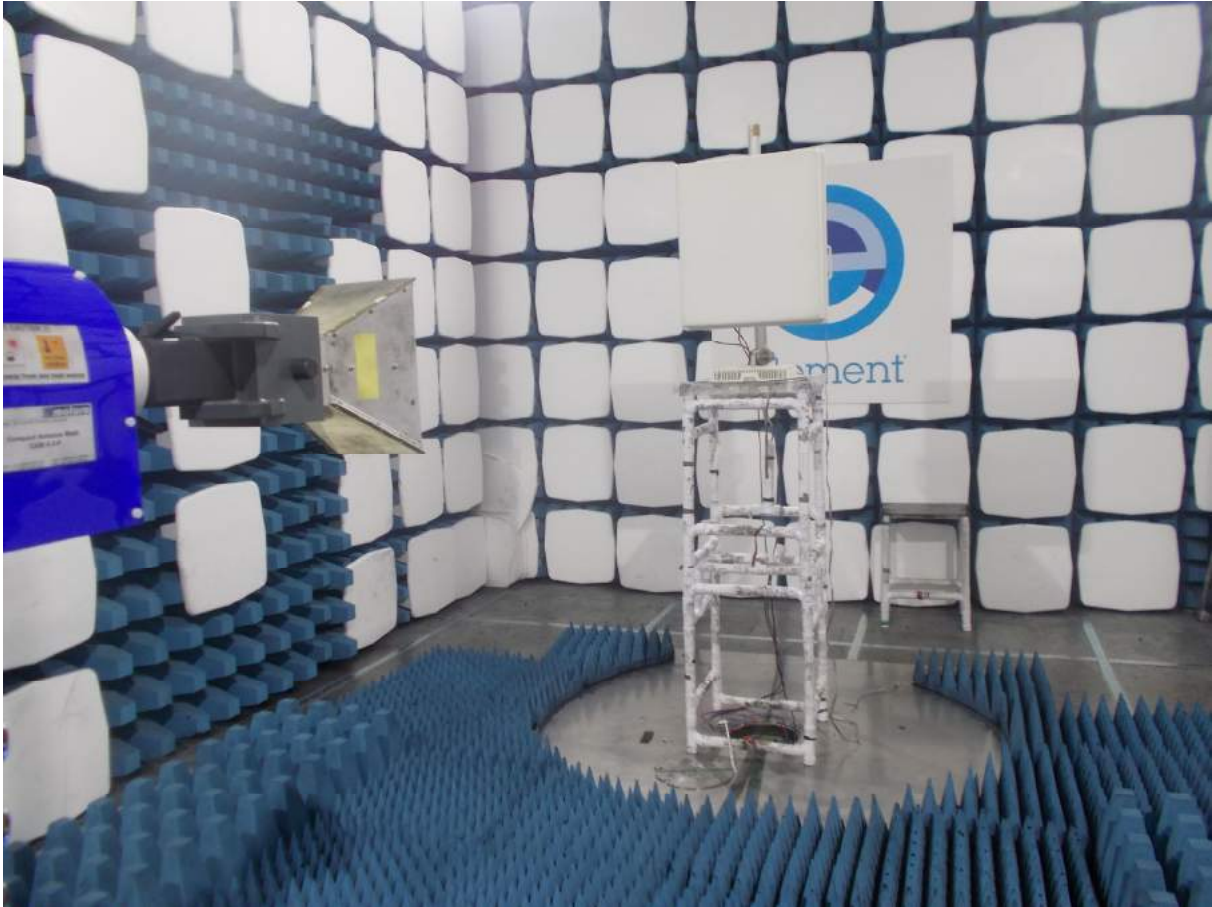
In the 3 GHz - 5 GHz range the offset is – 6 dB (made up from 22 dBi antenna gain and 16 dB fixed attenuation).

Antenna gain outside of the 3 GHz – 5GHz is taken to be 0 dBi, any offsets relate to a correction based on the distance used for limit calculation and measurements.

Figure i Test Setup



11.5 Test Set-up Photograph



11.6 Test Equipment

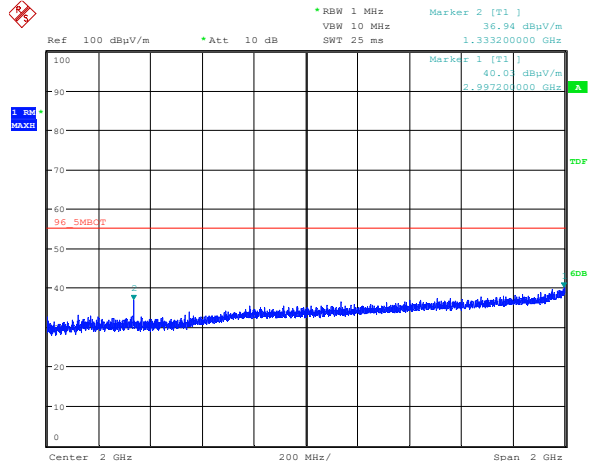
Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
Bilog	Chase	CBL611/A	U573	2023-01-28
EMI Receiver	R&S	ESR7	U456	2021-12-17
1-18GHz Horn	EMCO	3115	L139	2021-07-16
Spectrum Analyser	R&S	FSU46	REF910	2021-11-18
Horn 18-26GHz (&U330)	Flann	20240-20	L300	2022-04-23
Standard Gain Horn 26-40	Flann	22240-20	L301	2021-10-22
Spectrum Analyser	R&S	FSU26	U405	2021-07-17
Pre Amp	Agilent	8449B	L572	2021-10-19
10 dB	Bird	-	U376	Cal in Use
6 dB	Bird	-	L222	Cal in Use
HI Pass Filter 5-16 GHz	Atlantic Microwave	AFH-05000 Rev A	U663	2022-01-30
High Pass Filter	Atlantic Microwave	AFH-07000	U558	2022-01-30

11.7 Test Results

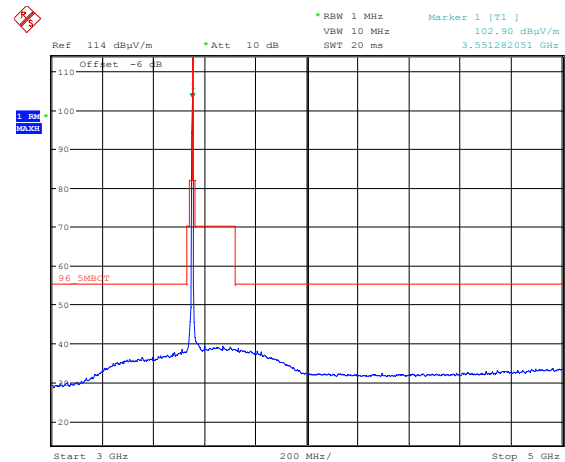
Beamforming; Power setting: 40.0; QPSK MIMO; Channel: 3552.5 MHz										
Detector	Freq. (MHz)	Meas'd Emission (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-amp Gain (dB)	Duty Cycle Corr'n (dB)	Distance Extrap'n Factor (dB)	Field Strength (dBμV/m)	Field Strength (μV/m)	Limit (μV/m)
No emissions within 20 dB of the limit										



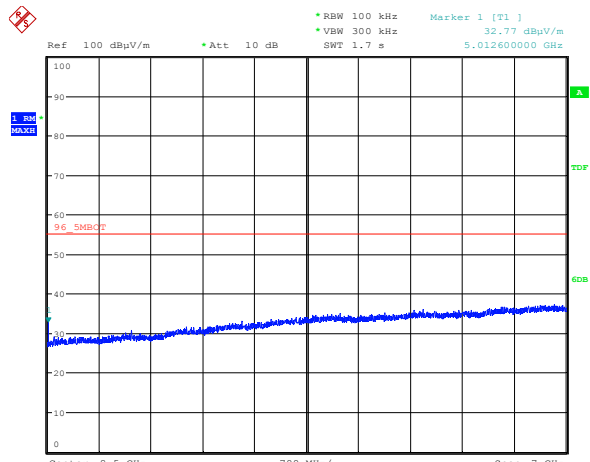
30 MHz to 1 GHz; Beamform; QPSK; MIMO.



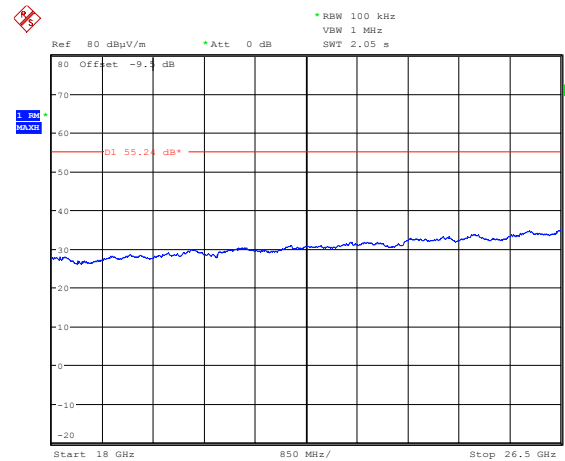
1 GHz to 3 GHz; Beamform; QPSK; MIMO.



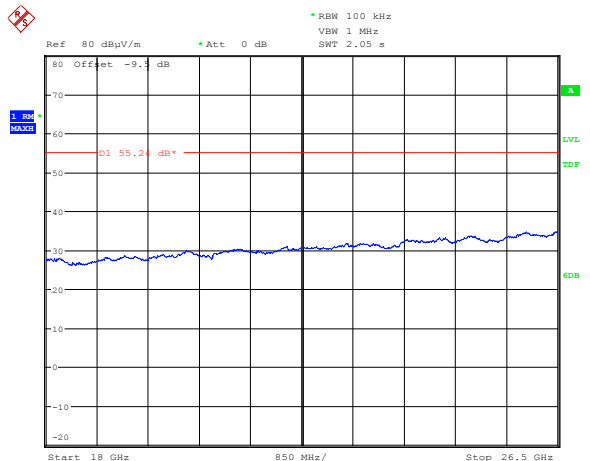
3 GHz to 5 GHz; Beamform; QPSK; MIMO.



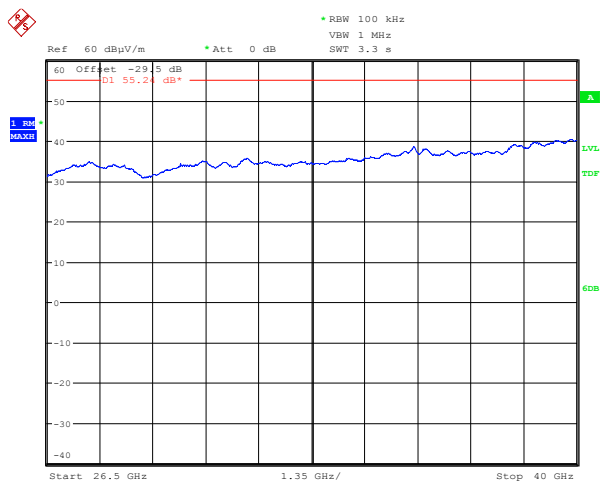
5 GHz to 12 GHz; Beamform; QPSK; MIMO.



12 GHz to 18 GHz; Beamform; QPSK; MIMO.



18 GHz to 26.5 GHz; Beamform; QPSK; MIMO.

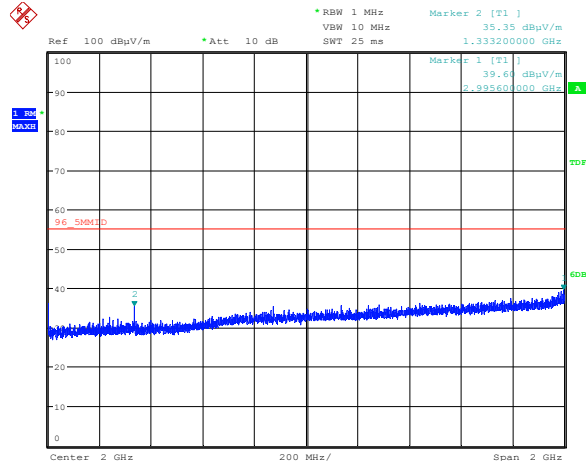


26.5 GHz to 40 GHz; Beamform; QPSK; MIMO.

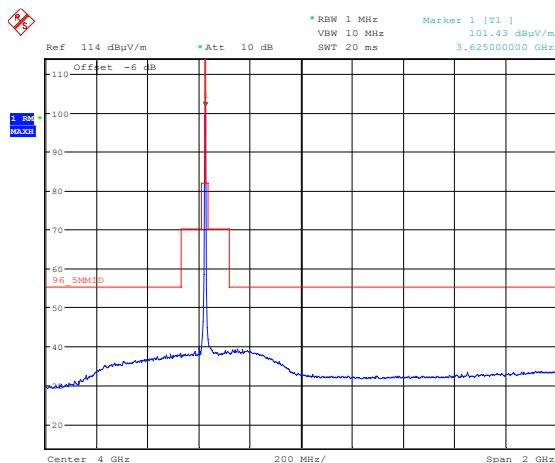
Beamforming; Power setting: 39.5; QPSK MIMO; Channel: 3625 MHz										
Detector	Freq. (MHz)	Meas'd Emission (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-amp Gain (dB)	Duty Cycle Corr'n (dB)	Distance Extrap'n Factor (dB)	Field Strength (dBμV/m)	Field Strength (μV/m)	Limit (μV/m)
No emissions within 20 dB of the limit										



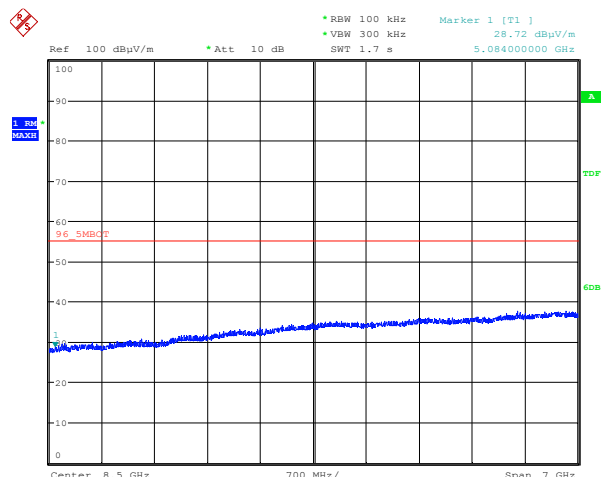
30 MHz to 1 GHz; Beamform; QPSK; MIMO.



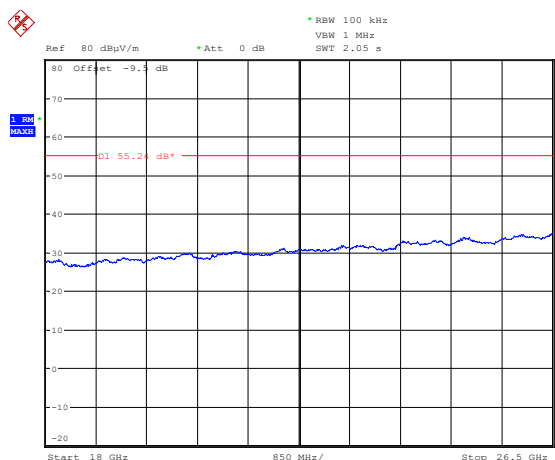
1 GHz to 3 GHz; Beamform; QPSK; MIMO.



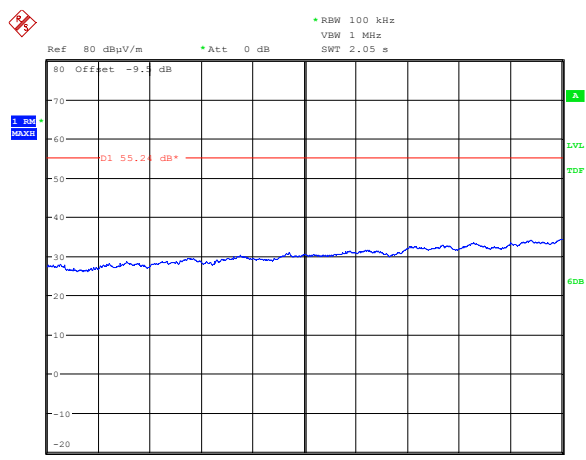
3 GHz to 5 GHz; Beamform; QPSK; MIMO.



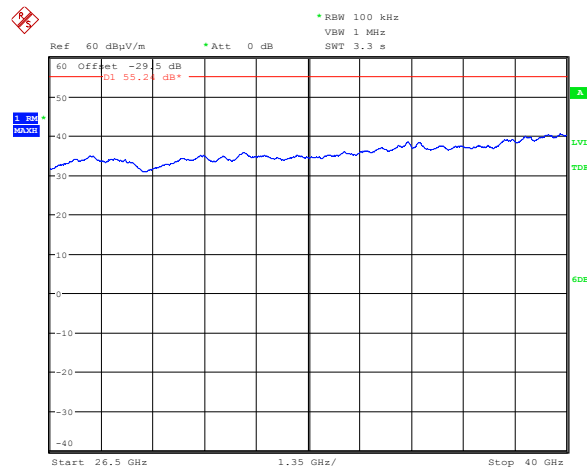
5 GHz to 12 GHz; Beamform; QPSK; MIMO.



12 GHz to 18 GHz; Beamform; QPSK; MIMO.



18 GHz to 26.5 GHz; Beamform; QPSK; MIMO.

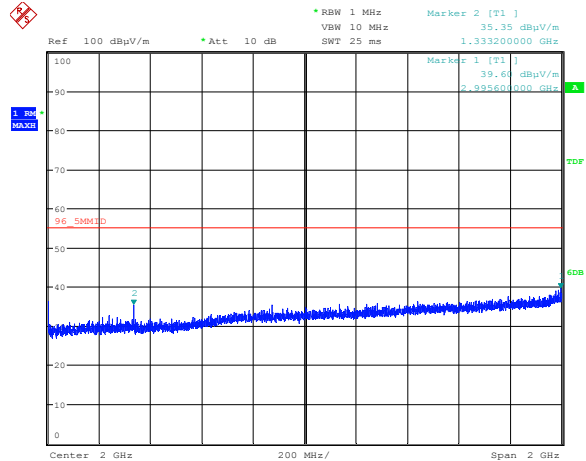


26.5 GHz to 40 GHz; Beamform; QPSK; MIMO.

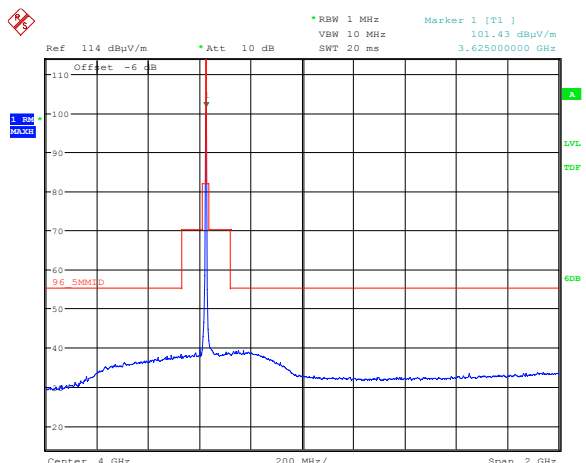
Beamforming; Power setting: 40.0; QPSK MIMO-A; Channel: 3697.5 MHz										
Detector	Freq. (MHz)	Meas'd Emission (dBμV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-amp Gain (dB)	Duty Cycle Corr'n (dB)	Distance Extrap'n Factor (dB)	Field Strength (dBμV/m)	Field Strength (μV/m)	Limit (μV/m)
No emissions within 20 dB of the limit										



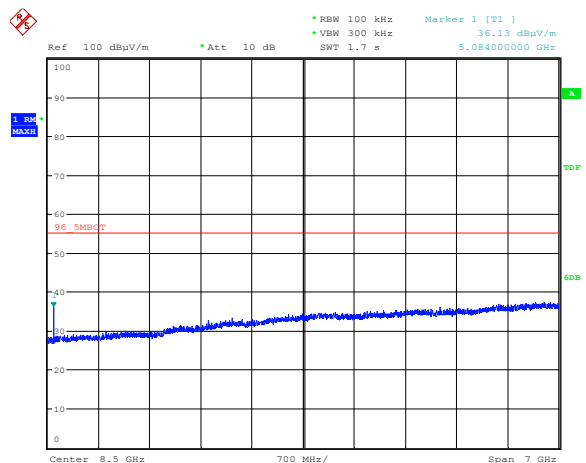
30 MHz to 1 GHz; Beamform; QPSK; MIMO-A.



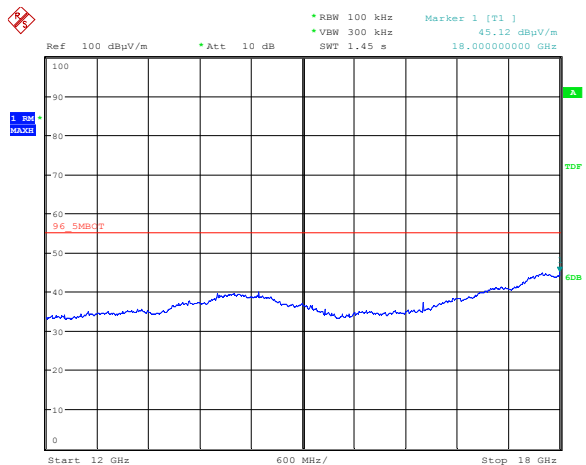
1 GHz to 3 GHz; Beamform; QPSK; MIMO-A.



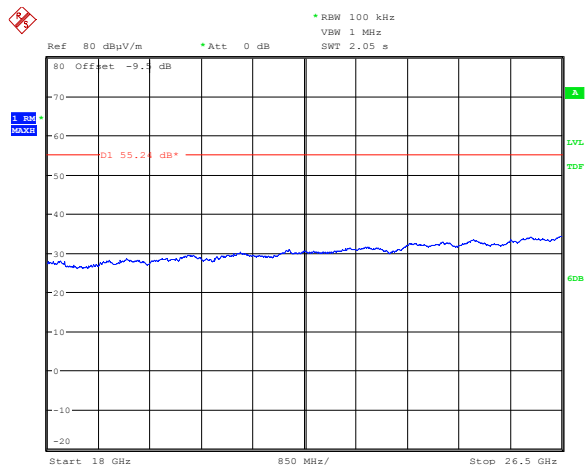
3 GHz to 5 GHz; Beamform; QPSK; MIMO-A.



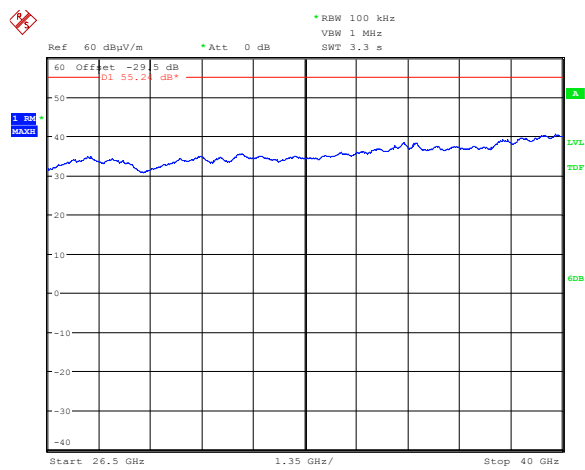
5 GHz to 12 GHz; Beamform; QPSK; MIMO-A.



12 GHz to 18 GHz; Beamform; QPSK; MIMO-A.



18 GHz to 26.5 GHz; Beamform; QPSK; MIMO-A.



26.5 GHz to 40 GHz; Beamform; QPSK; MIMO.

12 Emission Mask

12.1 Definition

Out-of-band emission.

Emission on a frequency or frequencies immediately outside the necessary bandwidth that results from the modulation process but excluding spurious emissions.

Spurious emission.

Emission on a frequency or frequencies that are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products, and frequency conversion products, but exclude out-of-band emissions.

12.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	Part 96.41 (e)
EUT Channels:	Low / Mid / High
EUT Channel Bandwidths:	5 MHz, 20 MHz and 40 MHz
Deviations From Standard:	None
Measurement BW:	1 MHz
Spectrum Analyzer Video BW: (requirement at least 3x RBW)	10 MHz
Measurement Detector:	RMS

Environmental Conditions (Normal Environment)

Temperature: 24 °C	+15 °C to +35 °C (as declared)
Humidity: 60 % RH	20 % RH to 75 % RH (as declared)
Supply: 48 V dc	48 V dc (as declared)

12.3 Test Limit

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 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed –25 dBm/MHz.

Additional protection levels. The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed –40 dBm/MHz.

12.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure v, the emissions from the EUT were measured on a spectrum analyser.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst case configuration in each bandwidth.

Specification limits are defined in terms of conducted levels

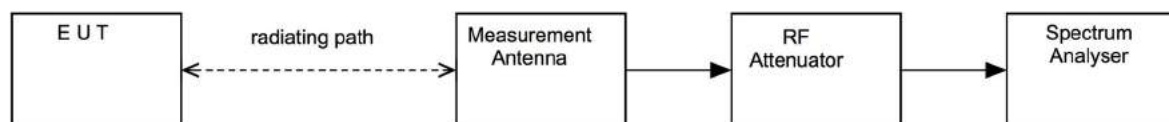
It is not possible to take a conducted measurement on this equipment due to the antenna configuration

Antenna gain is taken into account as an offset on the spectrum analyser to relate back to a conducted measurement

For beamforming mode the offset is –6 dB (made up from 22 dBi antenna gain and 16 dB fixed attenuation).

For Sector and Mu-MIMO mode the offset is 0 dB (made up from 16 dBi antenna gain and 16 dB fixed attenuation).

Figure v Test Setup

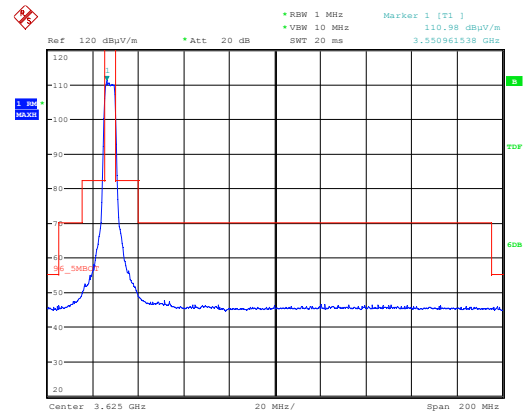


12.5 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
1-18GHz Horn	EMCO	3115	L139	2021-07-16
Spectrum Analyser	R&S	FSU26	U405	2021-07-17
Pre Amp	Agilent	8449B	L572	2021-10-19

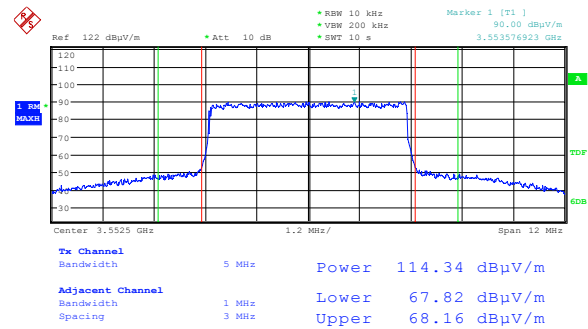
12.6 Test Results

Sector Mode; 5 MHz bandwidth; Bottom channel

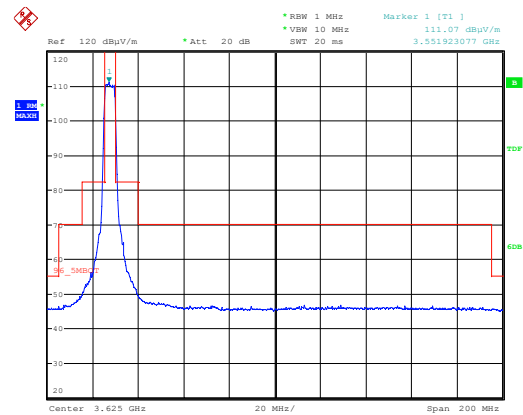


Date: 17 JUN 2021 11:17:10

Emission Mask QPSK; 3552.5 MHz. MIMO A

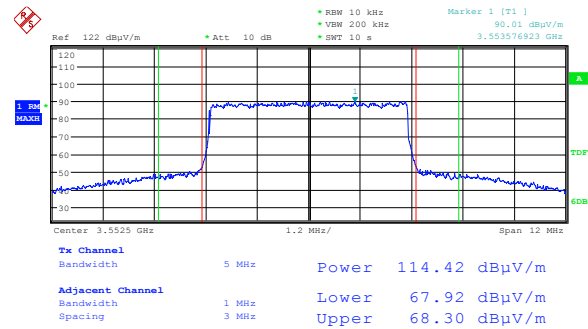


Emission Mask QPSK; 3552.5 MHz; MIMO B
Integration Method.

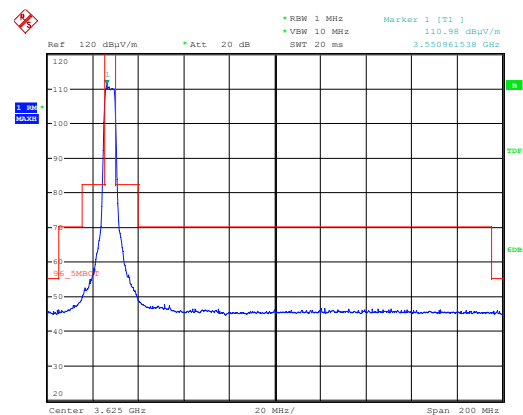


Date: 17 JUN 2021 11:22:29

Emission Mask QPSK; 3552.5 MHz. MIMO B

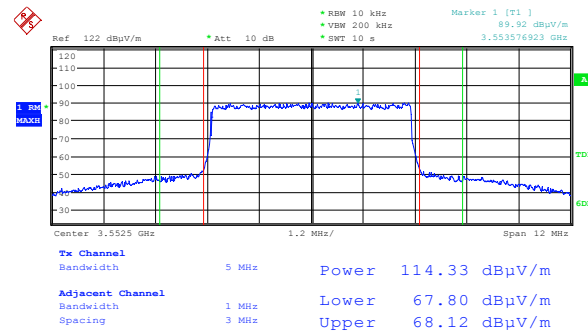


Emission Mask QPSK; 3552.5 MHz; MIMO B
Integration Method.

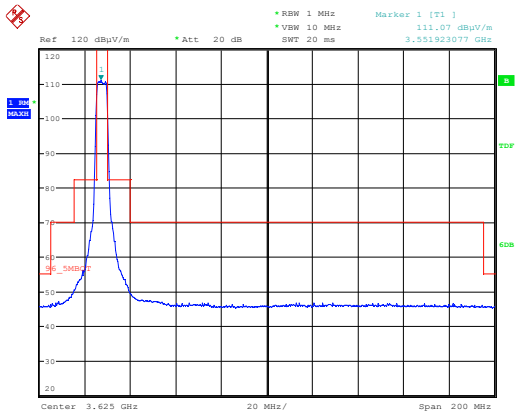


Date: 17 JUN 2021 11:17:10

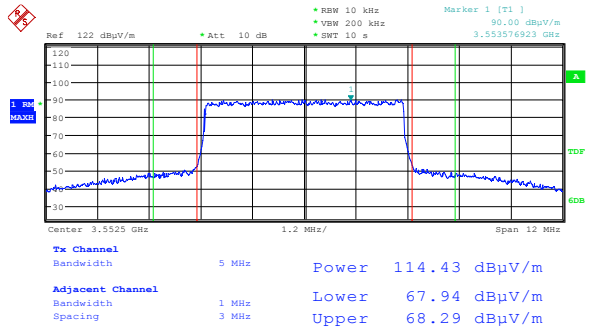
Emission Mask 16 QAM; 3552.5 MHz. MIMO A



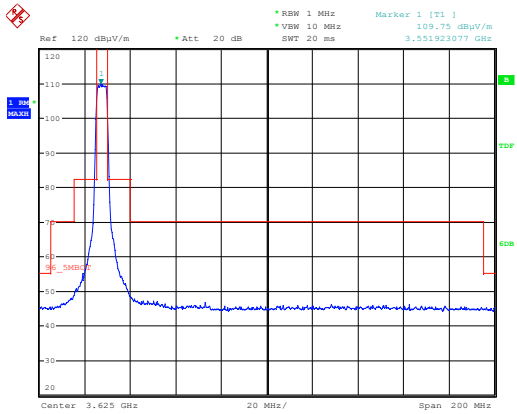
Emission Mask 16 QAM; 3552.5 MHz; MIMO A
Integration Method.



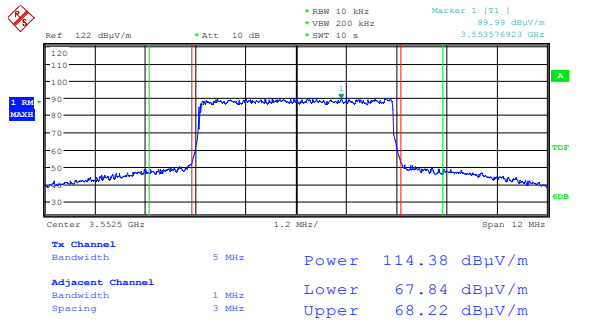
Emission Mask 16 QAM; 3552.5 MHz. MIMOB



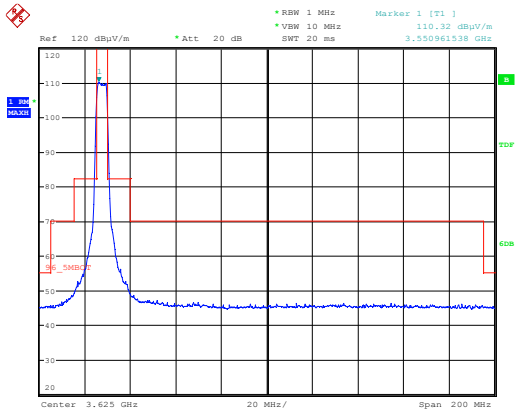
Emission Mask 16 QAM; 3552.5 MHz; MIMOB
Integration Method.



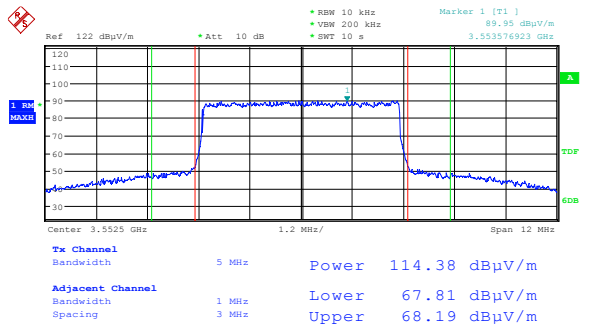
Emission Mask 64 QAM; 3552.5 MHz. MIMOA



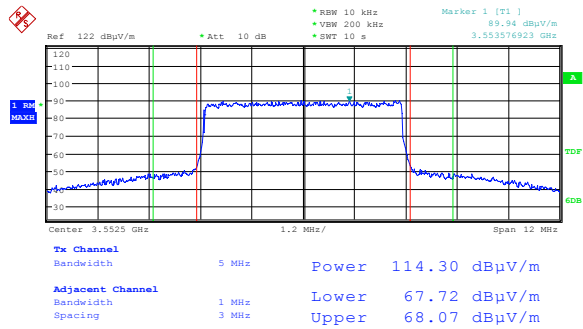
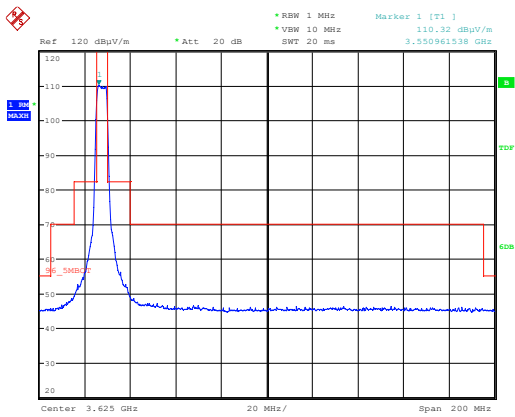
Emission Mask 64 QAM; 3552.5 MHz; MIMOA
Integration Method.



Emission Mask 64 QAM; 3552.5 MHz. MIMOB



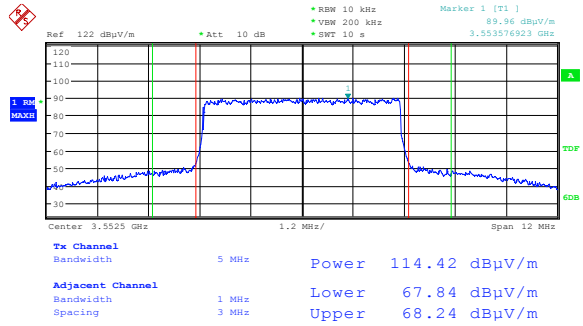
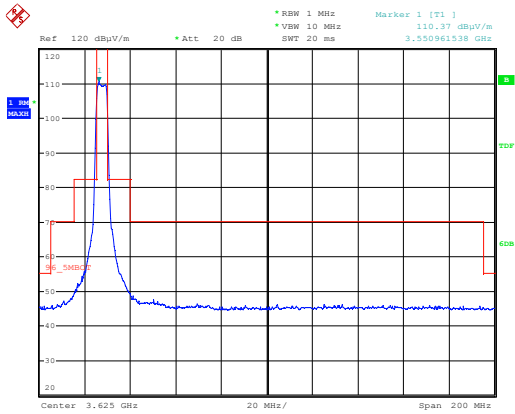
Emission Mask 64 QAM; 3552.5 MHz; MIMOB
Integration Method.



Emission Mask 256 QAM; 3552.5 MHz; MIMO A
Integration Method.

Date: 17 JUN 2021 11:28:54

Emission Mask 256 QAM; 3552.5 MHz. MIMO A



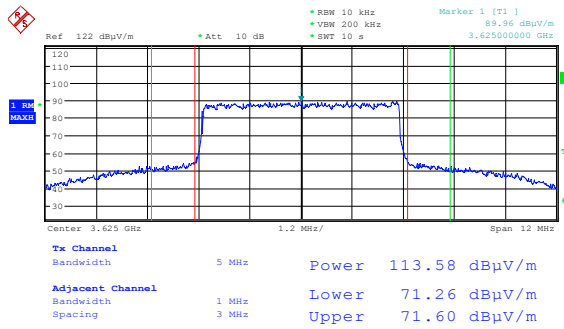
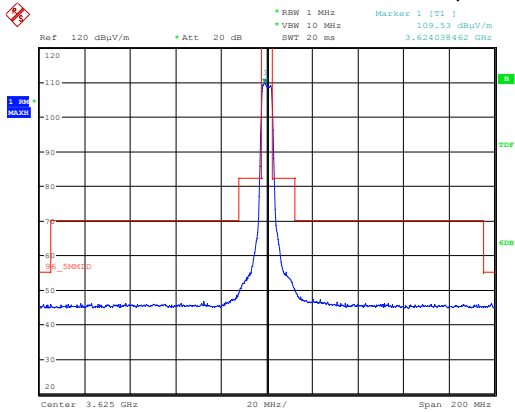
Emission Mask 256 QAM; 3552.5 MHz; MIMO B
Integration Method.

Date: 17 JUN 2021 11:29:26

Emission Mask 256 QAM; 3552.5 MHz. MIMO B

Frequency: 3552.5 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	114.34	Lower Channel	N/A	67.82	82.24	Pass
			Upper Channel	N/A	68.16		Pass
	16 QAM	114.33	Lower Channel	N/A	67.80		Pass
			Upper Channel	N/A	68.12		Pass
	64 QAM	114.38	Lower Channel	N/A	67.84		Pass
			Upper Channel	N/A	68.22		Pass
	256 QAM	114.30	Lower Channel	N/A	67.72		Pass
			Upper Channel	N/A	68.07		Pass
B	QPSK	114.42	Lower Channel	N/A	67.92		Pass
			Upper Channel	N/A	68.30		Pass
	16 QAM	114.43	Lower Channel	N/A	67.94		Pass
			Upper Channel	N/A	68.29		Pass
	64 QAM	114.38	Lower Channel	N/A	67.81		Pass
			Upper Channel	N/A	68.19		Pass
	256 QAM	1114.42	Lower Channel	N/A	67.84		Pass
			Upper Channel	N/A	68.24		Pass

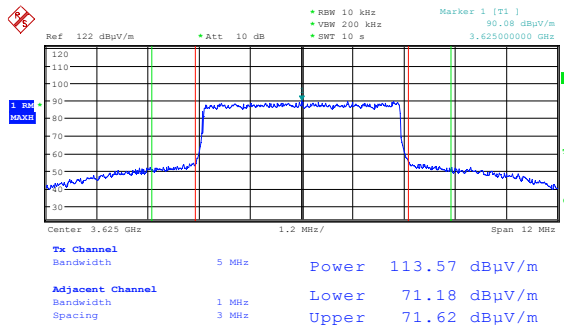
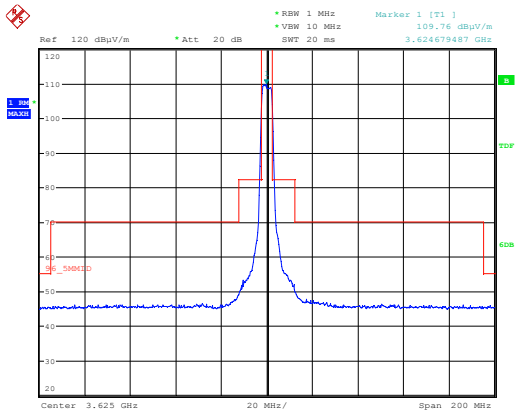
Sector Mode; 5 MHz bandwidth; Middle channel



Emission Mask QPSK; 3625 MHz; MIMO A
Integration Method.

Date: 17.JUN.2021 11:50:07

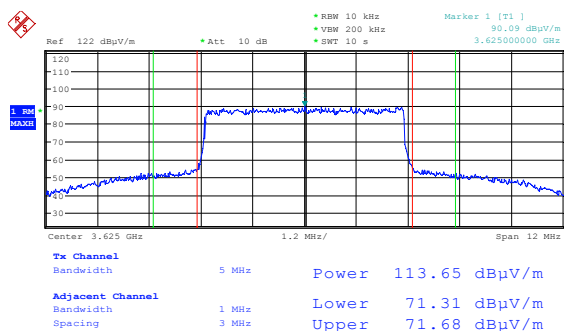
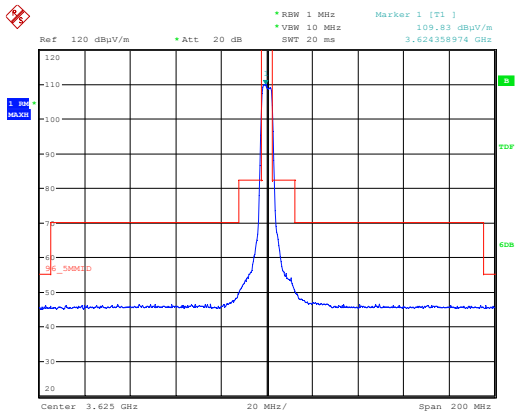
Emission Mask QPSK; 3625 MHz. MIMO A



Emission Mask QPSK; 3625 MHz; MIMO B
Integration Method.

Date: 17.JUN.2021 11:53:03

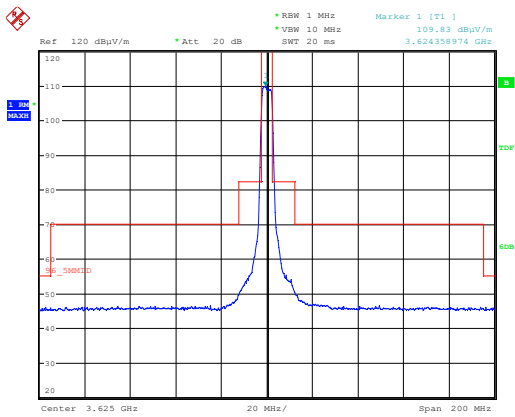
Emission Mask QPSK; 3625 MHz. MIMO B



Emission Mask 16 QAM; 3625 MHz; MIMO A
Integration Method.

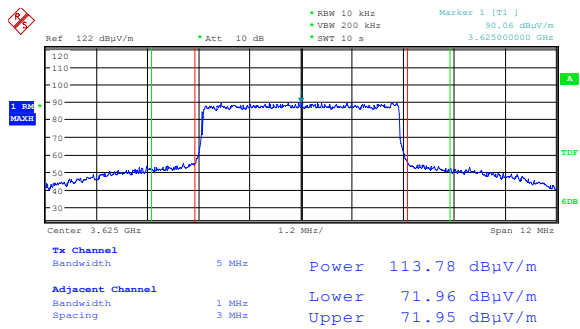
Date: 17.JUN.2021 11:55:45

Emission Mask 16 QAM; 3625 MHz. MIMO A

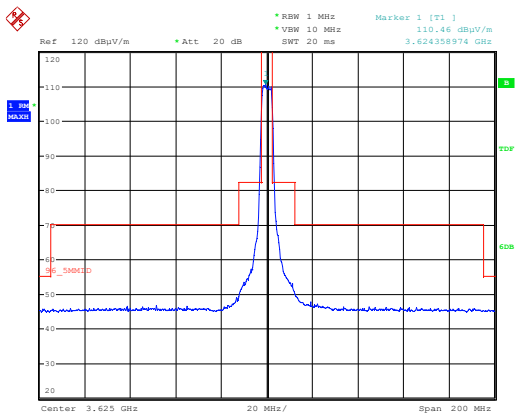


Date: 17 JUN 2021 11:55:45

Emission Mask 16 QAM; 3625 MHz. MIMOB

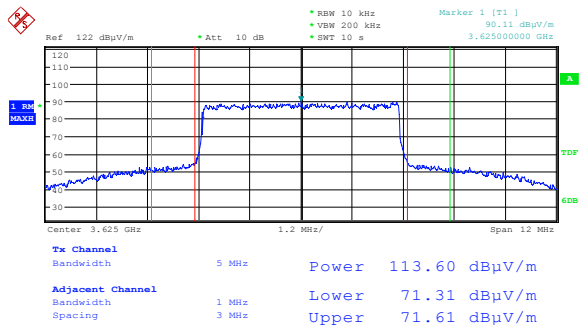


Emission Mask 16 QAM; 3625 MHz; MIMOB
Integration Method.

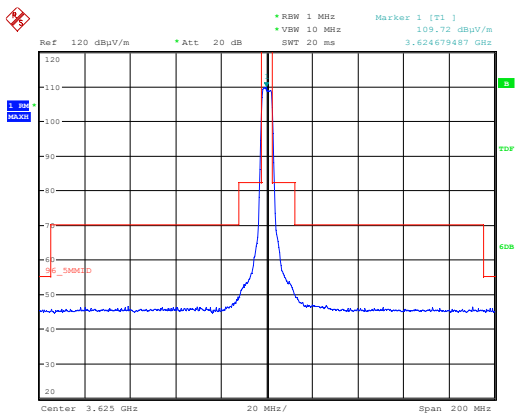


Date: 17 JUN 2021 11:51:11

Emission Mask 64 QAM; 3625 MHz. MIMO A

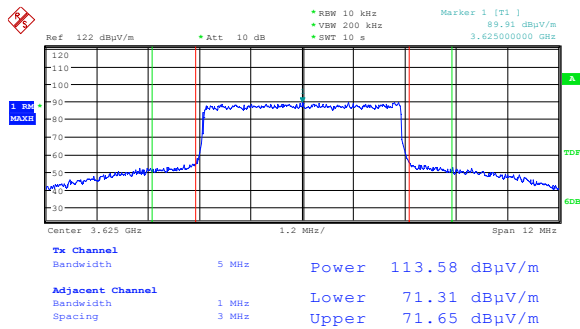


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

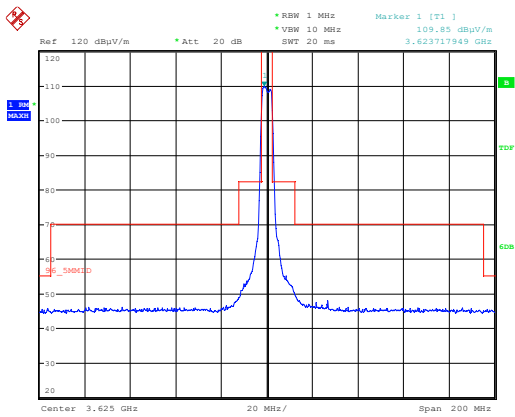


Date: 17 JUN 2021 11:56:40

Emission Mask 64 QAM; 3625 MHz. MIMOB

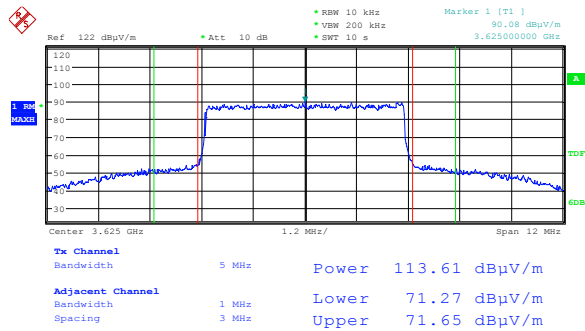


Emission Mask 64 QAM; 3625 MHz; MIMOB
Integration Method.

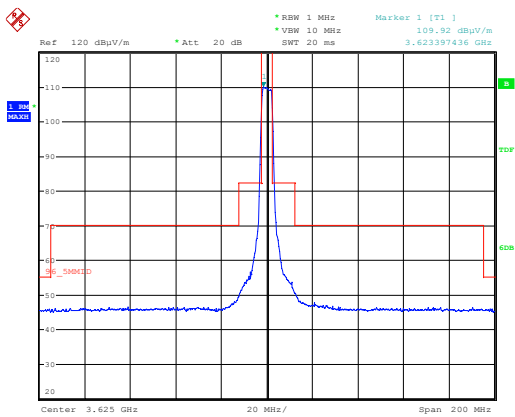


Date: 17 JUN 2021 11:51:48

Emission Mask 256 QAM; 3625 MHz. MIMO A

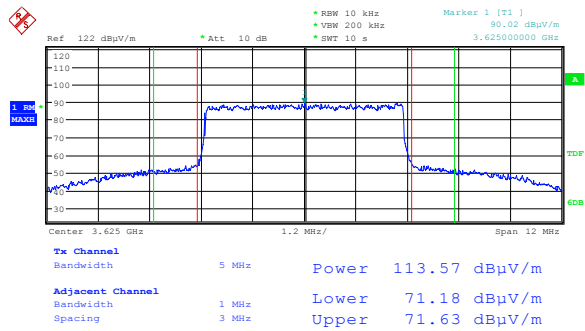


Emission Mask 256 QAM; 3625 MHz; MIMO A Integration Method.



Date: 17 JUN 2021 11:58:55

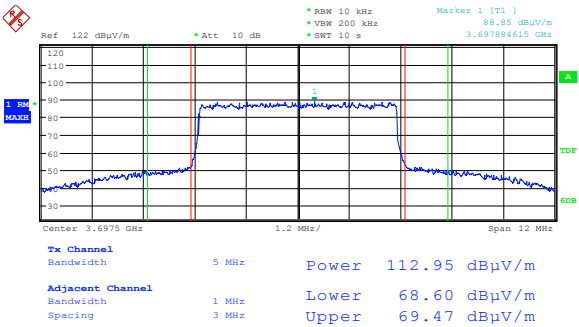
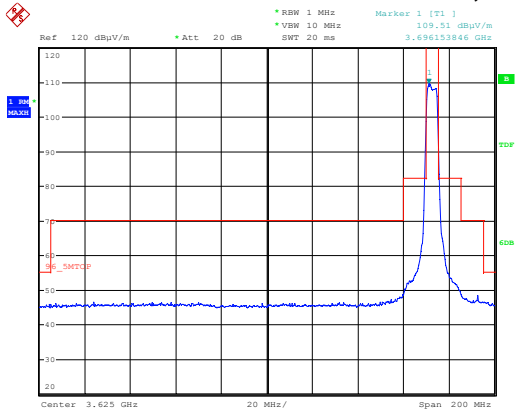
Emission Mask 256 QAM; 3625 MHz. MIMO B



Emission Mask 256 QAM; 3625 MHz; MIMO B Integration Method.

Frequency: 3625 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	113.58	Lower Channel	N/A	71.26	82.24	Pass
			Upper Channel	N/A	71.60		Pass
	16 QAM	113.65	Lower Channel	N/A	71.31		Pass
			Upper Channel	N/A	71.68		Pass
	64 QAM	113.60	Lower Channel	N/A	71.31		Pass
			Upper Channel	N/A	71.61		Pass
	256 QAM	113.61	Lower Channel	N/A	71.27		Pass
			Upper Channel	N/A	71.65		Pass
B	QPSK	113.57	Lower Channel	N/A	71.18		Pass
			Upper Channel	N/A	71.62		Pass
	16 QAM	113.78	Lower Channel	N/A	71.96		Pass
			Upper Channel	N/A	71.95		Pass
	64 QAM	113.58	Lower Channel	N/A	71.31		Pass
			Upper Channel	N/A	71.65		Pass
	256 QAM	113.57	Lower Channel	N/A	71.18		Pass
			Upper Channel	N/A	71.63		Pass

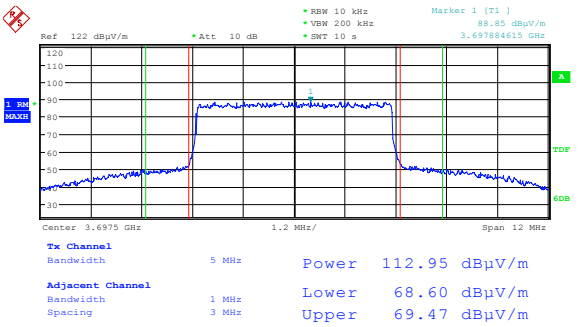
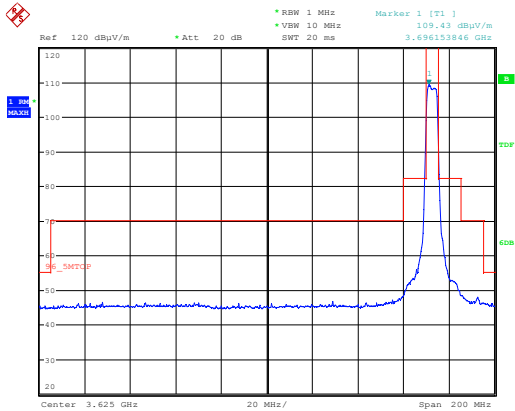
Sector Mode; 5 MHz bandwidth; Top channel



Emission Mask QPSK; 3697.5 MHz; MIMO A
Integration Method.

Date: 17 JUN 2021 11:15:17

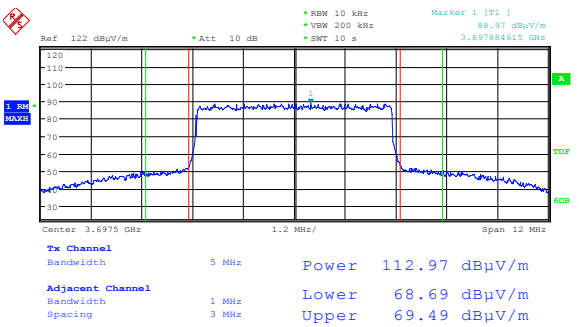
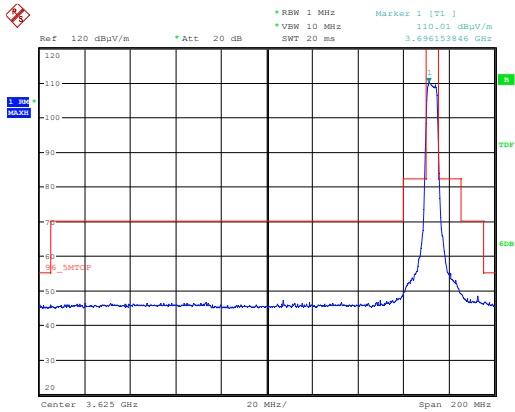
Emission Mask QPSK; 3697.5 MHz. MIMO A



Emission Mask QPSK; 3697.5 MHz; MIMO B
Integration Method.

Date: 17 JUN 2021 11:09:34

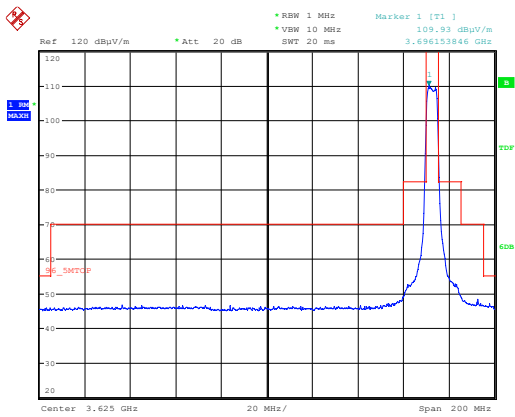
Emission Mask QPSK; 3697.5 MHz. MIMO B



Emission Mask 16 QAM; 3697.5 MHz; MIMO A
Integration Method.

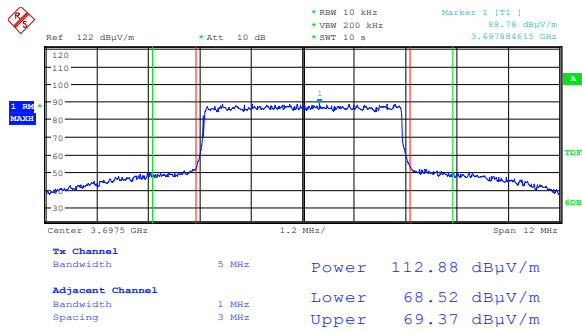
Date: 17 JUN 2021 11:13:42

Emission Mask 16 QAM; 3697.5 MHz. MIMO A

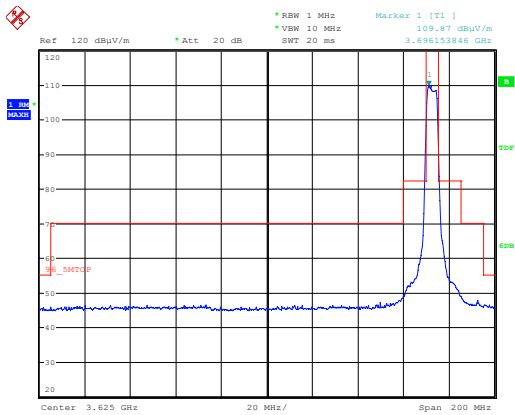


Date: 17 JUN 2021 11:08:53

Emission Mask 16 QAM; 3697.5 MHz. MIMOB

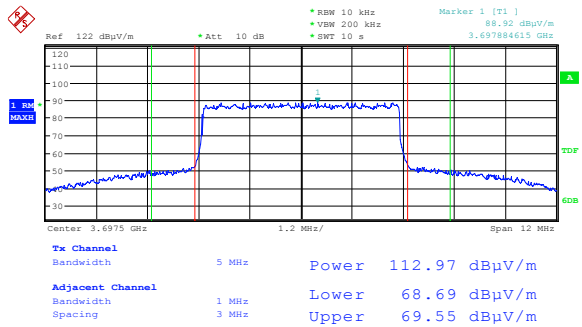


Emission Mask 16 QAM; 3697.5 MHz; MIMOB
Integration Method.

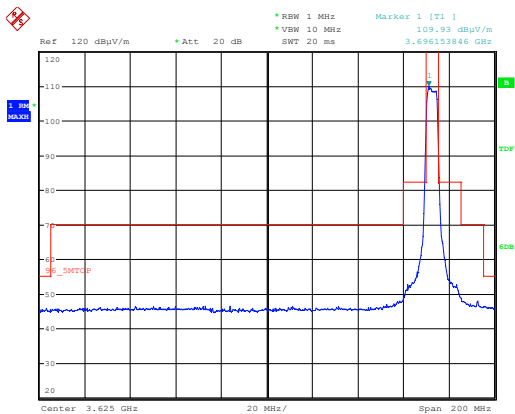


Date: 17 JUN 2021 11:13:03

Emission Mask 64 QAM; 3697.5 MHz. MIMO A

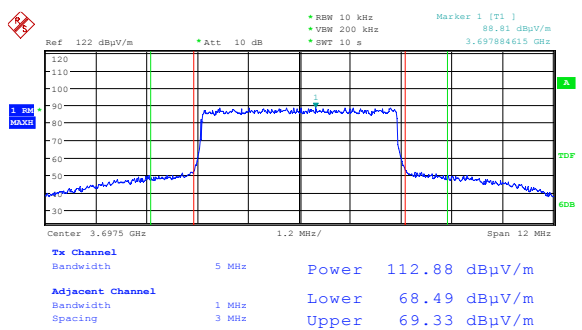


Emission Mask 64 QAM; 3697.5 MHz; MIMO A
Integration Method.

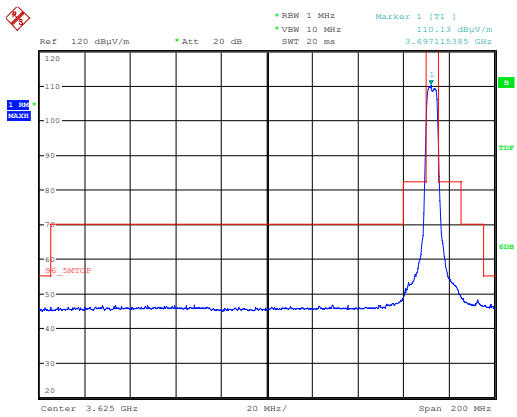


Date: 17 JUN 2021 11:07:06

Emission Mask 64 QAM; 3697.5 MHz. MIMO B

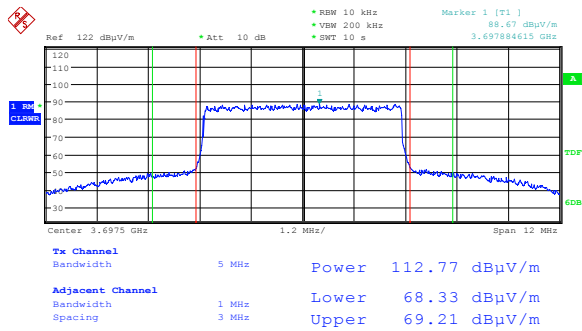


Emission Mask 64 QAM; 3697.5 MHz; MIMO B
Integration Method.

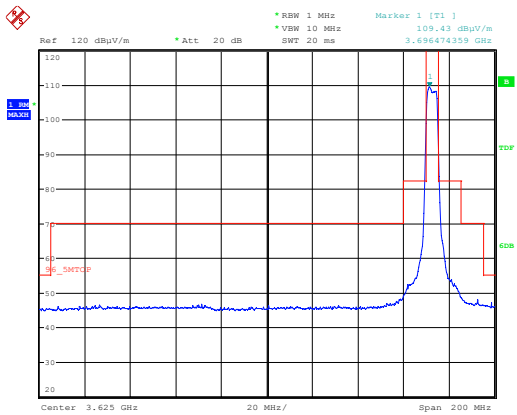


Date: 17 JUN 2021 11:11:53

Emission Mask 256 QAM; 3697.5 MHz. MIMO A

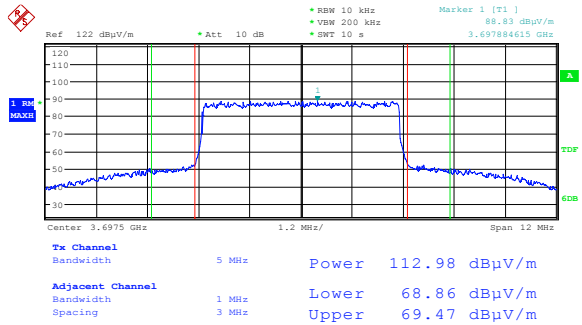


Emission Mask 256 QAM; 3697.5 MHz; MIMO A
Integration Method.



Date: 17 JUN 2021 11:06:01

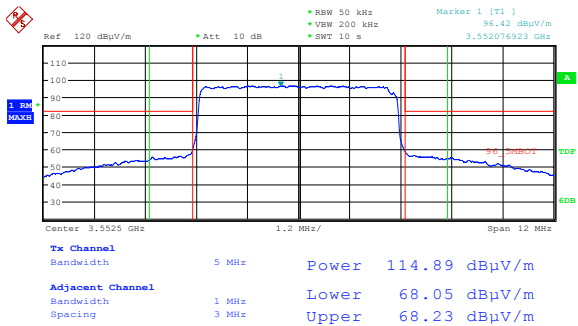
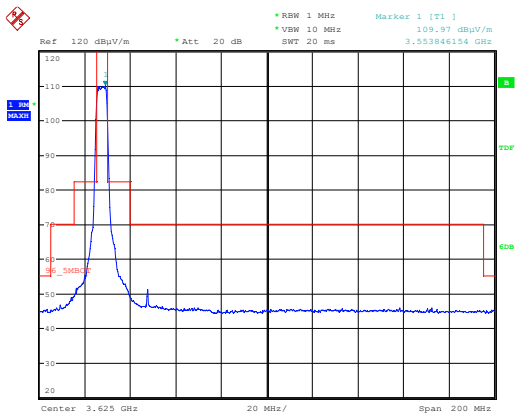
Emission Mask 256 QAM; 3697.5 MHz. MIMO B



Emission Mask 256 QAM; 3697.5 MHz; MIMO B
Integration Method.

Frequency: 3697.5 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	112.77	Lower Channel	N/A	68.34	82.24	Pass
			Upper Channel	N/A	69.22		Pass
	16 QAM	112.97	Lower Channel	N/A	68.69		Pass
			Upper Channel	N/A	69.49		Pass
	64 QAM	112.97	Lower Channel	N/A	68.69		Pass
			Upper Channel	N/A	69.55		Pass
	256 QAM	112.77	Lower Channel	N/A	68.33		Pass
			Upper Channel	N/A	69.21		Pass
B	QPSK	112.95	Lower Channel	N/A	68.60		Pass
			Upper Channel	N/A	69.47		Pass
	16 QAM	112.88	Lower Channel	N/A	68.52		Pass
			Upper Channel	N/A	69.37		Pass
	64 QAM	112.88	Lower Channel	N/A	68.49		Pass
			Upper Channel	N/A	69.33		Pass
	256 QAM	112.98	Lower Channel	N/A	68.86		Pass
			Upper Channel	N/A	69.47		Pass

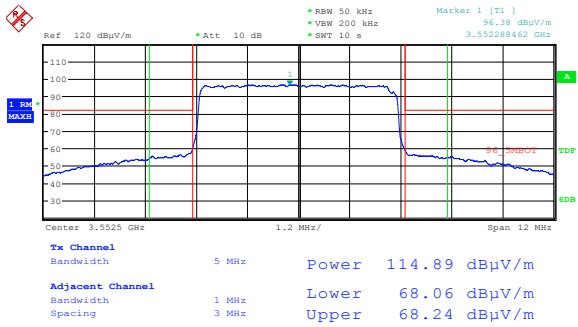
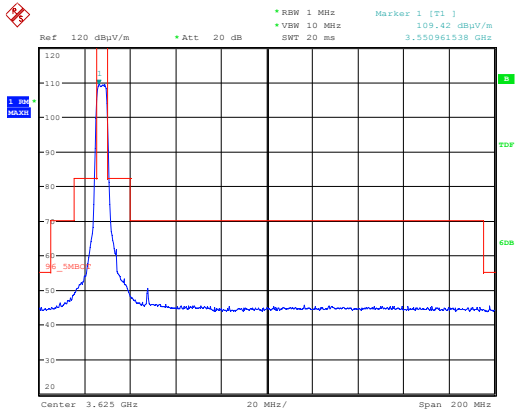
MuMIMO; 5 MHz Bandwidth; Bottom Channel



Emission Mask QPSK; 3552.5 MHz; MIMO A Integration Method.

Date: 16 JUN 2021 15:04:19

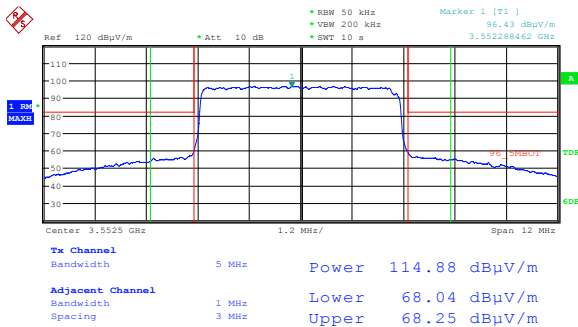
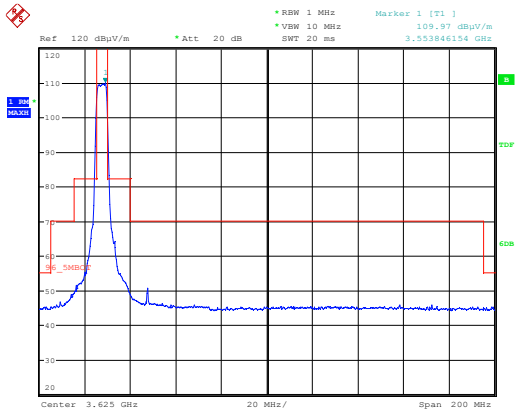
Emission Mask QPSK; 3552.5 MHz; MIMO A.



Emission Mask QPSK; 3552.5 MHz; MIMO B Integration Method.

Date: 16 JUN 2021 15:00:37

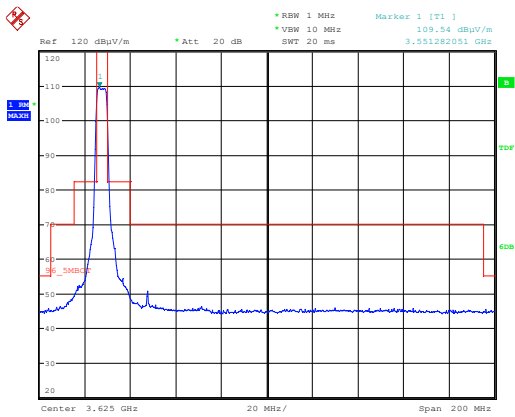
Emission Mask QPSK; 3552.5 MHz; MIMO B.



Emission Mask 16 QAM; 3552.5 MHz; MIMO A Integration Method.

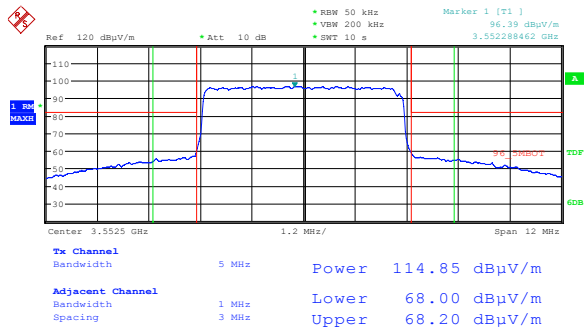
Date: 16 JUN 2021 15:03:29

Emission Mask 16 QAM; 3552.5 MHz; MIMO A.

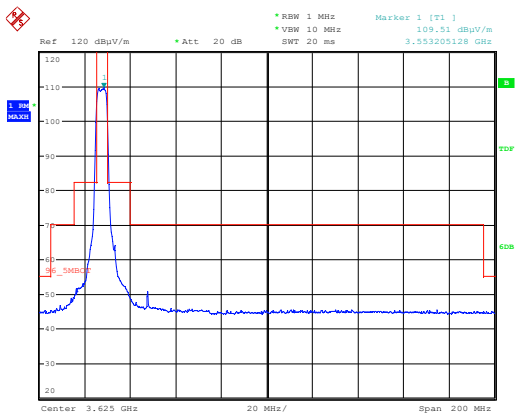


Date: 16 JUN 2021 14:59:58

Emission Mask 16 QAM; 3552.5 MHz; MIMOB.

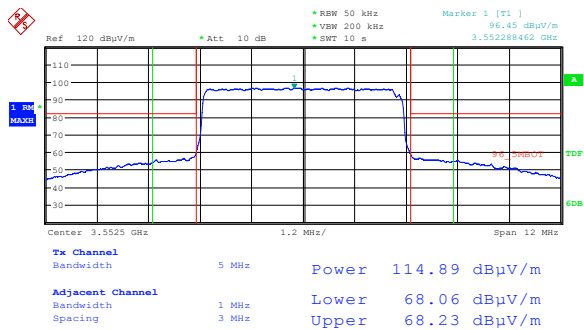


Emission Mask 16 QAM; 3552.5 MHz; MIMOB
Integration Method.

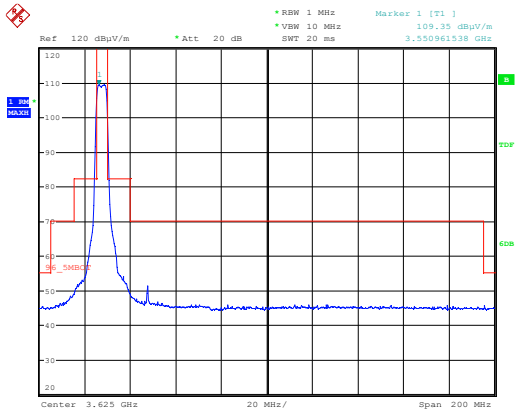


Date: 16 JUN 2021 15:02:40

Emission Mask 64 QAM; 3552.5 MHz; MIMO A.

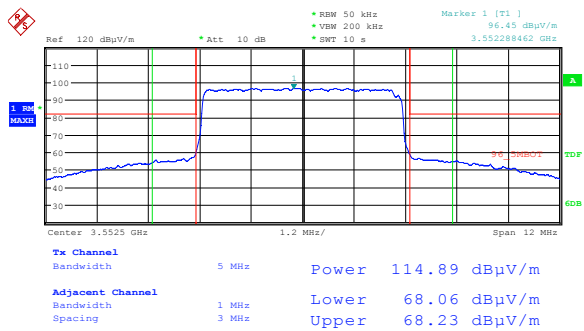


Emission Mask 64 QAM; 3552.5 MHz; MIMO A
Integration Method.

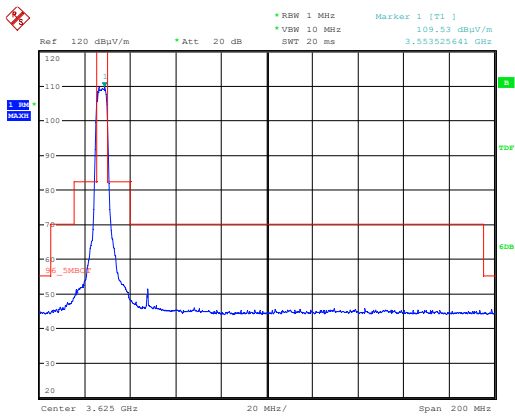


Date: 16 JUN 2021 14:57:38

Emission Mask 64 QAM; 3552.5 MHz; MIMO B.

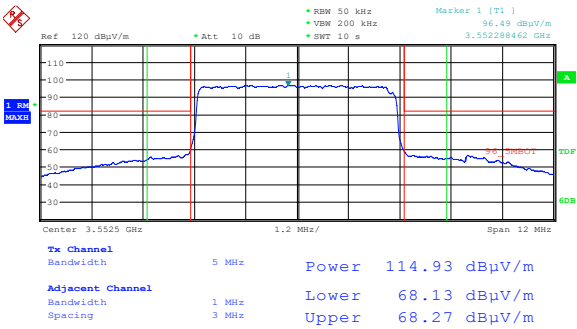


Emission Mask 64 QAM; 3552.5 MHz; MIMO B
Integration Method.

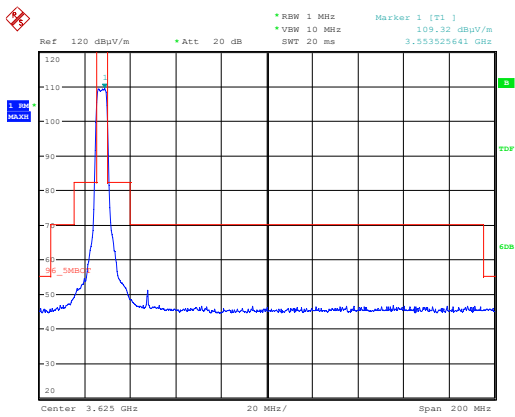


Date: 16 JUN 2021 15:01:23

Emission Mask 256 QAM; 3552.5 MHz; MIMO A.

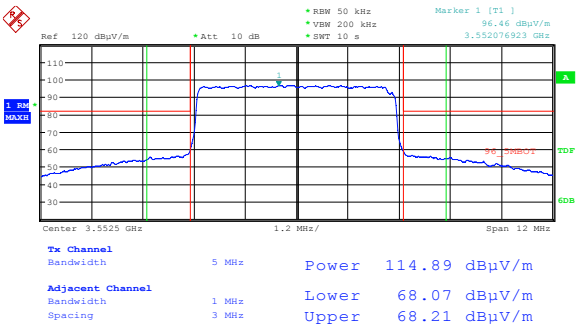


Emission Mask 256 QAM; 3552.5 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 14:53:48

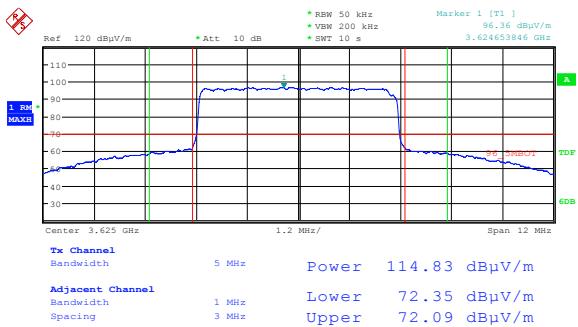
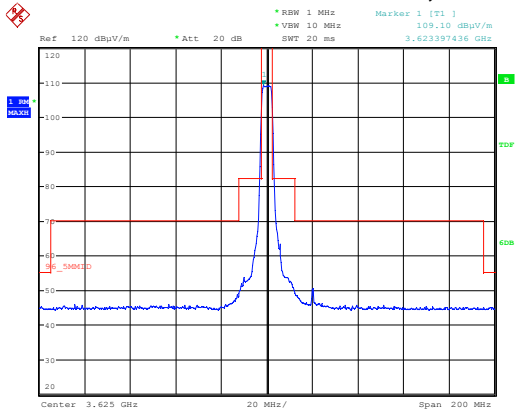
Emission Mask 256 QAM; 3552.5 MHz; MIMO B.



Emission Mask 256 QAM; 3552.5 MHz; MIMO B
Integration Method.

Frequency: 3552.5 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	114.89	Lower Channel	N/A	68.04	82.24	Pass
			Upper Channel	N/A	68.23		Pass
	16 QAM	114.88	Lower Channel	N/A	68.04		Pass
			Upper Channel	N/A	68.25		Pass
	64 QAM	114.89	Lower Channel	N/A	68.06		Pass
			Upper Channel	N/A	68.23		Pass
	256 QAM	114.93	Lower Channel	N/A	68.13		Pass
			Upper Channel	N/A	68.27		Pass
B	QPSK	114.89	Lower Channel	N/A	68.06		Pass
			Upper Channel	N/A	68.24		Pass
	16 QAM	114.85	Lower Channel	N/A	68.00		Pass
			Upper Channel	N/A	68.20		Pass
	64 QAM	114.86	Lower Channel	N/A	68.01		Pass
			Upper Channel	N/A	68.22		Pass
	256 QAM	114.89	Lower Channel	N/A	68.07		Pass
			Upper Channel	N/A	68.21		Pass

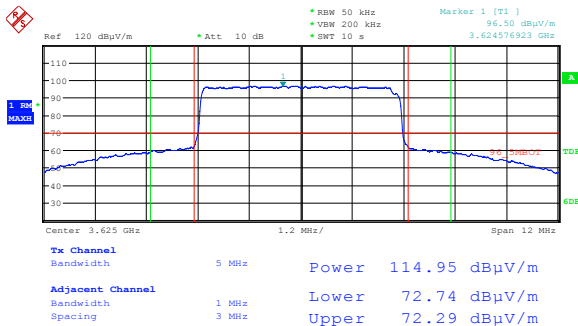
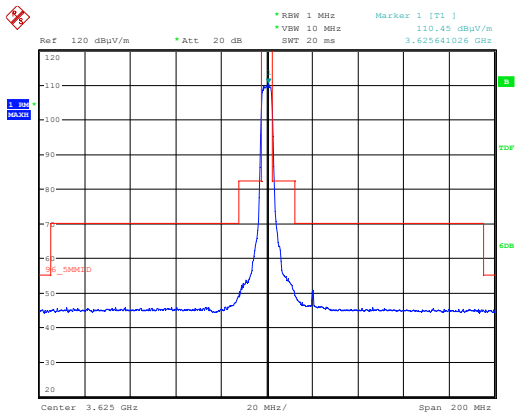
MuMIMO; 5 MHz Bandwidth; Middle Channel



Emission Mask QPSK; 3625 MHz; MIMO A
Integration Method.

Date: 16 JUN 2021 15:07:51

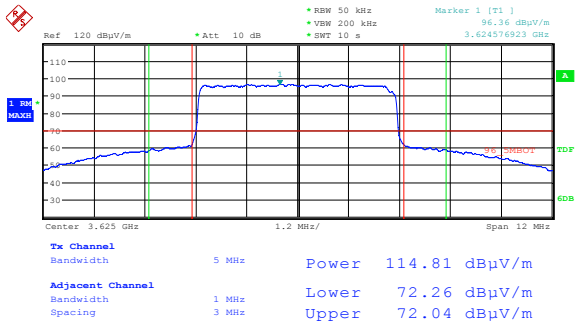
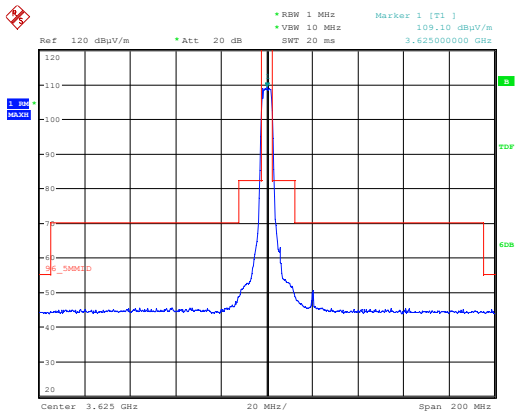
Emission Mask QPSK; 3625 MHz; MIMO A.



Emission Mask QPSK; 3625 MHz; MIMO B
Integration Method.

Date: 16 JUN 2021 15:14:28

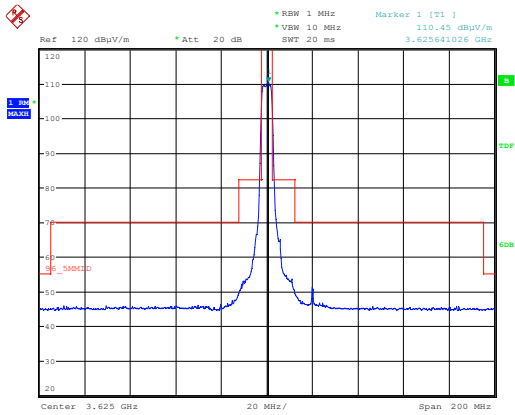
Emission Mask QPSK; 3625 MHz; MIMO B.



Emission Mask 16 QAM; 3625 MHz; MIMO A
Integration Method.

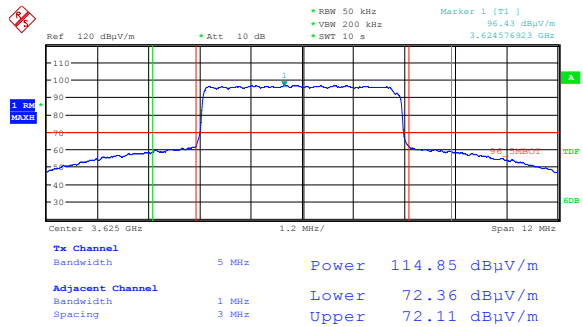
Date: 16 JUN 2021 15:11:10

Emission Mask 16 QAM; 3625 MHz; MIMO A.

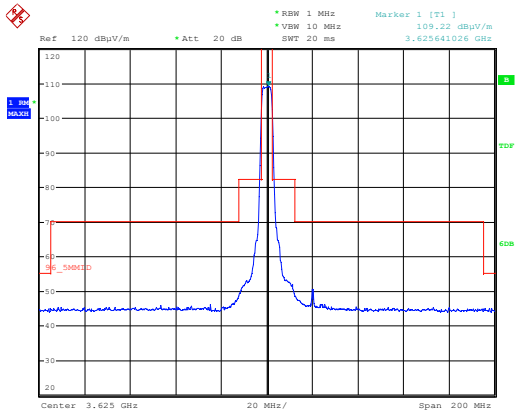


Date: 16 JUN 2021 15:16:19

Emission Mask 16 QAM; 3625 MHz; MIMOB.

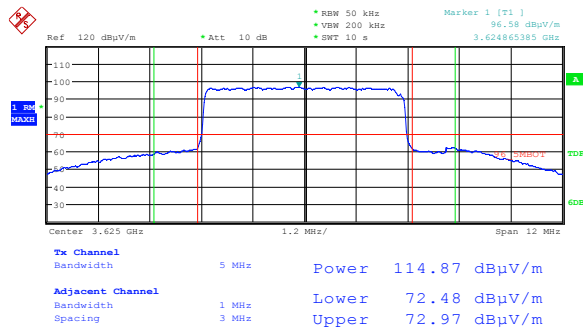


Emission Mask 16 QAM; 3625 MHz; MIMOB
Integration Method.

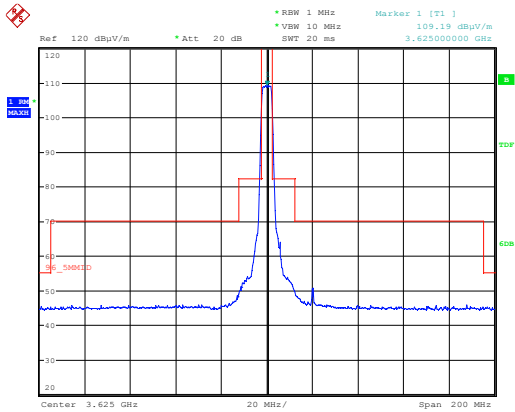


Date: 16 JUN 2021 15:12:01

Emission Mask 64 QAM; 3625 MHz; MIMO A.

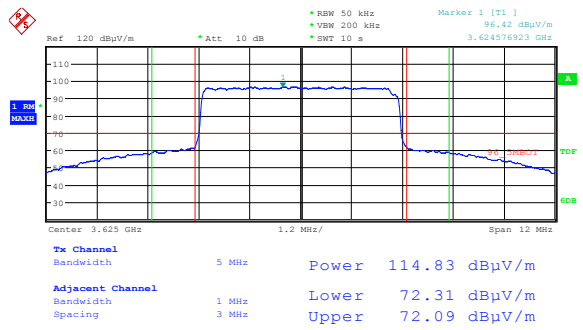


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

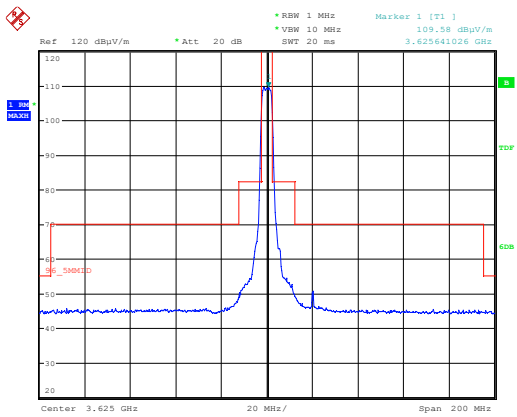


Date: 16 JUN 2021 15:18:01

Emission Mask 64 QAM; 3625 MHz; MIMOB.

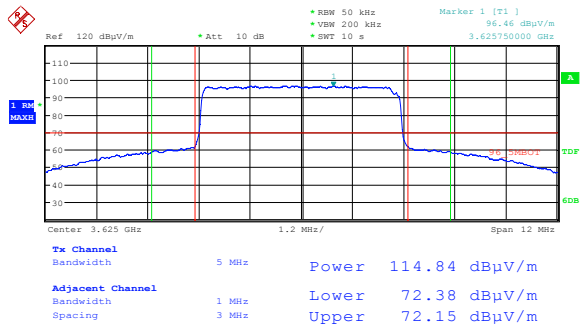


Emission Mask 64 QAM; 3625 MHz; MIMOB
Integration Method.

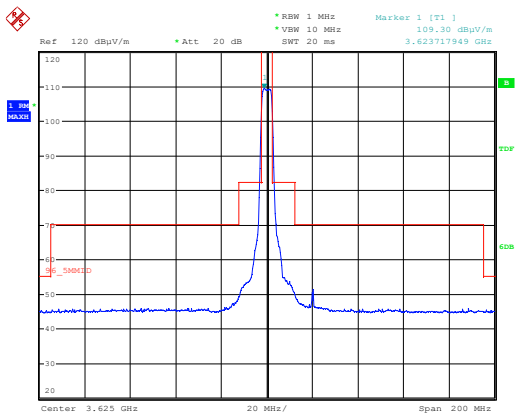


Date: 16 JUN 2021 15:13:52

Emission Mask 256 QAM; 3625 MHz; MIMO A.

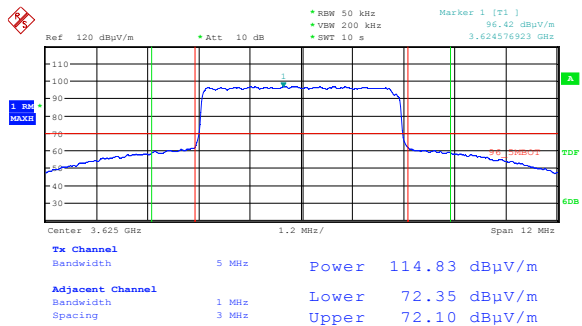


Emission Mask 256 QAM; 3625 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 15:26:26

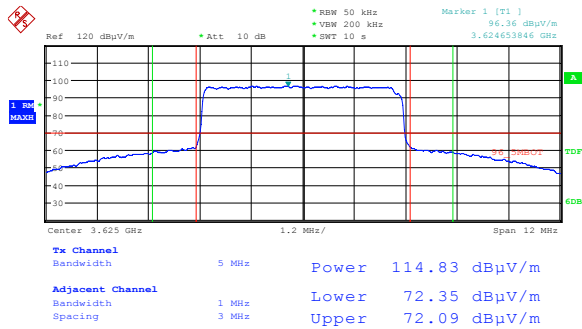
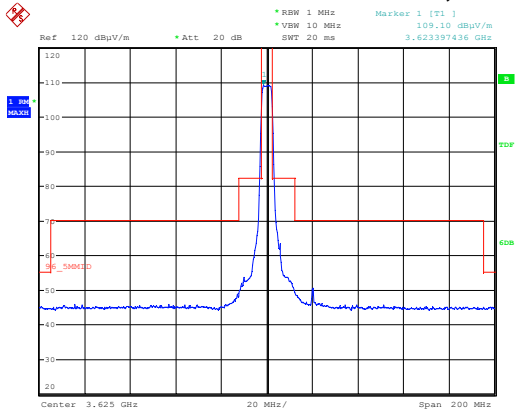
Emission Mask 256 QAM; 3625 MHz; MIMO B.



Emission Mask 256 QAM; 3625 MHz; MIMO B
Integration Method.

Frequency: 3625 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	114.83	Lower Channel	N/A	72.35	82.24	Pass
			Upper Channel	N/A	72.09		Pass
	16 QAM	114.81	Lower Channel	N/A	72.26		Pass
			Upper Channel	N/A	72.04		Pass
	64 QAM	114.87	Lower Channel	N/A	72.48		Pass
			Upper Channel	N/A	72.97		Pass
	256 QAM	114.84	Lower Channel	N/A	73.38		Pass
			Upper Channel	N/A	72.15		Pass
B	QPSK	114.95	Lower Channel	N/A	72.74		Pass
			Upper Channel	N/A	72.29		Pass
	16 QAM	114.85	Lower Channel	N/A	72.36		Pass
			Upper Channel	N/A	72.11		Pass
	64 QAM	114.83	Lower Channel	N/A	72.31		Pass
			Upper Channel	N/A	72.09		Pass
	256 QAM	114.83	Lower Channel	N/A	72.35		Pass
			Upper Channel	N/A	72.10		Pass

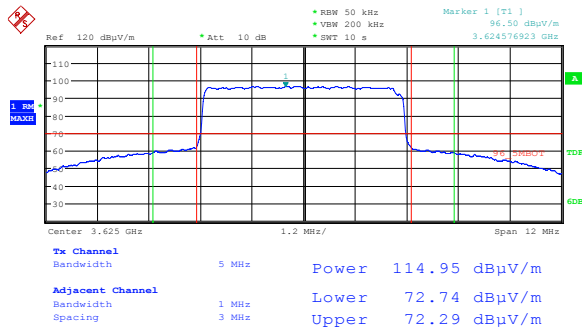
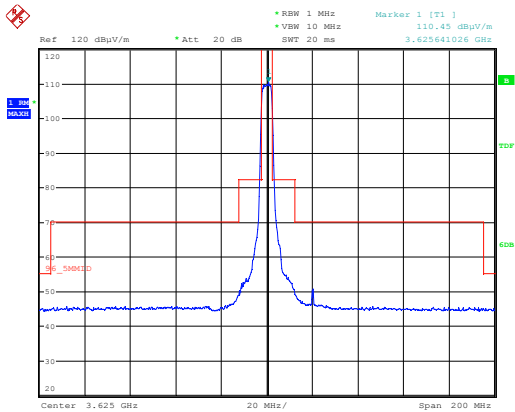
MuMIMO; 5 MHz Bandwidth; Top Channel



Emission Mask QPSK; 3697.5 MHz; MIMO A
Integration Method.

Date: 16 JUN 2021 15:07:51

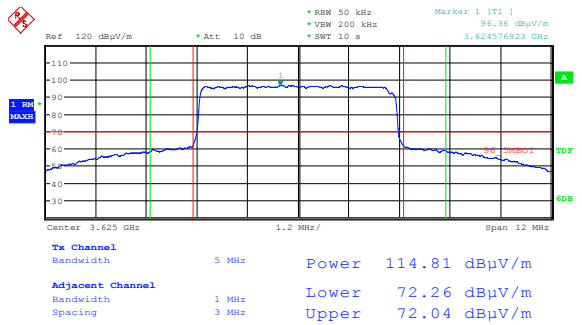
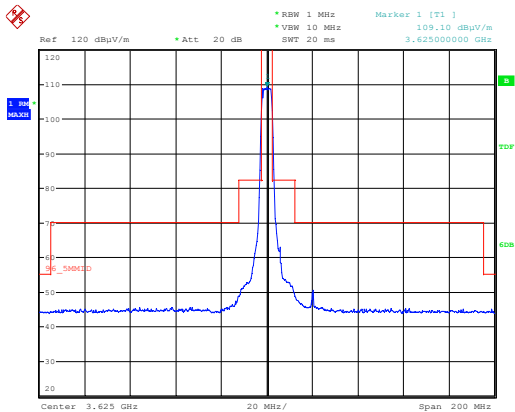
Emission Mask QPSK; 3697.5 MHz; MIMO A.



Emission Mask QPSK; 3697.5 MHz; MIMO B
Integration Method.

Date: 16 JUN 2021 15:14:28

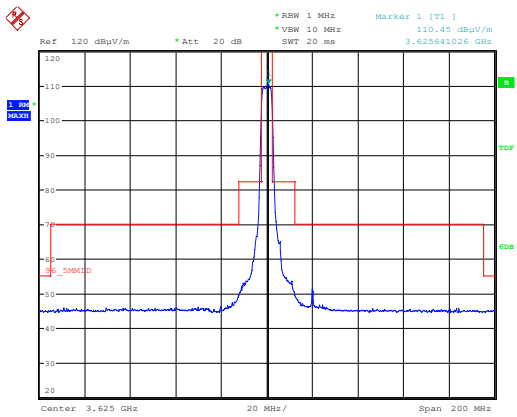
Emission Mask QPSK; 3697.5 MHz; MIMO B.



Emission Mask 16 QAM; 3697.5 MHz; MIMO A
Integration Method.

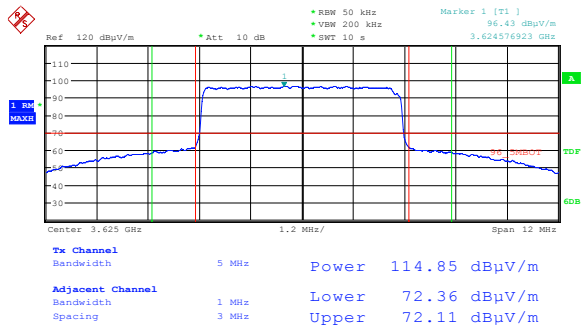
Date: 16 JUN 2021 15:11:10

Emission Mask 16 QAM; 3697.5 MHz; MIMO A.

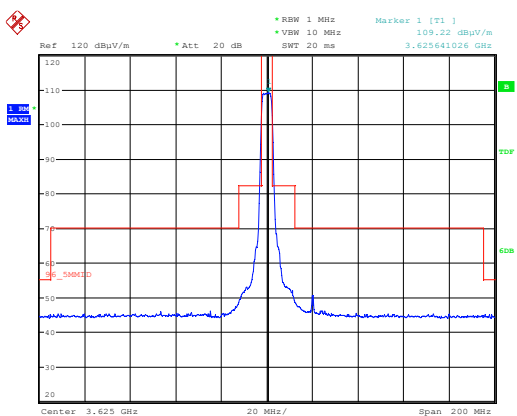


Date: 16 JUN 2021 15:16:19

Emission Mask 16 QAM; 3697.5 MHz; MIMOB.

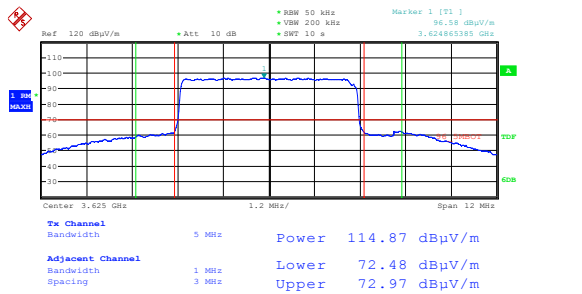


Emission Mask 16 QAM; 3697.5 MHz; MIMOB
Integration Method.

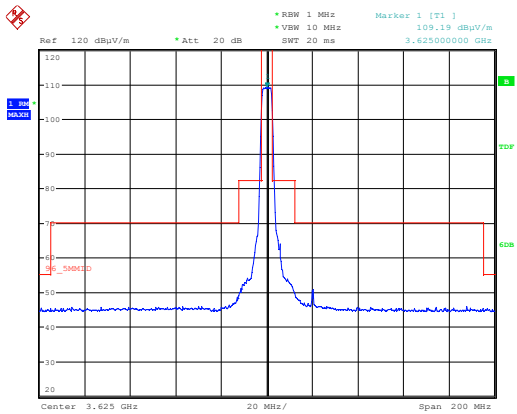


Date: 16 JUN 2021 15:12:01

Emission Mask 64 QAM; 3697.5 MHz; MIMO A.

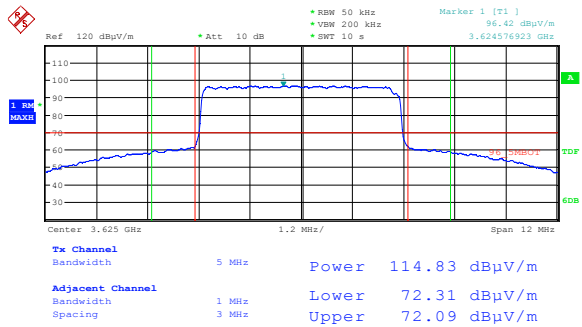


Emission Mask 64 QAM; 3697.5 MHz; MIMO A
Integration Method.

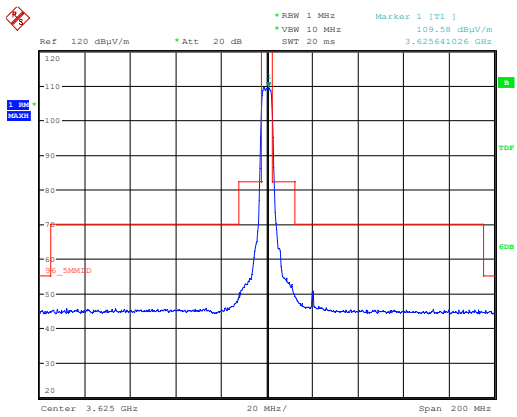


Date: 16 JUN 2021 15:18:01

Emission Mask 64 QAM; 3697.5 MHz; MIMO B.

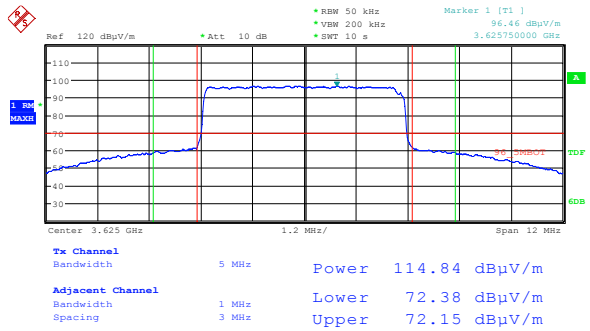


Emission Mask 64 QAM; 3697.5 MHz; MIMO B
Integration Method.

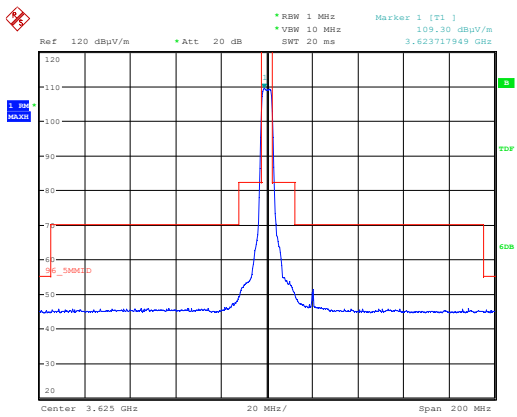


Date: 16 JUN 2021 15:13:52

Emission Mask 256 QAM; 3697.5 MHz; MIMO A.

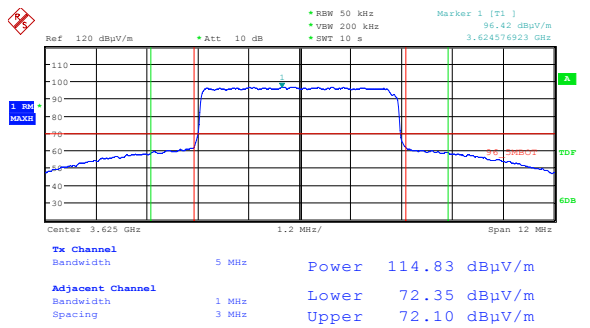


Emission Mask 256 QAM; 3697.5 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 15:26:26

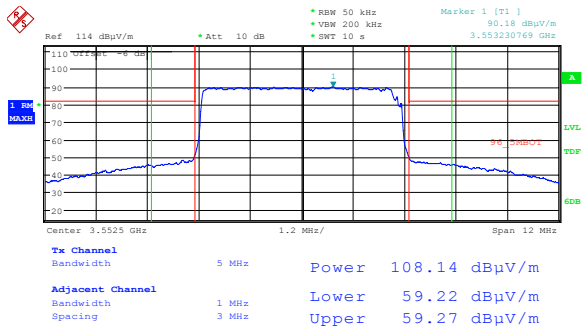
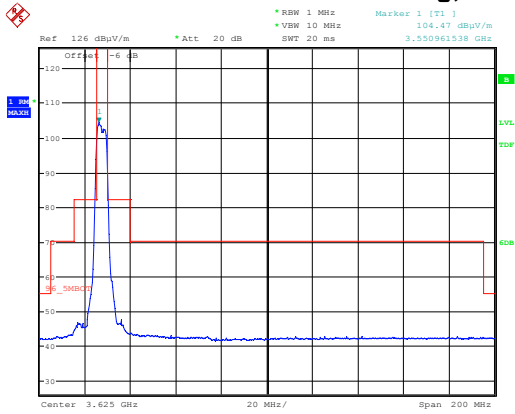
Emission Mask 256 QAM; 3697.5 MHz; MIMO B.



Emission Mask 256 QAM; 3697.5 MHz; MIMO B
Integration Method.

Frequency: 3697.5 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	114.38	Lower Channel	N/A	70.33	82.24	Pass
			Upper Channel	N/A	70.31		Pass
	16 QAM	114.35	Lower Channel	N/A	70.28		Pass
			Upper Channel	N/A	70.24		Pass
	64 QAM	114.96	Lower Channel	N/A	70.39		Pass
			Upper Channel	N/A	70.50		Pass
	256 QAM	114.27	Lower Channel	N/A	70.09		Pass
			Upper Channel	N/A	69.99		Pass
B	QPSK	114.27	Lower Channel	N/A	69.99		Pass
			Upper Channel	N/A	70.01		Pass
	16 QAM	114.37	Lower Channel	N/A	72.54		Pass
			Upper Channel	N/A	70.09		Pass
	64 QAM	114.26	Lower Channel	N/A	70.02		Pass
			Upper Channel	N/A	69.99		Pass
	256 QAM	114.37	Lower Channel	N/A	72.55		Pass
			Upper Channel	N/A	70.06		Pass

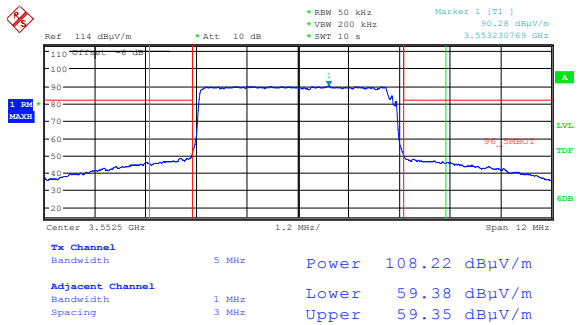
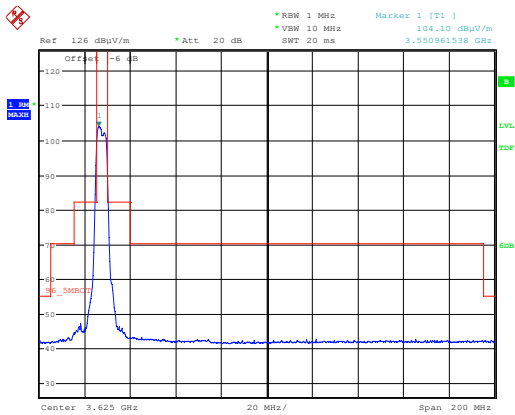
Beamforming; 5 MHz Bandwidth; Bottom Channel



Emission Mask QPSK; 3552.5 MHz; MIMO A
Integration Method.

Date: 16.JUN.2021 14:12:49

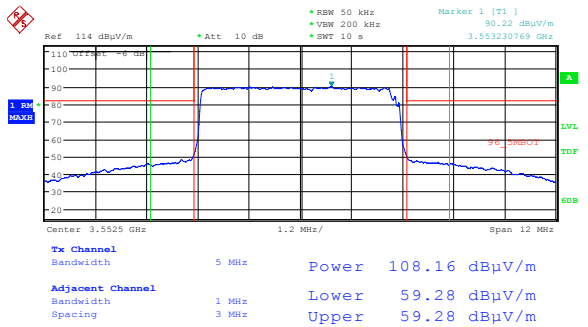
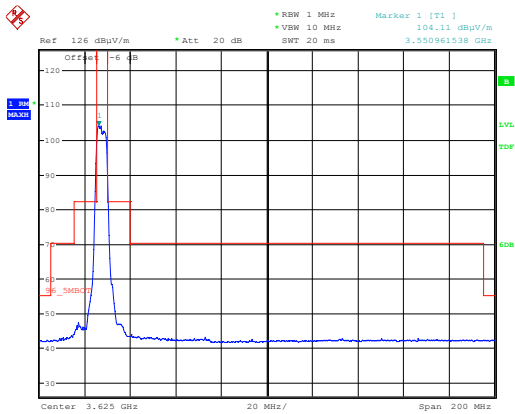
Emission Mask QPSK; 3552.5 MHz; MIMO A.



Emission Mask QPSK; 3552.5 MHz; MIMO B
Integration Method.

Date: 16.JUN.2021 14:19:43

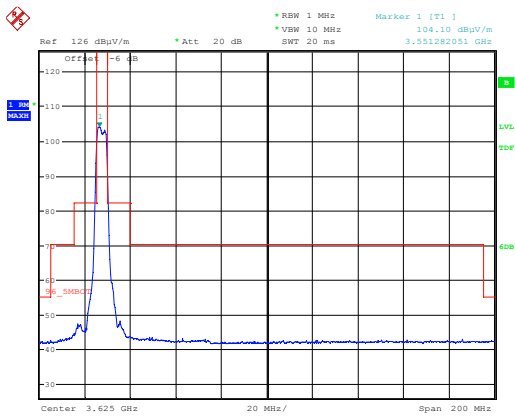
Emission Mask QPSK; 3552.5 MHz; MIMO B.



Emission Mask 16 QAM; 3552.5 MHz; MIMO A
Integration Method.

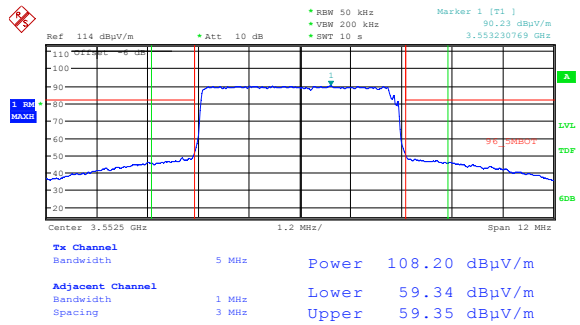
Date: 16.JUN.2021 14:13:52

Emission Mask 16 QAM; 3552.5 MHz; MIMO A.

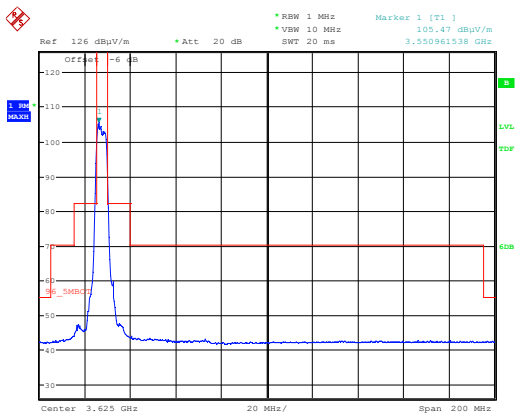


Date: 16 JUN 2021 14:20:33

Emission Mask 16 QAM; 3552.5 MHz; MIMOB.

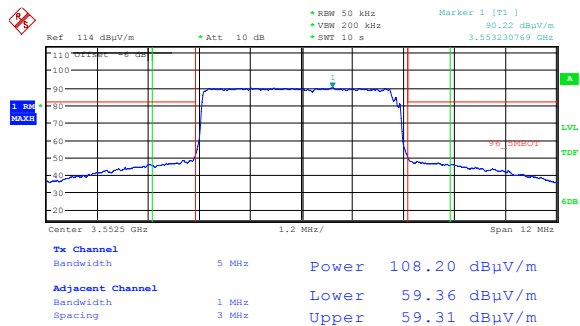


Emission Mask 16 QAM; 3552.5 MHz; MIMOB
Integration Method.

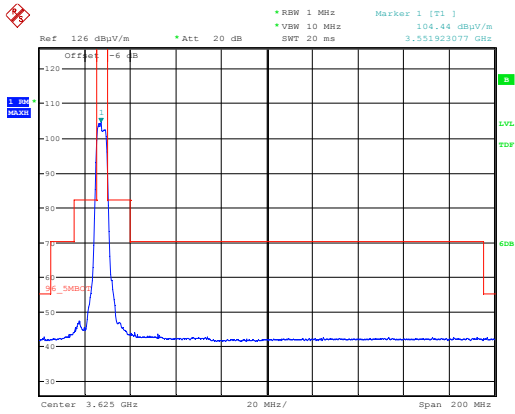


Date: 16 JUN 2021 14:15:10

Emission Mask 64 QAM; 3552.5 MHz; MIMO A.

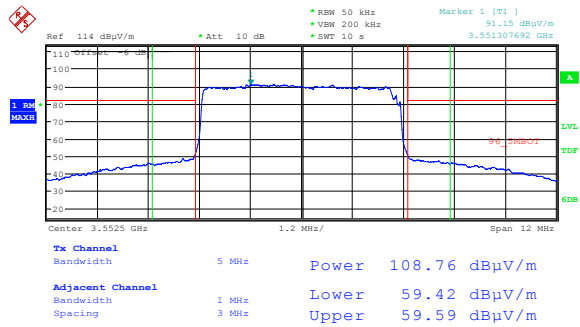


Emission Mask 64 QAM; 3552.5 MHz; MIMO A
Integration Method.

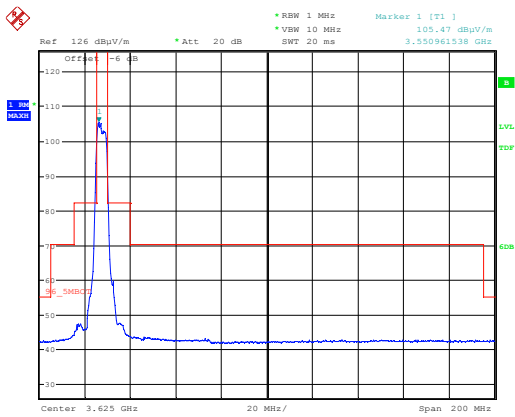


Date: 16 JUN 2021 14:21:05

Emission Mask 64 QAM; 3552.5 MHz; MIMOB.

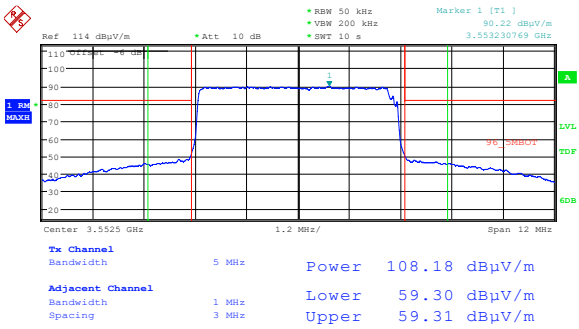


Emission Mask 64 QAM; 3552.5 MHz; MIMOB
Integration Method.

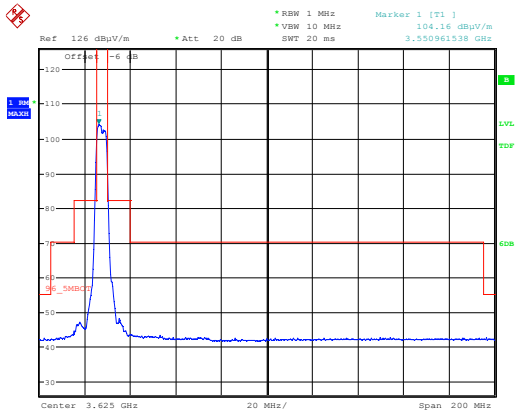


Date: 16 JUN 2021 14:17:28

Emission Mask 256 QAM; 3552.5 MHz; MIMO A.

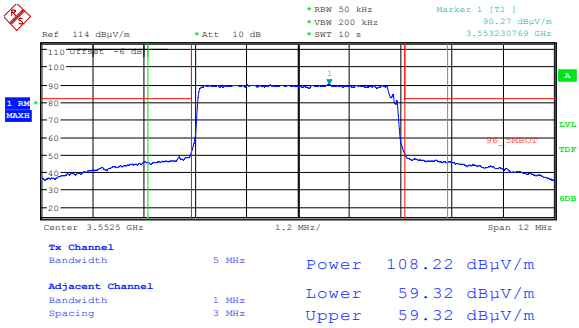


Emission Mask 256 QAM; 3552.5 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 14:22:19

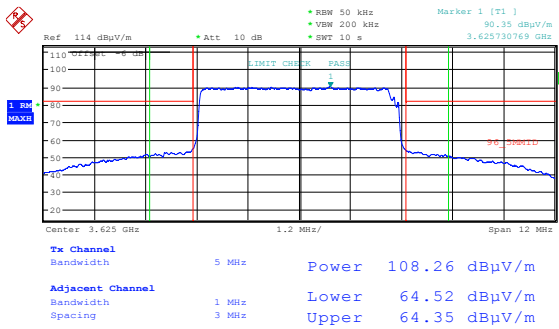
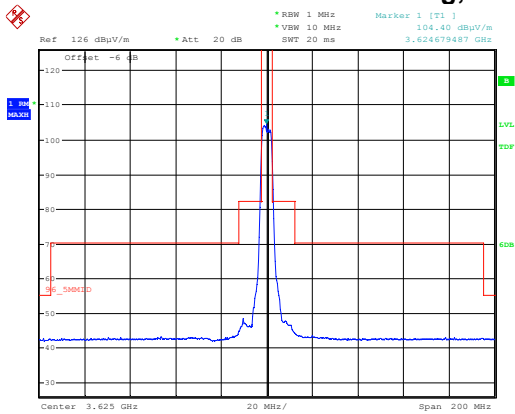
Emission Mask 256 QAM; 3552.5 MHz; MIMO B.



Emission Mask 256 QAM; 3552.5 MHz; MIMO B
Integration Method.

Frequency: 3552.5 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	108.14	Lower Channel	N/A	59.22	82.24	Pass
			Upper Channel	N/A	59.27		Pass
	16 QAM	108.16	Lower Channel	N/A	59.28		Pass
			Upper Channel	N/A	59.28		Pass
	64 QAM	108.20	Lower Channel	N/A	59.36		Pass
			Upper Channel	N/A	59.31		Pass
	256 QAM	108.18	Lower Channel	N/A	59.30		Pass
			Upper Channel	N/A	59.31		Pass
B	QPSK	108.22	Lower Channel	N/A	59.38		Pass
			Upper Channel	N/A	59.35		Pass
	16 QAM	108.20	Lower Channel	N/A	59.34		Pass
			Upper Channel	N/A	59.35		Pass
	64 QAM	108.76	Lower Channel	N/A	59.42		Pass
			Upper Channel	N/A	59.59		Pass
	256 QAM	108.22	Lower Channel	N/A	59.32		Pass
			Upper Channel	N/A	59.32		Pass

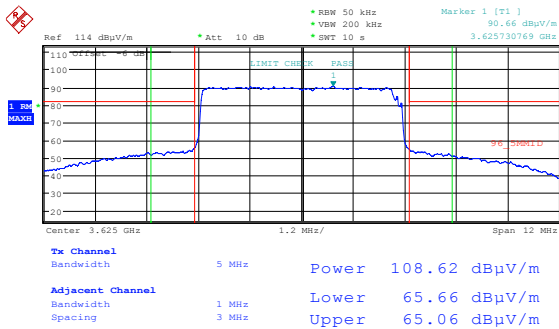
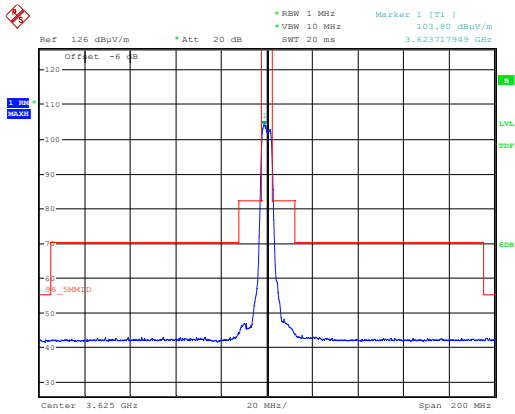
Beamforming; 5 MHz Bandwidth; Middle Channel



Emission Mask QPSK; 3625 MHz; MIMO A
Integration Method.

Date: 16.JUN.2021 13:49:25

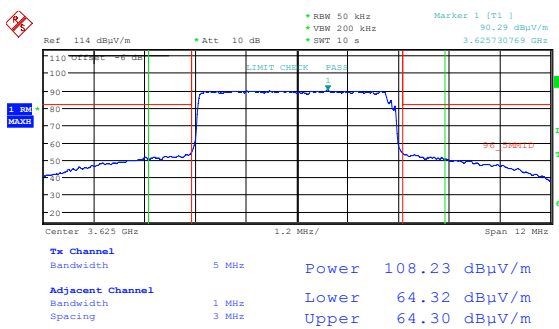
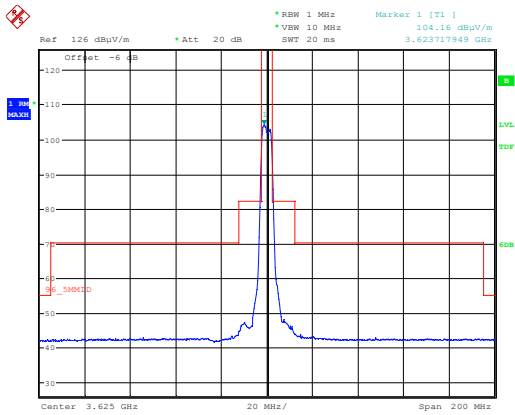
Emission Mask QPSK; 3625 MHz; MIMO A.



Emission Mask QPSK; 3625 MHz; MIMO B
Integration Method.

Date: 16.JUN.2021 13:55:33

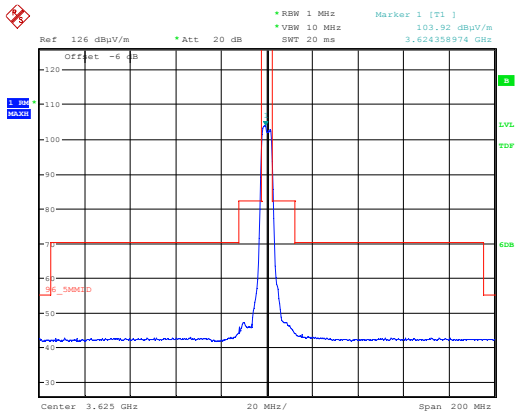
Emission Mask QPSK; 3625 MHz; MIMO B.



Emission Mask 16 QAM; 3625 MHz; MIMO A
Integration Method.

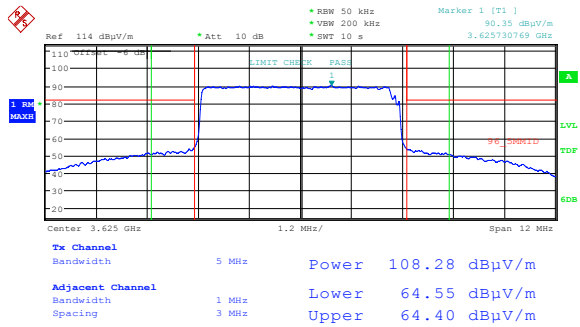
Date: 16.JUN.2021 13:51:15

Emission Mask 16 QAM; 3625 MHz; MIMO A.

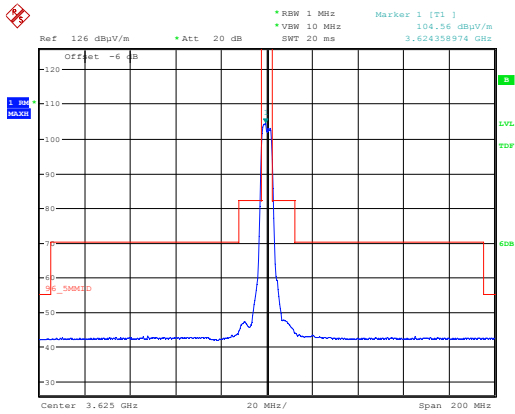


Date: 16 JUN 2021 13:57:22

Emission Mask 16 QAM; 3625 MHz; MIMO B.

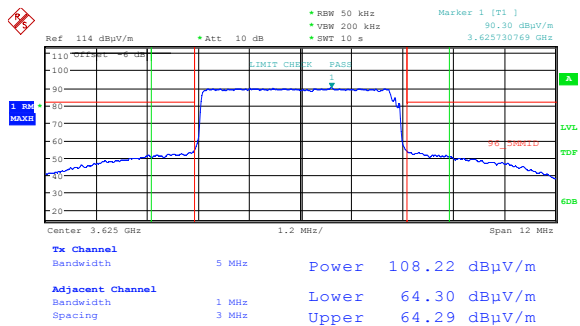


Emission Mask 16 QAM; 3625 MHz; MIMO B
Integration Method.

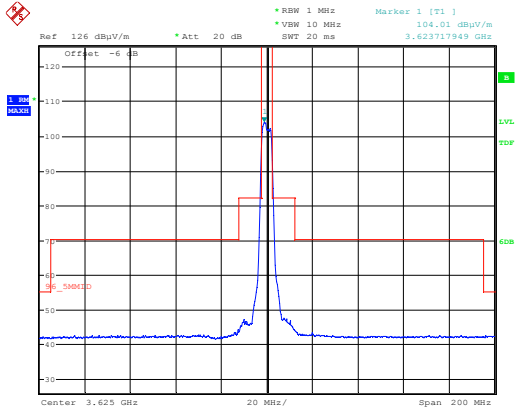


Date: 16 JUN 2021 13:53:57

Emission Mask 64 QAM; 3625 MHz; MIMO A.

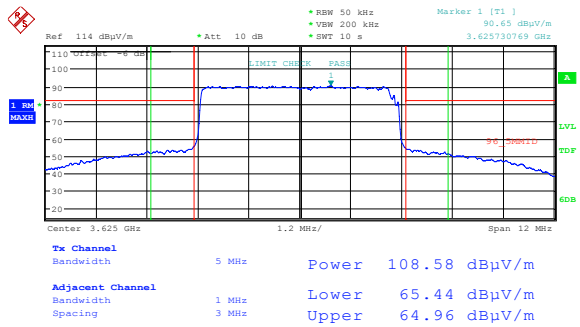


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

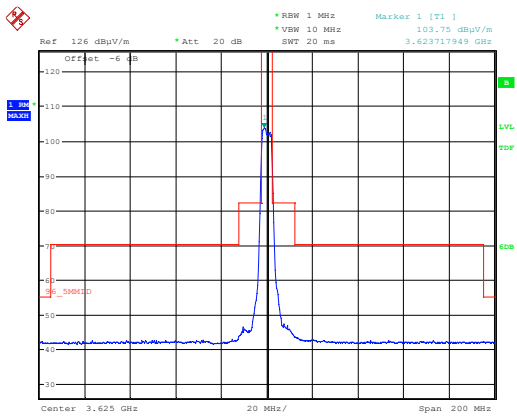


Date: 16 JUN 2021 13:58:20

Emission Mask 64 QAM; 3625 MHz; MIMO B.

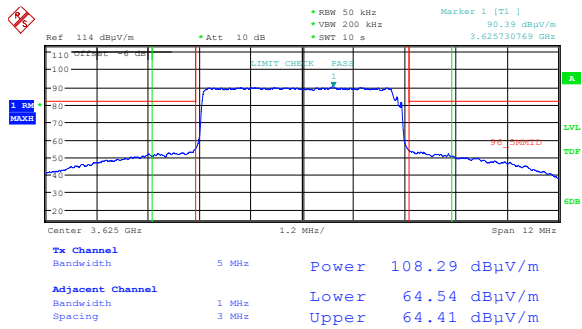


Emission Mask 64 QAM; 3625 MHz; MIMO B
Integration Method.

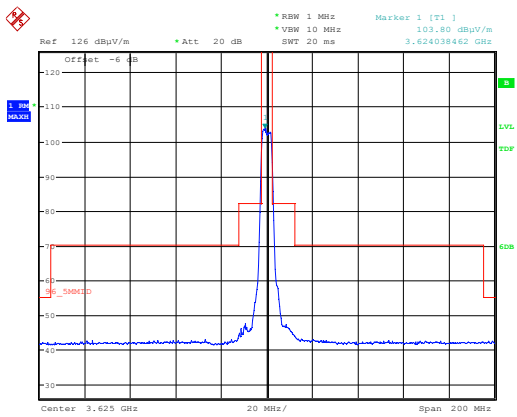


Date: 16 JUN 2021 13:54:40

Emission Mask 256 QAM; 3625 MHz; MIMO A.

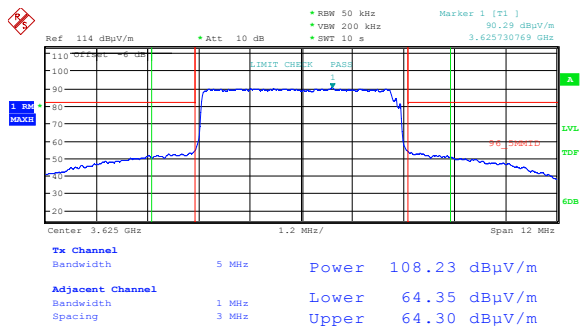


Emission Mask 256 QAM; 3625 MHz; MIMO A
Integration Method.



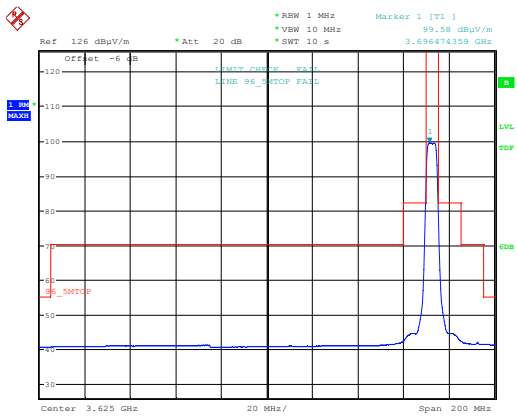
Date: 16 JUN 2021 13:58:45

Emission Mask 256 QAM; 3625 MHz; MIMO B.

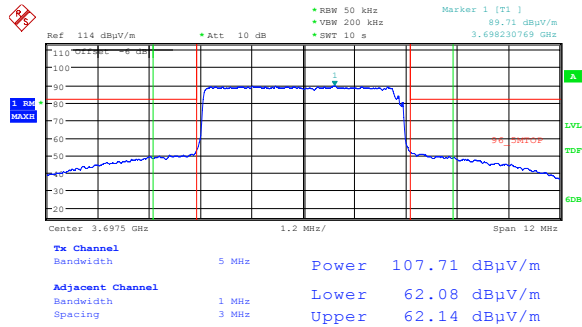


Emission Mask 256 QAM; 3625 MHz; MIMO B
Integration Method.

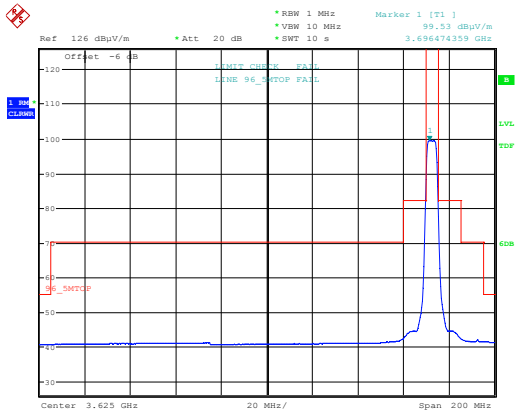
Frequency: 3625 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	108.26	Lower Channel	N/A	64.52	82.24	Pass
			Upper Channel	N/A	64.35		Pass
	16 QAM	108.23	Lower Channel	N/A	64.23		Pass
			Upper Channel	N/A	64.30		Pass
	64 QAM	108.22	Lower Channel	N/A	64.30		Pass
			Upper Channel	N/A	64.29		Pass
	256 QAM	108.29	Lower Channel	N/A	64.54		Pass
			Upper Channel	N/A	64.41		Pass
B	QPSK	108.62	Lower Channel	N/A	65.66		Pass
			Upper Channel	N/A	65.06		Pass
	16 QAM	108.28	Lower Channel	N/A	64.55		Pass
			Upper Channel	N/A	64.40		Pass
	64 QAM	108.58	Lower Channel	N/A	65.44		Pass
			Upper Channel	N/A	64.96		Pass
	256 QAM	108.23	Lower Channel	N/A	64.35		Pass
			Upper Channel	N/A	64.30		Pass



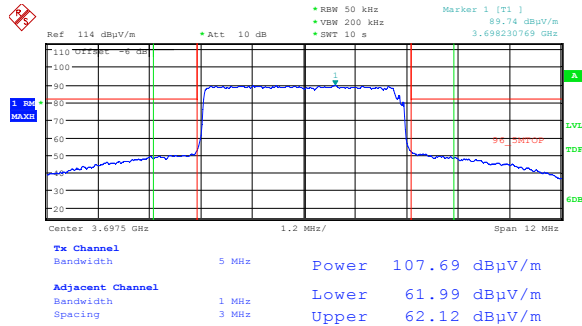
Date: 16 JUN 2021 13:11:55
Emission Mask 16 QAM; 3697.5 MHz; MIMOB.



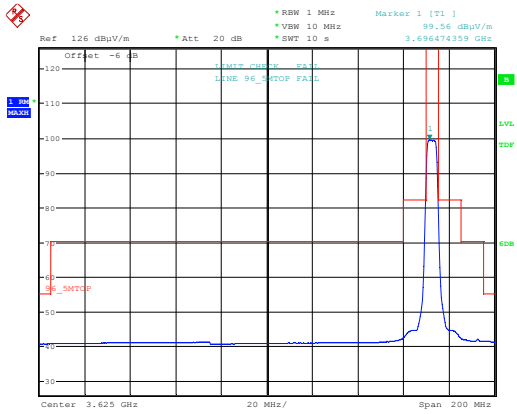
Emission Mask 16 QAM; 3697.5 MHz; MIMOB
Integration Method.



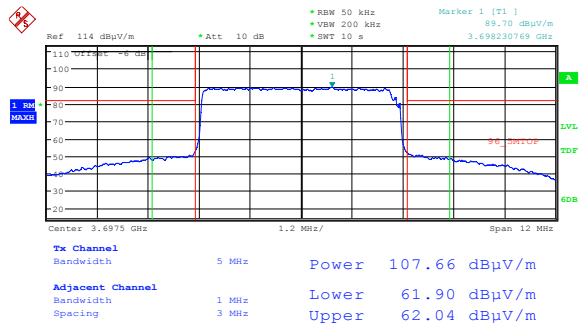
Date: 16 JUN 2021 13:03:18
Emission Mask 64 QAM; 3697.5 MHz; MIMO A.



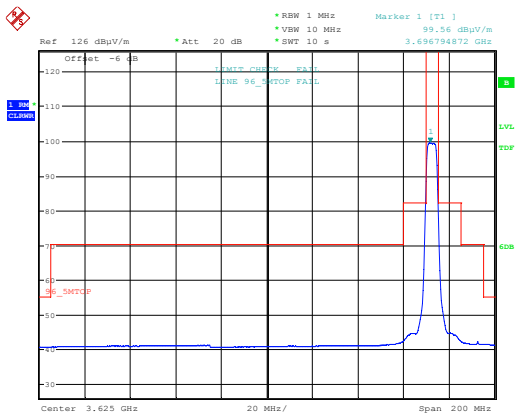
Emission Mask 64 QAM; 3697.5 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 13:17:59
Emission Mask 64 QAM; 3697.5 MHz; MIMOB.

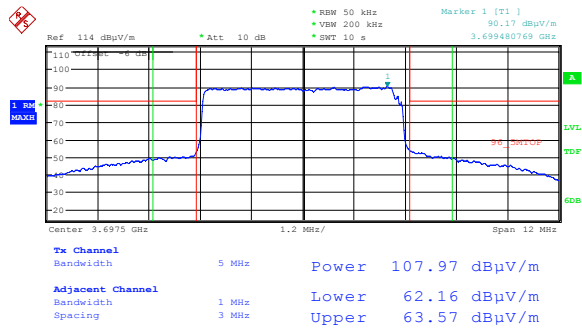


Emission Mask 64 QAM; 3697.5 MHz; MIMOB
Integration Method.

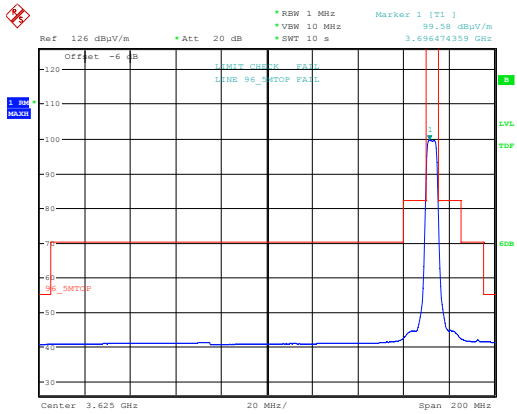


Date: 16 JUN 2021 13:06:42

Emission Mask 256 QAM; 3697.5 MHz; MIMO A.

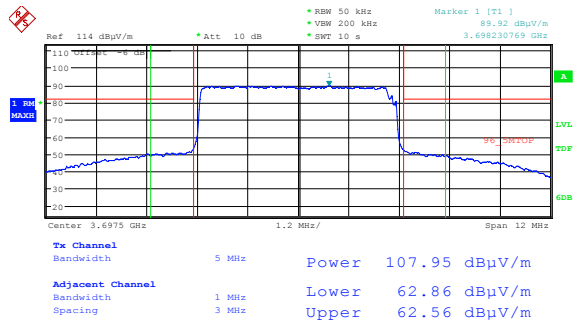


Emission Mask 256 QAM; 3697.5 MHz; MIMO A
Integration Method.



Date: 16 JUN 2021 13:20:06

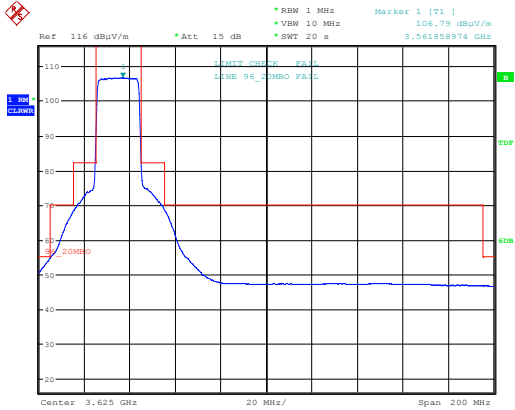
Emission Mask 256 QAM; 3697.5 MHz; MIMO B.



Emission Mask 256 QAM; 3697.5 MHz; MIMO B
Integration Method.

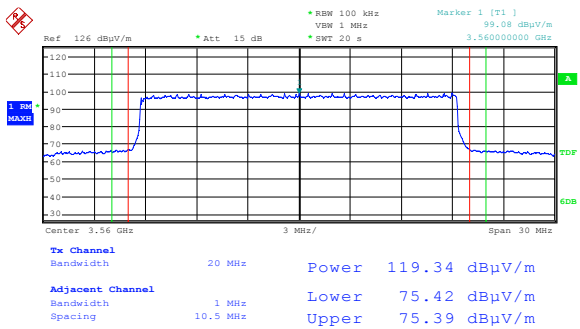
Frequency: 3697.5 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	107.70	Lower Channel	N/A	62.02	82.24	Pass
			Upper Channel	N/A	62.10		Pass
	16 QAM	107.71	Lower Channel	N/A	62.07		Pass
			Upper Channel	N/A	62.15		Pass
	64 QAM	107.69	Lower Channel	N/A	61.99		Pass
			Upper Channel	N/A	62.12		Pass
	256 QAM	107.97	Lower Channel	N/A	62.16		Pass
			Upper Channel	N/A	63.57		Pass
B	QPSK	107.67	Lower Channel	N/A	61.94		Pass
			Upper Channel	N/A	62.06		Pass
	16 QAM	107.71	Lower Channel	N/A	62.08		Pass
			Upper Channel	N/A	62.14		Pass
	64 QAM	107.66	Lower Channel	N/A	61.90		Pass
			Upper Channel	N/A	62.04		Pass
	256 QAM	107.95	Lower Channel	N/A	62.86		Pass
			Upper Channel	N/A	62.65		Pass

Sector Mode; 20 MHz bandwidth; Bottom channel

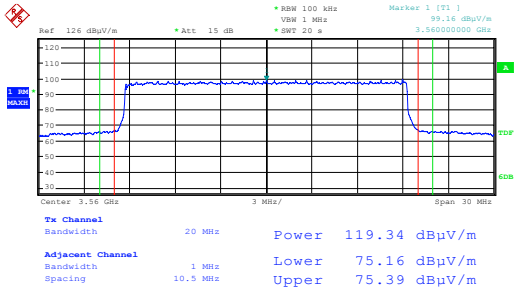


Date: 21.JUN.2021 11:44:47

Emission Mask QPSK; 3560 MHz; MIMO A.

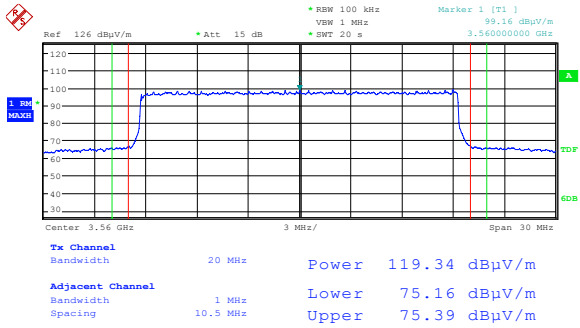


Emission Mask QPSK; 3560 MHz; MIMO A
Integration Method.

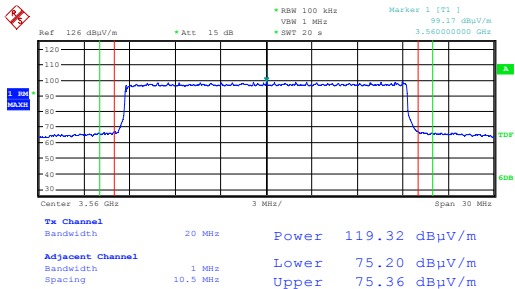


Date: 21.JUN.2021 14:07:11

Emission Mask QPSK; 3560 MHz; MIMO B.

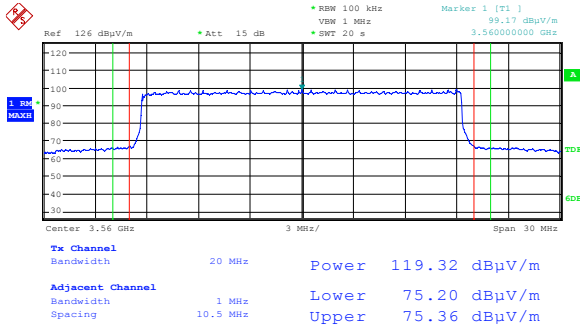


Emission Mask QPSK; 3560 MHz; MIMO B
Integration Method.

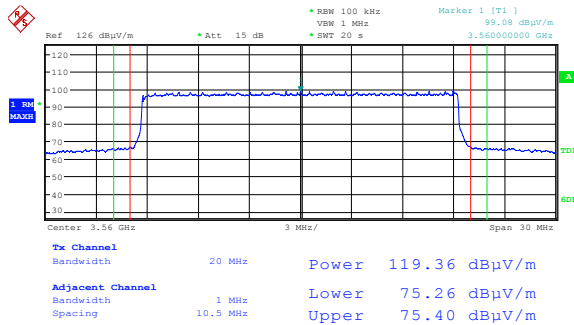
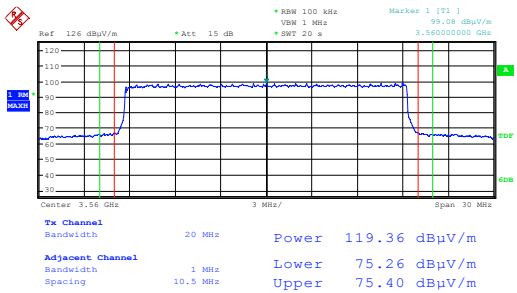


Date: 21.JUN.2021 14:10:36

Emission Mask 16 QAM; 3560 MHz; MIMO A.



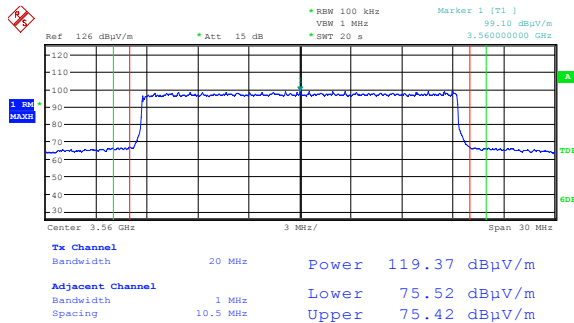
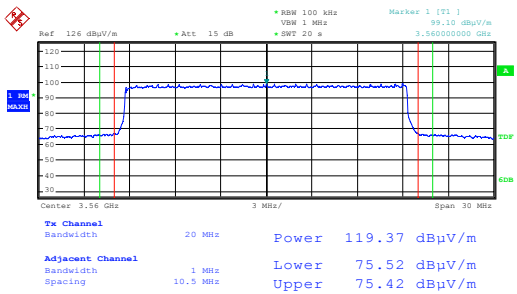
Emission Mask 16 QAM; 3560 MHz; MIMO A
Integration Method.



Emission Mask 16 QAM; 3560 MHz; MIMO B
Integration Method.

Date: 21.JUN.2021 14:05:48

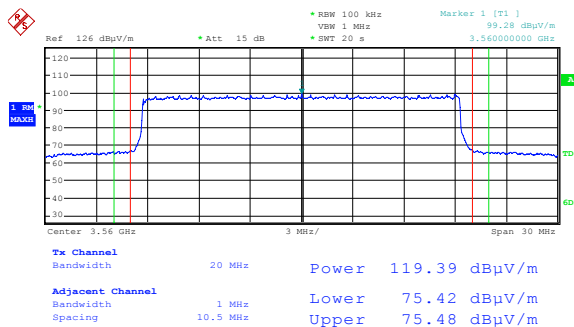
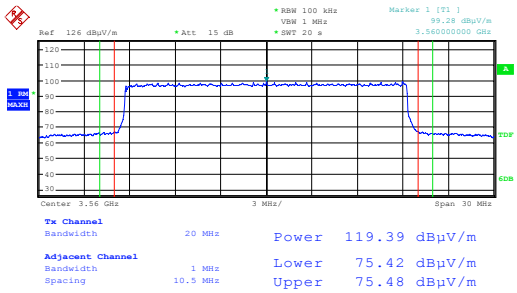
Emission Mask 16 QAM; 3560 MHz; MIMO B.



Emission Mask 64 QAM; 3560 MHz; MIMO A
Integration Method.

Date: 21.JUN.2021 14:09:04

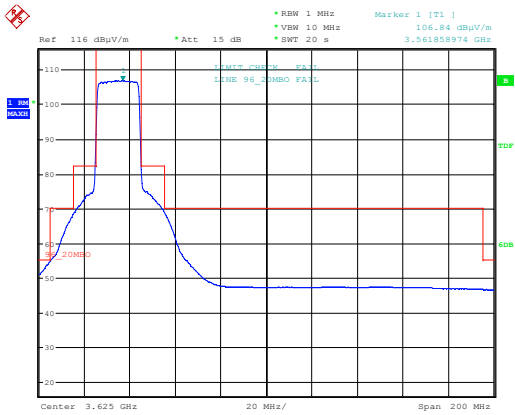
Emission Mask 64 QAM; 3560 MHz; MIMO A.



Emission Mask 64 QAM; 3560 MHz; MIMO B
Integration Method.

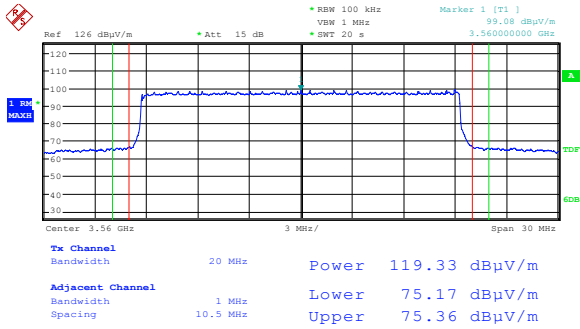
Date: 21.JUN.2021 14:04:20

Emission Mask 64 QAM; 3560 MHz; MIMO B.

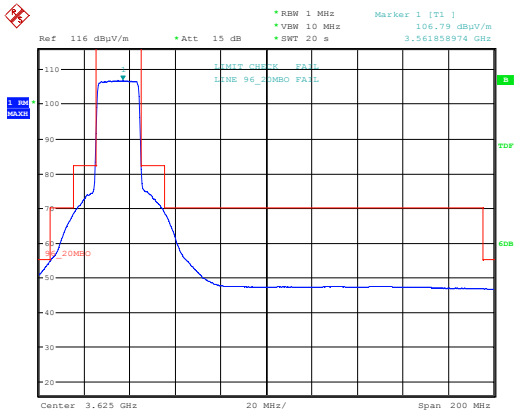


Date: 21.JUN.2021 11:52:06

Emission Mask 256 QAM; 3560 MHz; MIMO A.

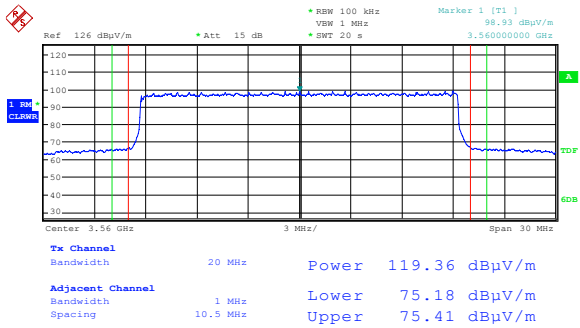


Emission Mask 256 QAM; 3560 MHz; MIMO B
Integration Method.



Date: 21.JUN.2021 11:59:04

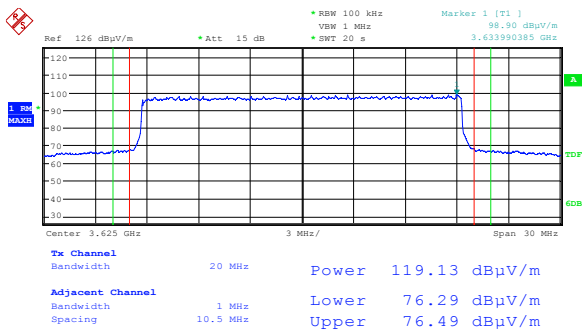
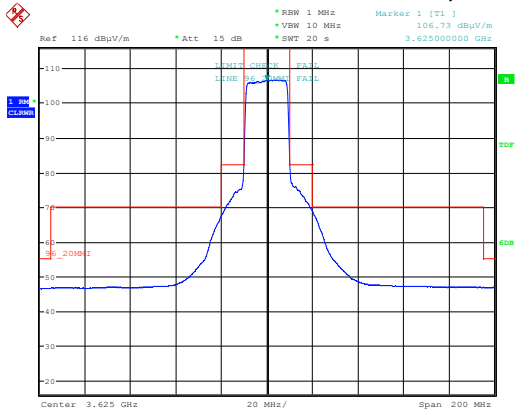
Emission Mask 256 QAM; 3560 MHz; MIMO B.



Emission Mask 256 QAM; 3560 MHz; MIMO B
Integration Method.

Frequency: 3560 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.34	Lower Channel	N/A	75.42	82.24	Pass
			Upper Channel	N/A	75.39		Pass
	16 QAM	119.32	Lower Channel	N/A	75.20		Pass
			Upper Channel	N/A	75.36		Pass
	64 QAM	119.37	Lower Channel	N/A	75.52		Pass
			Upper Channel	N/A	75.42		Pass
	256 QAM	119.33	Lower Channel	N/A	75.17		Pass
			Upper Channel	N/A	75.36		Pass
B	QPSK	119.34	Lower Channel	N/A	75.16		Pass
			Upper Channel	N/A	75.39		Pass
	16 QAM	119.36	Lower Channel	N/A	75.26		Pass
			Upper Channel	N/A	75.40		Pass
	64 QAM	119.39	Lower Channel	N/A	75.42		Pass
			Upper Channel	N/A	75.48		Pass
	256 QAM	119.36	Lower Channel	N/A	75.18		Pass
			Upper Channel	N/A	75.41		Pass

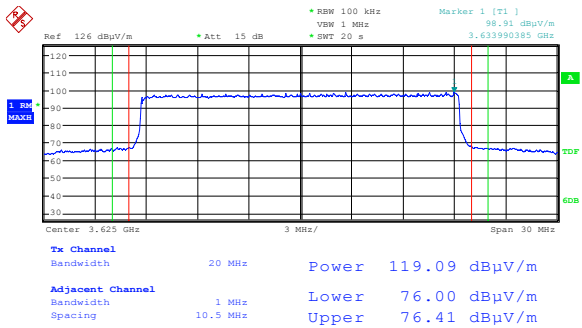
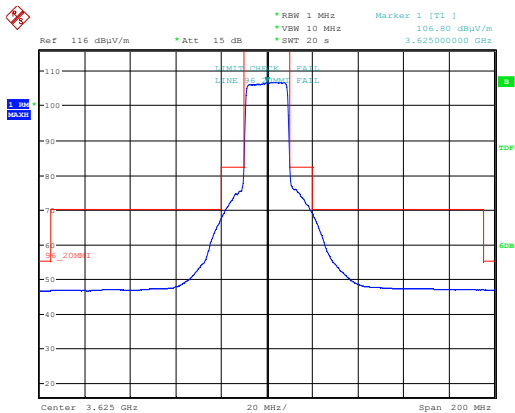
Sector Mode; 20 MHz bandwidth; Middle channel



Emission Mask QPSK; 3625 MHz; MIMO A
Integration Method.

Date: 21.JUN.2021 12:21:28

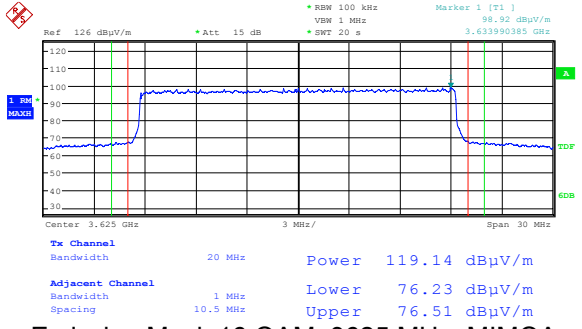
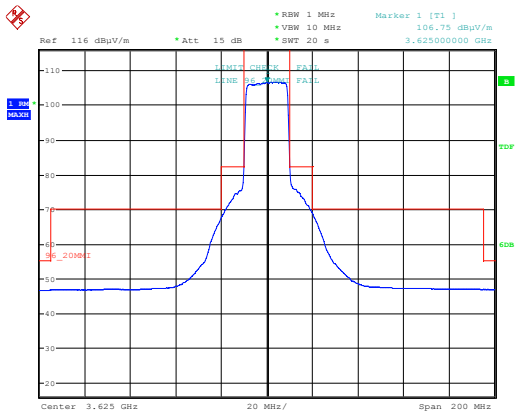
Emission Mask QPSK; 3625 MHz; MIMO A.



Emission Mask QPSK; 3625 MHz; MIMO B
Integration Method.

Date: 21.JUN.2021 12:24:22

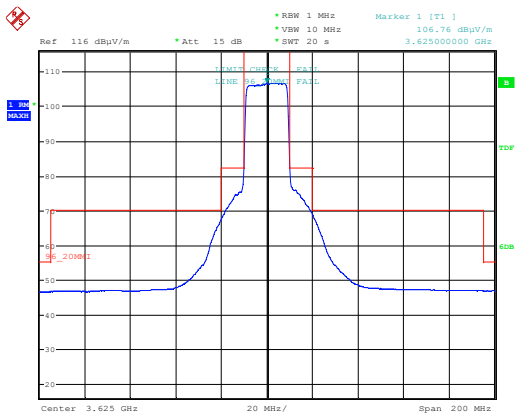
Emission Mask QPSK; 3625 MHz; MIMO B.



Emission Mask 16 QAM; 3625 MHz; MIMO A
Integration Method.

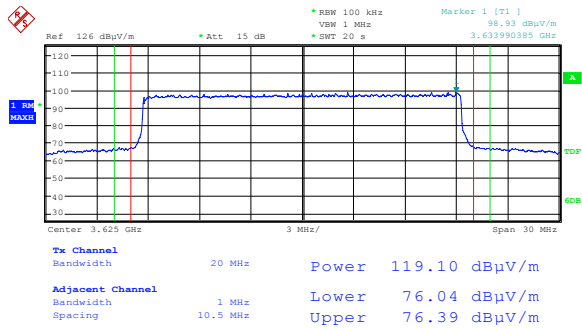
Date: 21.JUN.2021 12:22:23

Emission Mask 16 QAM; 3625 MHz; MIMO A.

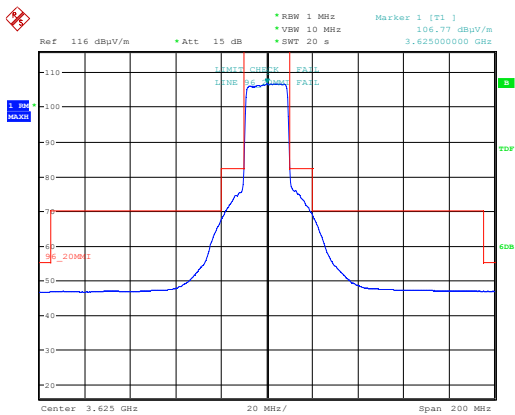


Date: 21.JUN.2021 12:25:07

Emission Mask 16 QAM; 3625 MHz; MIMO B.

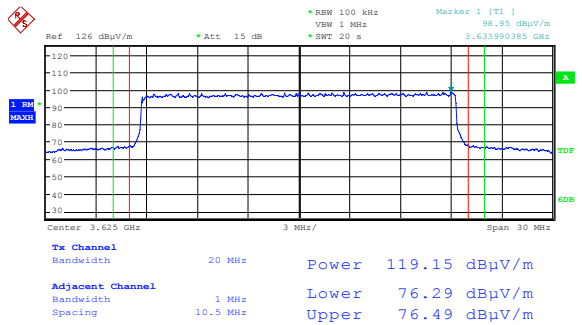


Emission Mask 16 QAM; 3625 MHz; MIMO B
Integration Method.

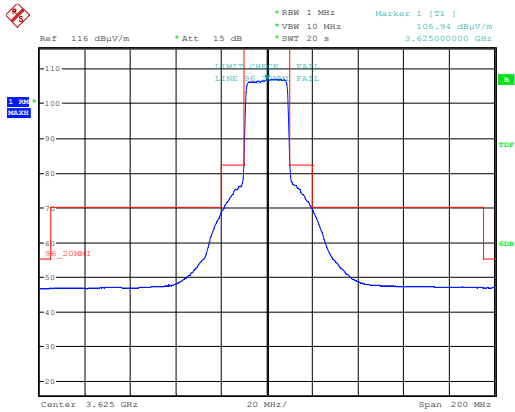


Date: 21.JUN.2021 12:23:03

Emission Mask 64 QAM; 3625 MHz; MIMO A.

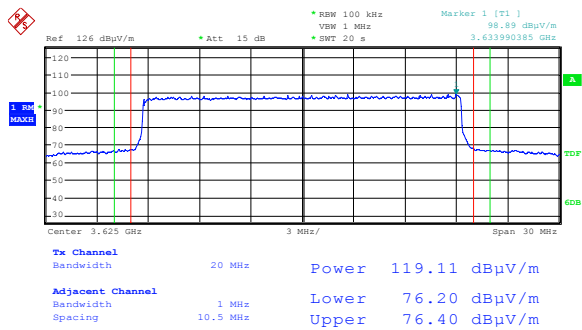


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

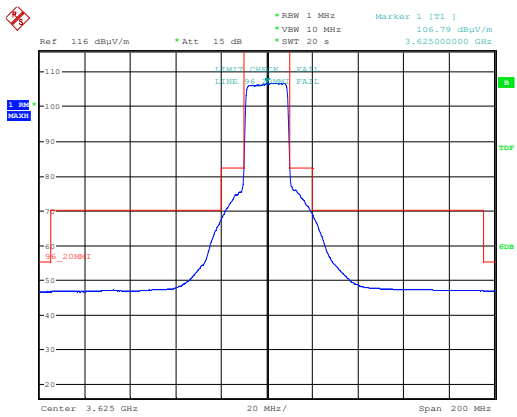


Date: 21.JUN.2021 12:25:42

Emission Mask 64 QAM; 3625 MHz; MIMO B.

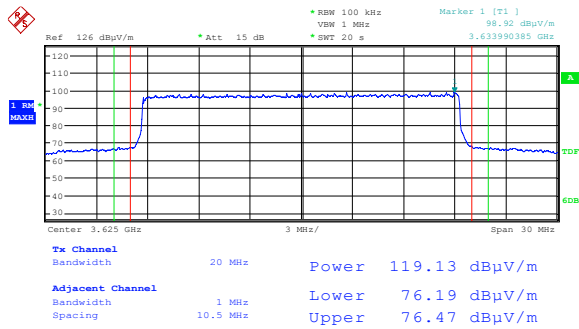


Emission Mask 64 QAM; 3625 MHz; MIMO B
Integration Method.

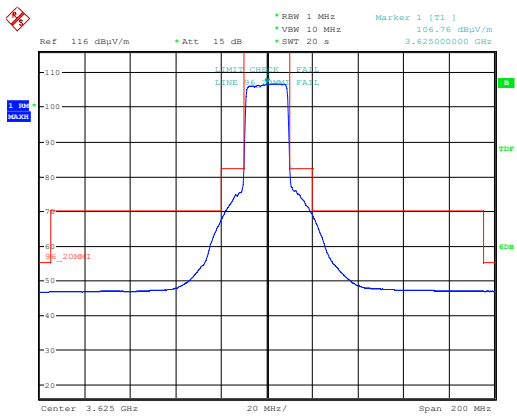


Date: 21.JUN.2021 12:23:39

Emission Mask 256 QAM; 3625 MHz; MIMO A.

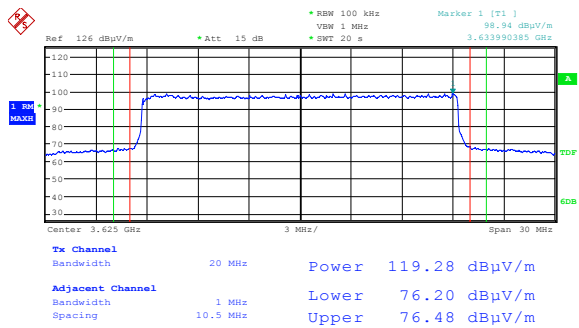


Emission Mask 256 QAM; 3625 MHz; MIMO A
Integration Method.



Date: 21.JUN.2021 12:27:13

Emission Mask 256 QAM; 3625 MHz; MIMO B.



Emission Mask 256 QAM; 3625 MHz; MIMO B
Integration Method.

Frequency: 3625 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.13	Lower Channel	N/A	76.29	82.24	Pass
			Upper Channel	N/A	76.49		Pass
	16 QAM	119.14	Lower Channel	N/A	76.23		Pass
			Upper Channel	N/A	76.51		Pass
	64 QAM	119.15	Lower Channel	N/A	76.29		Pass
			Upper Channel	N/A	76.49		Pass
	256 QAM	119.13	Lower Channel	N/A	76.19		Pass
			Upper Channel	N/A	76.47		Pass
B	QPSK	119.09	Lower Channel	N/A	76.00		Pass
			Upper Channel	N/A	76.41		Pass
	16 QAM	119.10	Lower Channel	N/A	76.04		Pass
			Upper Channel	N/A	76.39		Pass
	64 QAM	119.11	Lower Channel	N/A	76.20		Pass
			Upper Channel	N/A	76.40		Pass
	256 QAM	119.28	Lower Channel	N/A	76.20		Pass
			Upper Channel	N/A	76.48		Pass

1 RM
CLRW

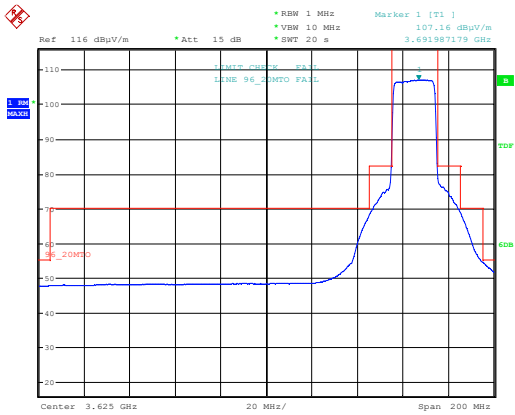
Date: 21.JUN.2021 10:55:14



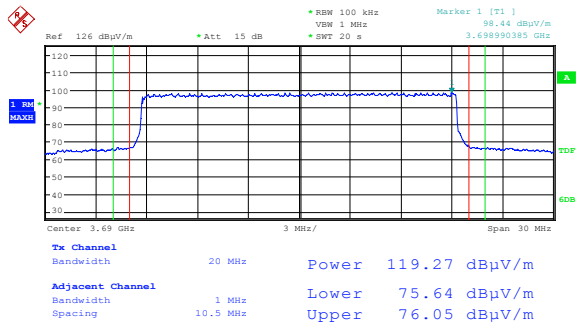
Date: 21.JUN.2021 11:00:33



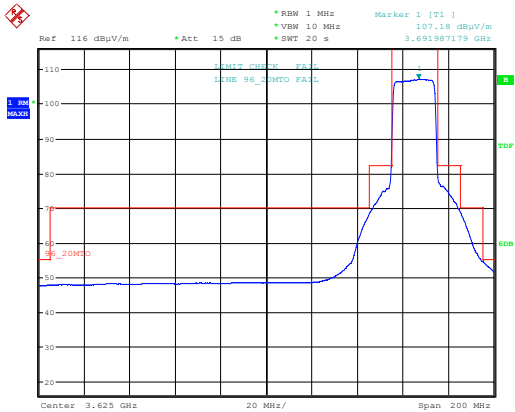
Date: 21.JUN.2021 10:56:05



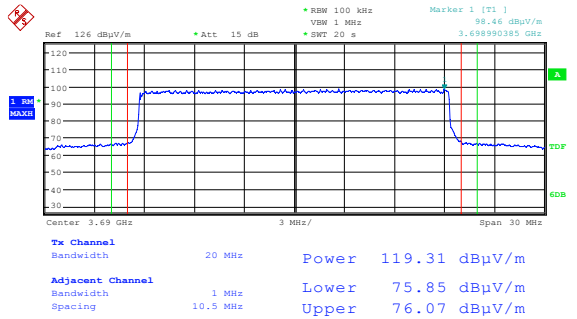
Date: 21.JUN.2021 11:02:05
Emission Mask 16 QAM; 3690 MHz; MIMO B.



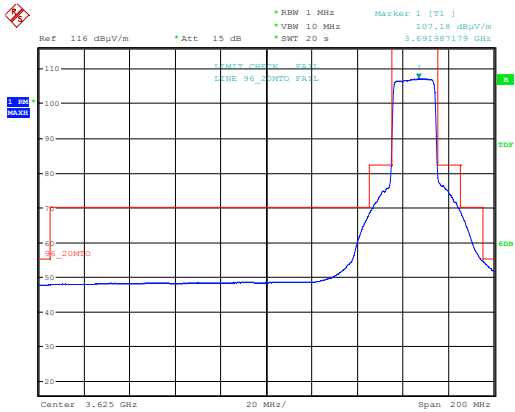
Emission Mask 16 QAM; 3690 MHz; MIMO B
Integration Method.



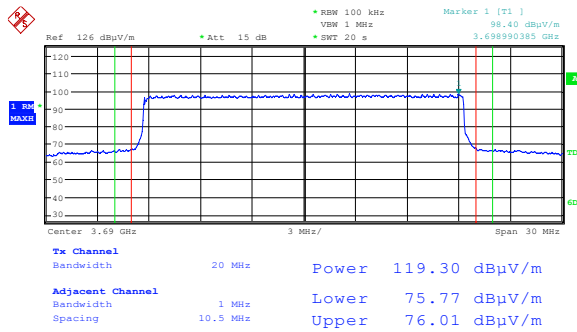
Date: 21.JUN.2021 10:57:03
Emission Mask 64 QAM; 3690 MHz; MIMO A.



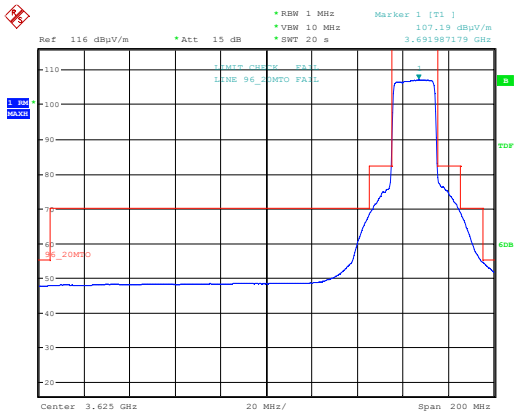
Emission Mask 64 QAM; 3690 MHz; MIMO A
Integration Method.



Date: 21.JUN.2021 11:03:09
Emission Mask 64 QAM; 3690 MHz; MIMO B.

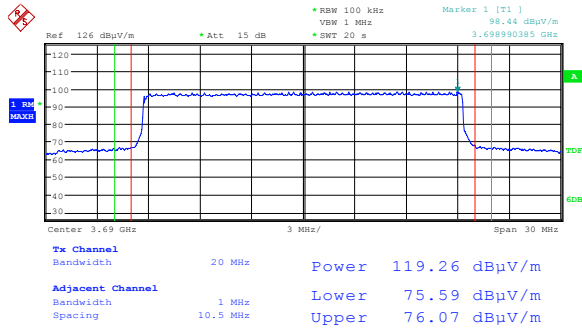


Emission Mask 64 QAM; 3690 MHz; MIMO B
Integration Method.

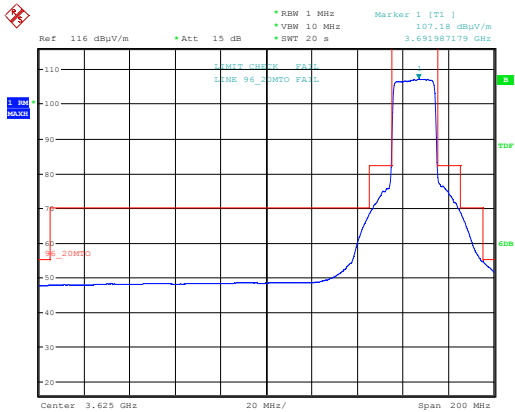


Date: 21.JUN.2021 10:58:06

Emission Mask 256 QAM; 3690 MHz; MIMO A.

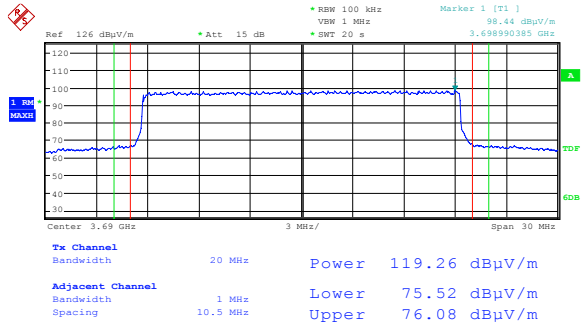


Emission Mask 256 QAM; 3690 MHz; MIMO A
Integration Method.



Date: 21.JUN.2021 11:22:10

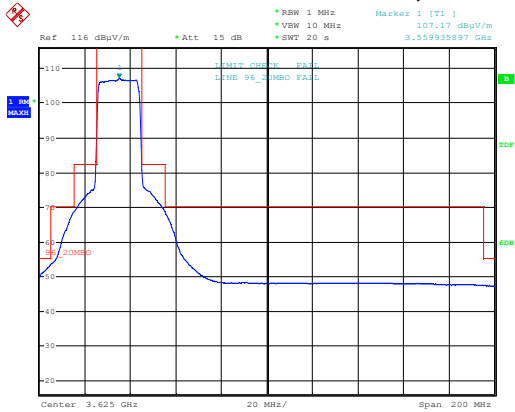
Emission Mask 256 QAM; 3690 MHz; MIMO B.



Emission Mask 256 QAM; 3690 MHz; MIMO B
Integration Method.

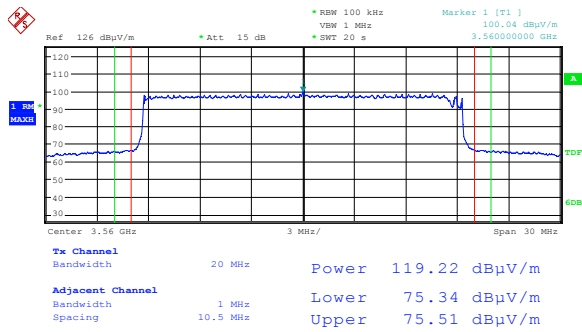
Frequency: 3690 MHz; Sector Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.29	Lower Channel	N/A	75.53	82.24	Pass
			Upper Channel	N/A	76.13		Pass
	16 QAM	119.30	Lower Channel	N/A	75.81		Pass
			Upper Channel	N/A	76.12		Pass
	64 QAM	119.31	Lower Channel	N/A	75.85		Pass
			Upper Channel	N/A	76.07		Pass
	256 QAM	119.26	Lower Channel	N/A	75.59		Pass
			Upper Channel	N/A	76.07		Pass
B	QPSK	119.27	Lower Channel	N/A	75.46		Pass
			Upper Channel	N/A	76.05		Pass
	16 QAM	119.27	Lower Channel	N/A	75.64		Pass
			Upper Channel	N/A	76.05		Pass
	64 QAM	119.30	Lower Channel	N/A	75.77		Pass
			Upper Channel	N/A	76.01		Pass
	256 QAM	119.26	Lower Channel	N/A	75.52		Pass
			Upper Channel	N/A	76.08		Pass

MuMIMO; 20 MHz Bandwidth; Bottom Channel



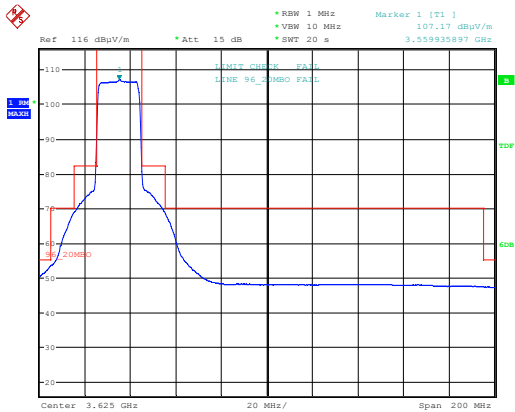
Date: 21.JUN.2021 15:05:04

Emission Mask QPSK; 3560 MHz; MIMO.A.



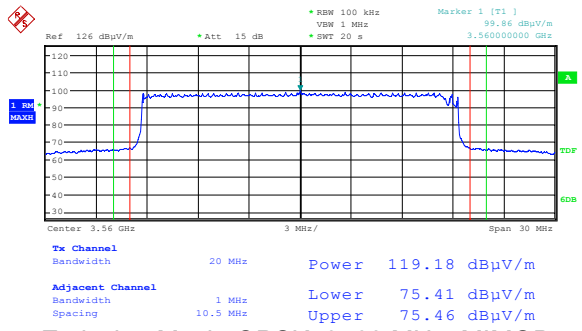
Emission Mask QPSK; 3560 MHz; MIMO.A
Integration Method.

Tx Channel
Bandwidth 20 MHz Power 119.22 dBμV/m
Adjacent Channel
Bandwidth 1 MHz Lower 75.34 dBμV/m
Spacing 10.5 MHz Upper 75.51 dBμV/m



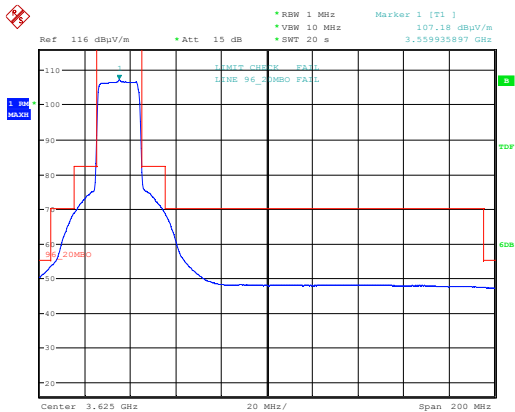
Date: 21.JUN.2021 15:02:12

Emission Mask QPSK; 3560 MHz; MIMO.B.



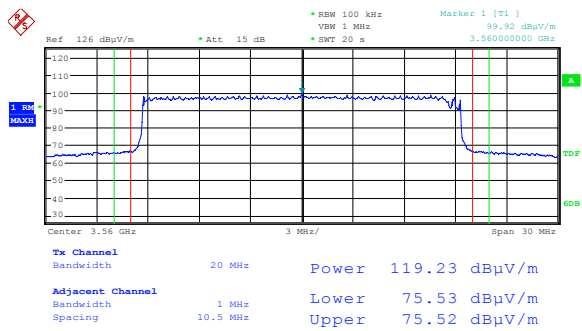
Emission Mask QPSK; 3560 MHz; MIMO.B
Integration Method.

Tx Channel
Bandwidth 20 MHz Power 119.18 dBμV/m
Adjacent Channel
Bandwidth 1 MHz Lower 75.41 dBμV/m
Spacing 10.5 MHz Upper 75.46 dBμV/m



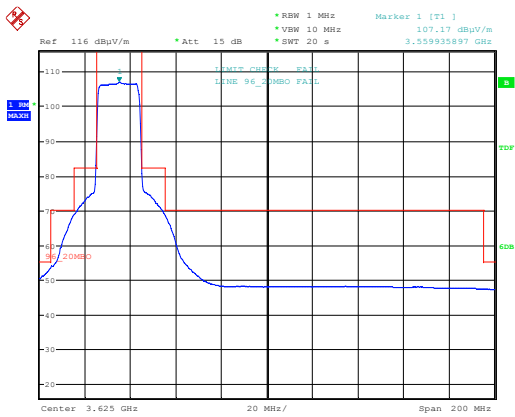
Date: 21.JUN.2021 15:04:20

Emission Mask 16 QAM; 3560 MHz; MIMO.A.



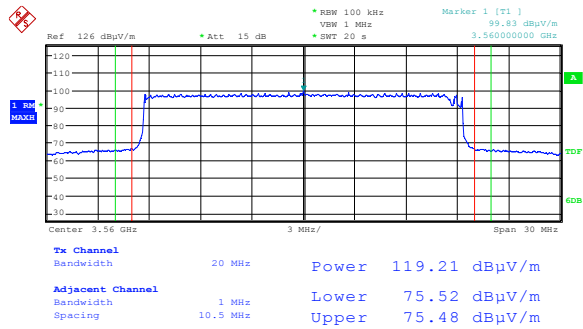
Emission Mask 16 QAM; 3560 MHz; MIMO.A
Integration Method.

Tx Channel
Bandwidth 20 MHz Power 119.23 dBμV/m
Adjacent Channel
Bandwidth 1 MHz Lower 75.53 dBμV/m
Spacing 10.5 MHz Upper 75.52 dBμV/m

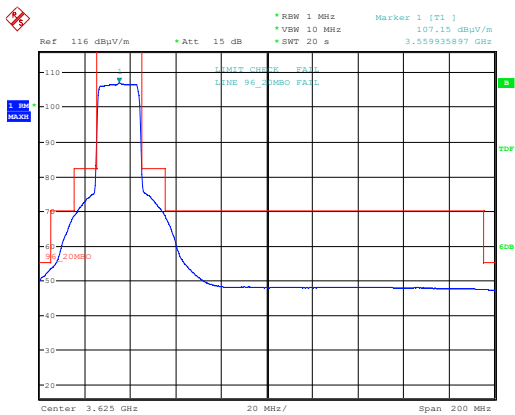


Date: 21.JUN.2021 15:02:48

Emission Mask 256 QAM; 3560 MHz; MIMO A.

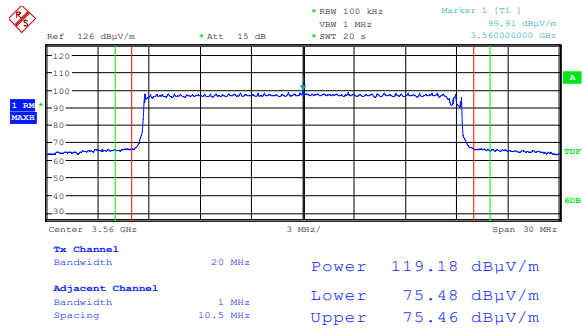


Emission Mask 256 QAM; 3560 MHz; MIMO A
Integration Method.



Date: 21.JUN.2021 14:59:11

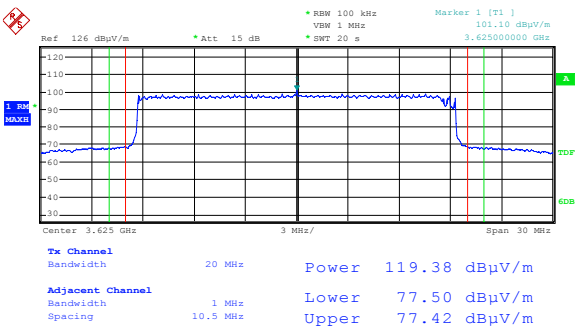
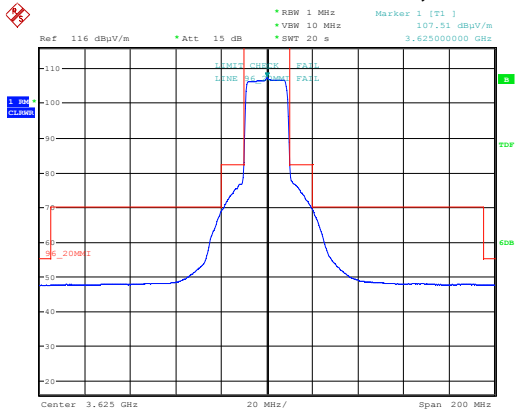
Emission Mask 256 QAM; 3560 MHz; MIMO B.



Emission Mask 256 QAM; 3560 MHz; MIMO B
Integration Method.

Frequency: 3560 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.22	Lower Channel	N/A	75.34	82.24	Pass
			Upper Channel	N/A	75.51		Pass
	16 QAM	119.23	Lower Channel	N/A	75.53		Pass
			Upper Channel	N/A	75.52		Pass
	64 QAM	119.22	Lower Channel	N/A	75.52		Pass
			Upper Channel	N/A	75.50		Pass
	256 QAM	119.21	Lower Channel	N/A	75.52		Pass
			Upper Channel	N/A	75.48		Pass
B	QPSK	119.18	Lower Channel	N/A	75.41		Pass
			Upper Channel	N/A	75.46		Pass
	16 QAM	119.17	Lower Channel	N/A	75.38		Pass
			Upper Channel	N/A	75.46		Pass
	64 QAM	119.18	Lower Channel	N/A	75.49		Pass
			Upper Channel	N/A	75.46		Pass
	256 QAM	119.18	Lower Channel	N/A	75.48		Pass
			Upper Channel	N/A	75.46		Pass

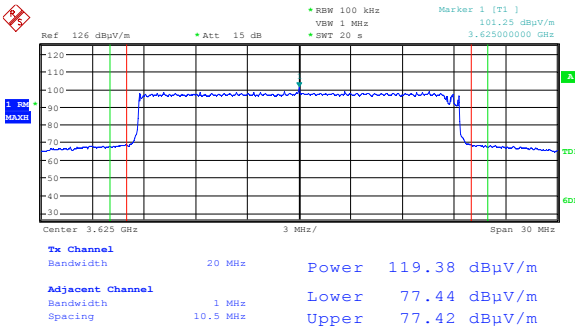
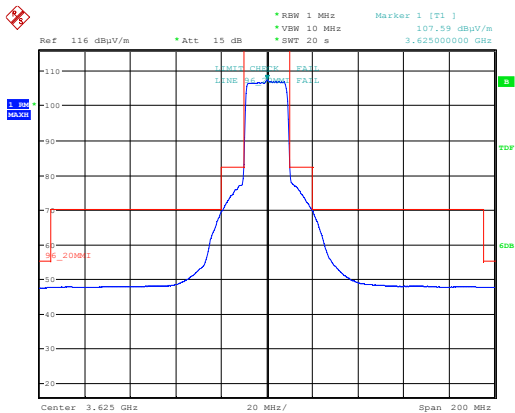
MuMIMO; 20 MHz Bandwidth; Middle Channel



Emission Mask QPSK; 3625 MHz; MIMO A
Integration Method.

Date: 21.JUN.2021 12:43:53

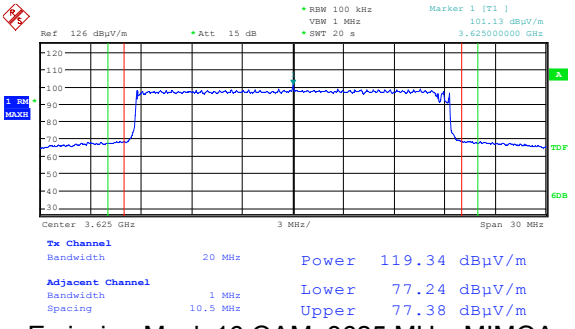
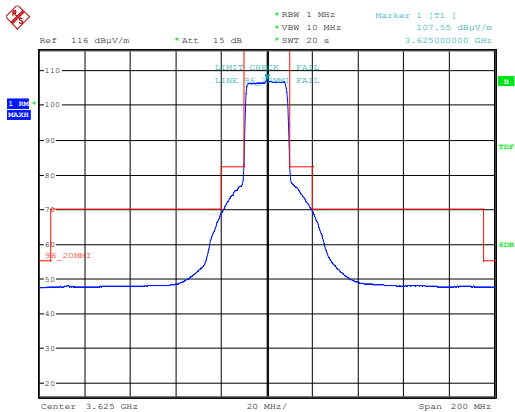
Emission Mask QPSK; 3625 MHz; MIMO A.



Emission Mask QPSK; 3625 MHz; MIMO B
Integration Method.

Date: 21.JUN.2021 12:57:53

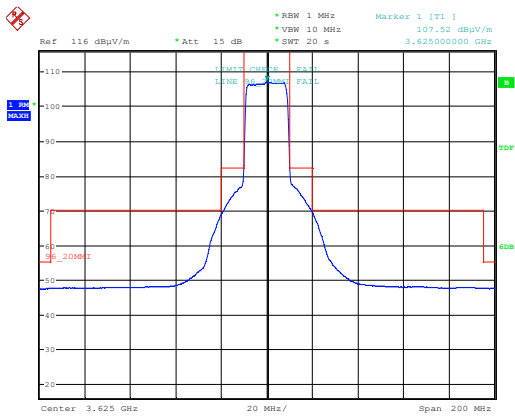
Emission Mask QPSK; 3625 MHz; MIMO B.



Emission Mask 16 QAM; 3625 MHz; MIMO A
Integration Method.

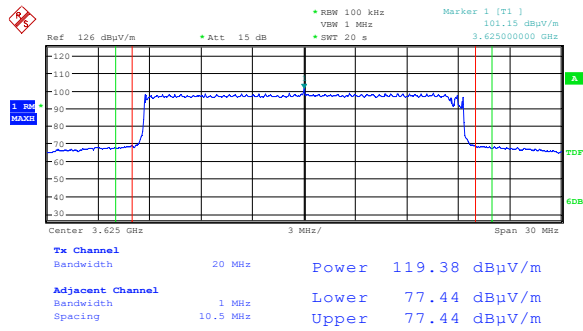
Date: 21.JUN.2021 12:44:37

Emission Mask 16 QAM; 3625 MHz; MIMO A.

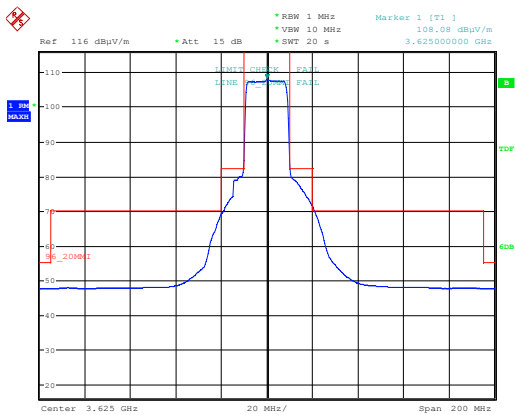


Date: 21.JUN.2021 12:59:06

Emission Mask 16 QAM; 3625 MHz; MIMO B.

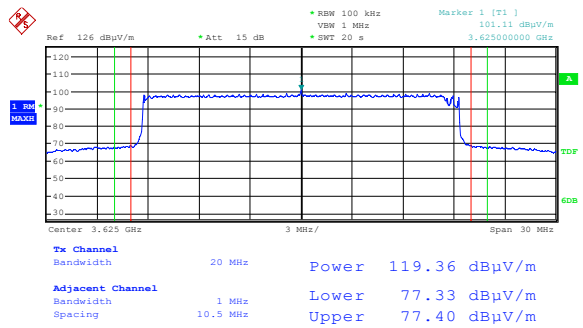


Emission Mask 16 QAM; 3625 MHz; MIMO B
Integration Method.

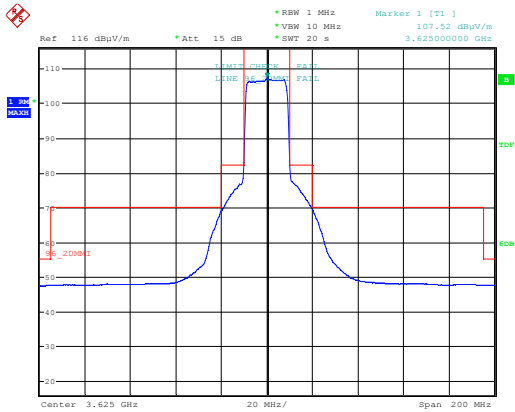


Date: 21.JUN.2021 12:56:15

Emission Mask 64 QAM; 3625 MHz; MIMO A.

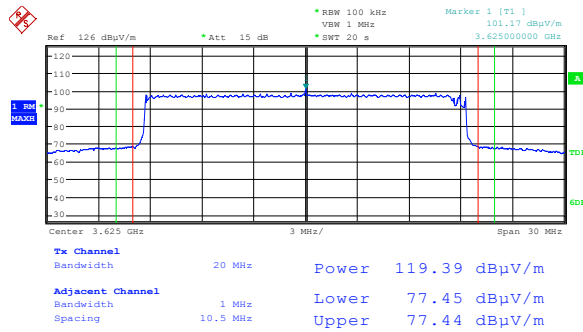


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

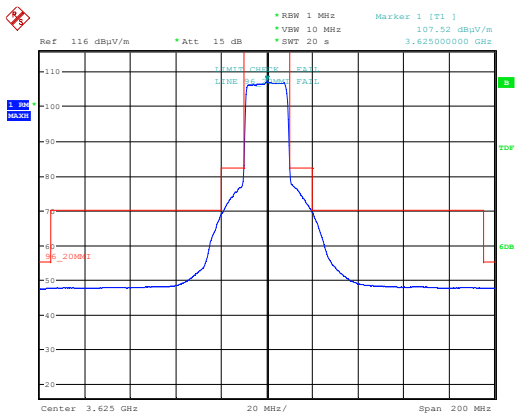


Date: 21.JUN.2021 12:59:36

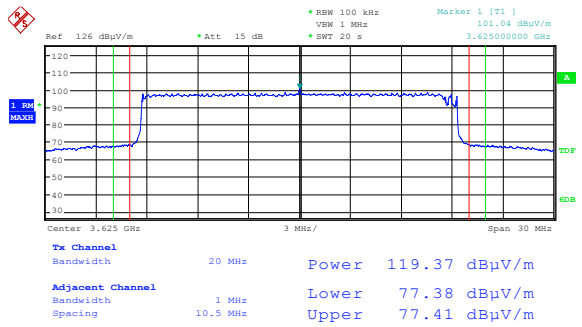
Emission Mask 64 QAM; 3625 MHz; MIMO B.



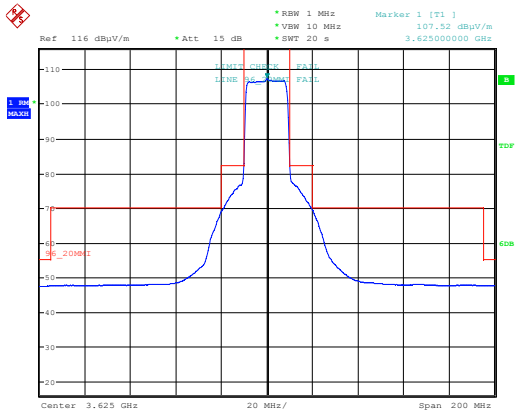
Emission Mask 64 QAM; 3625 MHz; MIMO B
Integration Method.



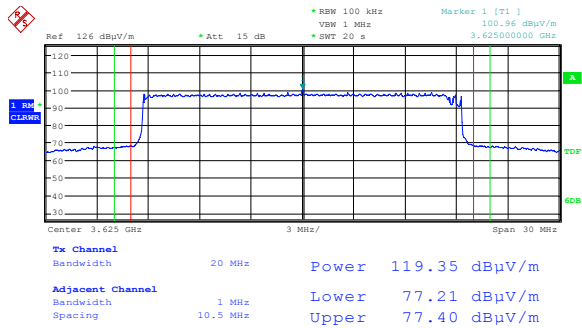
Date: 21.JUN.2021 12:56:51
Emission Mask 256 QAM; 3625 MHz; MIMO A.



Emission Mask 256 QAM; 3625 MHz; MIMO A
Integration Method.



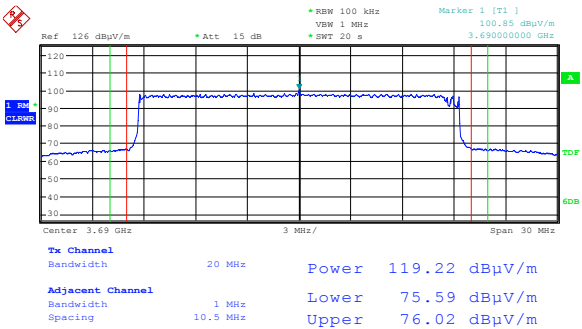
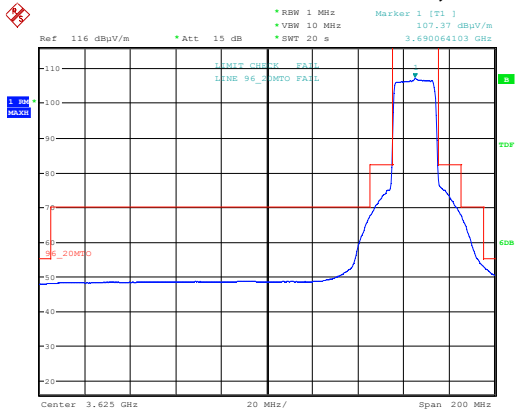
Date: 21.JUN.2021 13:00:13
Emission Mask 256 QAM; 3625 MHz; MIMO B.



Emission Mask 256 QAM; 3625 MHz; MIMO B
Integration Method.

Frequency: 3625 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.38	Lower Channel	N/A	77.50	82.24	Pass
			Upper Channel	N/A	77.42		Pass
	16 QAM	119.34	Lower Channel	N/A	77.24		Pass
			Upper Channel	N/A	77.38		Pass
	64 QAM	119.36	Lower Channel	N/A	77.33		Pass
			Upper Channel	N/A	77.40		Pass
	256 QAM	119.37	Lower Channel	N/A	77.38		Pass
			Upper Channel	N/A	77.41		Pass
B	QPSK	119.38	Lower Channel	N/A	77.44		Pass
			Upper Channel	N/A	77.42		Pass
	16 QAM	119.38	Lower Channel	N/A	77.44		Pass
			Upper Channel	N/A	77.44		Pass
	64 QAM	119.39	Lower Channel	N/A	77.45		Pass
			Upper Channel	N/A	77.44		Pass
	256 QAM	119.35	Lower Channel	N/A	77.21		Pass
			Upper Channel	N/A	77.40		Pass

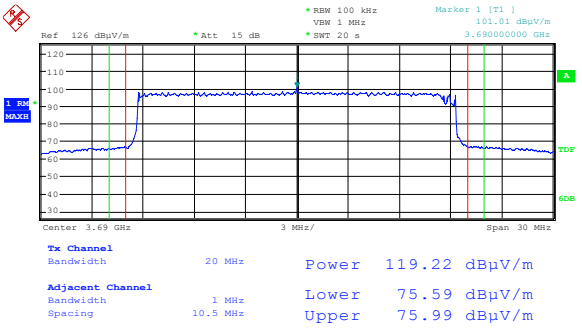
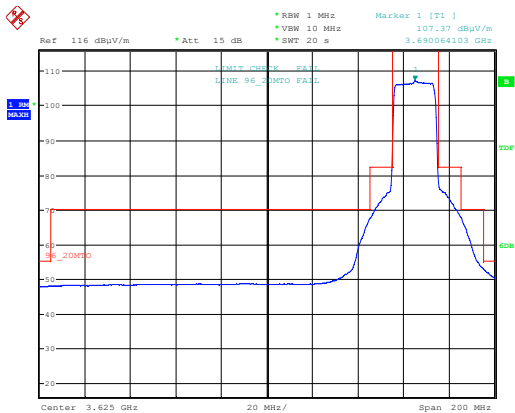
MuMIMO; 20 MHz Bandwidth; Top Channel



Emission Mask QPSK; 3690 MHz; MIMO A
Integration Method.

Date: 21.JUN.2021 14:31:13

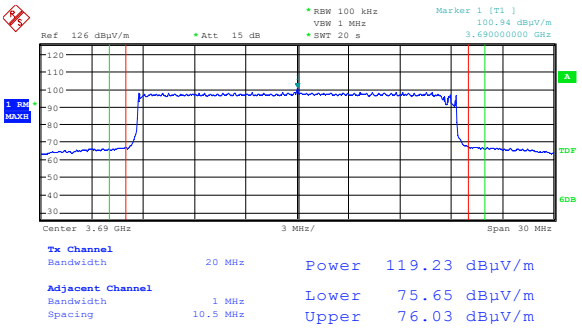
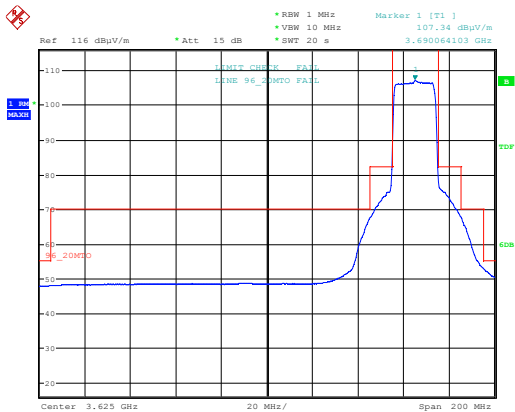
Emission Mask QPSK; 3690 MHz; MIMO A.



Emission Mask QPSK; 3690 MHz; MIMO B
Integration Method.

Date: 21.JUN.2021 14:27:15

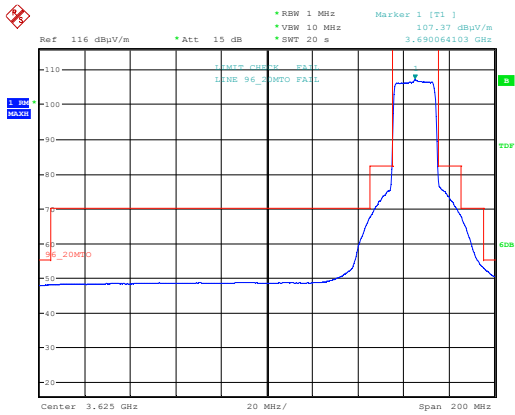
Emission Mask QPSK; 3690 MHz; MIMO B.



Emission Mask 16 QAM; 3690 MHz; MIMO A
Integration Method.

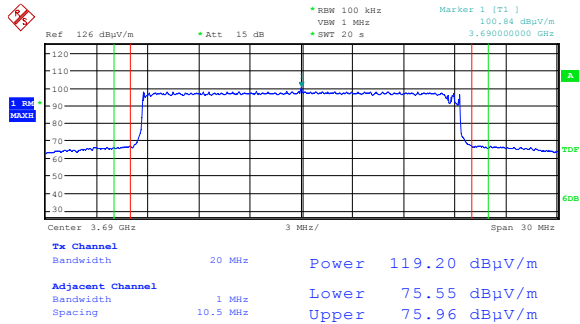
Date: 21.JUN.2021 14:29:44

Emission Mask 16 QAM; 3690 MHz; MIMO A.

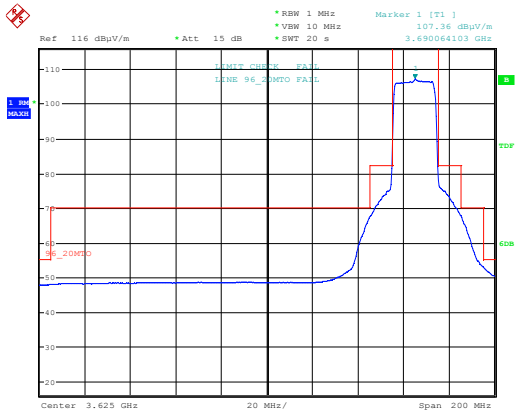


Date: 21.JUN.2021 14:26:40

Emission Mask 16 QAM; 3690 MHz; MIMO B.

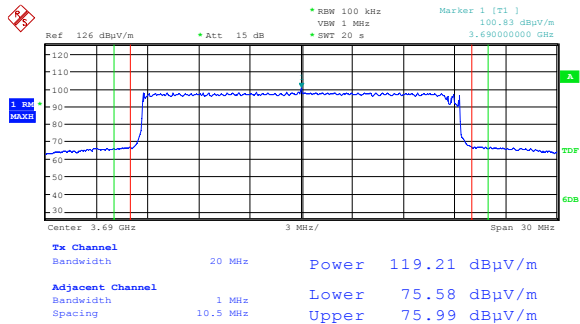


Emission Mask 16 QAM; 3690 MHz; MIMO B
Integration Method.

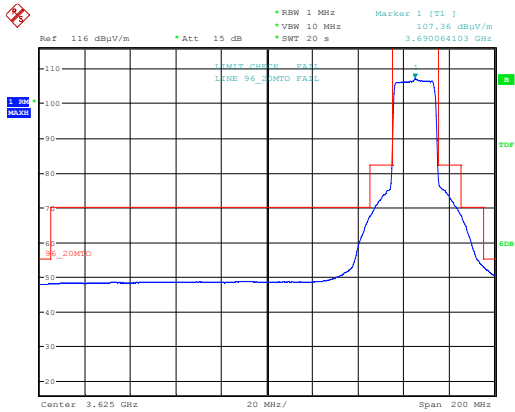


Date: 21.JUN.2021 14:29:05

Emission Mask 64 QAM; 3690 MHz; MIMO A.

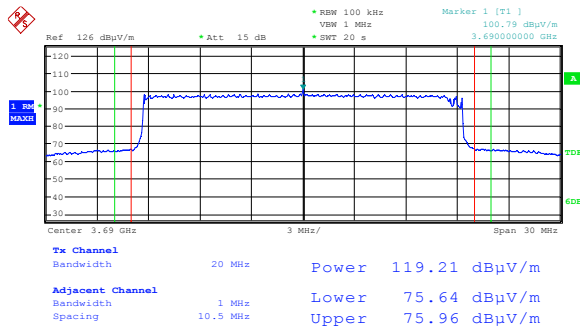


Emission Mask 64 QAM; 3690 MHz; MIMO A
Integration Method.

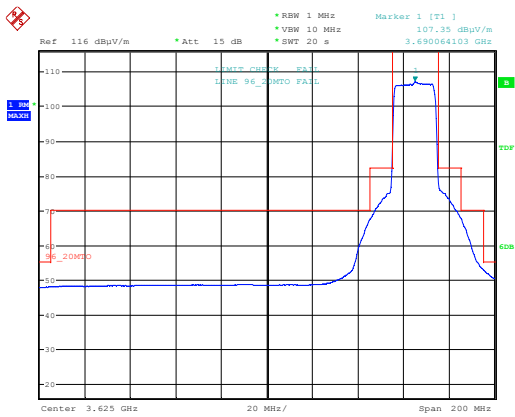


Date: 21.JUN.2021 14:25:19

Emission Mask 64 QAM; 3690 MHz; MIMO B.

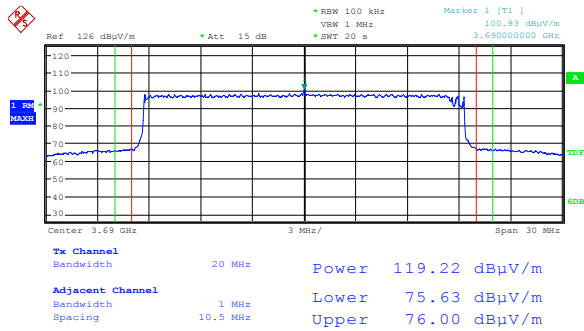


Emission Mask 64 QAM; 3690 MHz; MIMO B
Integration Method.

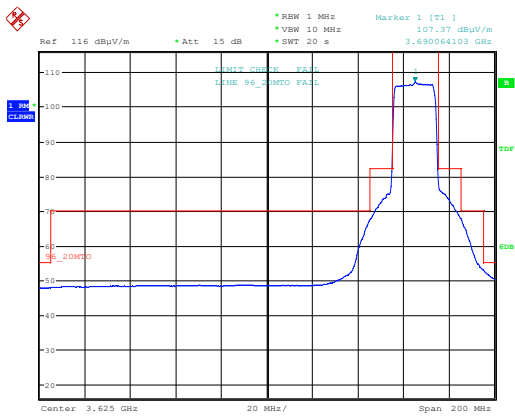


Date: 21.JUN.2021 14:28:23

Emission Mask 256 QAM; 3690 MHz; MIMO A.

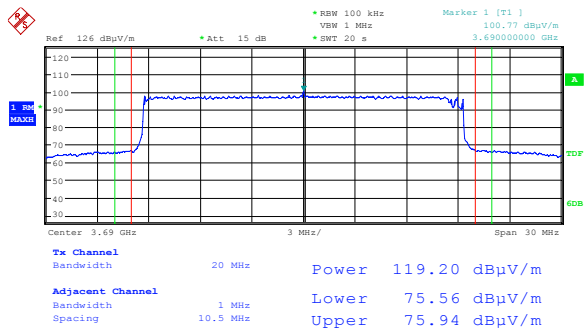


Emission Mask 256 QAM; 3690 MHz; MIMO A
Integration Method.



Date: 21.JUN.2021 14:24:30

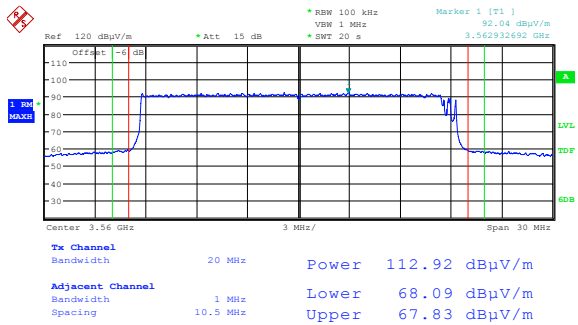
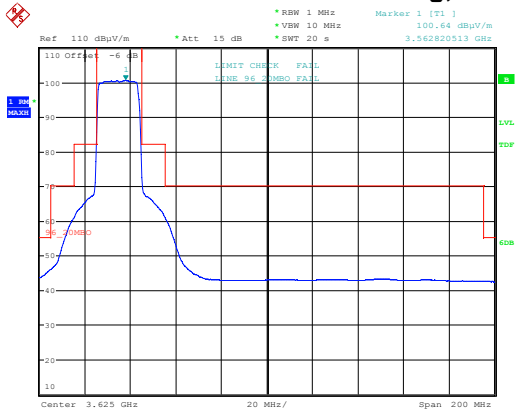
Emission Mask 256 QAM; 3690 MHz; MIMO B.



Emission Mask 256 QAM; 3690 MHz; MIMO B
Integration Method.

Frequency: 3690 MHz; MuMIMO Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	119.22	Lower Channel	N/A	75.59	82.24	Pass
			Upper Channel	N/A	76.02		Pass
	16 QAM	119.23	Lower Channel	N/A	75.65		Pass
			Upper Channel	N/A	76.03		Pass
	64 QAM	119.21	Lower Channel	N/A	75.58		Pass
			Upper Channel	N/A	75.99		Pass
	256 QAM	119.22	Lower Channel	N/A	75.63		Pass
			Upper Channel	N/A	76.00		Pass
B	QPSK	119.22	Lower Channel	N/A	75.59		Pass
			Upper Channel	N/A	75.99		Pass
	16 QAM	119.20	Lower Channel	N/A	75.55		Pass
			Upper Channel	N/A	75.96		Pass
	64 QAM	119.21	Lower Channel	N/A	75.64		Pass
			Upper Channel	N/A	75.96		Pass
	256 QAM	119.20	Lower Channel	N/A	75.56		Pass
			Upper Channel	N/A	75.94		Pass

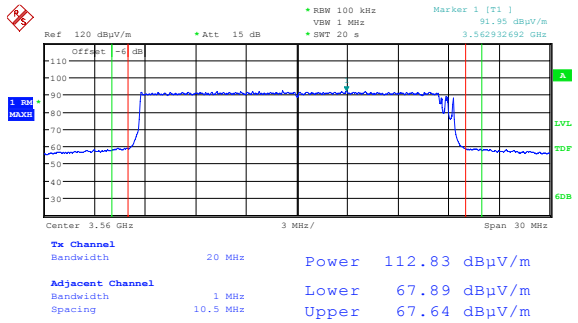
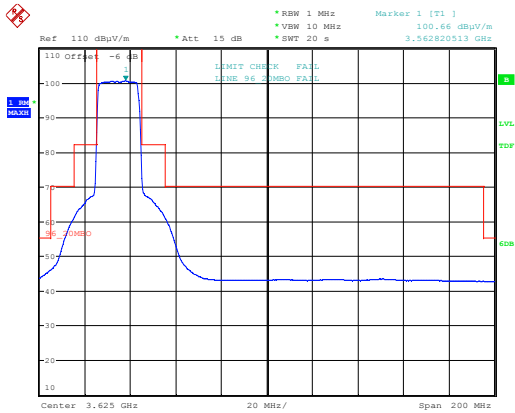
Beamforming; 20 MHz Bandwidth; Bottom Channel



Emission Mask QPSK; 3560 MHz; MIMO A
Integration Method.

Date: 21.JUN.2021 10:03:56

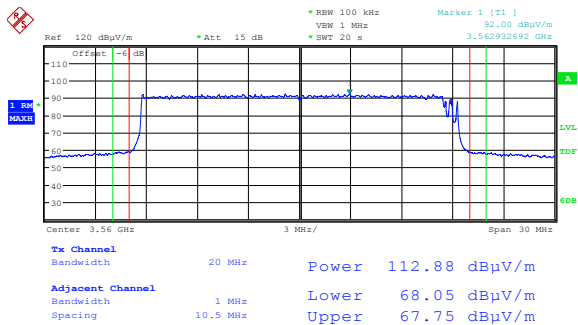
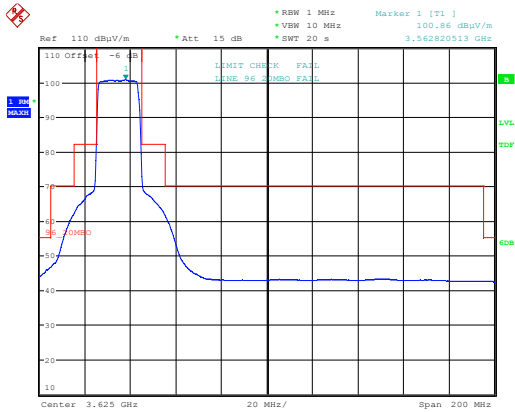
Emission Mask QPSK; 3560 MHz; MIMO A.



Emission Mask QPSK; 3560 MHz; MIMO B
Integration Method.

Date: 21.JUN.2021 09:57:43

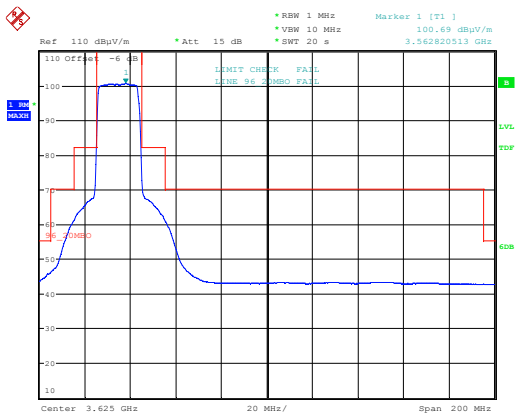
Emission Mask QPSK; 3560 MHz; MIMO B.



Emission Mask 16 QAM; 3560 MHz; MIMO A
Integration Method.

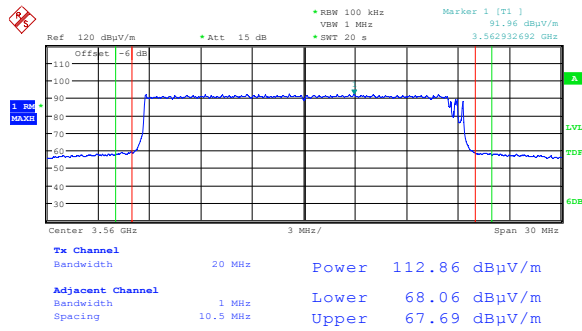
Date: 21.JUN.2021 10:02:30

Emission Mask 16 QAM; 3560 MHz; MIMO A.

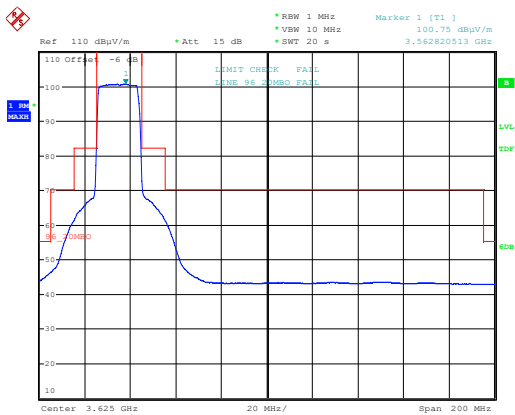


Date: 21.JUN.2021 09:58:22

Emission Mask 256 QAM; 3560 MHz; MIMO A.

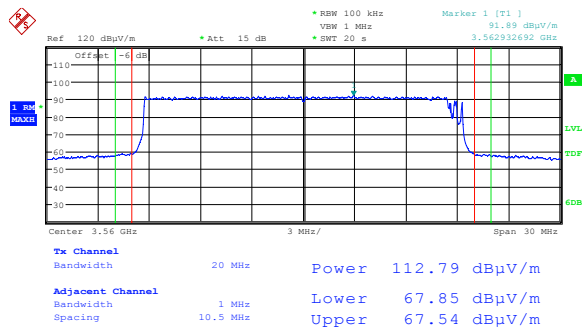


Emission Mask 256 QAM; 3560 MHz; MIMO A
Integration Method.



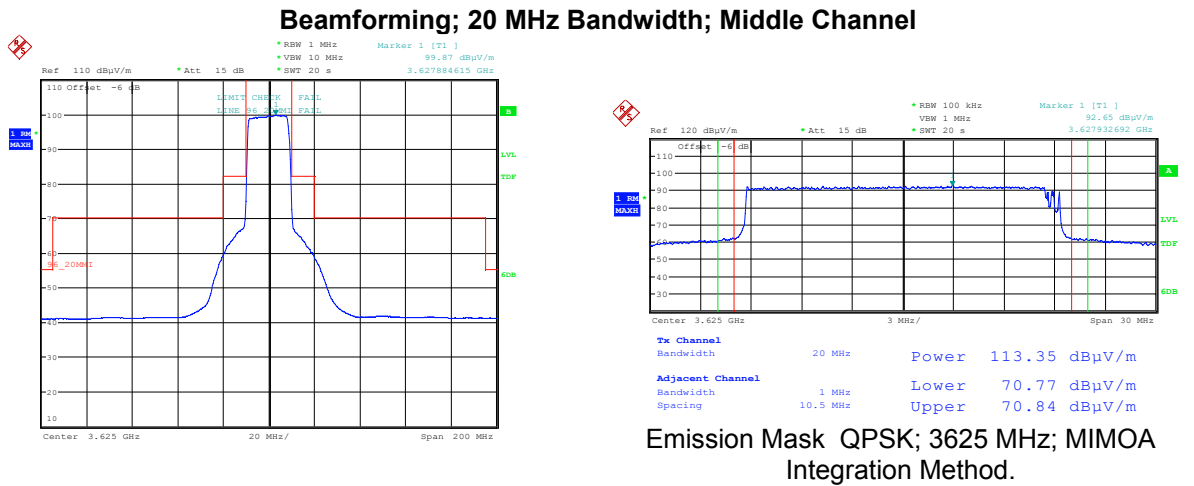
Date: 21.JUN.2021 09:54:31

Emission Mask 256 QAM; 3560 MHz; MIMO B.



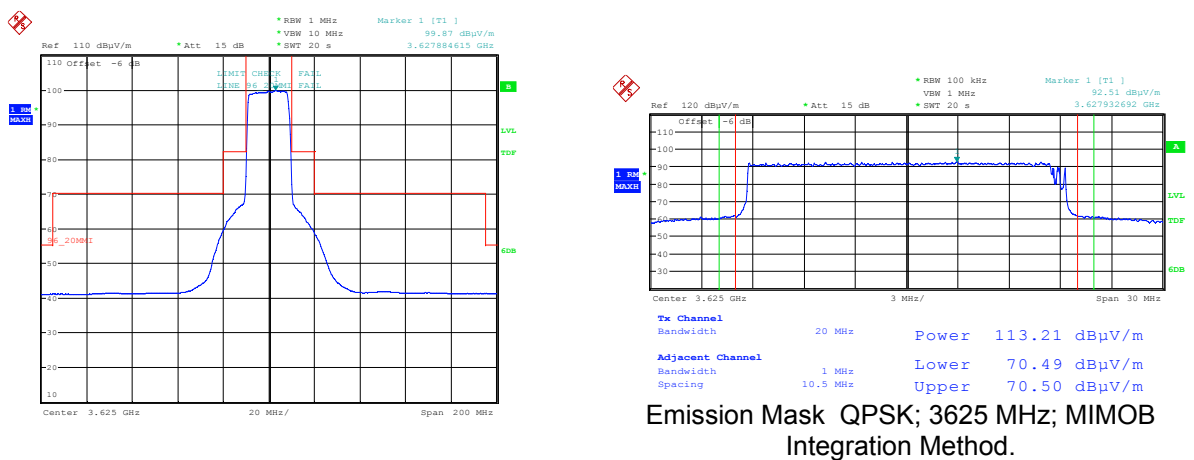
Emission Mask 256 QAM; 3560 MHz; MIMO B
Integration Method.

Frequency: 3560 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	112.92	Lower Channel	N/A	68.09	82.24	Pass
			Upper Channel	N/A	67.83		Pass
	16 QAM	112.88	Lower Channel	N/A	68.05		Pass
			Upper Channel	N/A	67.75		Pass
	64 QAM	112.87	Lower Channel	N/A	68.09		Pass
			Upper Channel	N/A	67.71		Pass
	256 QAM	112.86	Lower Channel	N/A	68.06		Pass
			Upper Channel	N/A	67.69		Pass
B	QPSK	112.83	Lower Channel	N/A	67.89		Pass
			Upper Channel	N/A	67.64		Pass
	16 QAM	112.81	Lower Channel	N/A	67.85		Pass
			Upper Channel	N/A	67.59		Pass
	64 QAM	112.78	Lower Channel	N/A	67.94		Pass
			Upper Channel	N/A	67.54		Pass
	256 QAM	112.79	Lower Channel	N/A	67.85		Pass
			Upper Channel	N/A	67.54		Pass



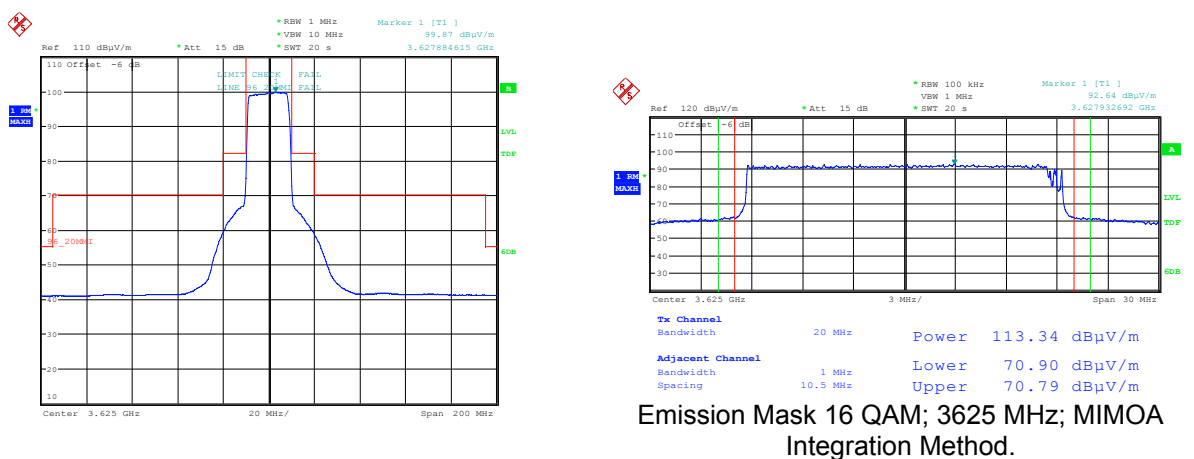
Date: 18.JUN.2021 16:20:53

Emission Mask QPSK; 3625 MHz; MIMO-A.



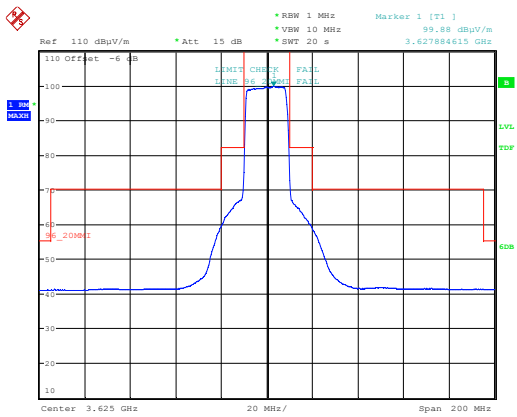
Date: 18.JUN.2021 16:24:01

Emission Mask QPSK; 3625 MHz; MIMOB.



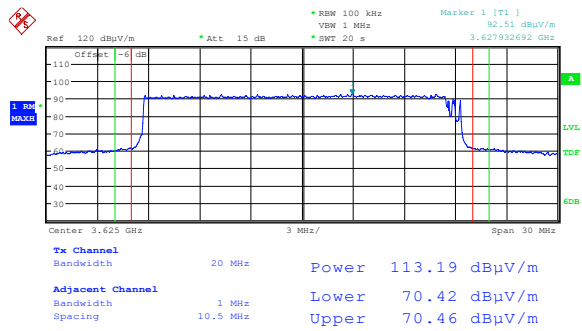
Date: 18.JUN.2021 16:22:02

Emission Mask 16 QAM; 3625 MHz; MIMO-A.

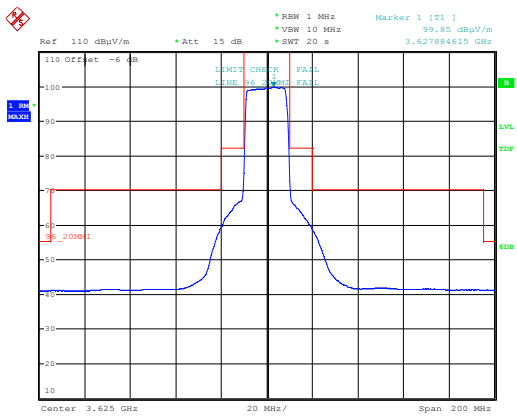


Date: 18.JUN.2021 16:24:56

Emission Mask 16 QAM; 3625 MHz; MIMO B.

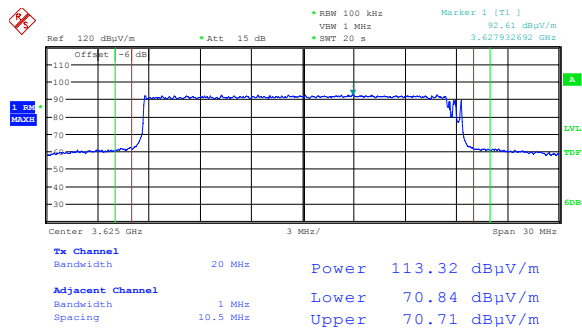


Emission Mask 16 QAM; 3625 MHz; MIMO B
Integration Method.

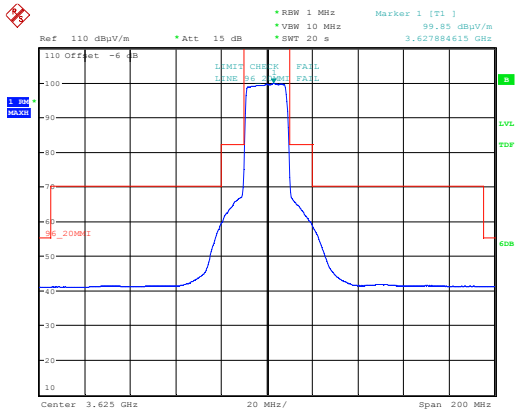


Date: 18.JUN.2021 16:23:16

Emission Mask 64 QAM; 3625 MHz; MIMO A.

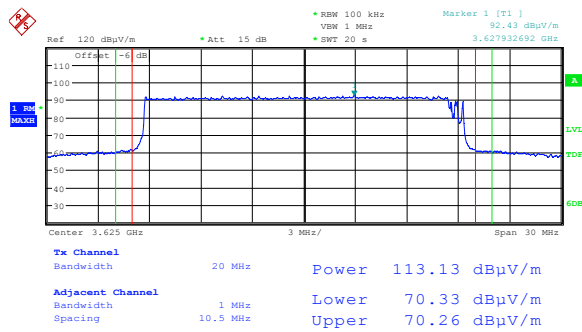


Emission Mask 64 QAM; 3625 MHz; MIMO A
Integration Method.

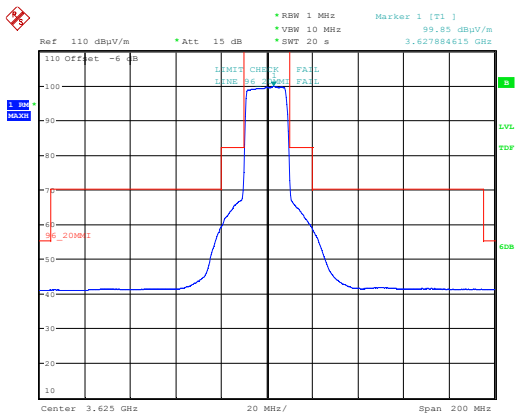


Date: 18.JUN.2021 16:25:54

Emission Mask 64 QAM; 3625 MHz; MIMO B.

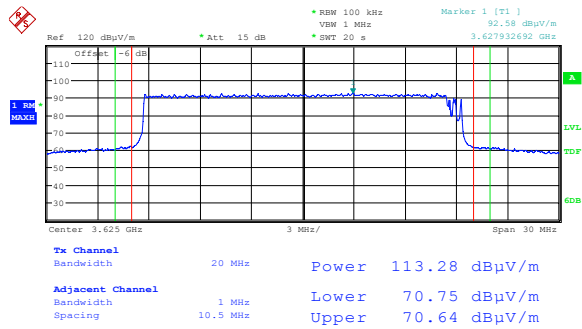


Emission Mask 64 QAM; 3625 MHz; MIMO B
Integration Method.

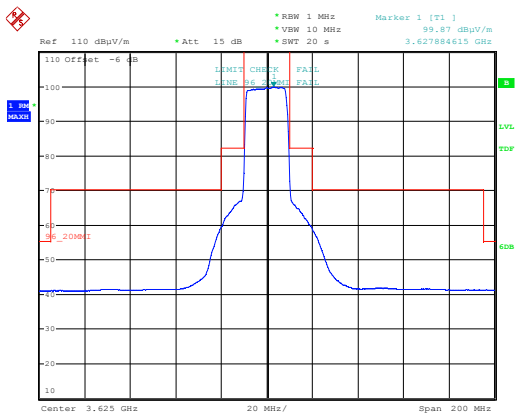


Date: 18.JUN.2021 16:19:53

Emission Mask 256 QAM; 3625 MHz; MIMO A.

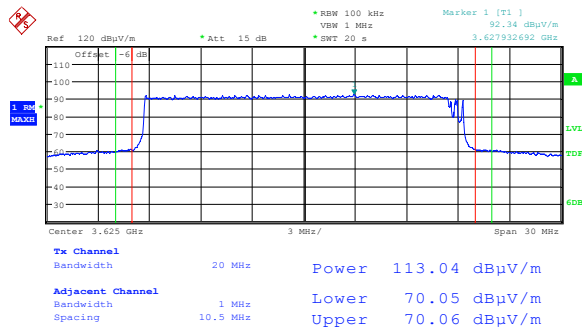


Emission Mask 256 QAM; 3625 MHz; MIMO A
Integration Method.



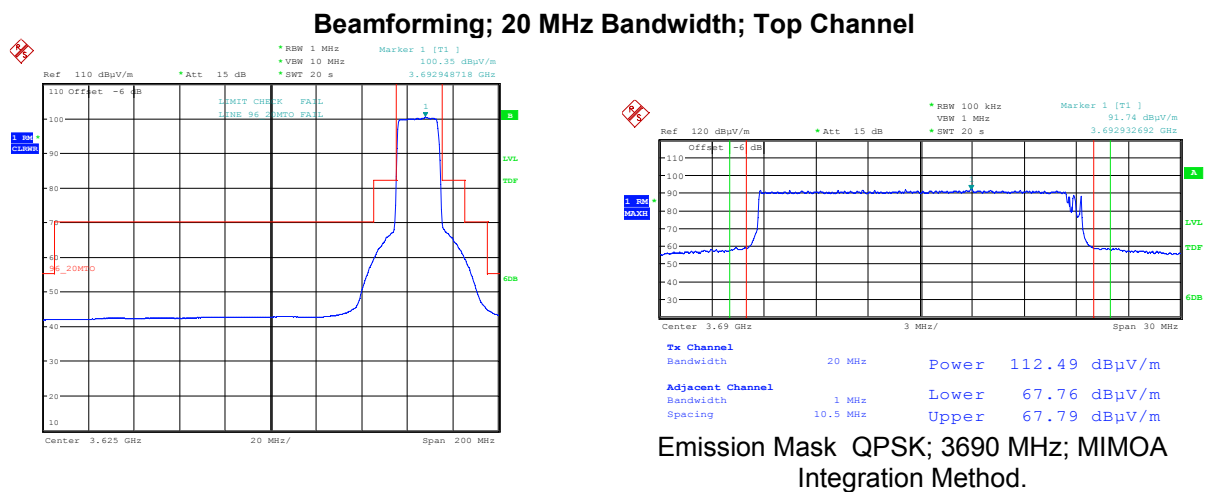
Date: 18.JUN.2021 16:26:42

Emission Mask 256 QAM; 3625 MHz; MIMO B.

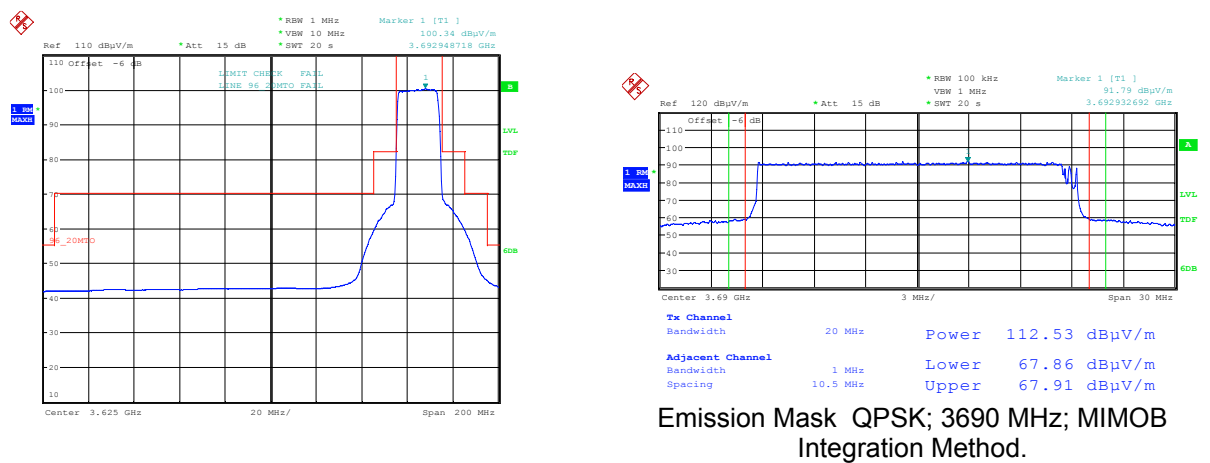


Emission Mask 256 QAM; 3625 MHz; MIMO B
Integration Method.

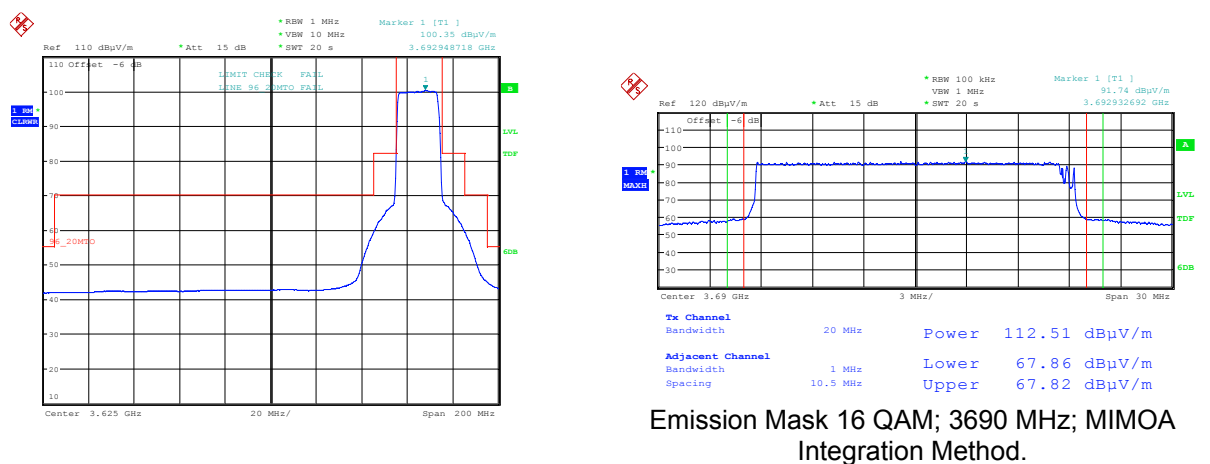
Frequency: 3625 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	113.35	Lower Channel	N/A	70.77	82.24	Pass
			Upper Channel	N/A	70.84		Pass
	16 QAM	113.34	Lower Channel	N/A	70.90		Pass
			Upper Channel	N/A	70.79		Pass
	64 QAM	113.32	Lower Channel	N/A	70.84		Pass
			Upper Channel	N/A	70.71		Pass
	256 QAM	113.28	Lower Channel	N/A	70.75		Pass
			Upper Channel	N/A	70.64		Pass
B	QPSK	113.21	Lower Channel	N/A	70.49		Pass
			Upper Channel	N/A	70.50		Pass
	16 QAM	113.19	Lower Channel	N/A	70.42		Pass
			Upper Channel	N/A	70.46		Pass
	64 QAM	113.13	Lower Channel	N/A	70.33		Pass
			Upper Channel	N/A	70.26		Pass
	256 QAM	113.04	Lower Channel	N/A	70.05		Pass
			Upper Channel	N/A	70.06		Pass



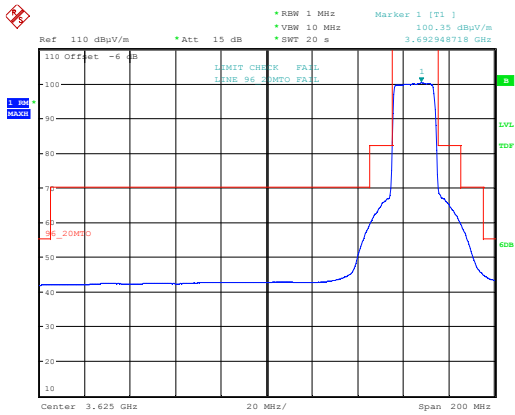
Emission Mask QPSK; 3690 MHz; MIMO-A.



Emission Mask QPSK; 3690 MHz; MIMOB.

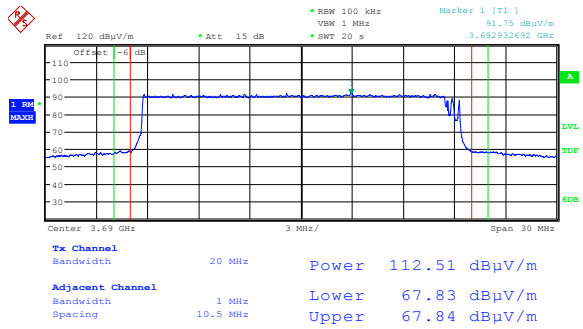


Emission Mask 16 QAM; 3690 MHz; MIMO-A.

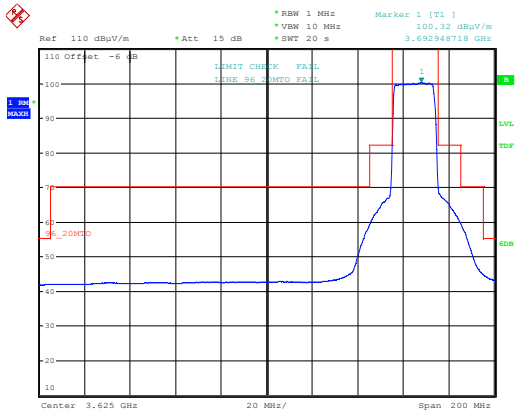


Date: 21.JUN.2021 10:21:36

Emission Mask 256 QAM; 3690 MHz; MIMO A.

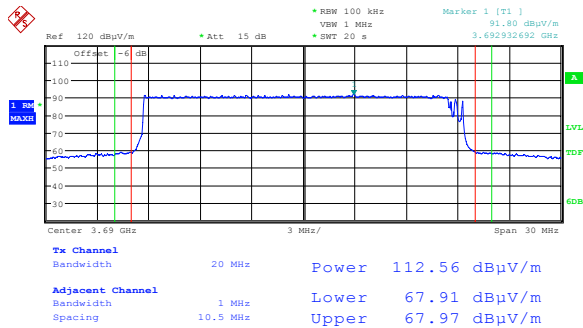


Emission Mask 256 QAM; 3690 MHz; MIMO B
Integration Method.



Date: 21.JUN.2021 10:26:52

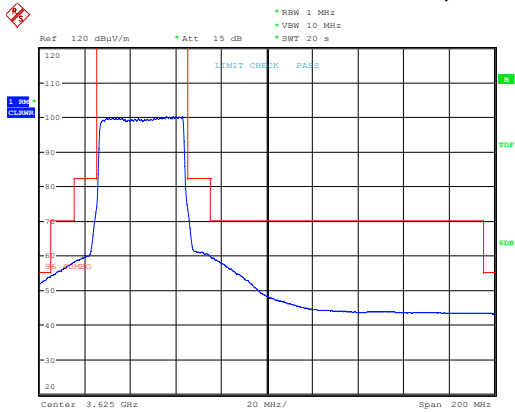
Emission Mask 256 QAM; 3690 MHz; MIMO B.



Emission Mask 256 QAM; 3690 MHz; MIMO B
Integration Method.

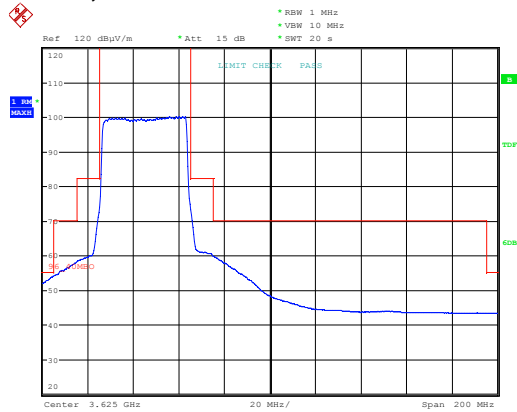
Frequency: 3690 MHz; Beamforming Mode;							
MIMO	Modulation Mode	Channel power (dBuV/m)	Integration channel	Integration channel level (dBc)	Integration channel level (dBuV/m)	Limit (dBuV/m)	Verdict
A	QPSK	112.49	Lower Channel	N/A	67.76	82.24	Pass
			Upper Channel	N/A	67.79		Pass
	16 QAM	112.51	Lower Channel	N/A	67.86		Pass
			Upper Channel	N/A	67.82		Pass
	64 QAM	112.49	Lower Channel	N/A	67.71		Pass
			Upper Channel	N/A	67.82		Pass
	256 QAM	112.51	Lower Channel	N/A	67.83		Pass
			Upper Channel	N/A	67.84		Pass
B	QPSK	112.53	Lower Channel	N/A	67.86		Pass
			Upper Channel	N/A	67.91		Pass
	16 QAM	112.54	Lower Channel	N/A	67.88		Pass
			Upper Channel	N/A	67.92		Pass
	64 QAM	112.54	Lower Channel	N/A	67.84		Pass
			Upper Channel	N/A	67.95		Pass
	256 QAM	112.56	Lower Channel	N/A	67.91		Pass
			Upper Channel	N/A	67.97		Pass

Sector Mode; 40 MHz bandwidth; Bottom channel



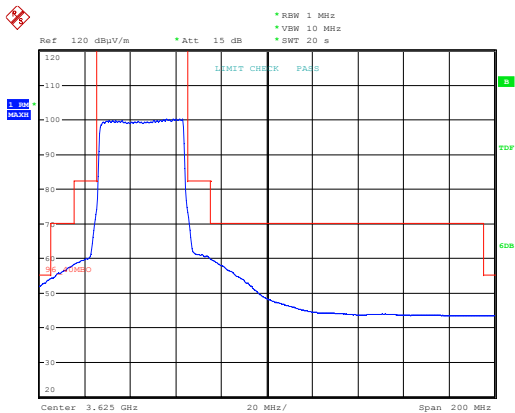
Date: 17.JUN.2021 15:41:02

Emission Mask QPSK; 3570 MHz; MIMO-A.



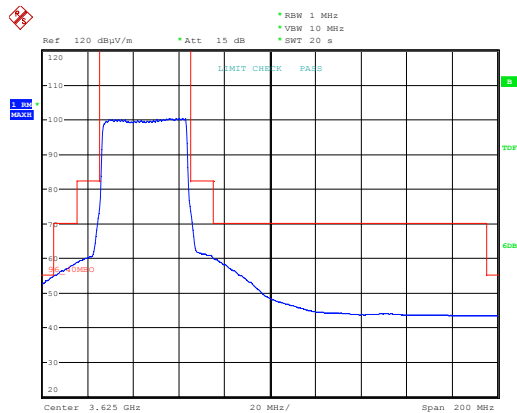
Date: 17.JUN.2021 15:58:32

Emission Mask QPSK; 3570 MHz; MIMO-B.



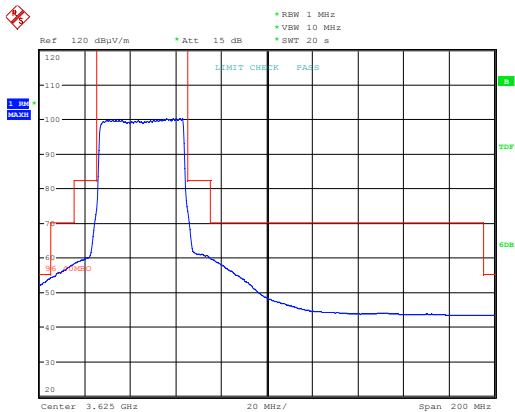
Date: 17.JUN.2021 15:42:01

Emission Mask 16 QAM; 3570 MHz; MIMO-A.



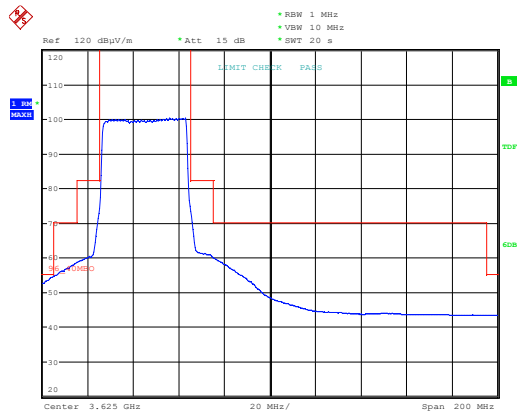
Date: 17.JUN.2021 15:59:14

Emission Mask 16 QAM; 3570 MHz; MIMO-B.



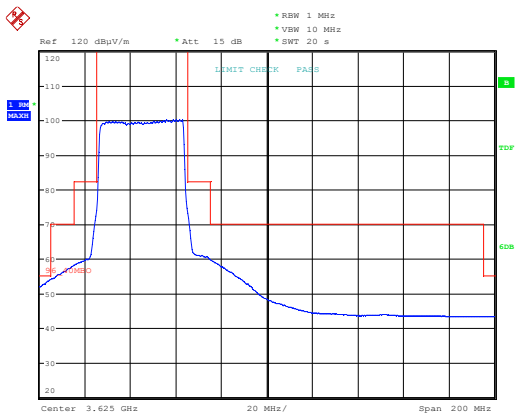
Date: 17.JUN.2021 15:50:57

Emission Mask 64 QAM; 3570 MHz; MIMO-A.



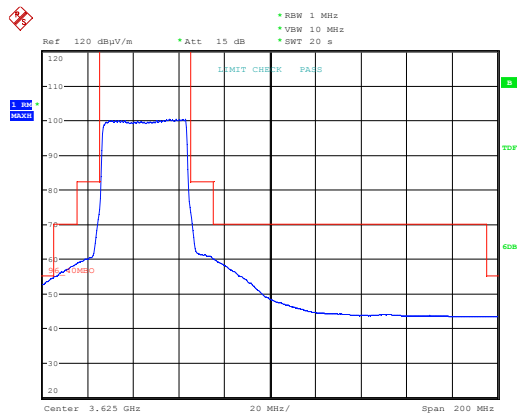
Date: 17.JUN.2021 16:00:00

Emission Mask 64 QAM; 3570 MHz; MIMO-B.



Date: 17.JUN.2021 15:52:24

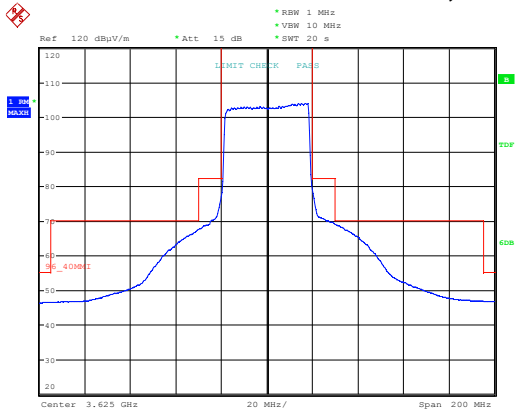
Emission Mask 256 QAM; 3570 MHz; MIMO A.



Date: 17.JUN.2021 16:00:42

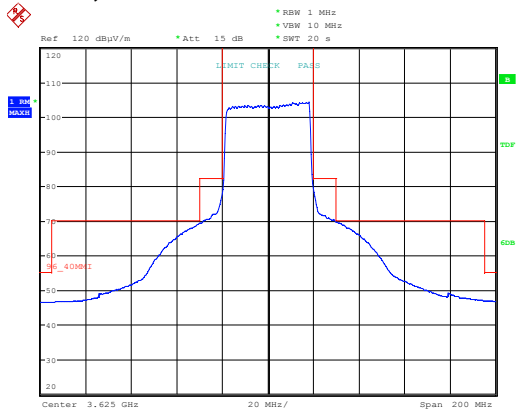
Emission Mask 256 QAM; 3570 MHz; MIMO B.

Sector Mode; 40 MHz bandwidth; Middle channel



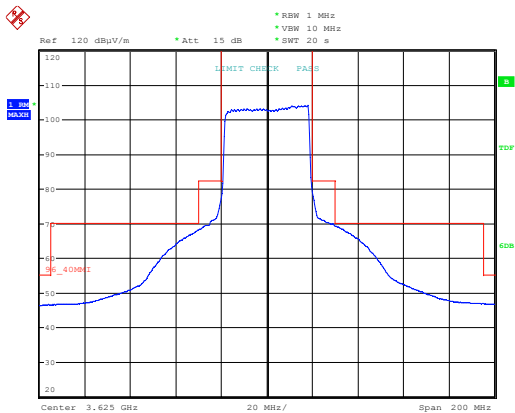
Date: 17.JUN.2021 16:22:11

Emission Mask QPSK; 3625 MHz; MIMO-A.



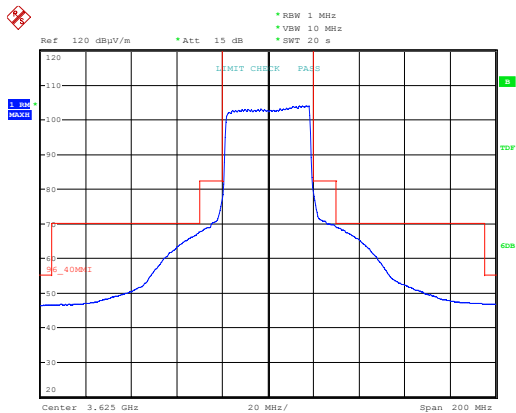
Date: 17.JUN.2021 16:29:30

Emission Mask QPSK; 3625 MHz; MIMO-B.



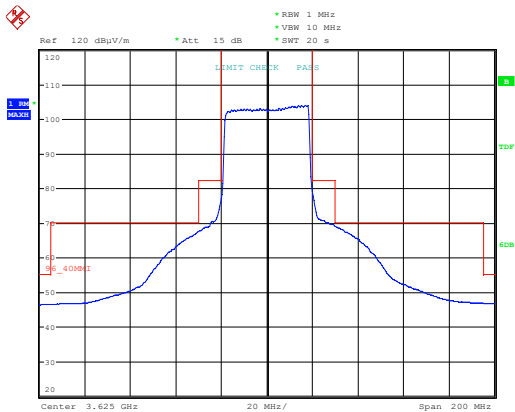
Date: 17.JUN.2021 16:22:49

Emission Mask 16 QAM; 3625 MHz; MIMO-A.



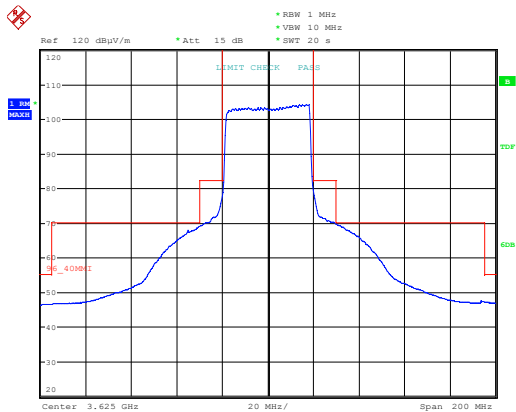
Date: 17.JUN.2021 16:32:47

Emission Mask 16 QAM; 3625 MHz; MIMO-B.



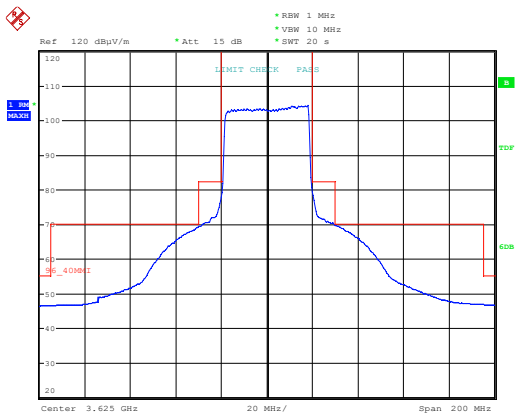
Date: 17.JUN.2021 16:24:14

Emission Mask 64 QAM; 3625 MHz; MIMO-A.



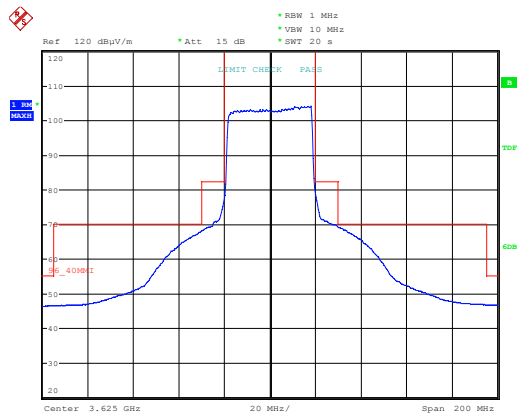
Date: 17.JUN.2021 16:33:28

Emission Mask 64 QAM; 3625 MHz; MIMO-B.



Date: 17.JUN.2021 16:27:36

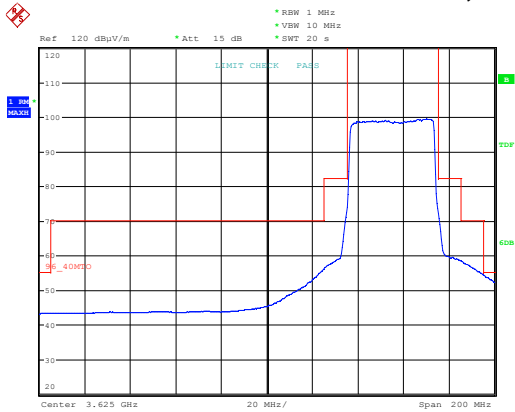
Emission Mask 256 QAM; 3625 MHz; MIMO A.



Date: 17.JUN.2021 16:34:37

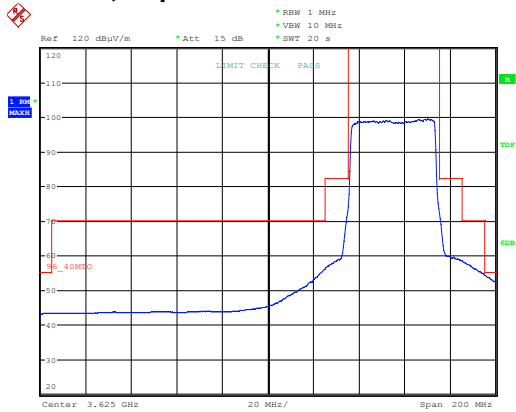
Emission Mask 256 QAM; 3625 MHz; MIMO B.

Sector Mode; 40 MHz bandwidth; Top channel



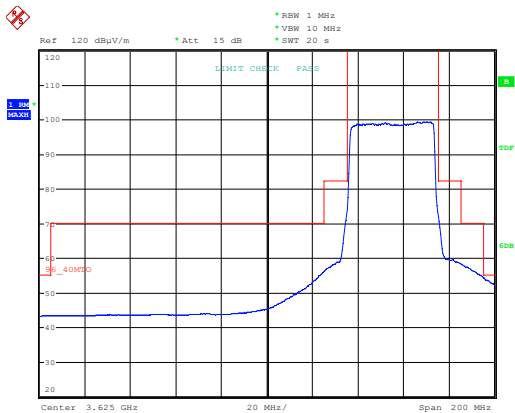
Date: 17.JUN.2021 16:10:49

Emission Mask QPSK; 3680 MHz; MIMO.A.



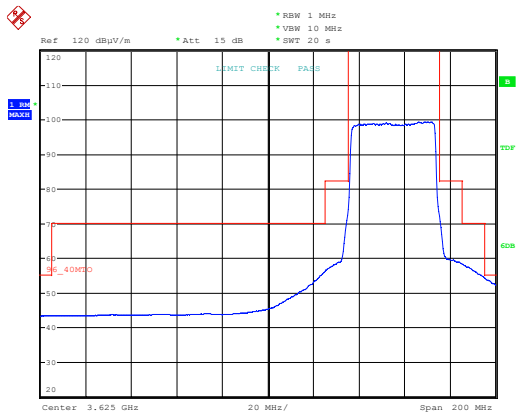
Date: 17.JUN.2021 16:07:03

Emission Mask QPSK; 3680 MHz; MIMOB.



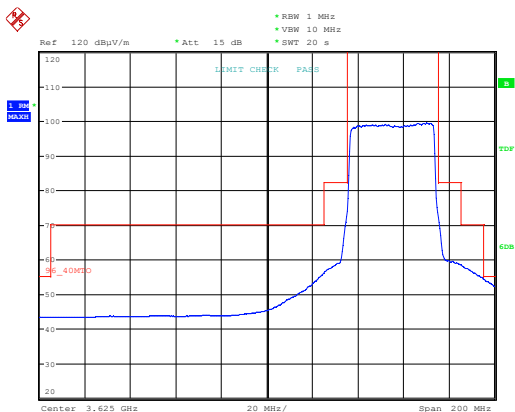
Date: 17.JUN.2021 16:09:34

Emission Mask 16 QAM; 3680 MHz; MIMO.A.



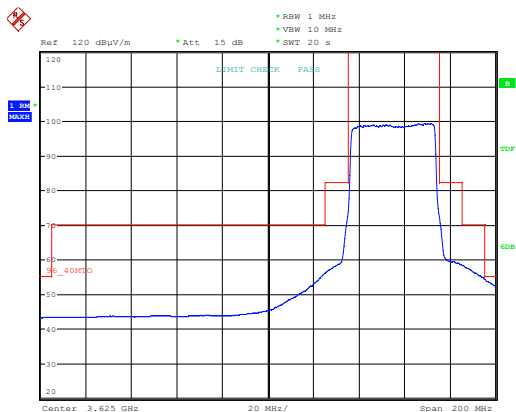
Date: 17.JUN.2021 16:06:02

Emission Mask 16 QAM; 3680 MHz; MIMOB.



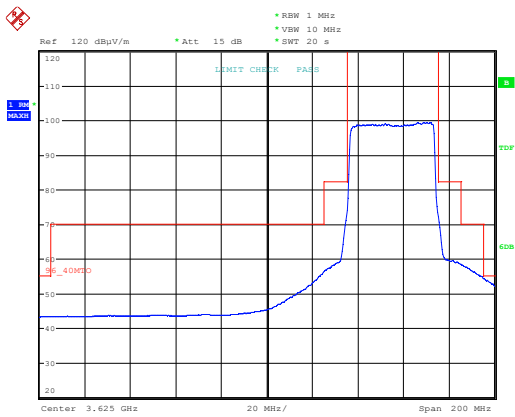
Date: 17.JUN.2021 16:08:40

Emission Mask 64 QAM; 3680 MHz; MIMO.A.



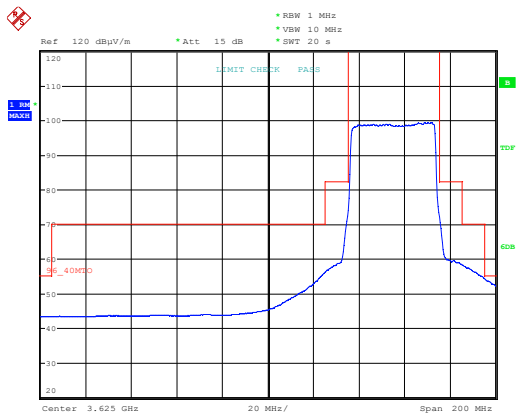
Date: 17.JUN.2021 16:05:19

Emission Mask 64 QAM; 3680 MHz; MIMOB.



Date: 17.JUN.2021 16:07:43

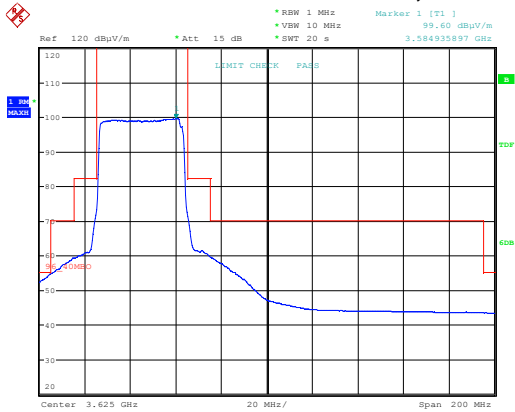
Emission Mask 256 QAM; 3680 MHz; MIMO A.



Date: 17.JUN.2021 16:04:09

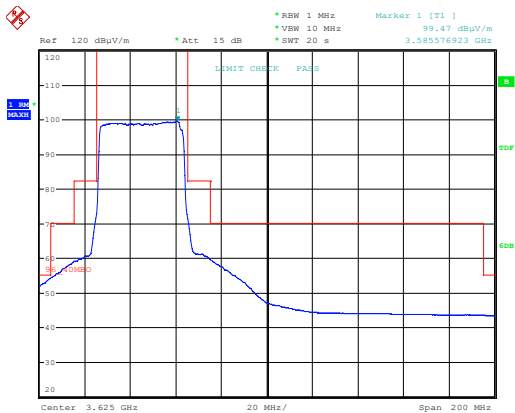
Emission Mask 256 QAM; 3680 MHz; MIMO B.

MuMIMO; 40 MHz Bandwidth; Bottom Channel



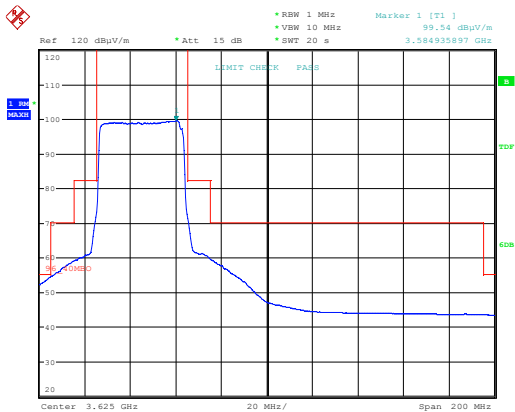
Date: 18.JUN.2021 11:14:34

Emission Mask QPSK; 3570 MHz; MIMO.A.



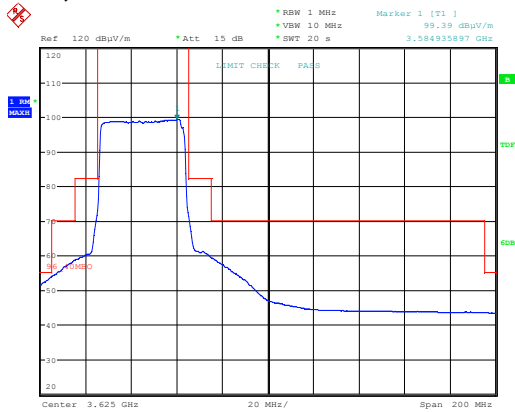
Date: 18.JUN.2021 11:13:57

Emission Mask 16 QAM; 3570 MHz; MIMO.A.



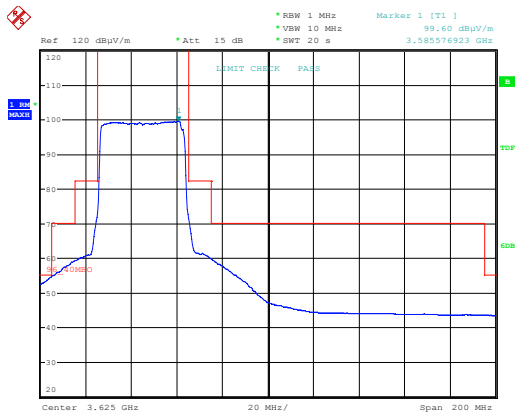
Date: 18.JUN.2021 11:13:11

Emission Mask 64 QAM; 3570 MHz; MIMO.A.



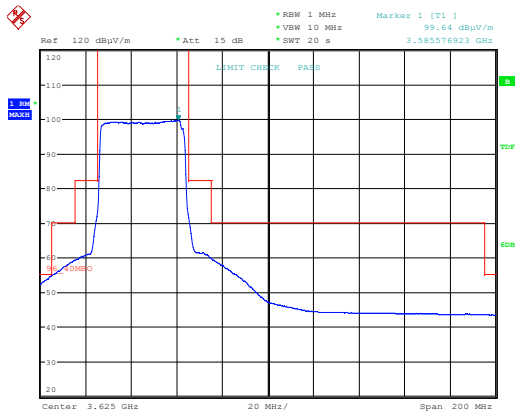
Date: 18.JUN.2021 11:10:57

Emission Mask QPSK; 3570 MHz; MIMOB.



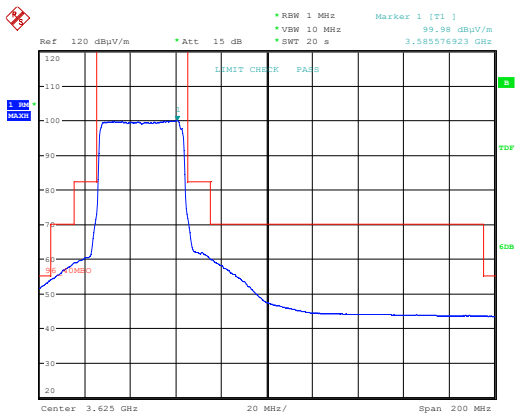
Date: 18.JUN.2021 11:09:34

Emission Mask 16 QAM; 3570 MHz; MIMOB.



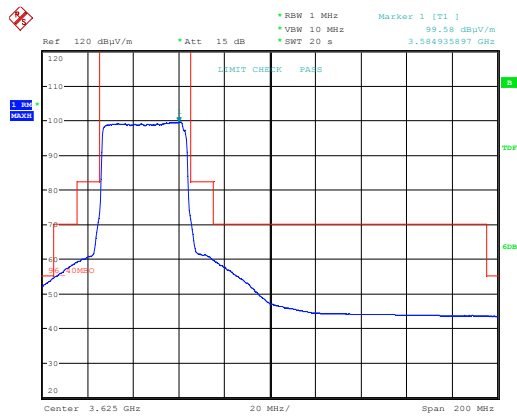
Date: 18.JUN.2021 11:06:39

Emission Mask 64 QAM; 3570 MHz; MIMOB.



Date: 18.JUN.2021 11:11:49

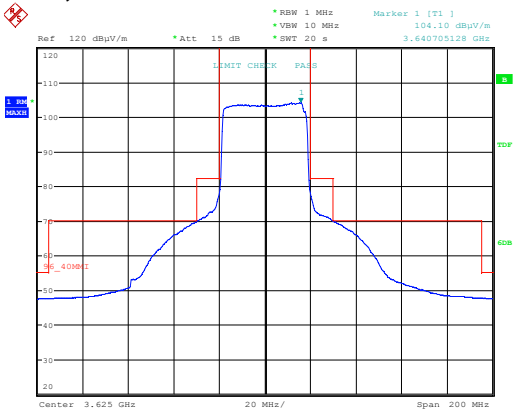
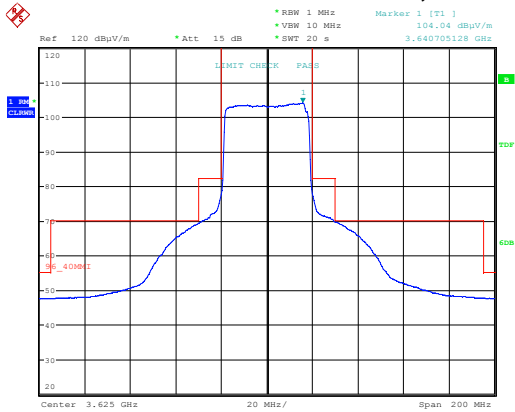
Emission Mask 256 QAM; 3570 MHz; MIMO A.



Date: 18.JUN.2021 11:07:43

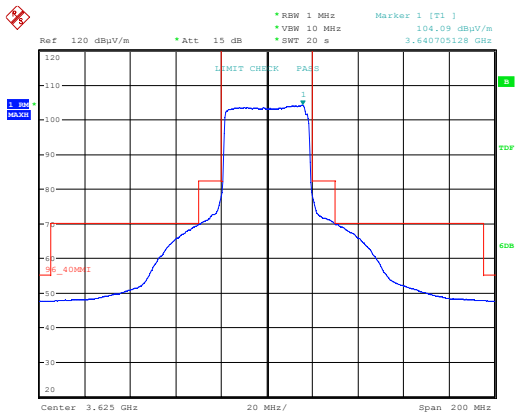
Emission Mask 256 QAM; 3570 MHz; MIMO B.

MuMIMO; 40 MHz Bandwidth; Middle Channel



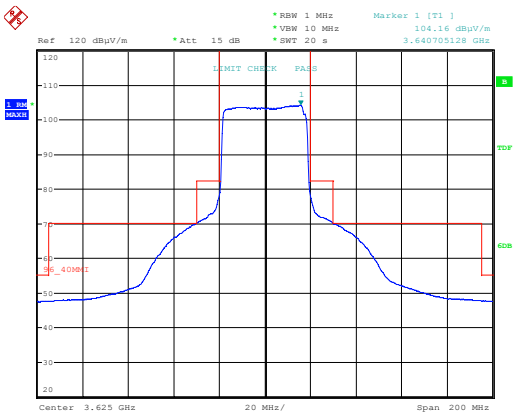
Date: 18.JUN.2021 11:17:42

Emission Mask QPSK; 3625 MHz; MIMO.A.



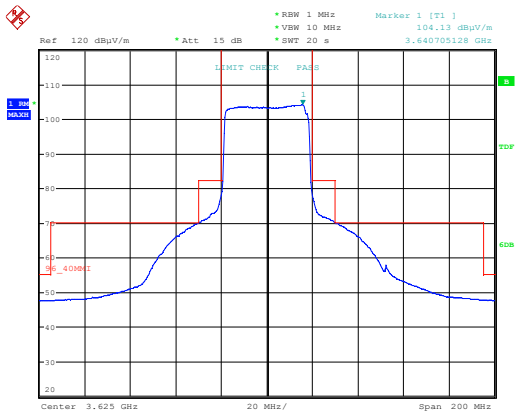
Date: 18.JUN.2021 11:23:50

Emission Mask QPSK; 3625 MHz; MIMOB.



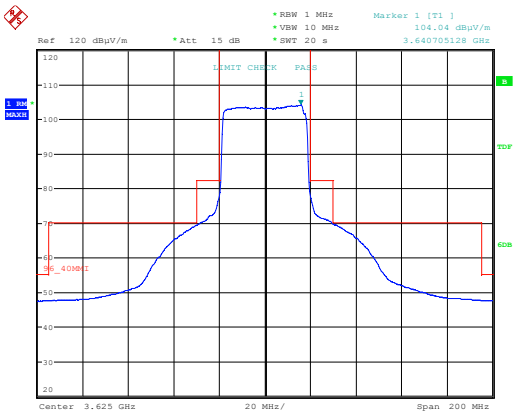
Date: 18.JUN.2021 11:18:41

Emission Mask 16 QAM; 3625 MHz; MIMO.A.



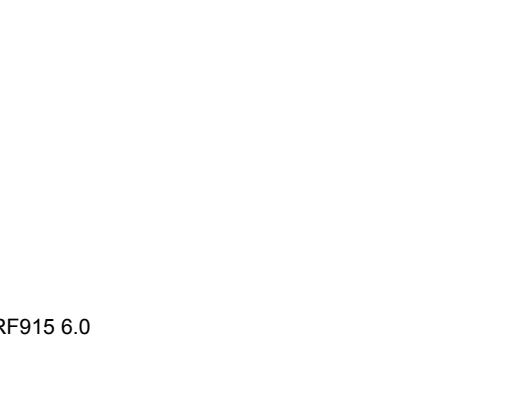
Date: 18.JUN.2021 11:25:20

Emission Mask 16 QAM; 3625 MHz; MIMOB.



Date: 18.JUN.2021 11:20:30

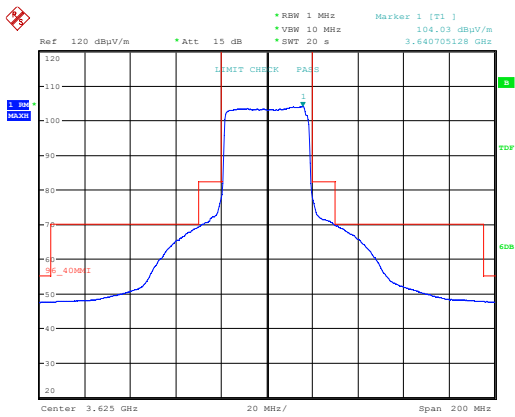
Emission Mask 64 QAM; 3625 MHz; MIMO.A.



Date: 18.JUN.2021 11:26:17

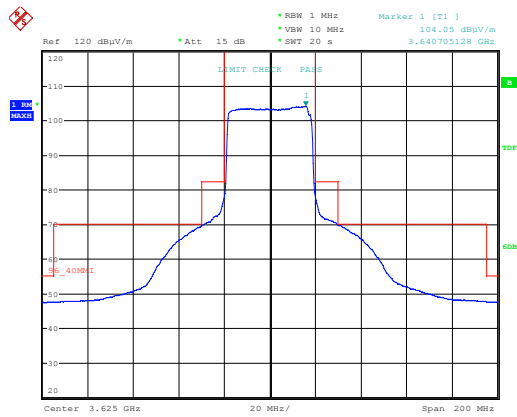
Emission Mask 64 QAM; 3625 MHz; MIMOB.





Date: 18.JUN.2021 11:23:03

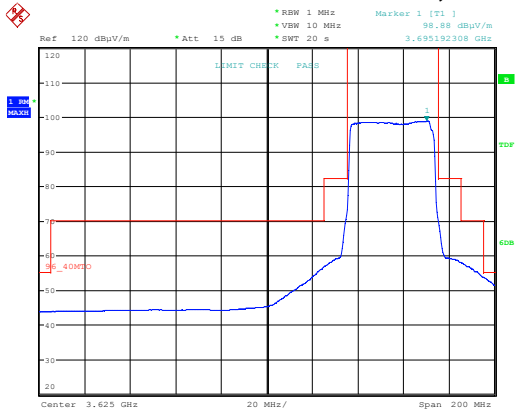
Emission Mask 256 QAM; 3625 MHz; MIMO A.



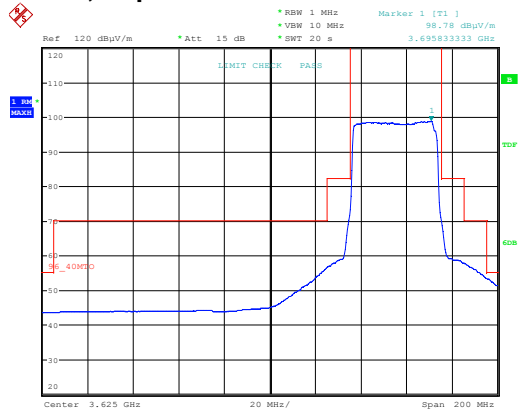
Date: 18.JUN.2021 11:27:07

Emission Mask 256 QAM; 3625 MHz; MIMO B.

MuMIMO; 40 MHz Bandwidth; Top Channel



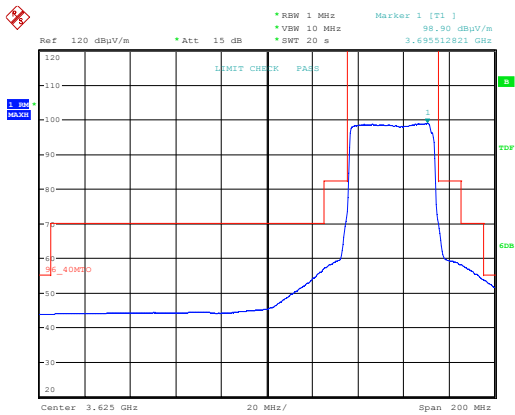
Date: 18.JUN.2021 10:03:56



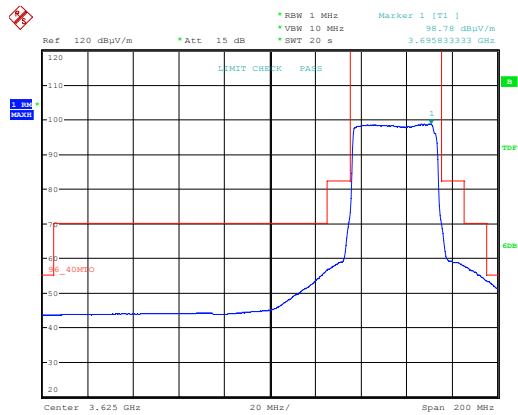
Date: 18.JUN.2021 10:41:36

Emission Mask QPSK; 3680 MHz; MIMO.A.

Emission Mask QPSK; 3680 MHz; MIMOB.



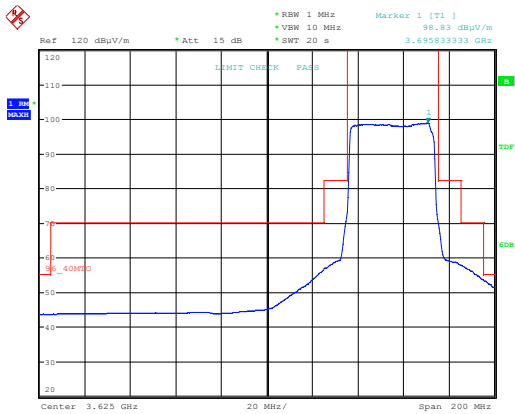
Date: 18.JUN.2021 10:34:45



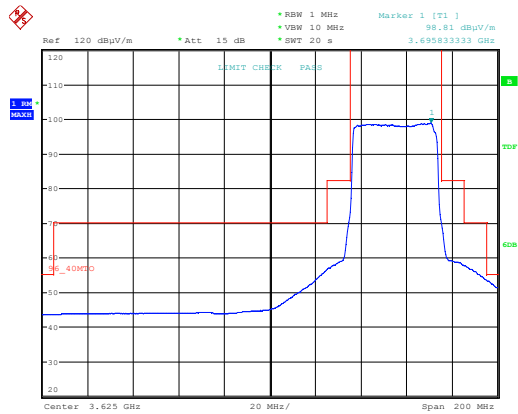
Date: 18.JUN.2021 10:43:30

Emission Mask 16 QAM; 3680 MHz; MIMO.A.

Emission Mask 16 QAM; 3680 MHz; MIMOB.



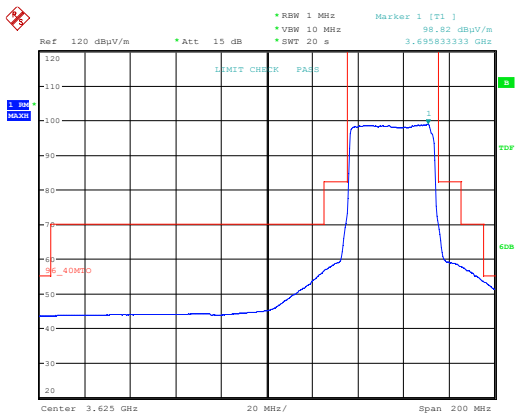
Date: 18.JUN.2021 10:37:37



Date: 18.JUN.2021 10:45:53

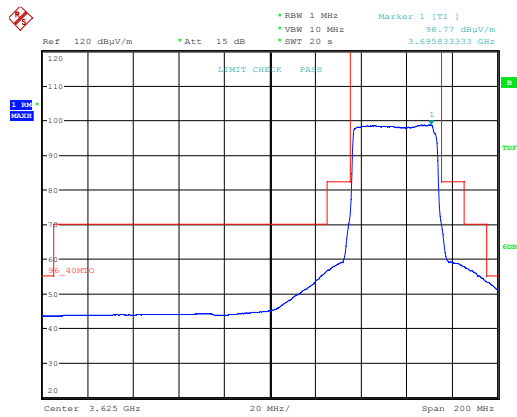
Emission Mask 64 QAM; 3680 MHz; MIMO.A.

Emission Mask 64 QAM; 3680 MHz; MIMOB.



Date: 18.JUN.2021 10:40:10

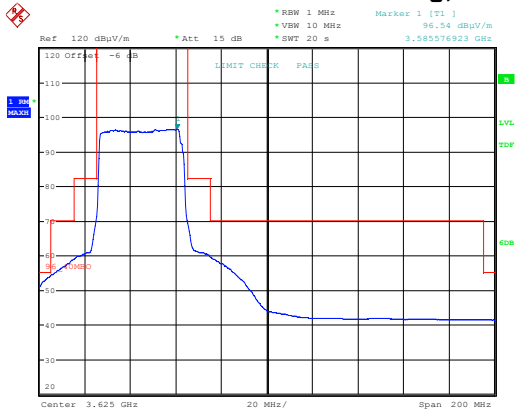
Emission Mask 256 QAM; 3680 MHz; MIMO A.



Date: 18.JUN.2021 10:48:31

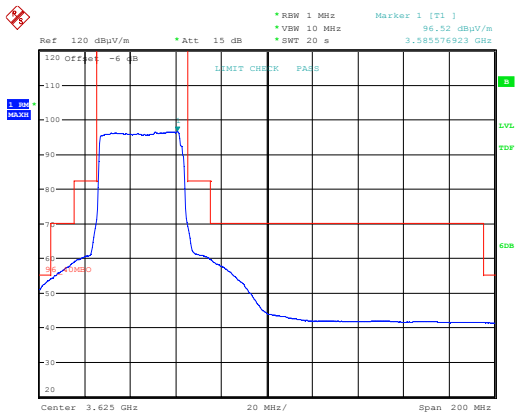
Emission Mask 256 QAM; 3680 MHz; MIMO B.

Beamforming; 40 MHz Bandwidth; Bottom Channel



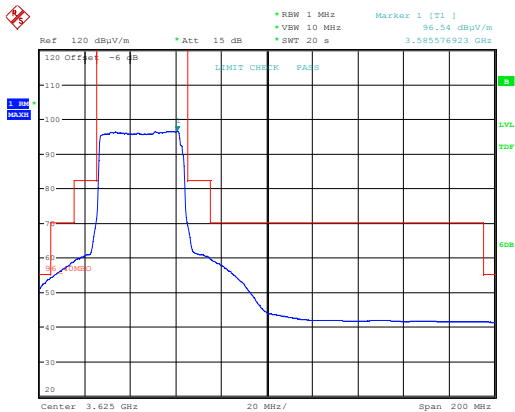
Date: 18.JUN.2021 14:57:18

Emission Mask QPSK; 3570 MHz; MIMO.A.



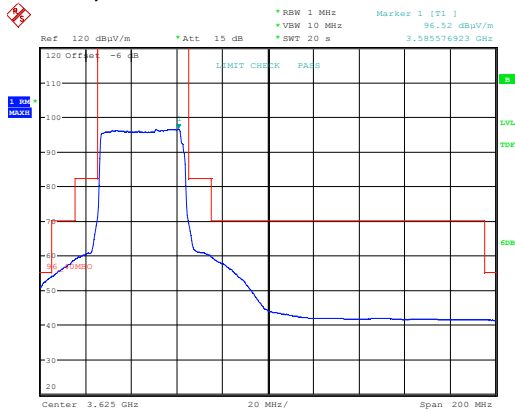
Date: 18.JUN.2021 14:54:11

Emission Mask 16 QAM; 3570 MHz; MIMO.A.



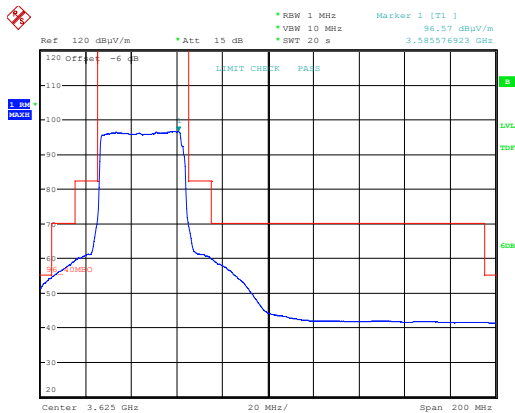
Date: 18.JUN.2021 14:49:08

Emission Mask 64 QAM; 3570 MHz; MIMO.A.



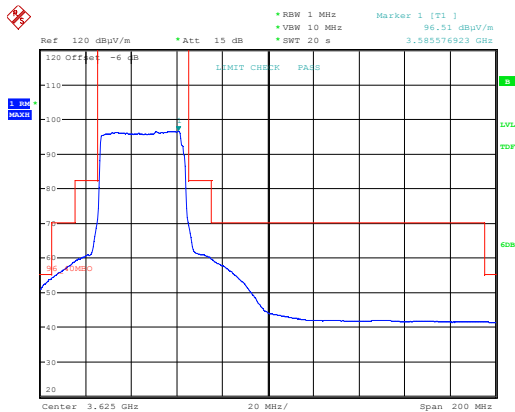
Date: 18.JUN.2021 14:46:45

Emission Mask QPSK; 3570 MHz; MIMOB.



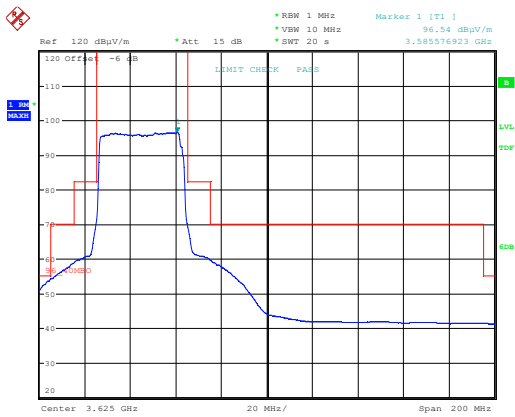
Date: 18.JUN.2021 14:43:24

Emission Mask 16 QAM; 3570 MHz; MIMOB.



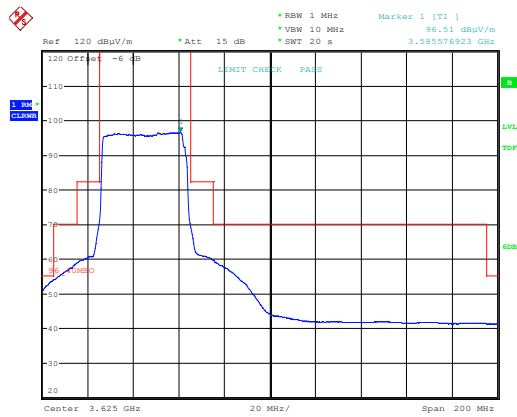
Date: 18.JUN.2021 14:41:43

Emission Mask 64 QAM; 3570 MHz; MIMOB.



Date: 18 JUN 2021 14:48:17

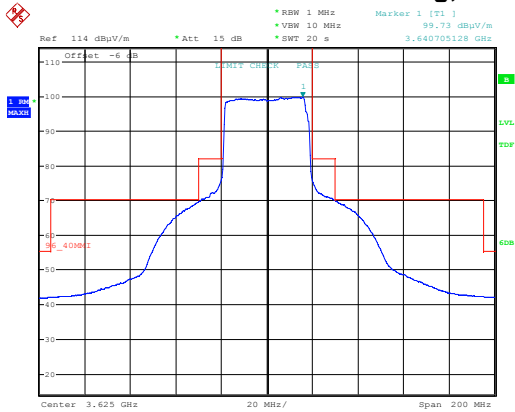
Emission Mask 256 QAM; 3570 MHz; MIMO A.



Date: 18 JUN 2021 14:39:56

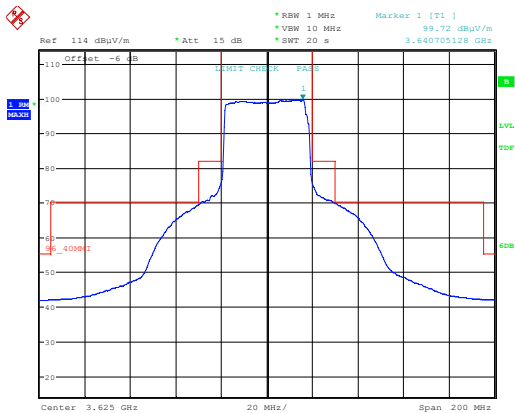
Emission Mask 256 QAM; 3570 MHz; MIMO B.

Beamforming; 40 MHz Bandwidth; Middle Channel



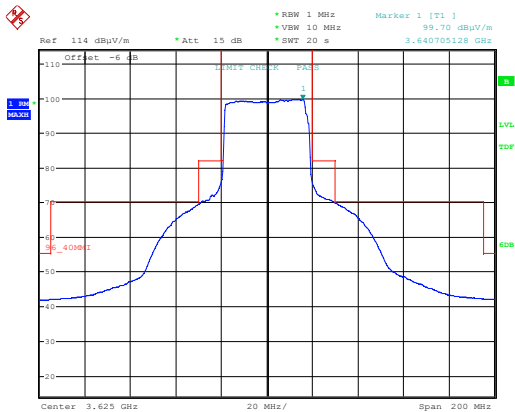
Date: 18.JUN.2021 12:27:29

Emission Mask QPSK; 3625 MHz; MIMO.A.



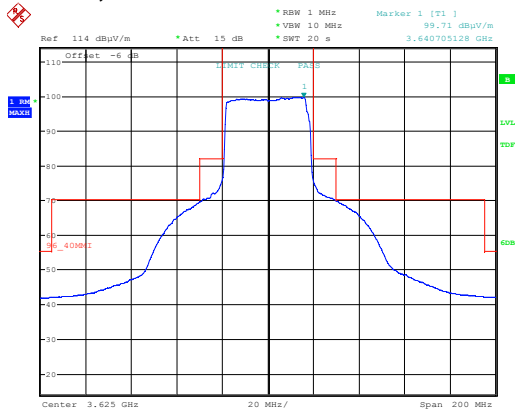
Date: 18.JUN.2021 12:26:35

Emission Mask 16 QAM; 3625 MHz; MIMO.A.



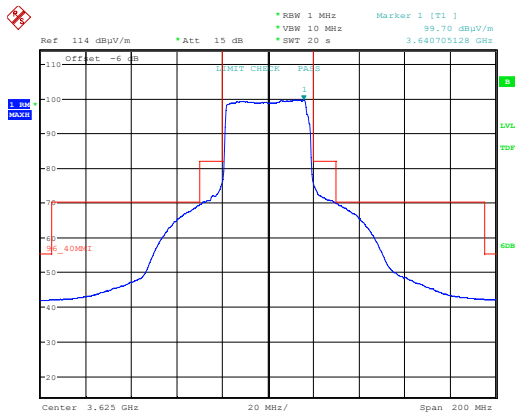
Date: 18.JUN.2021 12:28:51

Emission Mask 64 QAM; 3625 MHz; MIMO.A.



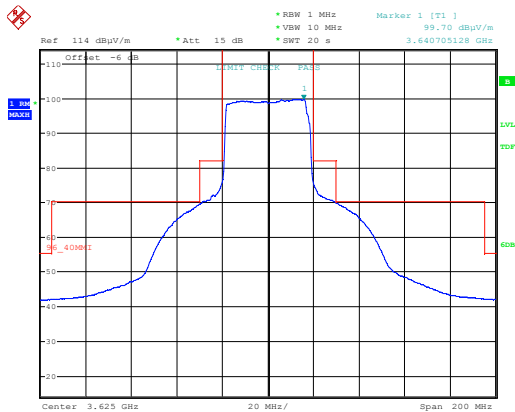
Date: 18.JUN.2021 12:32:06

Emission Mask QPSK; 3625 MHz; MIMOB.



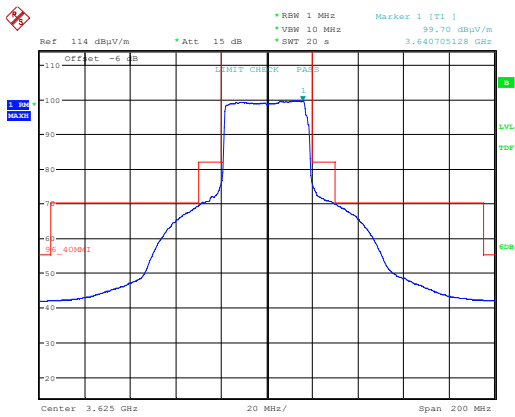
Date: 18.JUN.2021 12:33:32

Emission Mask 16 QAM; 3625 MHz; MIMOB.



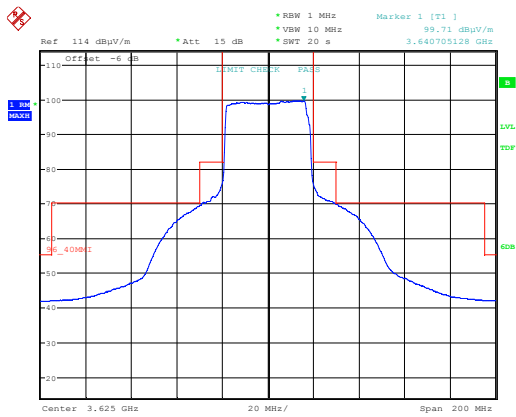
Date: 18.JUN.2021 12:34:43

Emission Mask 64 QAM; 3625 MHz; MIMOB.



Date: 18.JUN.2021 12:30:04

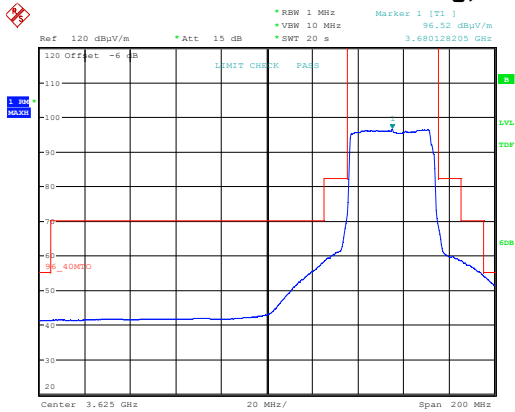
Emission Mask 256 QAM; 3625 MHz; MIMO A.



Date: 18.JUN.2021 12:35:55

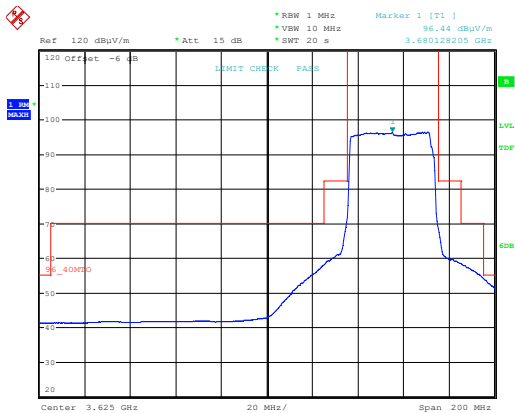
Emission Mask 256 QAM; 3625 MHz; MIMO B.

Beamforming; 40 MHz Bandwidth; Top Channel



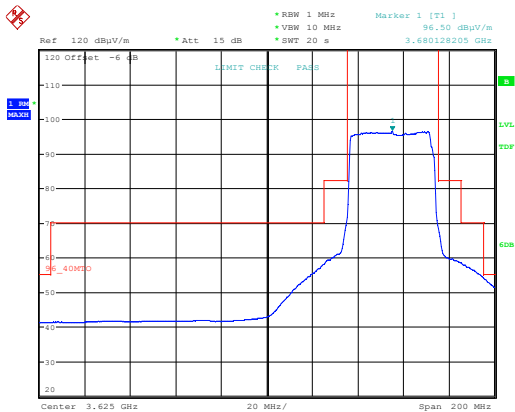
Date: 18.JUN.2021 15:21:41

Emission Mask QPSK; 3680 MHz; MIMO.A.



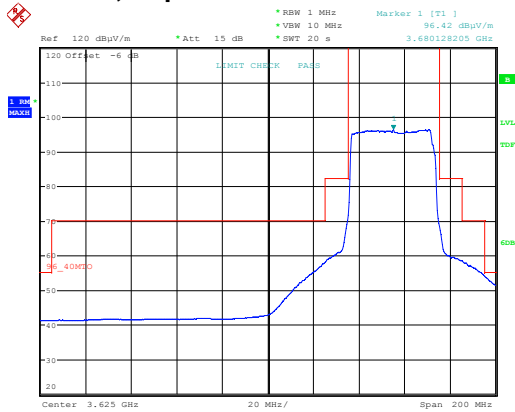
Date: 18.JUN.2021 15:22:52

Emission Mask 16 QAM; 3680 MHz; MIMO.A.



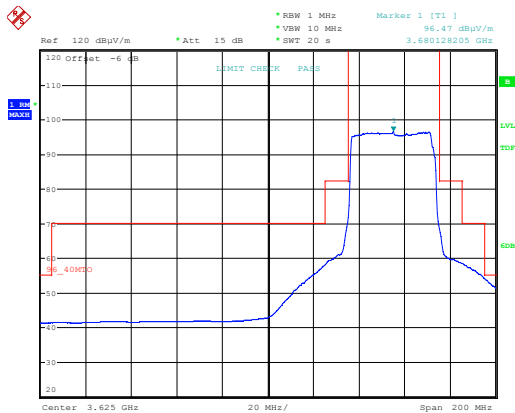
Date: 18.JUN.2021 15:18:10

Emission Mask 64 QAM; 3680 MHz; MIMO.A.



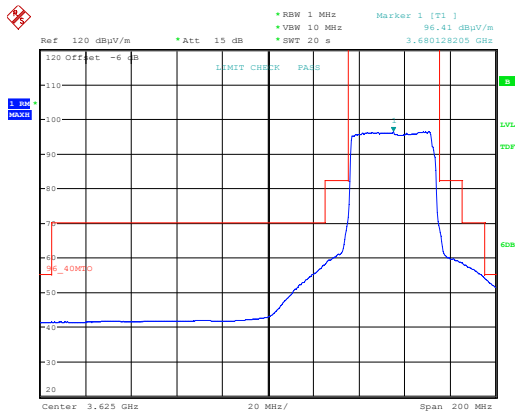
Date: 18.JUN.2021 15:29:18

Emission Mask QPSK; 3680 MHz; MIMOB.



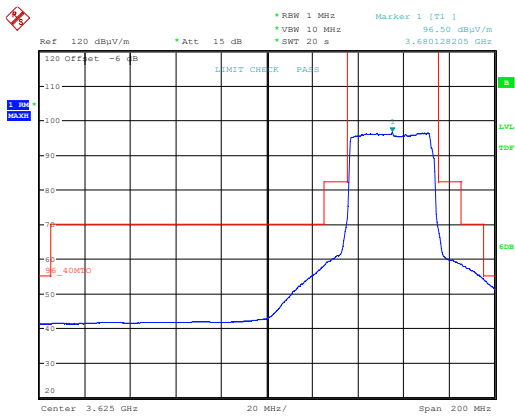
Date: 18.JUN.2021 15:38:39

Emission Mask 16 QAM; 3680 MHz; MIMOB.



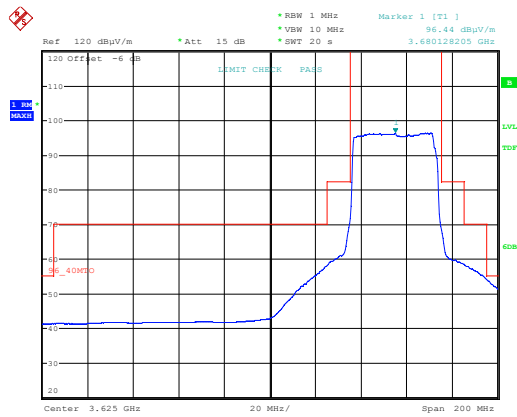
Date: 18.JUN.2021 15:39:35

Emission Mask 64 QAM; 3680 MHz; MIMOB.



Date: 18.JUN.2021 15:27:44

Emission Mask 256 QAM; 3680 MHz; MIMO A.



Date: 18.JUN.2021 15:41:46

Emission Mask 256 QAM; 3680 MHz; MIMO B.

13 Peak-to-average power ratio (PAPR)

13.1 Definition

Peak to average power ratio is define as the difference between peak power (or Peak PSD) and the average power (or Average PSD).

13.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	96.41 (g)
Channels / Frequencies Measured:	Low/ Middle / Top
Resolution Bandwidth: (Requirement 1 % of the Occupied Channel Bandwidth):	1 MHz
Modulation:	QPSK, 16 QAM, 64 QAM and 256 QAM
Deviations From Standard:	None
Temperature Extreme Environment Test Range:	N/A
Voltage Extreme Environment Test Range:	N/A

Environmental Conditions (Normal Environment)

Temperature: 24 °C	Standard Requirement: +20 °C
Humidity: 60 %RH	20 % RH to 75 % RH (as declared)

13.3 Test Limit

The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB.

13.4 Test Method

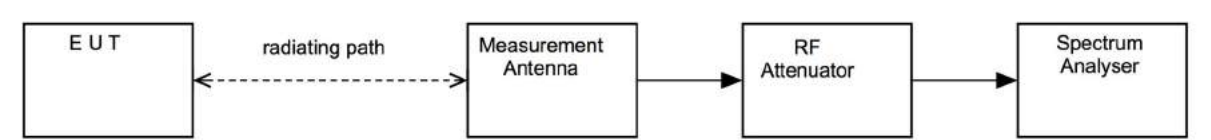
The following formula was use:

PAPR (dB) = P_{PK} (dBm or dBW) – P_{Avg} (dBm or dBW)

Where:

- PAPR** peak-to-average power ratio, in dB
- P_{PK}** measured peak power or peak PSD level, in dBm or dBW
- P_{Avg}** measured average power or average PSD level, in dBm or dBW

Figure v Test Setup



13.5 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
1-18GHz Horn	EMCO	3115	L139	2021-07-16
Power Meter	Agilent	N1911A	REF836	2022-09-08
Power Sensor	Agilent	N1922A	REF835	2022-09-08

13.6 Test Results**5 MHz Bandwidth****Bottom Channel**

<i>Frequency 3552.5 MHz; Sector Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.2	13	0	PASS
	16 QAM	8.2	13	0	PASS
	64 QAM	8.2	13	0	PASS
	256 QAM	8.2	13	0	PASS

<i>Frequency 3552.5 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.5	13	0	PASS
	256 QAM	8.5	13	0	PASS

<i>Frequency 3552.5 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.6	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.6	13	0	PASS
	256 QAM	8.6	13	0	PASS

Middle Channel

Frequency 3625 MHz; Sector Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	8.3	13	0	PASS
	16 QAM	8.3	13	0	PASS
	64 QAM	8.4	13	0	PASS
	256 QAM	8.3	13	0	PASS
B	QPSK	8.3	13	0	PASS
	16 QAM	8.3	13	0	PASS
	64 QAM	8.3	13	0	PASS
	256 QAM	8.4	13	0	PASS

Frequency 3625 MHz; MuMIMO Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.4	13	0	PASS
	256 QAM	8.5	13	0	PASS
B	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.5	13	0	PASS
	256 QAM	8.5	13	0	PASS

Frequency 3625 MHz; Beamforming Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.5	13	0	PASS
	256 QAM	8.5	13	0	PASS
B	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.5	13	0	PASS
	256 QAM	8.5	13	0	PASS

Top Channel

<i>Frequency 3697.5 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.4	13	0	PASS
	16 QAM	8.4	13	0	PASS
	64 QAM	8.4	13	0	PASS
	256 QAM	8.4	13	0	PASS

<i>Frequency 3697.5 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.5	13	0	PASS
	16 QAM	8.5	13	0	PASS
	64 QAM	8.5	13	0	PASS
	256 QAM	8.5	13	0	PASS

<i>Frequency 3697.5 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.3	13	0	PASS
	16 QAM	8.3	13	0	PASS
	64 QAM	8.3	13	0	PASS
	256 QAM	8.3	13	0	PASS

20 MHz Bandwidth**Bottom Channel**

<i>Frequency 3560 MHz; Sector Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	6.0	13	0	PASS
	16 QAM	6.0	13	0	PASS
	64 QAM	6.0	13	0	PASS
	256 QAM	6.0	13	0	PASS

<i>Frequency 3560 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	6.6	13	0	PASS
	16 QAM	6.5	13	0	PASS
	64 QAM	6.6	13	0	PASS
	256 QAM	6.6	13	0	PASS

<i>Frequency 3560 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	6.9	13	0	PASS
	16 QAM	6.9	13	0	PASS
	64 QAM	6.8	13	0	PASS
	256 QAM	7.0	13	0	PASS

Middle Channel

Frequency 3625 MHz; Sector Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	5.0	13	0	PASS
	16 QAM	5.0	13	0	PASS
	64 QAM	5.0	13	0	PASS
	256 QAM	5.0	13	0	PASS
B	QPSK	5.0	13	0	PASS
	16 QAM	5.0	13	0	PASS
	64 QAM	5.0	13	0	PASS
	256 QAM	5.0	13	0	PASS

Frequency 3625 MHz; MuMIMO Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	5.5	13	0	PASS
	16 QAM	5.5	13	0	PASS
	64 QAM	5.5	13	0	PASS
	256 QAM	5.6	13	0	PASS
B	QPSK	5.6	13	0	PASS
	16 QAM	5.5	13	0	PASS
	64 QAM	5.5	13	0	PASS
	256 QAM	5.5	13	0	PASS

Frequency 3625 MHz; Beamforming Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	6.2	13	0	PASS
	16 QAM	6.2	13	0	PASS
	64 QAM	6.2	13	0	PASS
	256 QAM	6.2	13	0	PASS
B	QPSK	6.2	13	0	PASS
	16 QAM	6.2	13	0	PASS
	64 QAM	6.2	13	0	PASS
	256 QAM	6.2	13	0	PASS

Top Channel

<i>Frequency 3690 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	6.9	13	0	PASS
	16 QAM	6.8	13	0	PASS
	64 QAM	6.8	13	0	PASS
	256 QAM	6.8	13	0	PASS

<i>Frequency 3690 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	7.2	13	0	PASS
	16 QAM	7.2	13	0	PASS
	64 QAM	7.2	13	0	PASS
	256 QAM	7.2	13	0	PASS

<i>Frequency 3690 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	7.3	13	0	PASS
	16 QAM	7.3	13	0	PASS
	64 QAM	7.3	13	0	PASS
	256 QAM	7.3	13	0	PASS

40 MHz Bandwidth**Bottom Channel**

<i>Frequency 3570 MHz; Sector Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	7.7	13	0	PASS
	16 QAM	7.7	13	0	PASS
	64 QAM	7.7	13	0	PASS
	256 QAM	7.7	13	0	PASS

<i>Frequency 3570 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.2	13	0	PASS
	16 QAM	8.2	13	0	PASS
	64 QAM	8.2	13	0	PASS
	256 QAM	8.2	13	0	PASS

<i>Frequency 3570 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.1	13	0	PASS
	16 QAM	8.1	13	0	PASS
	64 QAM	8.1	13	0	PASS
	256 QAM	8.1	13	0	PASS

Middle Channel

Frequency 3625 MHz; Sector Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	5.8	13	0	PASS
	16 QAM	5.8	13	0	PASS
	64 QAM	5.8	13	0	PASS
	256 QAM	5.8	13	0	PASS
B	QPSK	5.8	13	0	PASS
	16 QAM	5.8	13	0	PASS
	64 QAM	5.7	13	0	PASS
	256 QAM	5.8	13	0	PASS

Frequency 3625 MHz; MuMIMO Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	6.3	13	0	PASS
	16 QAM	6.3	13	0	PASS
	64 QAM	6.3	13	0	PASS
	256 QAM	6.3	13	0	PASS
B	QPSK	6.3	13	0	PASS
	16 QAM	6.3	13	0	PASS
	64 QAM	6.3	13	0	PASS
	256 QAM	6.3	13	0	PASS

Frequency 3625 MHz; Beamforming Mode					
MIMO	Mod Mode	Peak to average Ratio (dB)	Limit (dB)	Probability (%)	Verdict
A	QPSK	6.6	13	0	PASS
	16 QAM	6.6	13	0	PASS
	64 QAM	6.6	13	0	PASS
	256 QAM	6.6	13	0	PASS
B	QPSK	6.6	13	0	PASS
	16 QAM	6.6	13	0	PASS
	64 QAM	6.6	13	0	PASS
	256 QAM	6.6	13	0	PASS

Top Channel

<i>Frequency 3680 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	7.9	13	0	PASS
	16 QAM	7.9	13	0	PASS
	64 QAM	7.9	13	0	PASS
	256 QAM	7.9	13	0	PASS

<i>Frequency 3680 MHz; MuMIMO Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.0	13	0	PASS
	16 QAM	8.0	13	0	PASS
	64 QAM	8.0	13	0	PASS
	256 QAM	8.1	13	0	PASS

<i>Frequency 3680 MHz; Beamforming Mode</i>					
<i>MIMO</i>	<i>Mod Mode</i>	<i>Peak to average Ratio (dB)</i>	<i>Limit (dB)</i>	<i>Probability (%)</i>	<i>Verdict</i>
A	QPSK	8.1	13	0	PASS
	16 QAM	8.1	13	0	PASS
	64 QAM	8.1	13	0	PASS
	256 QAM	8.2	13	0	PASS

14 Peak EIRP Density and Equivalent Isotropically Radiated Power (EIRP)

14.1 Definition

The power per unit bandwidth.

14.2 Test Parameters

Test Location:	Pershore Airfield
Test Chamber:	Air field
Test Standard and Clause:	Part 96.41 (b)
EUT Channels / Frequencies Measured:	Low / Mid / High
EUT Channel Bandwidths:	5 MHz, 20 MHz and 40 MHz
Deviations From Standard:	None
Measurement BW:	1 MHz/ 10 MHz
Spectrum Analyzer Video BW:	3 MHz / 30 MHz
Measurement Detector:	Peak

Environmental Conditions (Normal Environment)

Temperature: 20 °C	+15 °C to +35 °C (as declared)
Humidity: 50 % RH	20 % RH to 75 % RH (as declared)
Supply: 48 V dc	48 V dc (as declared)

14.3 Test Limit

The limit are shown in table 2:

<i>Device</i>	<i>Maximum EIRP (dBm/10 MHz)</i>	<i>Maximum PSD (dBm/ MHz)</i>
End user Device	23	N/A
Category A CBSD	30	20
Category B CBSD	47	37

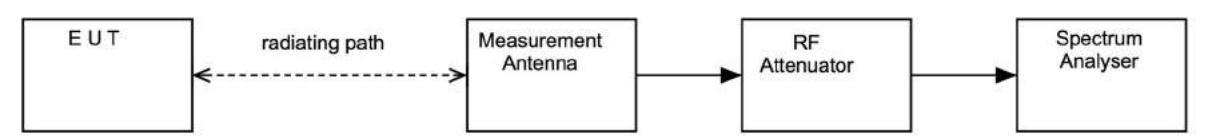
Table 2—EIRP and PSD limits for CBRs equipment

14.4 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure vi, the peak emission of the EUT was measured on a spectrum analyser, with path losses taken into account.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst case configuration in each bandwidth.

Figure vi Test Setup



14.5 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
Horn Antenna	A Info Inc	LB-10180-NF	REF2242	2022-07-13
FSU50	R&S	Spectrum Analyser	U544	2022-06-22
3161	EMCO	2- 4 GHz Horn	9910-1058	2022-05-21

14.6 Test Results – Peak EIRP Density

Bottom channel; Bandwidth: 5 MHz;						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3552.5	Sector	QPSK	A	37.0	37	PASS
3552.5	MuMIMO		A	36.6	37	PASS
3552.5	Beamform		A	36.3	37	PASS

Middle channel; Bandwidth: 5 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3625	Sector	QPSK	A	37.0	37	PASS
3625			B	36.7	37	PASS
3625	MuMIMO		A	36.7	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	16 QAM	A	36.7	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	36.6	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	64 QAM	A	36.8	37	PASS
3625			B	36.8	37	PASS
3625	MuMIMO		A	36.5	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	256 QAM	A	36.9	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	36.7	37	PASS
3625	Beamform		A	37.0	37	PASS

Top channel; Bandwidth: 5 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3697.5	Sector	QPSK	A	37.0	37	PASS
3697.5	MuMIMO		A	37.0	37	PASS
3697.5	Beamform		A	37.0	37	PASS

Bottom channel; Bandwidth: 20 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3560	Sector	QPSK	A	36.8	37	PASS
3560	MuMIMO		A	36.8	37	PASS
3560	Beamform		A	37.0	37	PASS

Middle channel; Bandwidth: 20 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3625	Sector	QPSK	A	36.9	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	37.0	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	16 QAM	A	36.9	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	37.0	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	64 QAM	A	36.9	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	37.0	37	PASS
3625	Beamform		A	37.0	37	PASS
3625	Sector	256 QAM	A	36.9	37	PASS
3625			B	36.9	37	PASS
3625	MuMIMO		A	37.0	37	PASS
3625	Beamform		A	37.0	37	PASS

Top channel; Bandwidth: 20 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3690	Sector	QPSK	A	37.0	37	PASS
3690	MuMIMO		A	37.0	37	PASS
3690	Beamform		A	36.7	37	PASS

Bottom channel; Bandwidth: 40 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3570	Sector	QPSK	A	37.0	37	PASS
3570	MuMIMO		A	36.9	37	PASS
3570	Beamform		A	36.8	37	PASS

Middle channel; Bandwidth: 40 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3625	Sector	QPSK	A	37.0	37	PASS
3625			B	37.0	37	PASS
3625	MuMIMO		A	36.8	37	PASS
3625	Beamform		A	36.9	37	PASS
3625	Sector	16 QAM	A	37.0	37	PASS
3625			B	37.0	37	PASS
3625	MuMIMO		A	36.4	37	PASS
3625	Beamform		A	36.9	37	PASS
3625	Sector	64 QAM	A	37.0	37	PASS
3625			B	37.0	37	PASS
3625	MuMIMO		A	36.6	37	PASS
3625	Beamform		A	36.7	37	PASS
3625	Sector	256 QAM	A	37.0	37	PASS
3625			B	37.0	37	PASS
3625	MuMIMO		A	36.6	37	PASS
3625	Beamform		A	37.0	37	PASS

Top channel; Bandwidth: 40 MHz						
Channel Frequency (MHz)	Transition Mode	Modulation	MIMO	Maximum PSD (dBm/ MHz)	Limit (dBm/ MHz)	Result
3680	Sector	QPSK	A	36.9	37	PASS
3680	MuMIMO		A	36.9	37	PASS
3680	Beamform		A	37.0	37	PASS

14.7 Test Results – Equivalent Isotropic Radiated Power (EIRP)

Bottom Channel: 3552.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.9
H	47	39.1
Total: dBm		42.5
Result:		PASS

Bottom Channel: 3552.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	38.7
H	47	39.2
Total: dBm		42.0
Result:		PASS

Bottom Channel: 3552.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	38.7
H	47	38.1
Total: dBm		41.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.5
H	47	39.3
Total: dBm		42.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.3
H	47	38.5
Total: dBm		41.9
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.0
H	47	38.9
Total: dBm		42.0
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.4
H	47	39.2
Total: dBm		42.3
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.5
H	47	39.2
Total: dBm		42.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.4
H	47	39.2
Total: dBm		42.3
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 16 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.2
H	47	37.7
Total: dBm		41.5
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 16 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.6
H	47	39.1
Total: dBm		42.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.4
H	47	39.2
Total: dBm		42.3
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.5
H	47	39.4
Total: dBm		42.5
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 64 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.0
H	47	39.2
Total: dBm		42.1
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 64 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.5
H	47	39.3
Total: dBm		42.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.4
H	47	39.3
Total: dBm		42.4
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.4
H	47	39.1
Total: dBm		42.3
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 256 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	38.7
H	47	38.8
Total: dBm		41.8
Result:		PASS

Middle Channel: 3625 MHz ; Bandwidth: 5 MHz; Modulation: 256 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	39.5
H	47	39.3
Total: dBm		42.4
Result:		PASS

Top Channel: 3697.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	40.2
H	47	37.9
Total: dBm		42.2
Result:		PASS

Top Channel: 3697.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	38.8
H	47	40.7
Total: dBm		42.9
Result:		PASS

Top Channel: 3697.5 MHz ; Bandwidth: 5 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Limit EIRP (dBm/10 MHz)	Maximum EIRP (dBm/10 MHz)
V	47	40.1
H	47	37.9
Total: dBm		42.1
Result:		PASS

Bottom Channel: 3560 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.9	47
V	43.2	
H	41.8	
H	41.9	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.5

Bottom Channel: 3560 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.8	47
V	42.9	
H	42.1	
H	42.1	
Result:		PASS
Total Power (dBm/10MHz)		45.5
Total Power (dBm/20MHz)		48.5

Bottom Channel: 3560 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.2	47
V	42.7	
H	43.4	
H	43.2	
Result:		PASS
Total Power (dBm/10MHz)		46.0
Total Power (dBm/20MHz)		48.9

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.9	
H	42.8	
H	42.8	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/20MHz)		48.8

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.5	47
V	42.5	
H	41.7	
H	42.4	
Result:		PASS
Total Power (dBm/10MHz)		45.5
Total Power (dBm/20MHz)		48.3

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 16 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.9	
H	42.8	
H	42.8	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/20MHz)		48.8

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 16 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.5	47
V	42.5	
H	41.7	
H	42.4	
Result:		PASS
Total Power (dBm/10MHz)		45.5
Total Power (dBm/20MHz)		48.3

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 64 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.9	
H	42.8	
H	42.8	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/20MHz)		48.8

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 64 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.5	47
V	42.5	
H	41.7	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		45.4
Total Power (dBm/20MHz)		48.3

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.6	
H	42.4	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 256 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	42.9	
H	42.8	
H	42.8	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/20MHz)		48.8

Middle Channel: 3625 MHz ; Bandwidth: 20 MHz; Modulation: 256 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.5	47
V	42.5	
H	41.7	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		45.4
Total Power (dBm/20MHz)		48.3

Top Channel: 3690 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.8	47
V	42.0	
H	43.1	
H	43.1	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/20MHz)		48.6

Top Channel: 3690 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.6	47
V	42.0	
H	43.2	
H	43.3	
Result:		PASS
Total Power (dBm/10MHz)		45.7
Total Power (dBm/20MHz)		48.6

Top Channel: 3690 MHz ; Bandwidth: 20 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.8	47
V	42.9	
H	40.8	
H	41.3	
Result:		PASS
Total Power (dBm/10MHz)		45.2
Total Power (dBm/20MHz)		48.1

Bottom Channel: 3570 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.4	47
V	43.2	
V	42.9	
V	42.6	
H	41.9	
H	42.7	
H	42.6	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		46.0
Total Power (dBm/40MHz)		51.7

Bottom Channel: 3570 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.6	47
V	43.5	
V	43.3	
V	42.1	
H	40.0	
H	40.5	
H	40.4	
H	40.3	
Result:		PASS
Total Power (dBm/10MHz)		45.3
Total Power (dBm/40MHz)		50.8

Bottom Channel: 3570 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.0	47
V	43.5	
V	43.2	
V	42.8	
H	41.0	
H	42.1	
H	41.9	
H	41.7	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/40MHz)		51.4

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.2	47
V	42.8	
V	42.5	
V	42.9	
H	41.9	
H	43.1	
H	42.9	
H	42.1	
Result:		PASS
Total Power (dBm/10MHz)		46.0
Total Power (dBm/40MHz)		51.6

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.2	47
V	42.8	
V	42.5	
V	42.9	
H	41.9	
H	43.1	
H	42.9	
H	42.1	
Result:		PASS
Total Power (dBm/10MHz)		46.0
Total Power (dBm/40MHz)		51.6

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.3	47
V	43.9	
V	43.9	
V	42.3	
H	39.6	
H	40.2	
H	39.9	
H	39.7	
Result:		PASS
Total Power (dBm/10MHz)		45.4
Total Power (dBm/40MHz)		50.9

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.6	47
V	42.8	
V	42.2	
V	41.6	
H	41.5	
H	42.4	
H	42.3	
H	42.6	
Result:		PASS
Total Power (dBm/10MHz)		46.6
Total Power (dBm/40MHz)		51.2

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.5	47
V	42.6	
V	42.5	
V	41.8	
H	42.4	
H	43.0	
H	42.8	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		45.8
Total Power (dBm/40MHz)		51.4

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 16 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.5	47
V	42.6	
V	42.5	
V	41.8	
H	42.4	
H	43.0	
H	42.8	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		45.8
Total Power (dBm/40MHz)		51.4

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 16 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.1	47
V	43.5	
V	43.5	
V	42.7	
H	39.1	
H	39.7	
H	39.5	
H	39.5	
Result:		PASS
Total Power (dBm/10MHz)		45.0
Total Power (dBm/40MHz)		50.6

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 16 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.3	47
V	43.3	
V	42.5	
V	42.5	
H	41.7	
H	42.1	
H	42.1	
H	42.0	
Result:		PASS
Total Power (dBm/10MHz)		45.8
Total Power (dBm/40MHz)		51.4

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.6	47
V	42.6	
V	42.7	
V	42.6	
H	42.0	
H	43.1	
H	43.0	
H	42.1	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/40MHz)		51.5

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 64 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.6	47
V	42.6	
V	42.7	
V	42.6	
H	42.0	
H	43.1	
H	43.0	
H	42.1	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/40MHz)		51.5

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 64 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	40.2	47
V	41.1	
V	40.8	
V	40.6	
H	42.2	
H	43.0	
H	43.2	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		45.2
Total Power (dBm/40MHz)		50.8

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 64 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.7	47
V	43.0	
V	43.1	
V	42.5	
H	40.4	
H	42.0	
H	42.1	
H	41.7	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/40MHz)		51.2

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.7	47
V	42.7	
V	42.5	
V	41.8	
H	42.3	
H	43.1	
H	43.3	
H	42.2	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/40MHz)		51.5

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 256 QAM ; EUT Mode: Sector; EUT Data Mode: MIMO B		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.7	47
V	42.7	
V	42.5	
V	41.8	
H	42.3	
H	43.1	
H	43.3	
H	42.2	
Result:		PASS
Total Power (dBm/10MHz)		45.9
Total Power (dBm/40MHz)		51.5

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 256 QAM ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	41.2	47
V	42.2	
V	42.0	
V	42.2	
H	40.5	
H	41.5	
H	41.2	
H	41.0	
Result:		PASS
Total Power (dBm/10MHz)		44.9
Total Power (dBm/40MHz)		50.5

Middle Channel: 3625 MHz ; Bandwidth: 40 MHz; Modulation: 256 QAM ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.4	47
V	43.0	
V	42.8	
V	42.7	
H	42.0	
H	43.1	
H	42.9	
H	42.3	
Result:		PASS
Total Power (dBm/10MHz)		46.1
Total Power (dBm/40MHz)		51.7

Top Channel: 3680 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Sector; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.5	47
V	43.7	
V	43.4	
V	42.7	
H	40.7	
H	41.1	
H	40.9	
H	41.6	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/40MHz)		51.2

Top Channel: 3680 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: MuMIMO; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	42.1	47
V	42.8	
V	42.8	
V	42.9	
H	40.9	
H	41.9	
H	42.3	
H	41.4	
Result:		PASS
Total Power (dBm/10MHz)		45.6
Total Power (dBm/40MHz)		51.2

Top Channel: 3680 MHz ; Bandwidth: 40 MHz; Modulation: QPSK ; EUT Mode: Beamform; EUT Data Mode: MIMO A		
Antenna Pol	Maximum EIRP (dBm/10 MHz)	Limit EIRP (dBm/10 MHz)
V	40.5	47
V	41.7	
V	42.6	
V	42.5	
H	41.8	
H	42.7	
H	42.6	
H	43.1	
Result:		PASS
Total Power (dBm/10MHz)		45.8
Total Power (dBm/40MHz)		51.3

15 Occupied Bandwidth

15.1 Definition

The OBW is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

15.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Radio Chamber
Test Standard and Clause:	Part 2.1049
EUT Channel Bandwidths:	5 MHz, 20 MHz and 40 MHz
EUT Test Modulations:	QPSK MIMO A & B, 16QAM MIMO A & B, 64QAM MIMO A & B and 256QAM MIMO A & B
Deviations From Standard:	None
Measurement BW:	200 kHz and 500 kHz
(Requirement: 1% to 5% OBW)	
Spectrum Analyzer Video BW:	500 kHz and 2 MHz
(requirement at least 3x RBW)	
Measurement Span:	7.5 MHz, 30 MHz and 60 MHz
(requirement 2 to 5 times OBW)	
Measurement Detector:	Peak

Environmental Conditions (Normal Environment)

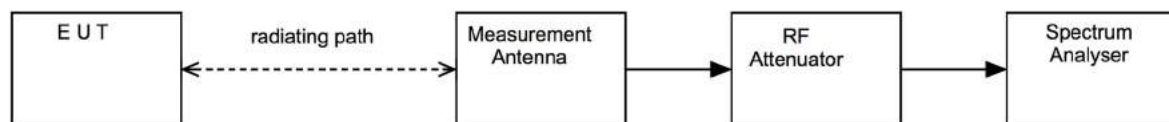
Temperature: 24 °C	+15 °C to +35 °C (as declared)
Humidity: 60 % RH	20 % RH to 75 % RH (as declared)
Supply: 48 V dc	48 V dc (as declared)

15.3 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure iii, the bandwidth of the EUT was measured on a spectrum analyser.

The measurements were performed with EUT set at its maximum duty. All modulation schemes, data rates and power settings were used to observe the worst-case configuration in each bandwidth.

Figure iii Test Setup

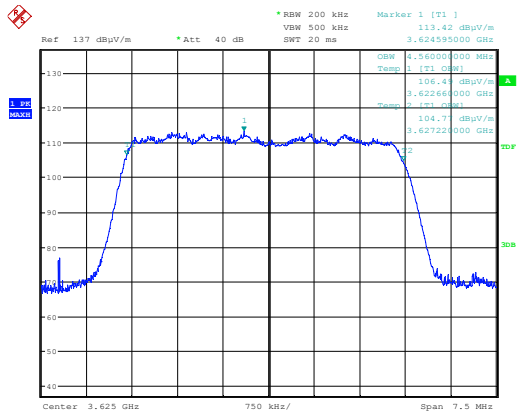


15.4 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
1-18GHz Horn	EMCO	3115	L139	2021-07-16
Spectrum Analyser	R&S	FSU26	U405	2021-07-17
Pre Amp	Agilent	8449B	L572	2021-10-19

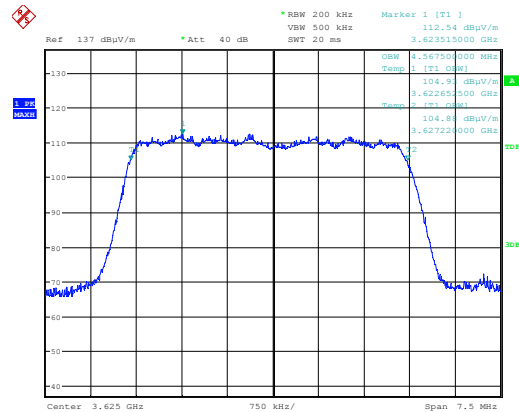
15.5 Test Results

5 MHz Bandwidth Beamforming



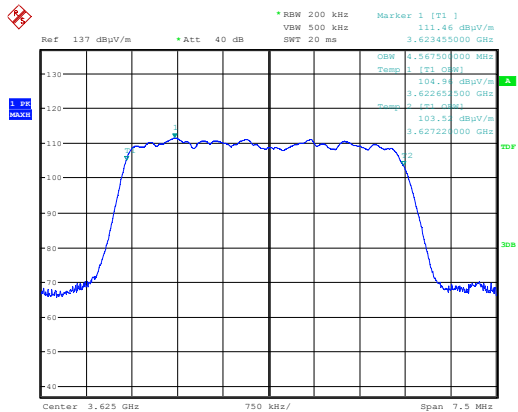
Date: 21.JUN.2021 17:25:07

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



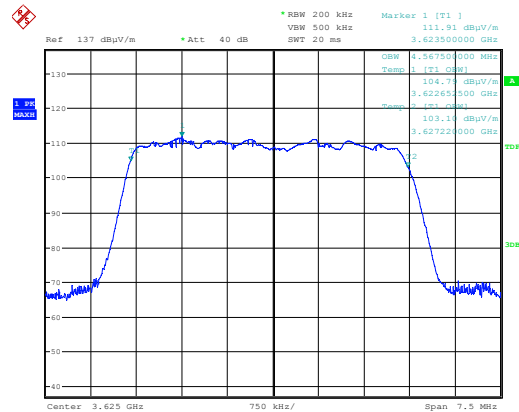
Date: 21.JUN.2021 17:30:01

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



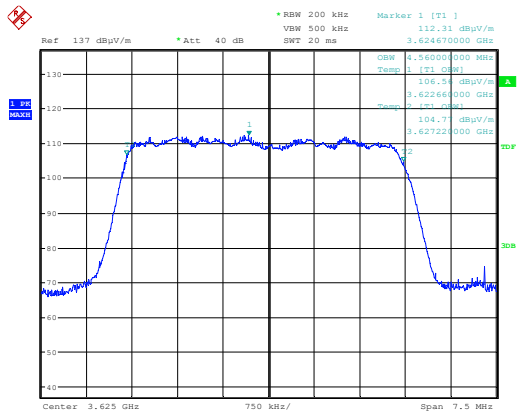
Date: 21.JUN.2021 17:28:25

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



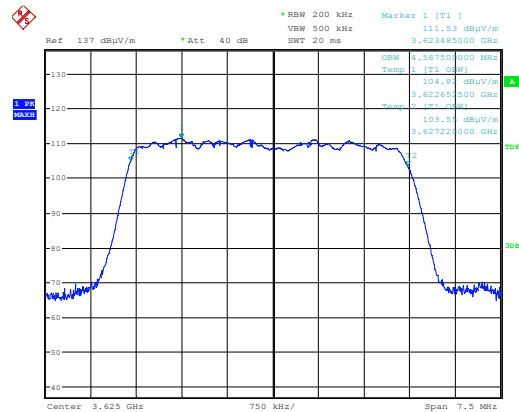
Date: 21.JUN.2021 17:30:27

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



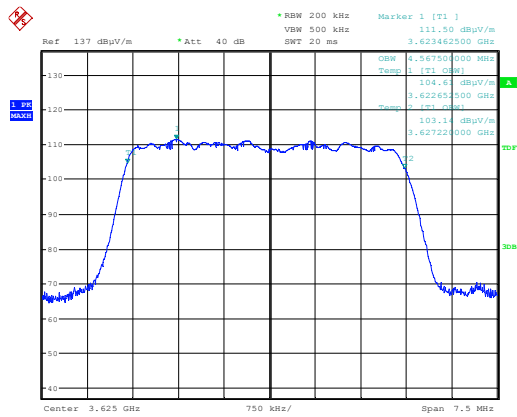
Date: 21.JUN.2021 17:29:08

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



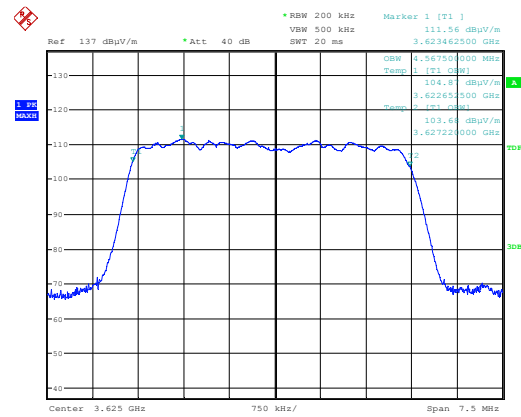
Date: 21.JUN.2021 17:30:56

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 17:29:35

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

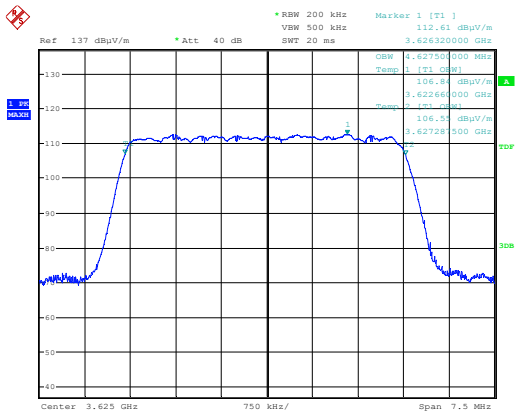


Date: 21.JUN.2021 17:31:41

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

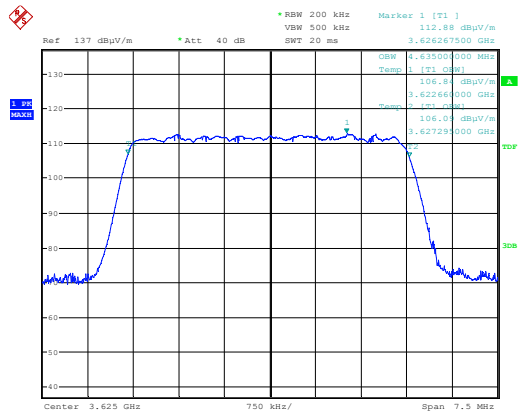
5 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3622.66000	3627.22000	4.5600	Pass
3625	QPSK	B	3622.65250	3627.22000	4.5675	Pass
3625	16QAM	A	3622.66000	3627.22000	4.5600	Pass
3625	16QAM	B	3622.65250	3627.22000	4.5675	Pass
3625	64QAM	A	3622.65250	3627.22000	4.5675	Pass
3625	64QAM	B	3622.65250	3627.22000	4.5675	Pass
3625	256QAM	A	3622.65250	3627.22000	4.5675	Pass
3625	256QAM	B	3622.65250	3627.22000	4.5675	Pass

5 MHz Bandwidth Sector



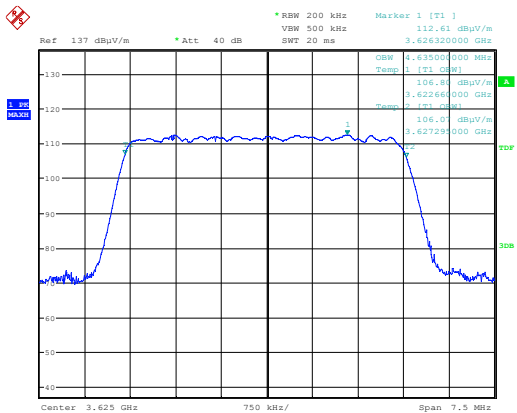
Date: 21.JUN.2021 17:22:50

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



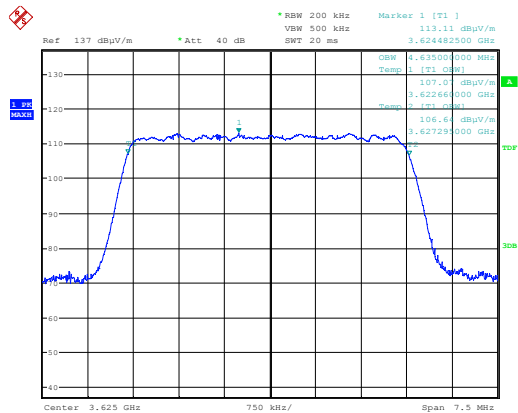
Date: 21.JUN.2021 17:20:56

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



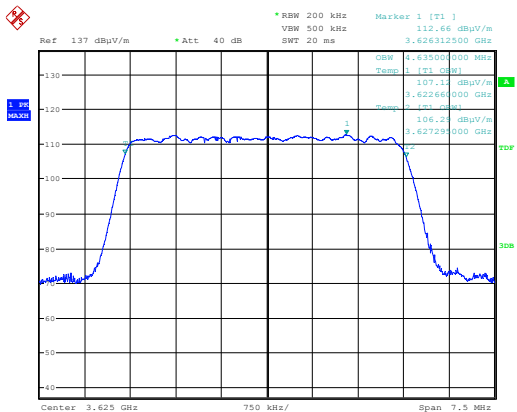
Date: 21.JUN.2021 17:22:28

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



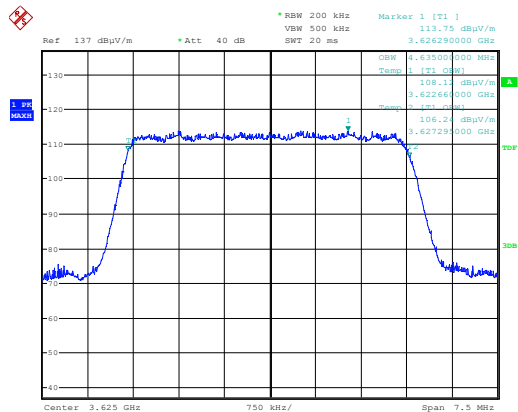
Date: 21.JUN.2021 17:20:31

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



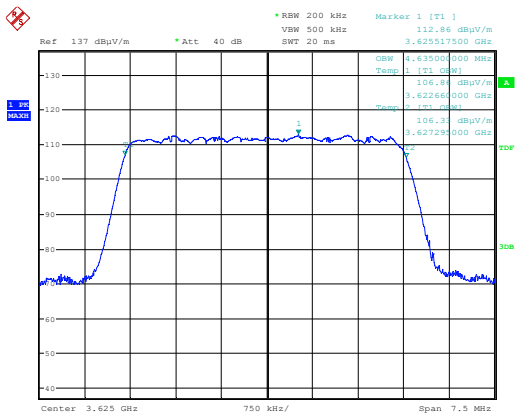
Date: 21.JUN.2021 17:21:52

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



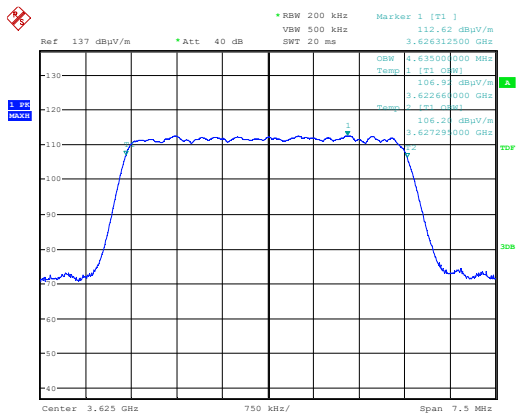
Date: 21.JUN.2021 17:20:01

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 17:21:19

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

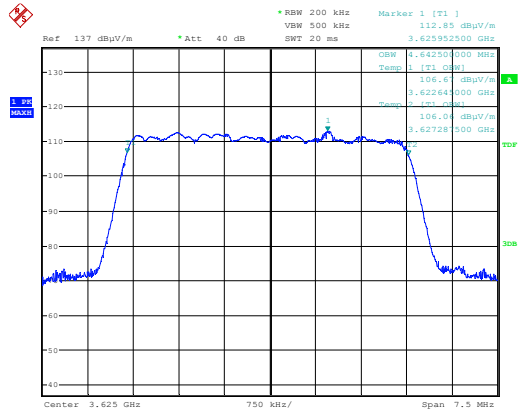
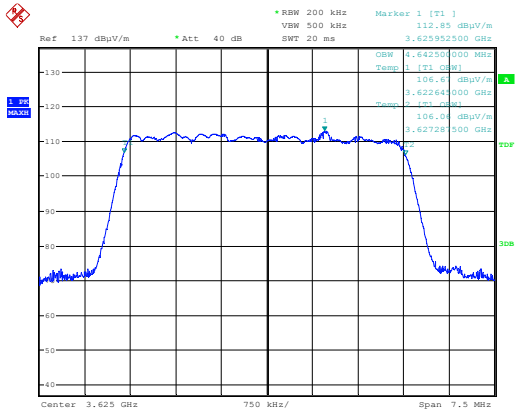


Date: 21.JUN.2021 17:18:33

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

5 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3622.66000	3627.28750	4.6275	Pass
3625	QPSK	B	3622.66000	3627.29500	4.6350	Pass
3625	16QAM	A	3622.66000	3627.29500	4.6350	Pass
3625	16QAM	B	3622.66000	3627.29500	4.6350	Pass
3625	64QAM	A	3622.66000	3627.29500	4.6350	Pass
3625	64QAM	B	3622.66000	3627.29500	4.6350	Pass
3625	256QAM	A	3622.66000	3627.29500	4.6350	Pass
3625	256QAM	B	3622.66000	3627.29500	4.6350	Pass

5 MHz Bandwidth MU-MIMO

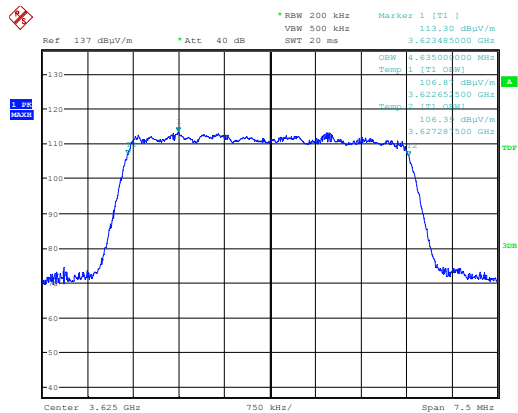
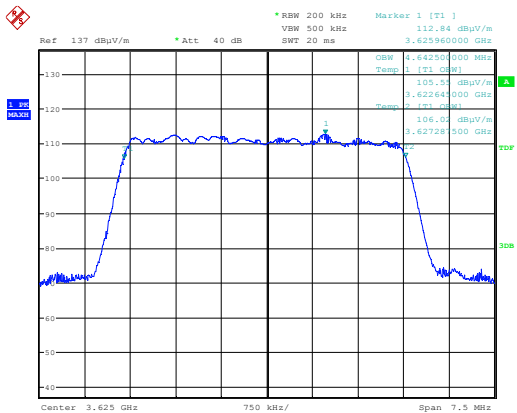


Date: 21.JUN.2021 17:06:41

Date: 21.JUN.2021 17:06:41

99 % Bandwidth QPSK; 3625 MHz; MIMO A.

99 % Bandwidth QPSK; 3625 MHz; MIMO B.

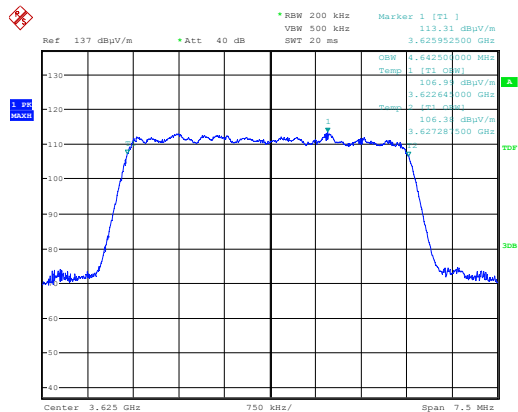
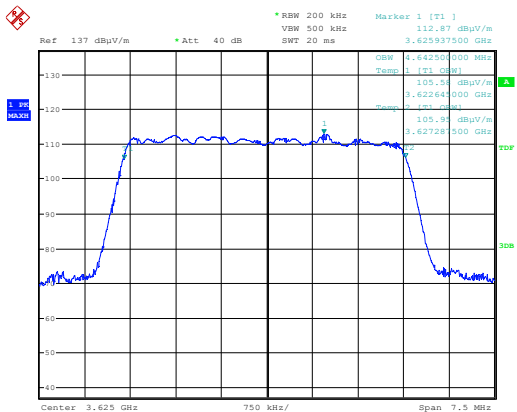


Date: 21.JUN.2021 17:07:27

Date: 21.JUN.2021 17:11:26

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.

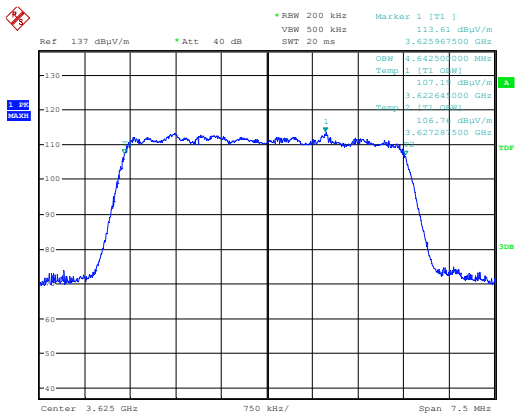


Date: 21.JUN.2021 17:08:26

Date: 21.JUN.2021 17:12:44

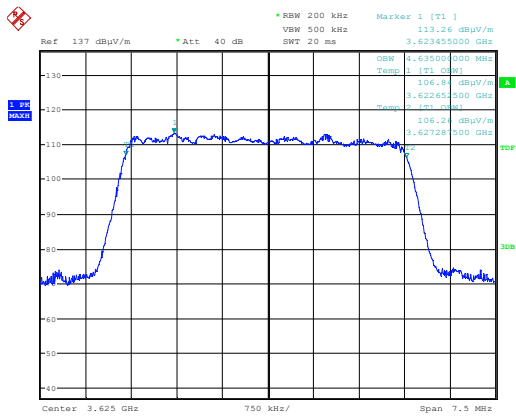
99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 17:09:07

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

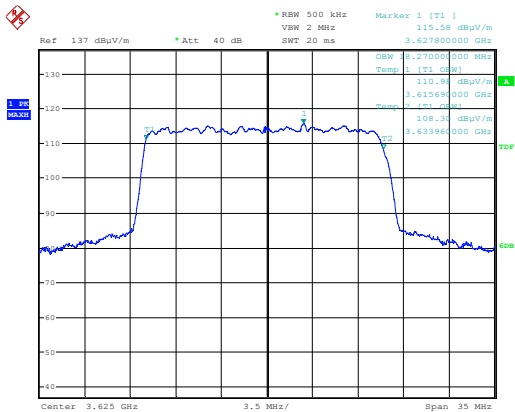


Date: 21.JUN.2021 17:13:24

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

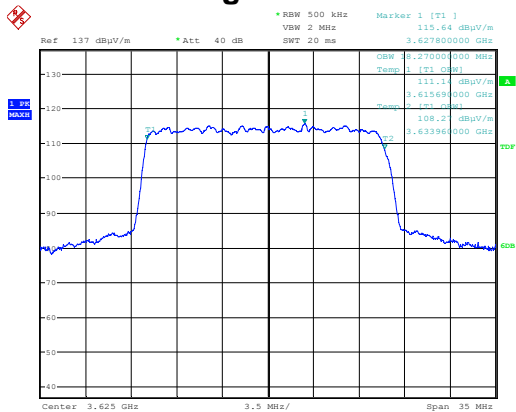
5 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3622.64500	3627.28750	4.6425	Pass
3625	QPSK	B	3622.64500	3627.28750	4.6425	Pass
3625	16QAM	A	3622.64500	3627.28750	4.6425	Pass
3625	16QAM	B	3622.64500	3627.28750	4.6425	Pass
3625	64QAM	A	3622.64500	3627.28750	4.6425	Pass
3625	64QAM	B	3622.65250	3627.28750	4.6350	Pass
3625	256QAM	A	3622.64500	3627.28750	4.6425	Pass
3625	256QAM	B	3622.65250	3627.28750	4.6350	Pass

20 MHz Bandwidth Beamforming



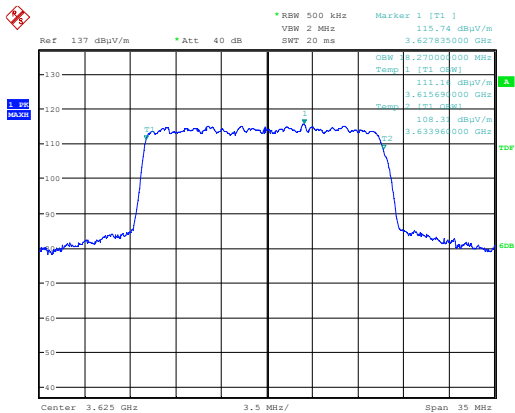
Date: 21.JUN.2021 16:07:29

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



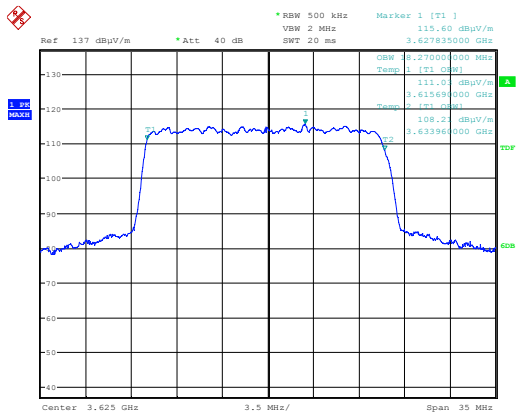
Date: 21.JUN.2021 16:11:14

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



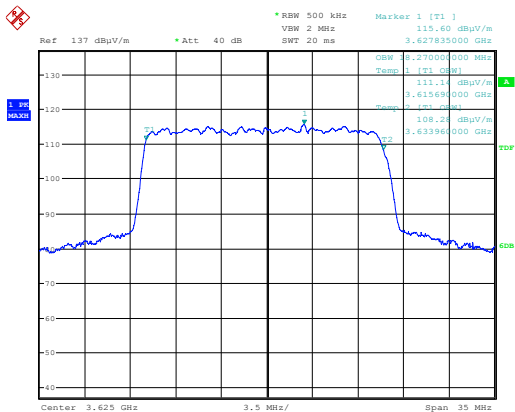
Date: 21.JUN.2021 16:08:04

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



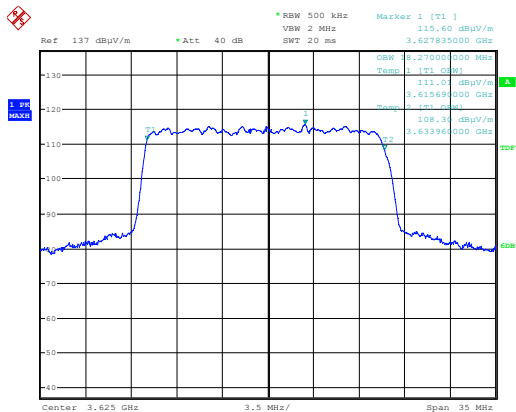
Date: 21.JUN.2021 16:12:19

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



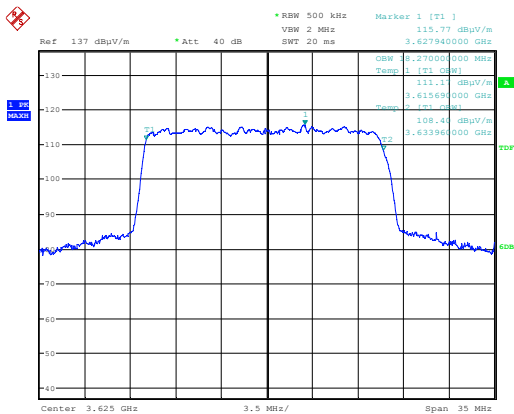
Date: 21.JUN.2021 16:09:20

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



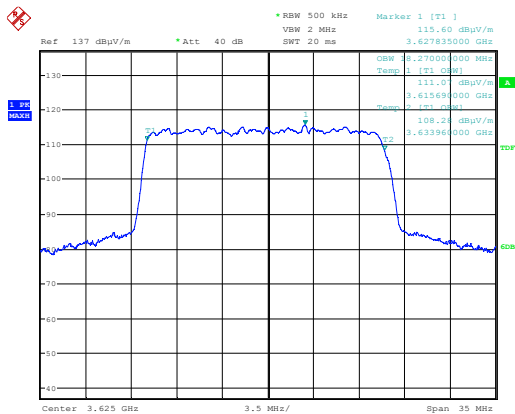
Date: 21.JUN.2021 16:13:09

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 16:09:56

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

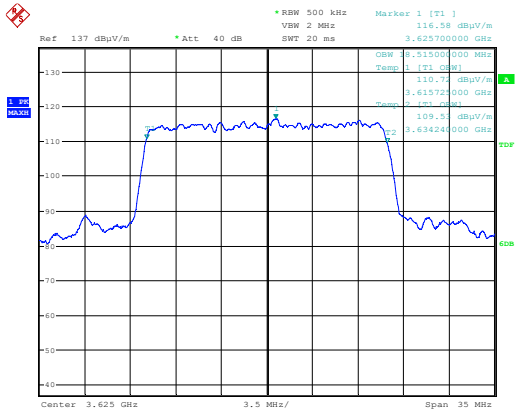


Date: 21.JUN.2021 16:14:10

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

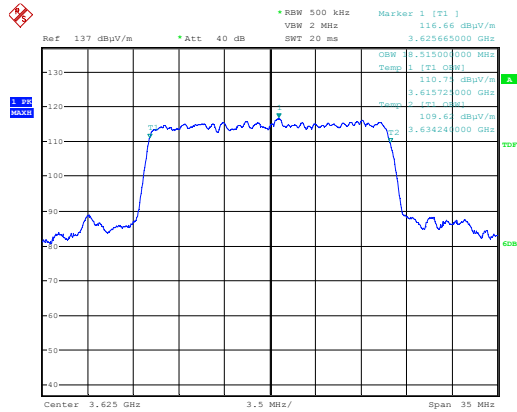
20 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3615.69000	3633.96000	18.2700	Pass
3625	QPSK	B	3615.69000	3633.96000	18.2700	Pass
3625	16QAM	A	3615.69000	3633.96000	18.2700	Pass
3625	16QAM	B	3615.69000	3633.96000	18.2700	Pass
3625	64QAM	A	3615.69000	3633.96000	18.2700	Pass
3625	64QAM	B	3615.69000	3633.96000	18.2700	Pass
3625	256QAM	A	3615.69000	3633.96000	18.2700	Pass
3625	256QAM	B	3615.69000	3633.96000	18.2700	Pass

20 MHz Bandwidth Sector



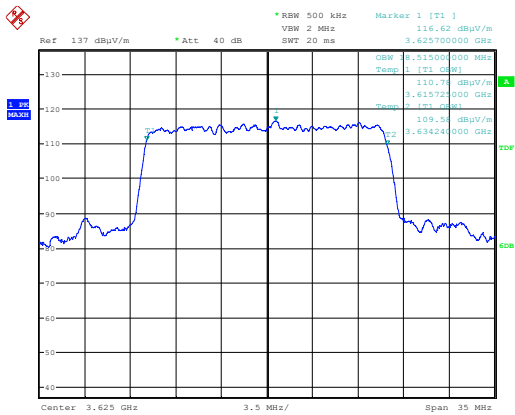
Date: 21.JUN.2021 16:01:00

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



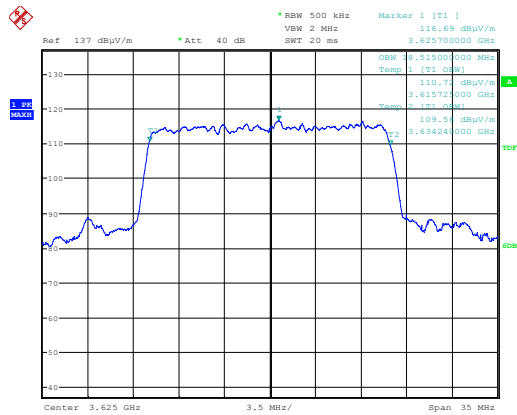
Date: 21.JUN.2021 15:54:46

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



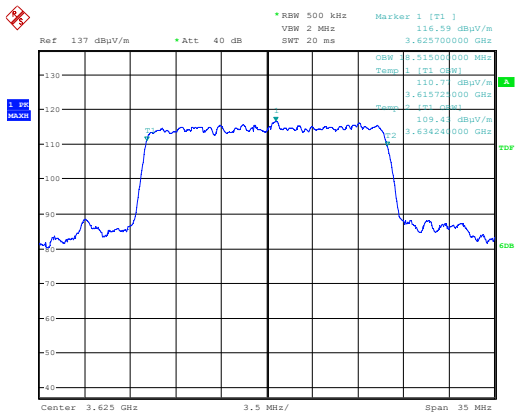
Date: 21.JUN.2021 15:58:11

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



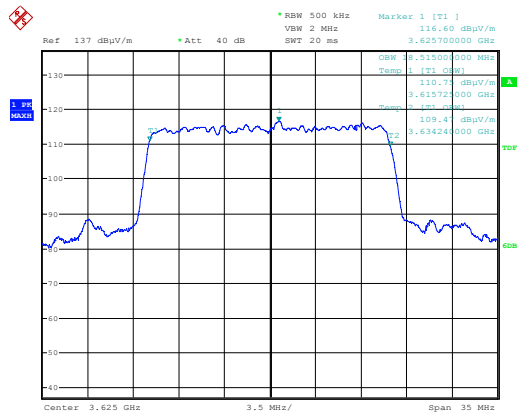
Date: 21.JUN.2021 15:53:25

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



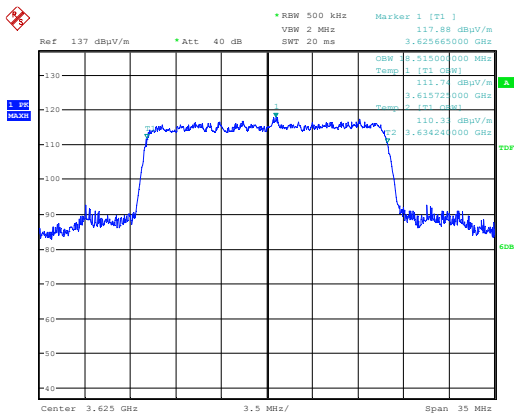
Date: 21.JUN.2021 15:57:28

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



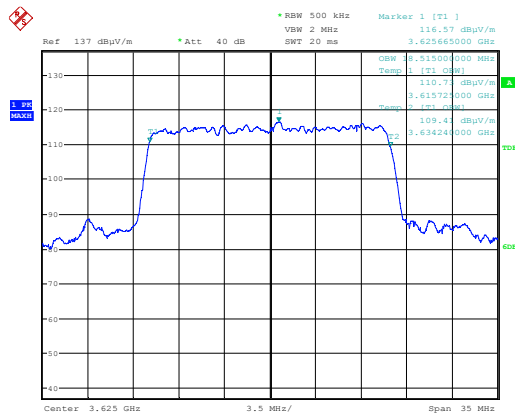
Date: 21.JUN.2021 15:52:36

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 15:56:07

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

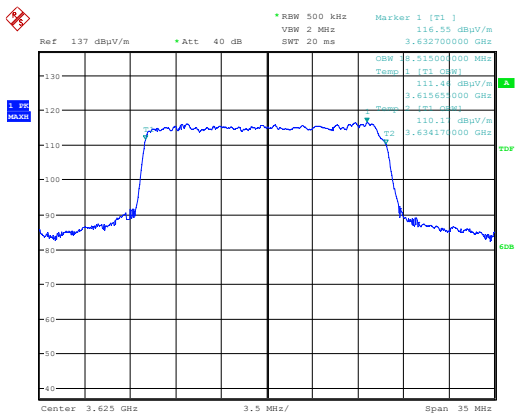


Date: 21.JUN.2021 15:52:00

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

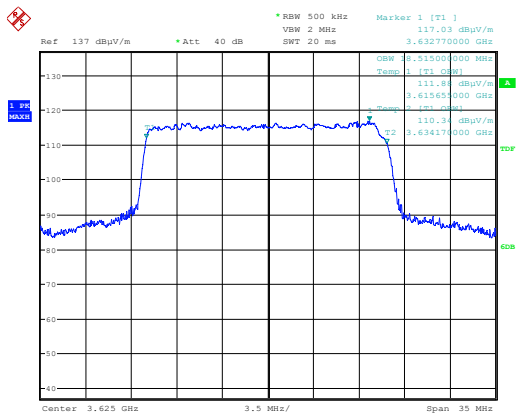
20 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3615.72500	3634.24000	18.5150	Pass
3625	QPSK	B	3615.72500	3634.24000	18.5150	Pass
3625	16QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	16QAM	B	3615.72500	3634.24000	18.5150	Pass
3625	64QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	64QAM	B	3615.72500	3634.24000	18.5150	Pass
3625	256QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	256QAM	B	3615.72500	3634.24000	18.5150	Pass

20 MHz Bandwidth MU-MIMO



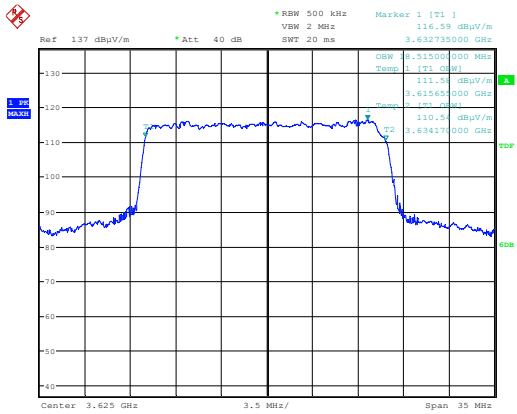
Date: 21.JUN.2021 15:39:47

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



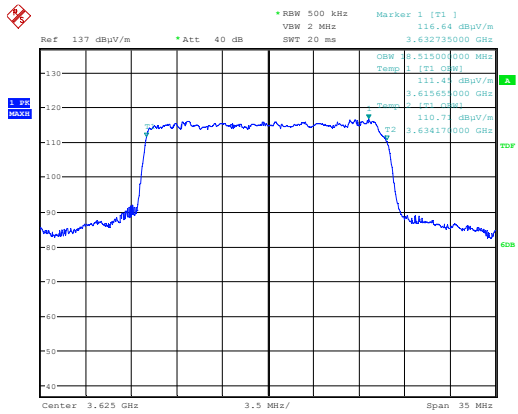
Date: 21.JUN.2021 15:42:16

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



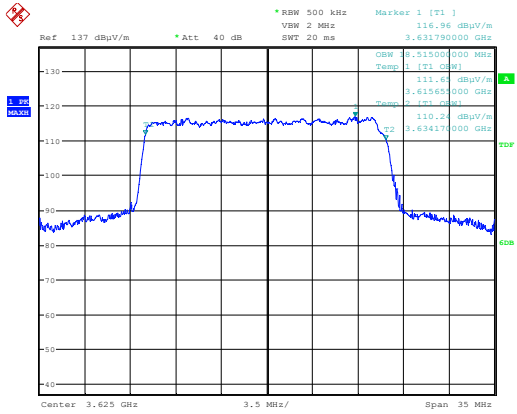
Date: 21.JUN.2021 15:40:26

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



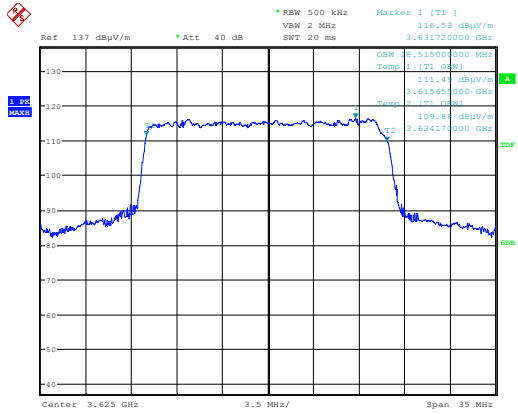
Date: 21.JUN.2021 15:42:46

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



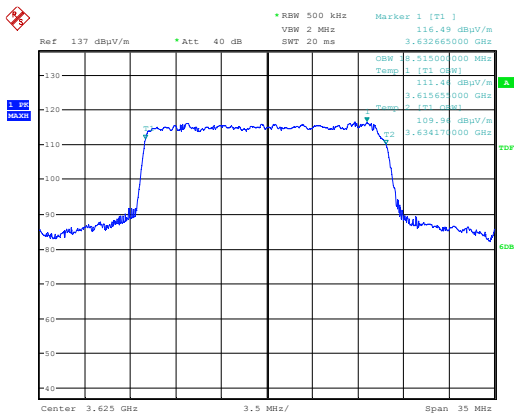
Date: 21.JUN.2021 15:40:55

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



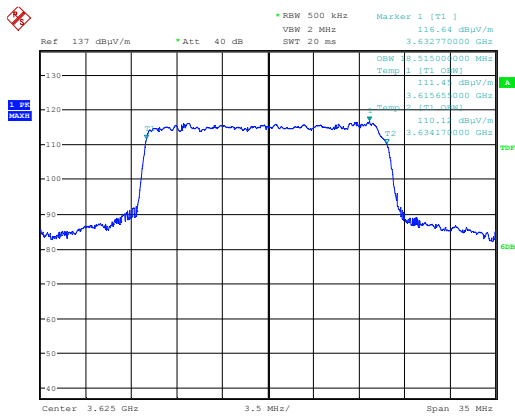
Date: 21.JUN.2021 15:43:16

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 15:41:19

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

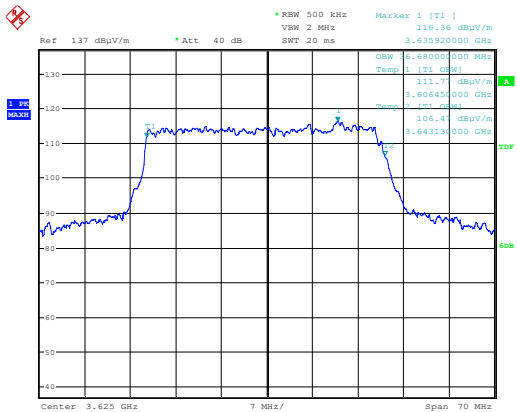


Date: 21.JUN.2021 15:43:48

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

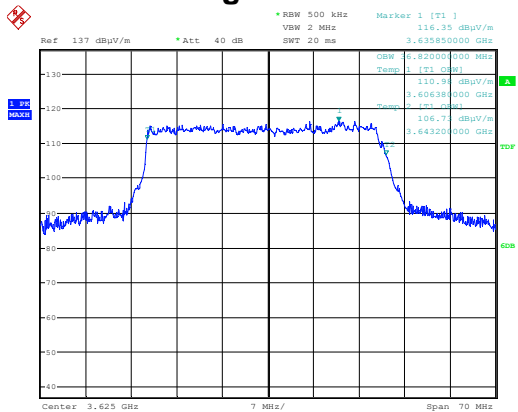
Top Channel 20 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3615.72500	3634.24000	18.5150	Pass
3625	QPSK	B	3615.72500	3634.24000	18.5150	Pass
3625	16QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	16QAM	B	3615.72500	3634.24000	18.5150	Pass
3625	64QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	64QAM	B	3615.72500	3634.24000	18.5150	Pass
3625	256QAM	A	3615.72500	3634.24000	18.5150	Pass
3625	256QAM	B	3615.72500	3634.24000	18.5150	Pass

40 MHz Bandwidth Beamforming



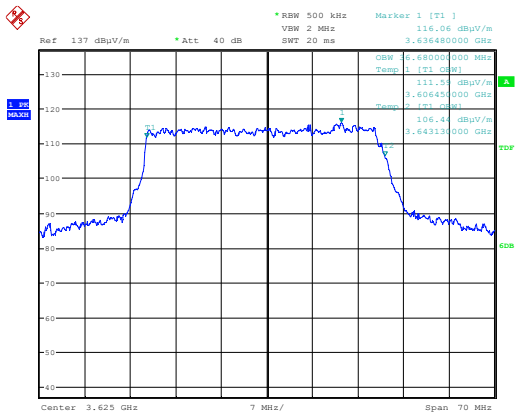
Date: 21.JUN.2021 16:33:08

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



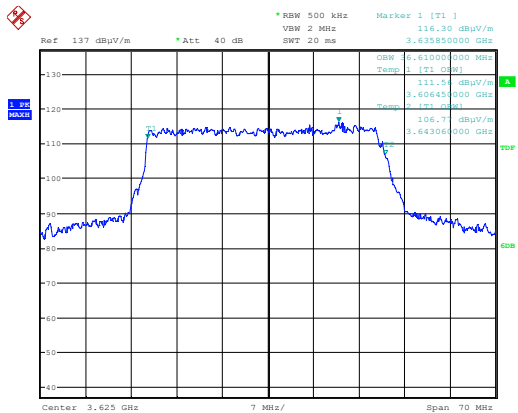
Date: 21.JUN.2021 16:39:59

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



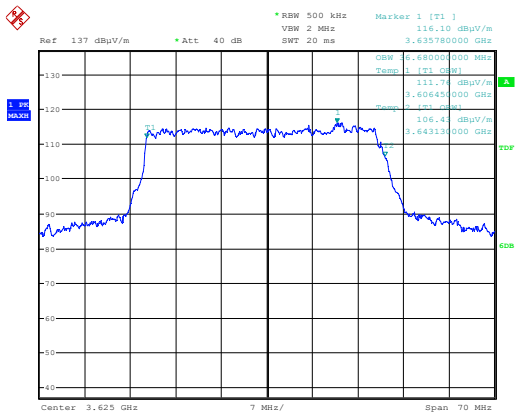
Date: 21.JUN.2021 16:36:08

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



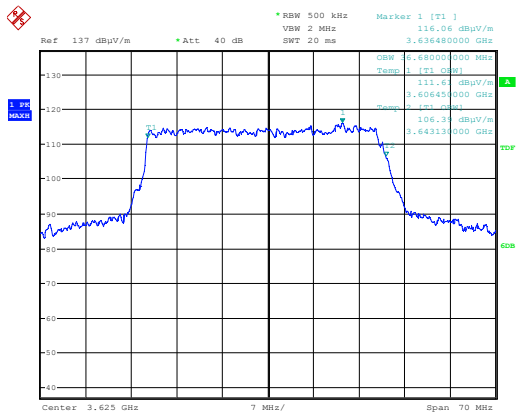
Date: 21.JUN.2021 16:40:32

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



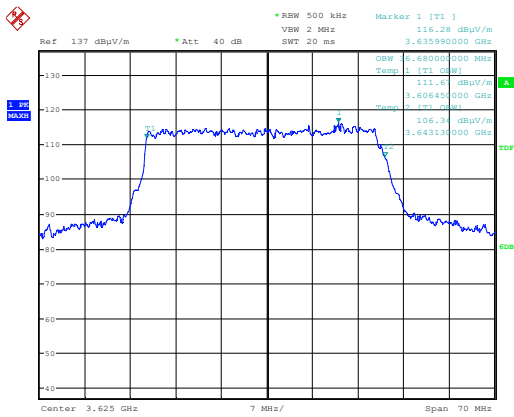
Date: 21.JUN.2021 16:37:11

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



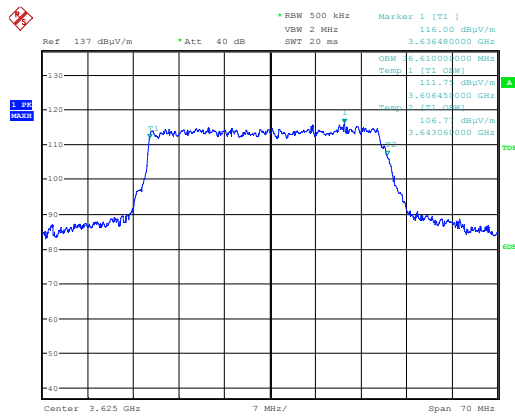
Date: 21.JUN.2021 16:41:38

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 16:39:28

99 % Bandwidth; 256QAM; 3625 MHz;
MIMO A.

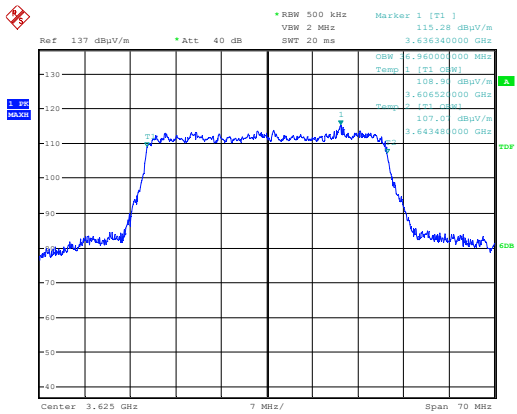


Date: 21.JUN.2021 16:42:05

99 % Bandwidth; 256QAM; 3625 MHz;
MIMO B.

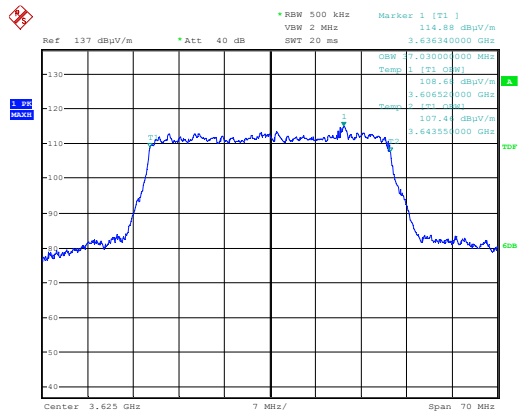
40 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3606.45000	3643.13000	36.6800	Pass
3625	QPSK	B	3606.45000	3643.13000	36.6800	Pass
3625	16QAM	A	3606.45000	3643.13000	36.6800	Pass
3625	16QAM	B	3606.45000	3643.13000	36.6800	Pass
3625	64QAM	A	3606.38000	3643.20000	36.8200	Pass
3625	64QAM	B	3606.45000	3643.06000	36.6100	Pass
3625	256QAM	A	3606.45000	3643.13000	36.6800	Pass
3625	256QAM	B	3606.45000	3643.06000	36.6100	Pass

40 MHz Bandwidth Sector



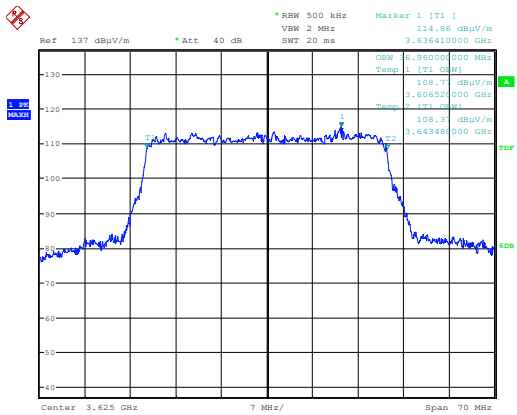
Date: 21.JUN.2021 16:53:14

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



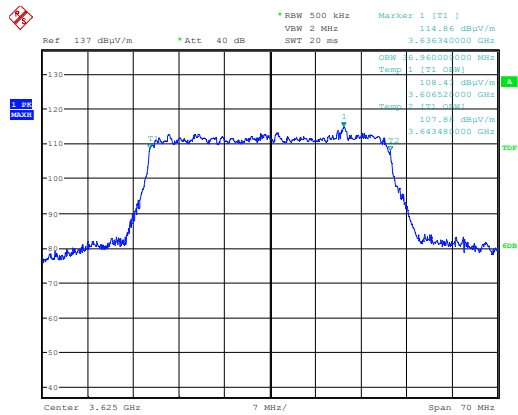
Date: 21.JUN.2021 16:48:03

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



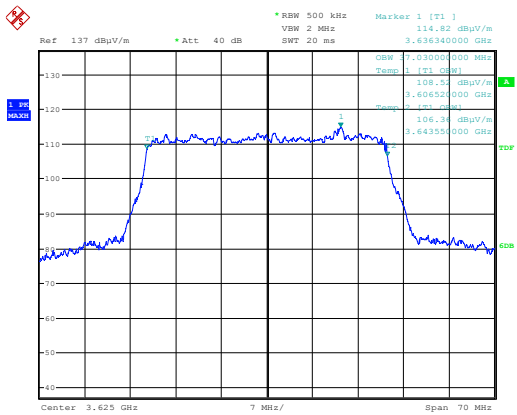
Date: 21.JUN.2021 16:52:46

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



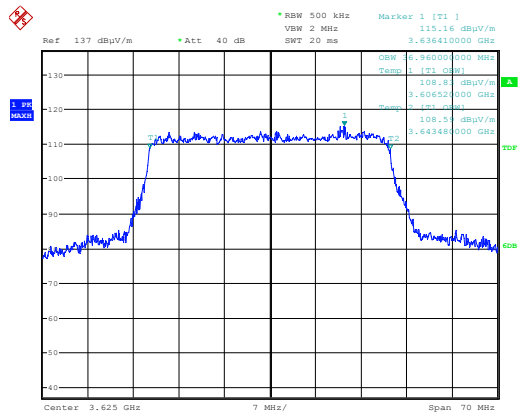
Date: 21.JUN.2021 16:46:05

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



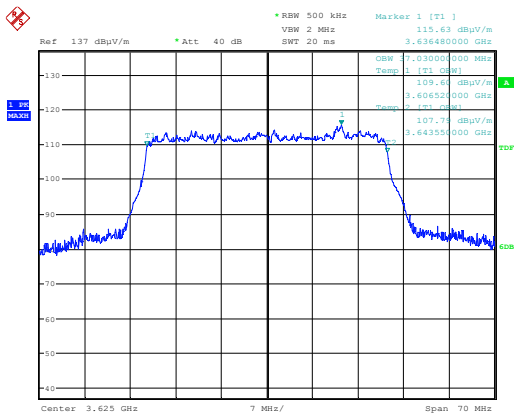
Date: 21.JUN.2021 16:52:14

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



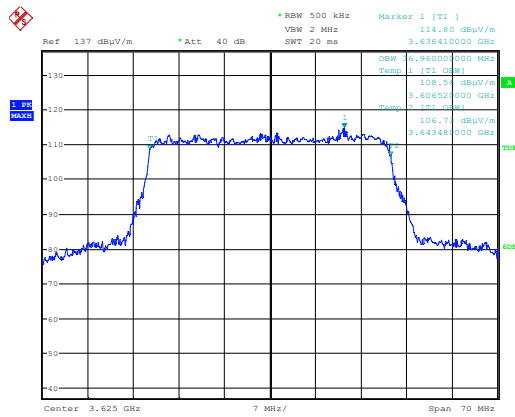
Date: 21.JUN.2021 16:46:34

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 16:50:41

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.

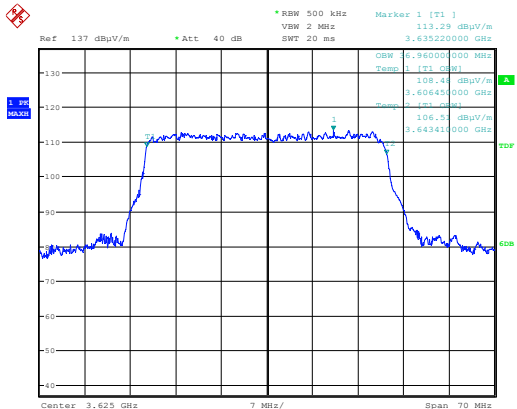


Date: 21.JUN.2021 16:44:18

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

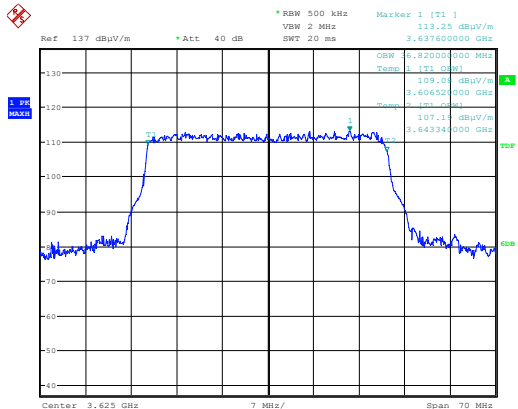
40 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3606.52000	3643.48000	36.9600	Pass
3625	QPSK	B	3606.52000	3643.48000	36.9600	Pass
3625	16QAM	A	3606.52000	3643.55000	37.0300	Pass
3625	16QAM	B	3606.52000	3643.55000	37.0300	Pass
3625	64QAM	A	3606.52000	3643.55000	37.0300	Pass
3625	64QAM	B	3606.52000	3643.48000	36.9600	Pass
3625	256QAM	A	3606.52000	3643.48000	36.9600	Pass
3625	256QAM	B	3606.52000	3643.48000	36.9600	Pass

40 MHz Bandwidth MU-MIMO



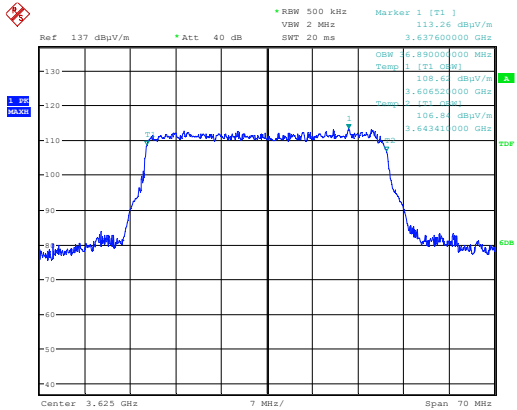
Date: 21.JUN.2021 16:55:51

99 % Bandwidth; QPSK; 3625 MHz; MIMO A.



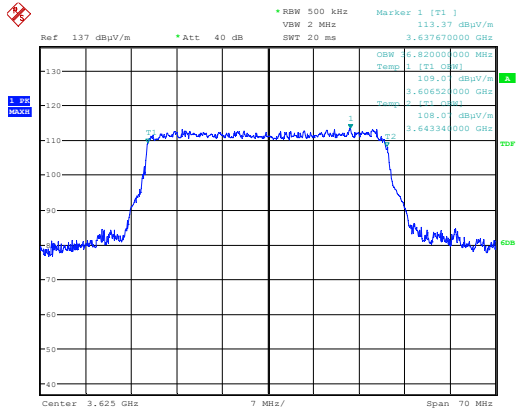
Date: 21.JUN.2021 16:58:58

99 % Bandwidth; QPSK; 3625 MHz; MIMO B.



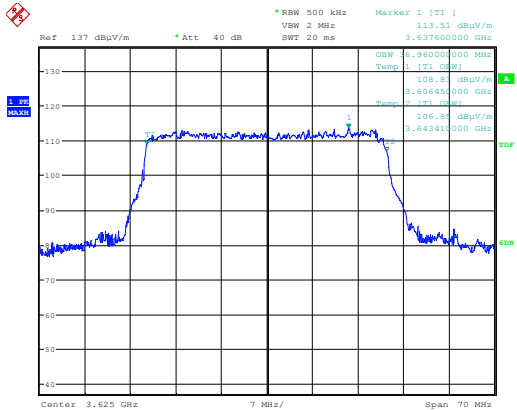
Date: 21.JUN.2021 16:56:35

99 % Bandwidth; 16QAM; 3625 MHz; MIMO A.



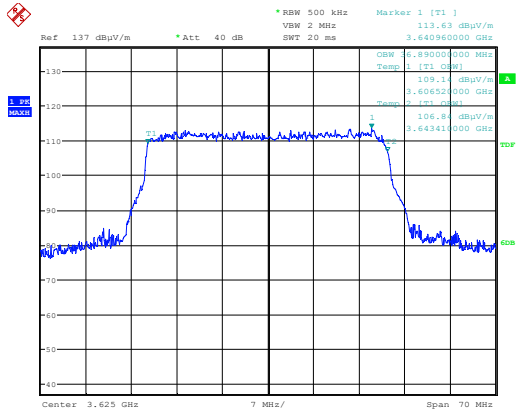
Date: 21.JUN.2021 16:59:46

99 % Bandwidth; 16QAM; 3625 MHz; MIMO B.



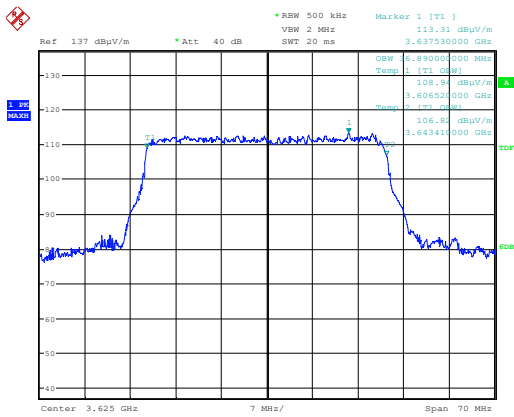
Date: 21.JUN.2021 16:57:22

99 % Bandwidth; 64QAM; 3625 MHz; MIMO A.



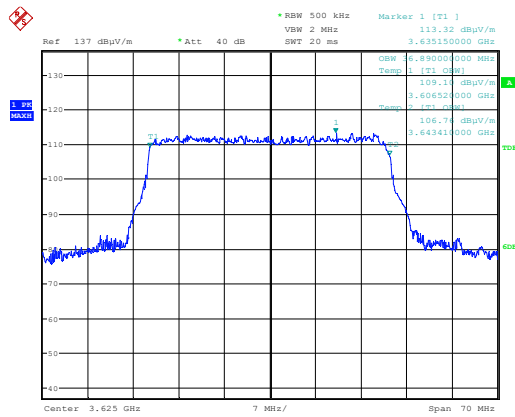
Date: 21.JUN.2021 17:00:15

99 % Bandwidth; 64QAM; 3625 MHz; MIMO B.



Date: 21.JUN.2021 16:58:16

99 % Bandwidth; 256QAM; 3625 MHz; MIMO A.



Date: 21.JUN.2021 17:00:48

99 % Bandwidth; 256QAM; 3625 MHz; MIMO B.

40 MHz bandwidth						
Frequency (MHz)	Modulation Mode	MIMO	FL (MHz)	FH (MHz)	99 % Bandwidth (MHz)	Result
3625	QPSK	A	3606.45000	3643.41000	36.9600	Pass
3625	QPSK	B	3606.52000	3643.41000	36.8900	Pass
3625	16QAM	A	3606.45000	3643.41000	36.9600	Pass
3625	16QAM	B	3606.52000	3643.41000	36.8900	Pass
3625	64QAM	A	3606.52000	3643.34000	36.8200	Pass
3625	64QAM	B	3606.52000	3643.34000	36.8200	Pass
3625	256QAM	A	3606.52000	3643.41000	36.8900	Pass
3625	256QAM	B	3606.52000	3643.41000	36.8900	Pass

16 Frequency stability

16.1 Definition

Frequency stability is a measure of frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at an appropriate reference temperature and the rated supply voltage.

16.2 Test Parameters

Test Location:	Element Skelmersdale
Test Chamber:	Blocking Laboratory
Test Standard and Clause:	2.1055
Frequency Measured:	3697.5 MHz
Resolution Bandwidth: (Requirement 1 % of the Occupied Channel Bandwidth):	50 kHz
Modulation:	Off
Deviations From Standard:	None
Temperature Extreme Environment Test Range:	-30 to +50 C
Voltage Extreme Environment Test Range:	Power = ±15% of Nominal;

Environmental Conditions (Normal Environment)

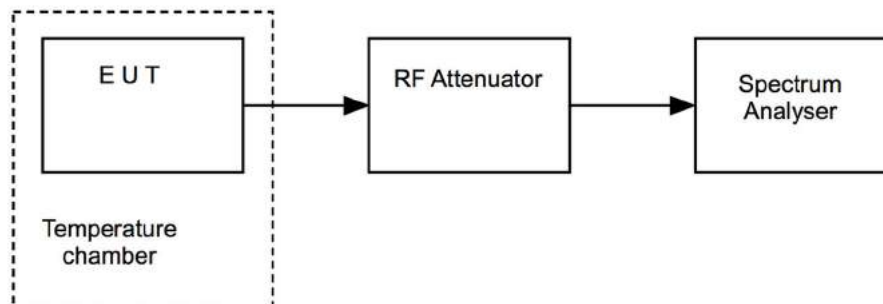
Temperature: 24 °C	Standard Requirement: +20 °C
Humidity: 60 %RH	20 % RH to 75 % RH (as declared)

16.3 Test Method

With the EUT setup as per section 9 of this report and connected as per Figure v, the frequency was measured under varying conditions of temperature and supply voltage.

The measurements were performed with EUT set in a CW mode of operation.

Figure v Test Setup



16.4 Test Equipment

Equipment Type	Manufacturer	Equipment Description	Element No	Due For Calibration
Spectrum Analyser	R&S	FSW 43	U728	2022-04-20
Multimeter	Agilent	34405a	REF976	2021-11-26
Power Supply	Farnell	AP60/50	U194	Use REF976
Temperature Indicator	Fluke	52 Series II	L426	2021-07-02
Temperature Chamber	ETS-S1000CHS	ETS	U522	Use L426

16.5 Test Results

EUT Frequency: 3697.5					
Test Environment		Measured Frequency (MHz)	Frequency error (kHz)	Drift (ppm)	Result
-30 C	V _{nominal}	3697.50420	6.30	1.70	PASS
-20 C	V _{nominal}	3697.50280	4.90	1.33	PASS
-10 C	V _{nominal}	3697.50160	3.70	1.00	PASS
0 C	V _{nominal}	3697.50070	2.80	0.76	PASS
+10 C	V _{nominal}	3697.49880	0.90	0.24	PASS
+20 C	V _{minimum}	3697.49790	0.00	0.00	PASS
	V _{nominal}	3697.49790	0.00	0.00	N/A
	V _{maximum}	3697.49790	0.00	0.00	PASS
+30 C	V _{nominal}	3697.49710	-0.80	-0.22	PASS
+40 C	V _{nominal}	3697.49650	-1.40	-0.38	PASS
+50 C	V _{nominal}	3697.49590	-2.00	-0.54	PASS

17 Measurement Uncertainty

Calculated Measurement Uncertainties

All statements of uncertainty are expanded standard uncertainty using a coverage factor of 1.96 to give a 95 % confidence:

[1] Radiated spurious emissions

Uncertainty in test result (30 MHz to 1 GHz) = **4.75 dB**

Uncertainty in test result (1 GHz to 18 GHz) = **4.46 dB**

[2] AC power line conducted emissions

Uncertainty in test result = **3.2 dB**

[3] Occupied bandwidth

Uncertainty in test result = **15.58 %**

[4] Conducted carrier power

Uncertainty in test result (Power Meter) = **0.93 dB**

[5] Conducted RF power out-of-band

Uncertainty in test result – up to 8.1 GHz = **3.31 dB**

Uncertainty in test result – 8.1 GHz to 15.3 GHz = **4.43 dB**

[6] Radiated RF power out-of-band

Uncertainty in test result (30 MHz to 1 GHz) = **4.75 dB**

Uncertainty in test result (1 GHz to 18 GHz) = **4.46 dB**

[7] Power spectral density

Uncertainty in test result (Spectrum Analyser) = **3.11 dB**

[8] ERP / EIRP

Uncertainty in test result (Laboratory) = **4.71 dB**

Uncertainty in test result (Pershore OATS) = **4.26 dB**