





Report Reference ID:	REP002340
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Test specification:	Title 47 – Telecommunication Chapter I – Federal Communications Commission Subchapter B – Common carrier services Part 96 – CITIZENS BROADBAND RADIO SERVICE
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Applicant:	TEKO Telecom Srl. Via Meucci, 24/a I-40024 Castel S. Pietro Terme (BO) (Italy)
Apparatus:	Cell Hub High-Power Radio Remote Unit
	XR35WH2/ACY-C
FCC ID:	XM2-X35H2B

Testing laboratory:	Nemko Italy Spa Via del Carroccio, 4 20853 Biassono (MB) – Italy Telephone: +39 039 2201201 Facsimile: +39 039 2201221
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	Name and title	Date
Tested by:	 _____ P. Barbieri, Wireless/EMC Specialist	11/07/2022
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Table of contents

Section 1: Report summary	3
1.1 Test specification	3
1.2 Statement of compliance	3
1.3 Exclusions	3
1.4 Registration number	3
1.5 Test report revision history	3
1.6 Limits of responsibility	3
Section 2: Summary of test results	4
2.1 FCC Part 96, test results	4
Section 3: Equipment under test (EUT) and application details	5
3.1 Applicant details	5
3.2 Modular equipment	5
3.3 Product details	5
3.4 Application purpose	5
3.5 Composite/related equipment	6
3.6 Sample information	6
3.7 EUT technical specifications	6
3.8 Accessories and support equipment	7
3.9 Operation of the EUT during testing	8
3.10 EUT setup diagram	8
Section 4: Engineering considerations	9
4.1 Modifications incorporated in the EUT	9
4.2 Deviations from laboratory tests procedures	9
4.3 Technical judgment	9
Section 5: Test conditions	10
5.1 Deviations from laboratory tests procedures	10
5.2 Test conditions, power source and ambient temperatures	10
5.3 Measurement uncertainty	10
5.4 Test equipment	12
Appendix A: Test results	13
Clause 96.41(e)(3) Occupied bandwidth	13
Clause 96.41(b)(g) Peak output power at RF antenna connector	38
Clause 96.41(e)(1)(2)(3) Spurious emissions at RF antenna connector	71
Clause 96.41(e)(1)(2)(3) Radiated Spurious emissions	145
Clause 2.1055 Frequency stability	228
Appendix B: Block diagrams of test set-ups	283
Appendix C: EUT Photos	284

Section 1: Report summary

1.1 Test specification

Specifications	Part 96 – CITIZENS BROADBAND RADIO SERVICE
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1.2 Statement of compliance

Compliance	<p>In the configuration tested the EUT was found compliant Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Test method: ANSI C63.26-2015, 662911 D01 Multiple Transmitter Output v02r01, 662911 D02 MIMO with Cross-Polarized Antennas v01</p>
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1.3 Exclusions

Exclusions	None
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1.4 Registration number

Test site FCC ID number	682159
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1.5 Test report revision history

Revision #	Details of changes made to test report
REP002340TRF	Original report issued

1.6 Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

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Section 2: Summary of test results

2.1 FCC Part 96, test results

Part	Methods	Test description	Verdict
§96.41(e)(3)	2.1049	Occupied bandwidth	Pass
§96.41(b)	2.1046	Peak output power at RF antenna connector EIRP	Pass
§96.41(b)	2.1046	Peak output power at RF antenna connector PSD	Pass
§96.41(g)	2.1046	Peak output power at RF antenna connector PAPR	Pass
§96.41(e)	2.1051	Spurious emissions at RF antenna connector	Pass
§96.41(e)	2.1053	Radiated spurious emissions	Pass
	2.1055	Frequency stability	Pass
Notes:			

Section 3: Equipment under test (EUT) and application details

3.1 Applicant details

Applicant complete business name	Name:	Teko Telecom Srl
	Federal Registration Number (FRN):	0018963462
	Grantee code	XM2
Mailing address	Address:	Via Meucci, 24/a
	City:	Castel S. Pietro Terme
	Province/State:	Bologna
	Post code:	40024
	Country:	Italy

3.2 Modular equipment

a) Single modular approval	Single modular approval Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
b) Limited single modular approval	Limited single modular approval Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

3.3 Product details

FCC ID	Grantee code:	XM2
	Product code:	-X35H2B
Equipment class	CBD	
Description of product as it is marketed	Base Station	
	Model name/number:	XR35WH2/ACY-C
	Serial number:	1033643092

3.4 Application purpose

Type of application	<input type="checkbox"/> Original certification <input type="checkbox"/> Change in identification of presently authorized equipment Original FCC ID: _____ Grant date: _____ <input checked="" type="checkbox"/> Class II permissive change or modification of presently authorized equipment
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Section 3: Equipment under test

3.5 Composite/related equipment

a) Composite equipment	The EUT is a composite device subject to an additional equipment authorization Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
b) Related equipment	The EUT is part of a system that operates with, or is marketed with, another device that requires an equipment authorization Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
c) Related FCC ID	If either of the above is "yes": <input type="checkbox"/> has been granted under the FCC ID(s) listed below: <input type="checkbox"/> is in the process of being filled under the FCC ID(s) listed below: <input type="checkbox"/> is pending with the FCC ID(s) listed below: <input type="checkbox"/> has a mix of pending and granted statues under the FCC ID(s) listed below: i FCC ID: ii FCC ID:

3.6 Sample information

Receipt date:	10/12/2022
Nemko sample ID number:	-----

3.7 EUT technical specifications

Operating band:	Down Link: 3550–3700 MHz
Operating frequency:	Wideband
Modulation type:	5G NR-TDD (16QAM, 64QAM, 256QAM, QPSK)
Occupied bandwidth:	5G NR: 5 MHz, 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz,
Channel spacing:	standard
Emission designator:	5G NR: D7W
RF Output	Down Link: 37dBm (5 W)
Category of CBSD	Category A and Category B
Antenna type:	External Antenna is not provided, equipment that has an external 50 Ω RF connector
Power source:	100-240 Vac

Remark: This equipment is professionally installed with an external antenna that adheres to the applicable maximum EIRP as documented in this test report.

Section 3: Equipment under test

3.8 Accessories and support equipment
 The following information identifies accessories used to exercise the EUT during testing:

Item # 1	
Type of equipment:	Server
Brand name:	Dell
Model name or number:	E38S
Serial number:	408P2T2
Nemko sample number:	-----
Connection port:	-----
Cable length and type:	-----
Item # 2	
Type of equipment:	
Brand name:	
Model name or number:	
Serial number:	
Nemko sample number:	
Connection port:	
Cable length and type:	
Item # 3	
Type of equipment:	
Brand name:	
Model name or number:	
Serial number:	
Nemko sample number:	
Connection port:	
Cable length and type:	
Item # 4	
Type of equipment:	
Brand name:	
Model name or number:	
Serial number:	
Nemko sample number:	
Connection port:	
Cable length and type:	

3.9 Operation of the EUT during testing

Details:

In down-link direction, normal working at max gain with max RF power output.

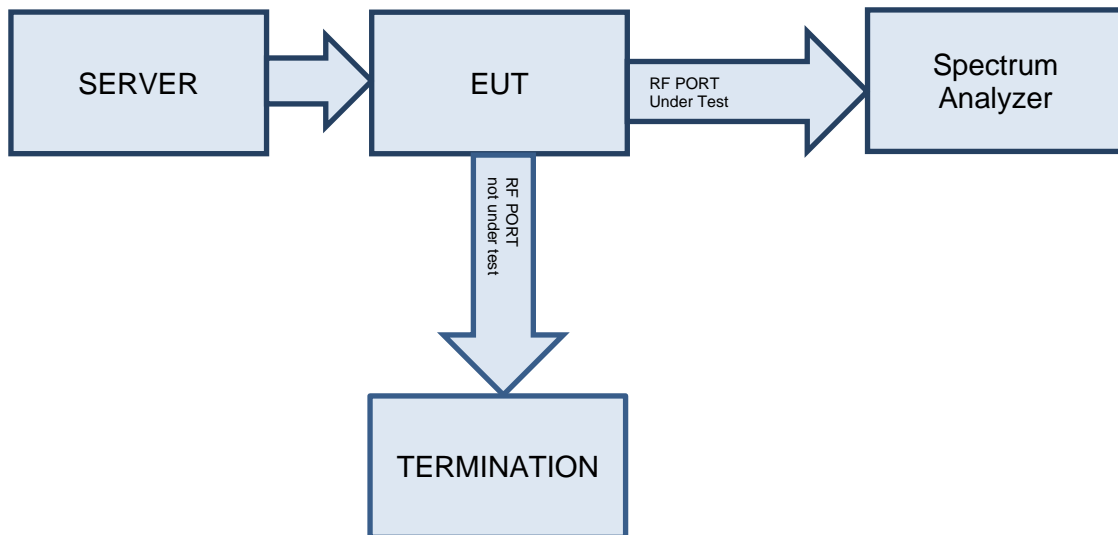
This report refers to measurement both RF port 1 and RF port 2.

When a RF port has been tested, the other one has been terminated on 50Ω load.

3.10 EUT setup diagram

In this system Cell Hub (Base Station) is the EUT. The server generates wanted signals in base band frequency and Cell Hub convert the signal to RF band.

Test setup :



Procedure

Connect the server to the input of EUT by means of optical fiber, so the EUT can work at the maximum power.

Connect the spectrum analyzer to the RF output connector of the EUT.

Section 4: Engineering considerations

4.1 Modifications incorporated in the EUT

Modifications

Modifications performed to the EUT during this assessment
None Yes , performed by Client or Nemko
Details:

4.2 Deviations from laboratory tests procedures

Deviations

Deviations from laboratory test procedures
None Yes - details are listed below:

4.3 Technical judgment

Judgment

None

Section 5: Test conditions

5.1 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

5.2 Test conditions, power source and ambient temperatures

<p>Normal temperature, humidity and air pressure test conditions</p>	<p>Temperature: 15–30 °C Relative humidity: 20–75 % Air pressure: 86–106 kPa</p> <p>When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.</p>
<p>Power supply range:</p>	<p>The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.</p>

5.3 Measurement uncertainty

The measurement uncertainty was calculated for each test and quantity listed in this test report, according to CISPR 16-4-2 and other specific test standard and is documented in Nemko Spa working manual WML1002 and WML0078. The assessment of conformity for each test performed on the equipment is performed not taking into account the measurement uncertainty. The two following possible verdicts are stated in the report:

P (Pass) - The measured values of the equipment respect the specification limit at the points tested. The specific risk of false accept is up to 50% when the measured result is close to the limit.

F (Fail) - One or more measured values of the equipment do not respect the specification limit at the points tested. The specific risk of false reject is up to 50% when the measured result is close to the limit.

Hereafter Nemko's measurement uncertainties are reported:

Section 5: Test conditions, continued

EUT	Type	Test	Range	Measurement Uncertainty	Notes	
Transmitter	Conducted	Frequency error	0.001 MHz ÷ 40 GHz	0.08 ppm	(1)	
		Carrier power RF Output Power	0.009 MHz ÷ 30 MHz	1.1 dB	(1)	
			30 MHz ÷ 18 GHz	1.5 dB	(1)	
			18 MHz ÷ 40 GHz	3.0 dB	(1)	
			40 MHz ÷ 140 GHz	5.0 dB	(1)	
		Adjacent channel power	1 MHz ÷ 18 GHz	1.4 dB	(1)	
		Conducted spurious emissions	0.009 MHz ÷ 18 GHz	3.0 dB	(1)	
			18 GHz ÷ 40 GHz	4.2 dB	(1)	
			40 GHz ÷ 220 GHz	6.0 dB	(1)	
		Intermodulation attenuation	1 MHz ÷ 18 GHz	2.2 dB	(1)	
		Attack time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)	
		Attack time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)	
		Release time – frequency behaviour	1 MHz ÷ 18 GHz	2.0 ms	(1)	
		Release time – power behaviour	1 MHz ÷ 18 GHz	2.5 ms	(1)	
		Transient behaviour of the transmitter– Transient frequency behaviour	1 MHz ÷ 18 GHz	0.2 kHz	(1)	
		Transient behaviour of the transmitter – Power level slope	1 MHz ÷ 18 GHz	9%	(1)	
		Frequency deviation - Maximum permissible frequency deviation	0.001 MHz ÷ 18 GHz	1.3%	(1)	
		Frequency deviation - Response of the transmitter to modulation frequencies above 3 kHz	0.001 MHz ÷ 18 GHz	0.5 dB	(1)	
		Dwell time	-	3%	(1)	
		Hopping Frequency Separation	0.01 MHz ÷ 18 GHz	1%	(1)	
Occupied Channel Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)			
Modulation Bandwidth	0.01 MHz ÷ 18 GHz	2%	(1)			
Radiated	Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)		
		26.5 GHz ÷ 66 GHz	8.0 dB	(1)		
		66 GHz ÷ 220 GHz	10 dB	(1)		
	Effective radiated power transmitter	10 kHz ÷ 26.5 GHz	6.0 dB	(1)		
		26.5 GHz ÷ 66 GHz	8.0 dB	(1)		
		66 GHz ÷ 220 GHz	10 dB	(1)		
Receiver	Radiated	Radiated spurious emissions	0.009 MHz ÷ 26.5 GHz	6.0 dB	(1)	
			26.5 GHz ÷ 66 GHz	8.0 dB	(1)	
			66 GHz ÷ 220 GHz	10 dB	(1)	
	Conducted	Sensitivity measurement	1 MHz ÷ 18 GHz	6.0 dB	(1)	
			Conducted spurious emissions	0.009 MHz ÷ 18 GHz	3.0 dB	(1)
				18 GHz ÷ 40 GHz	4.2 dB	(1)
	40 GHz ÷ 220 GHz	6.0 dB		(1)		

NOTES:
 (1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 %

5.4 Test equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next cal.
Spectrum Analyzer	Keysight	N9030B PXA	MY61330632	04/2023
Spectrum Analyzer	Keysight	N9041B UXA	US57220208	05/2023
Climatic Chambre	Angelantoni	ACS-Hygros 600	7237	11/2023
Trilog Broad Band Antenna	Schwarzbeck	VULB 9162	VULB 9162-25	07/2024
Bilog antenna (1 ÷ 18 GHz)	Schwarzbeck	STLP 9148	STPL 9148-123	06/2024
Double ridge horn antenna (4 ÷ 40 GHz)	RFSpin	DRH40	061106A40	04/2023
Broadband preamplifier (18 ÷ 40 GHz)	Sage	STB-1834034030-KFKF-L1	18490-01	05/2023
Broadband preamplifier (1 ÷ 18 GHz)	Schwarzbeck	BBV9718C	00121	03/2023
EMI receiver (2 Hz ÷ 44 GHz)	R&S	ESW44	101620	08/2023
Spectrum Analyzer (2 Hz ÷ 43.5 GHz)	R&S	FSW43	101767	12/2022
Controller	Maturo	FCU3.0	10041	NCR
Tilt antenna mast	Maturo	TAM4.0-E	10042	NCR
Turntable	Maturo	TT4.0-5T	2.527	NCR
Semi-anechoic chamber	Comtest	3m SAC	1711-150	09/2024

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use
 (*) Equipment supplied by manufacturer's

Appendix A: Test results

Clause 96.41(e)(3) Occupied bandwidth

(e) 3.5 GHz Emissions and Interference Limits

(3) *Measurement procedure.* (i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (*i.e.*, 1 MHz or 1 percent of emission bandwidth, as specified).

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test date: 10/12/2022 to 11/04/2022

Test results: Pass

Special notes

Measurements were performed for all modulation types. As an example, only measurements for 64 QAM modulation type are reported.

Test equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.
Spectrum Analyzer	Keysight	N9030B PXA	MY61330632
Spectrum Analyzer	Keysight	N9041B UXA	US57220208

Clause 96.41(e)(3) Occupied bandwidth, continued

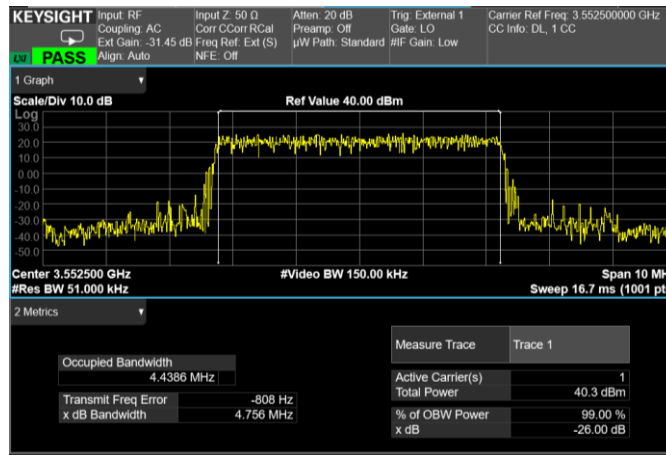
Test data

RF PORT 1

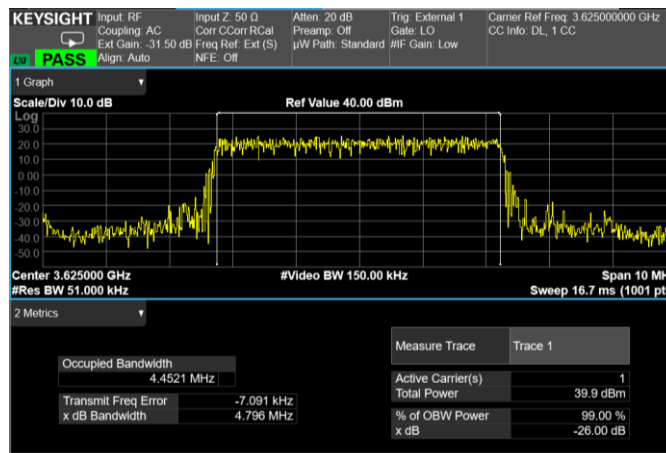
Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 5MHz (QPSK)	3552.5	4.45
Down-link	5G NR 5MHz (QPSK)	3625	4.44
Down-link	5G NR 5MHz (QPSK)	3697.5	4.44
Down-link	5G NR 5MHz (16QAM)	3552.5	4.45
Down-link	5G NR 5MHz (16QAM)	3625	4.45
Down-link	5G NR 5MHz (16QAM)	3697.5	4.44
Down-link	5G NR 5MHz (64QAM)	3552.5	4.44
Down-link	5G NR 5MHz (64QAM)	3625	4.45
Down-link	5G NR 5MHz (64QAM)	3697.5	4.44
Down-link	5G NR 5MHz (256QAM)	3552.5	4.45
Down-link	5G NR 5MHz (256QAM)	3625	4.44
Down-link	5G NR 5MHz (256QAM)	3697.5	4.45
Down-link	5G NR 10MHz (QPSK)	3555	8.57
Down-link	5G NR 10MHz (QPSK)	3625	8.57
Down-link	5G NR 10MHz (QPSK)	3695	8.57
Down-link	5G NR 10MHz (16QAM)	3555	8.57
Down-link	5G NR 10MHz (16QAM)	3625	8.57
Down-link	5G NR 10MHz (16QAM)	3695	8.57
Down-link	5G NR 10MHz (64QAM)	3555	8.57
Down-link	5G NR 10MHz (64QAM)	3625	8.57
Down-link	5G NR 10MHz (64QAM)	3695	8.57
Down-link	5G NR 10MHz (256QAM)	3555	8.57
Down-link	5G NR 10MHz (256QAM)	3625	8.57
Down-link	5G NR 10MHz (256QAM)	3695	8.57
Down-link	5G NR 15MHz (QPSK)	3557.5	13.54
Down-link	5G NR 15MHz (QPSK)	3625	13.54
Down-link	5G NR 15MHz (QPSK)	3692.5	13.53
Down-link	5G NR 15MHz (16QAM)	3557.5	13.54
Down-link	5G NR 15MHz (16QAM)	3625	13.53
Down-link	5G NR 15MHz (16QAM)	3692.5	13.53
Down-link	5G NR 15MHz (64QAM)	3557.5	13.53
Down-link	5G NR 15MHz (64QAM)	3625	13.54
Down-link	5G NR 15MHz (64QAM)	3692.5	13.53
Down-link	5G NR 15MHz (256QAM)	3557.5	13.54
Down-link	5G NR 15MHz (256QAM)	3625	13.54
Down-link	5G NR 15MHz (256QAM)	3692.5	13.53
Down-link	5G NR 20MHz (QPSK)	3560	18.21
Down-link	5G NR 20MHz (QPSK)	3625	18.20
Down-link	5G NR 20MHz (QPSK)	3690	18.20
Down-link	5G NR 20MHz (16QAM)	3560	18.21
Down-link	5G NR 20MHz (16QAM)	3625	18.20
Down-link	5G NR 20MHz (16QAM)	3690	18.20

Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 20MHz (64QAM)	3560	18.21
Down-link	5G NR 20MHz (64QAM)	3625	18.20
Down-link	5G NR 20MHz (64QAM)	3690	18.20
Down-link	5G NR 20MHz (256QAM)	3560	18.21
Down-link	5G NR 20MHz (256QAM)	3625	18.20
Down-link	5G NR 20MHz (256QAM)	3690	18.20
Down-link	5G NR 25MHz (QPSK)	3562.5	22.95
Down-link	5G NR 25MHz (QPSK)	3625	22.97
Down-link	5G NR 25MHz (QPSK)	3687.5	22.95
Down-link	5G NR 25MHz (16QAM)	3562.5	22.95
Down-link	5G NR 25MHz (16QAM)	3625	22.96
Down-link	5G NR 25MHz (16QAM)	3687.5	22.96
Down-link	5G NR 25MHz (64QAM)	3562.5	22.95
Down-link	5G NR 25MHz (64QAM)	3625	22.96
Down-link	5G NR 25MHz (64QAM)	3687.5	22.95
Down-link	5G NR 25MHz (256QAM)	3562.5	22.95
Down-link	5G NR 25MHz (256QAM)	3625	22.96
Down-link	5G NR 25MHz (256QAM)	3687.5	22.95
Down-link	5G NR 30MHz (QPSK)	3565	27.90
Down-link	5G NR 30MHz (QPSK)	3625	27.90
Down-link	5G NR 30MHz (QPSK)	3685	27.86
Down-link	5G NR 30MHz (16QAM)	3565	27.84
Down-link	5G NR 30MHz (16QAM)	3625	27.91
Down-link	5G NR 30MHz (16QAM)	3685	27.89
Down-link	5G NR 30MHz (64QAM)	3565	27.84
Down-link	5G NR 30MHz (64QAM)	3625	27.89
Down-link	5G NR 30MHz (64QAM)	3685	27.86
Down-link	5G NR 30MHz (256QAM)	3565	27.84
Down-link	5G NR 30MHz (256QAM)	3625	27.91
Down-link	5G NR 30MHz (256QAM)	3685	27.90
Down-link	5G NR 40MHz (QPSK)	3570	37.63
Down-link	5G NR 40MHz (QPSK)	3625	37.67
Down-link	5G NR 40MHz (QPSK)	3680	37.80
Down-link	5G NR 40MHz (16QAM)	3570	37.63
Down-link	5G NR 40MHz (16QAM)	3625	37.66
Down-link	5G NR 40MHz (16QAM)	3680	37.74
Down-link	5G NR 40MHz (64QAM)	3570	37.63
Down-link	5G NR 40MHz (64QAM)	3625	37.65
Down-link	5G NR 40MHz (64QAM)	3680	37.81
Down-link	5G NR 40MHz (256QAM)	3570	37.64
Down-link	5G NR 40MHz (256QAM)	3625	37.67
Down-link	5G NR 40MHz (256QAM)	3680	38.02
Down-link	5G NR 50MHz (QPSK)	3575	47.27
Down-link	5G NR 50MHz (QPSK)	3625	47.33
Down-link	5G NR 50MHz (QPSK)	3675	47.30
Down-link	5G NR 50MHz (16QAM)	3575	47.27
Down-link	5G NR 50MHz (16QAM)	3625	47.33
Down-link	5G NR 50MHz (16QAM)	3675	47.30
Down-link	5G NR 50MHz (64QAM)	3575	47.26

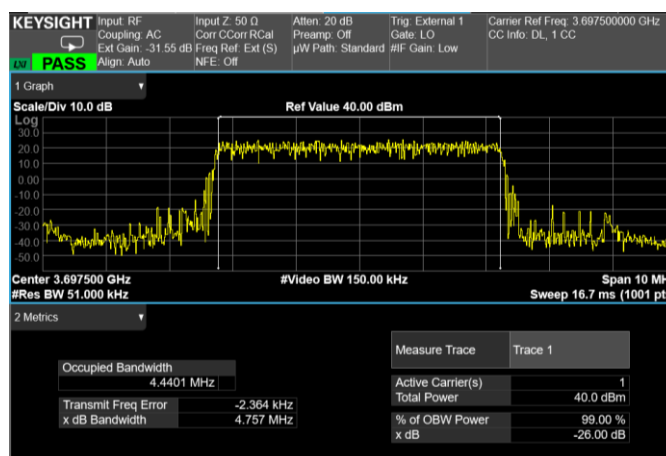
Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 50MHz (64QAM)	3625	47.33
Down-link	5G NR 50MHz (64QAM)	3675	47.31
Down-link	5G NR 50MHz (256QAM)	3575	47.27
Down-link	5G NR 50MHz (256QAM)	3625	47.33
Down-link	5G NR 50MHz (256QAM)	3675	47.31
Down-link	5G NR 60MHz (QPSK)	3580	57.59
Down-link	5G NR 60MHz (QPSK)	3625	57.55
Down-link	5G NR 60MHz (QPSK)	3670	57.53
Down-link	5G NR 60MHz (16QAM)	3580	57.59
Down-link	5G NR 60MHz (16QAM)	3625	57.62
Down-link	5G NR 60MHz (16QAM)	3670	57.53
Down-link	5G NR 60MHz (64QAM)	3580	57.55
Down-link	5G NR 60MHz (64QAM)	3625	57.62
Down-link	5G NR 60MHz (64QAM)	3670	57.57
Down-link	5G NR 60MHz (256QAM)	3580	57.56
Down-link	5G NR 60MHz (256QAM)	3625	57.56
Down-link	5G NR 60MHz (256QAM)	3670	57.57



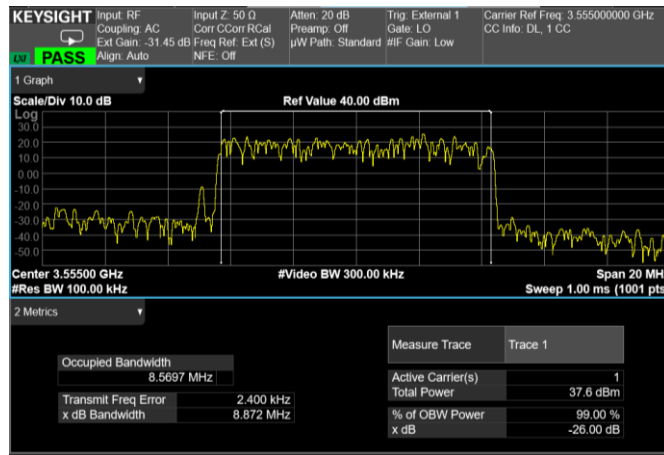
Channel: BOTTOM, Modulation: 64QAM,
BW=5MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=5MHz



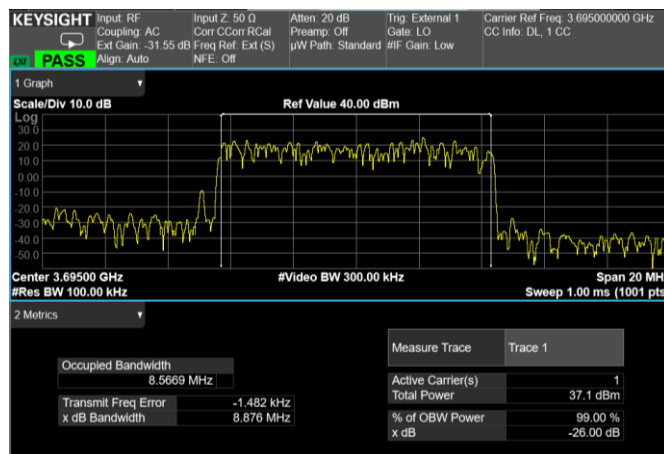
Channel: TOP, Modulation: 64QAM,
BW=5MHz



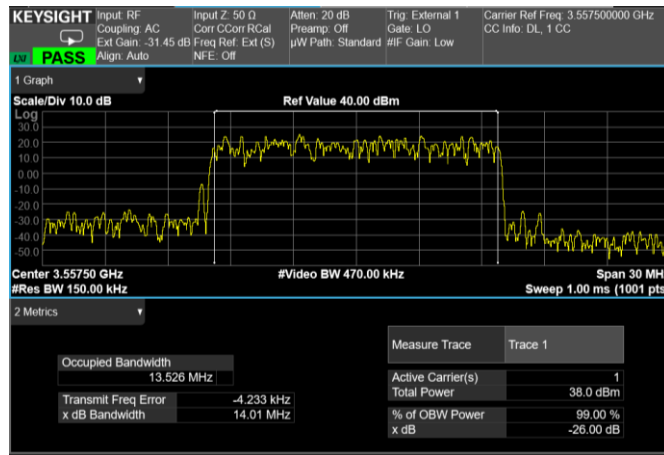
Channel: BOTTOM, Modulation: 64QAM, BW=10MHz



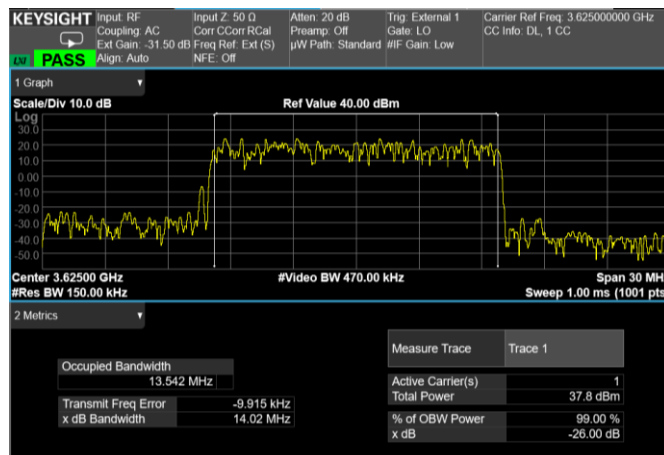
Channel: MIDDLE, Modulation: 64QAM, BW=10MHz



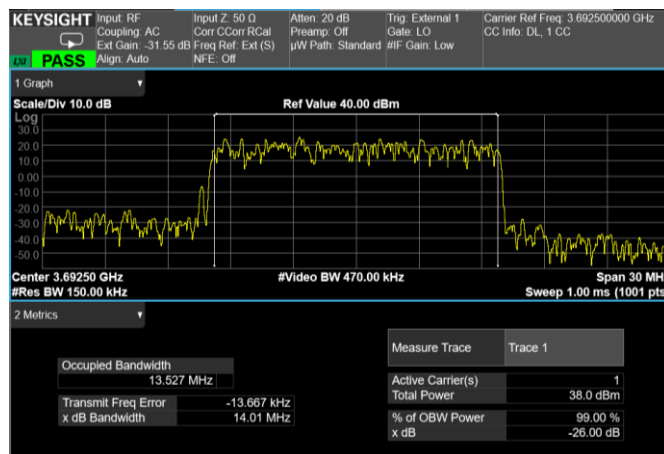
Channel: TOP, Modulation: 64QAM, BW=10MHz



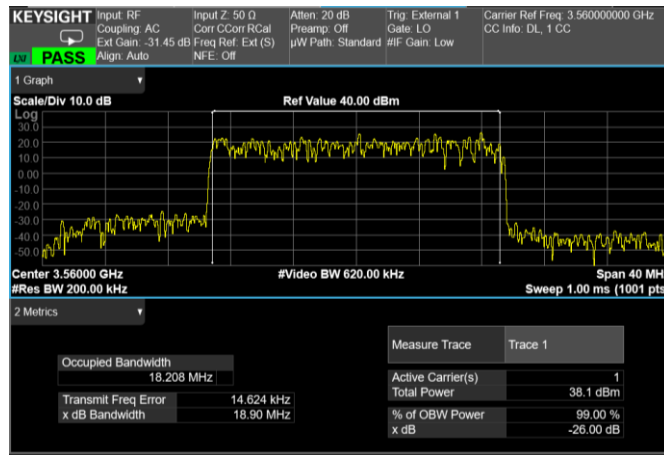
Channel: BOTTOM, Modulation: 64QAM,
BW=15MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=15MHz



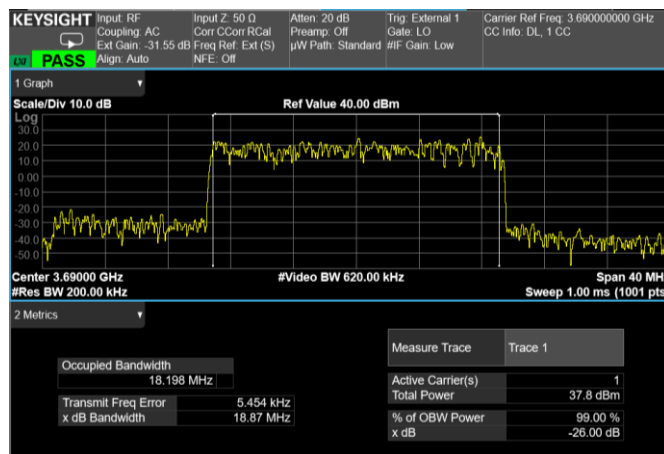
Channel: TOP, Modulation: 64QAM,
BW=15MHz



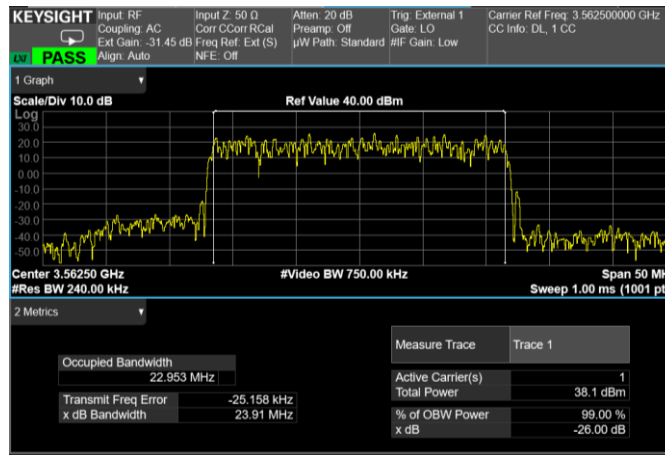
Channel: BOTTOM, Modulation: 64QAM, BW=20MHz



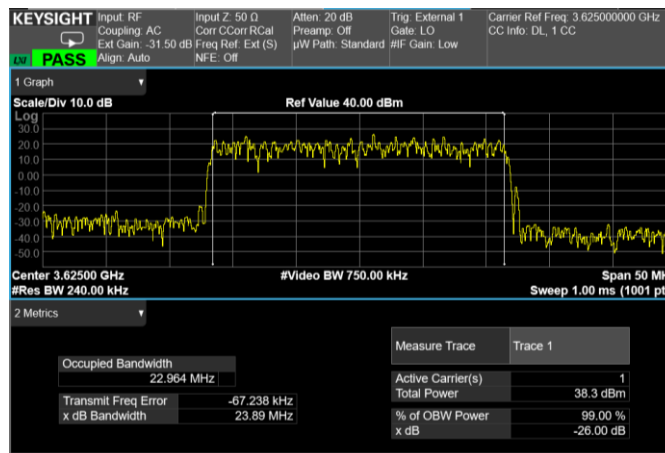
Channel: MIDDLE, Modulation: 64QAM, BW=20MHz



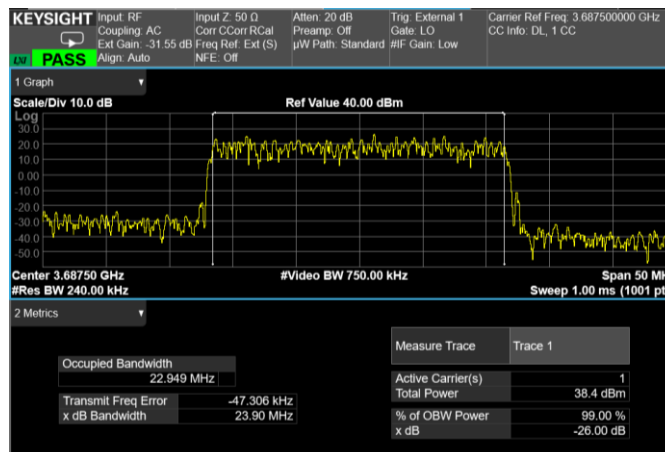
Channel: TOP, Modulation: 64QAM, BW=20MHz



Channel: BOTTOM, Modulation: 64QAM,
BW=25MHz



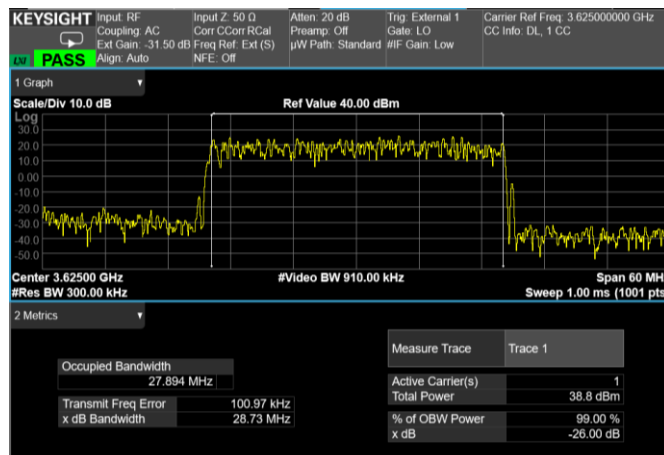
Channel: MIDDLE, Modulation: 64QAM,
BW=25MHz



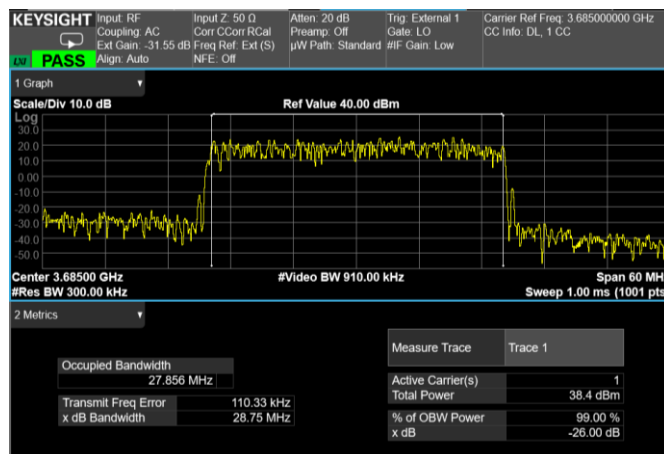
Channel: TOP, Modulation: 64QAM,
BW=25MHz



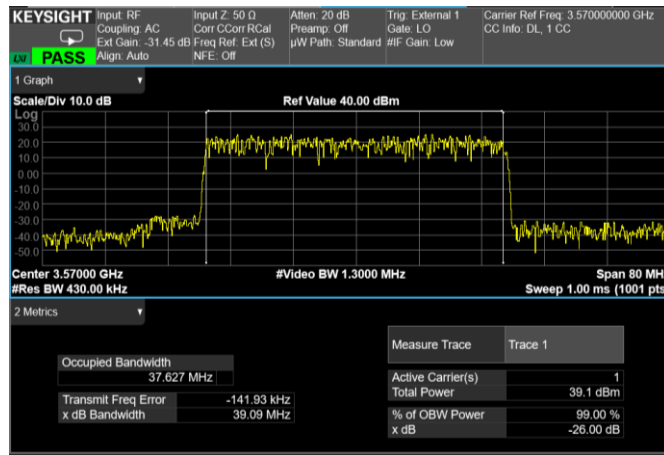
Channel: BOTTOM, Modulation: 64QAM, BW=30MHz



Channel: MIDDLE, Modulation: 64QAM, BW=30MHz



Channel: TOP, Modulation: 64QAM, BW=30MHz



Channel: BOTTOM, Modulation: 64QAM,
 BW=40MHz



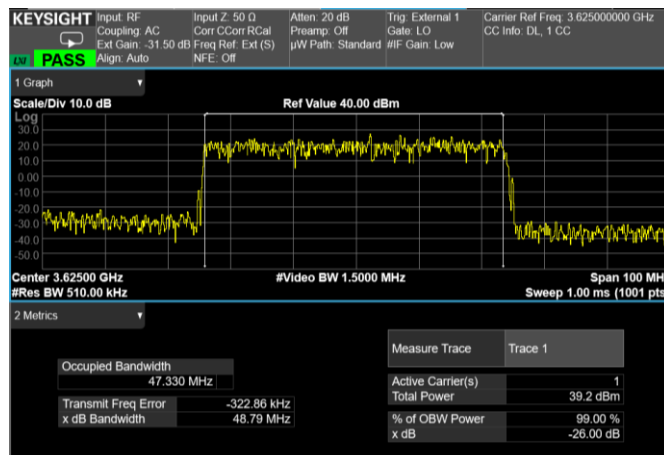
Channel: MIDDLE, Modulation: 64QAM,
 BW=40MHz



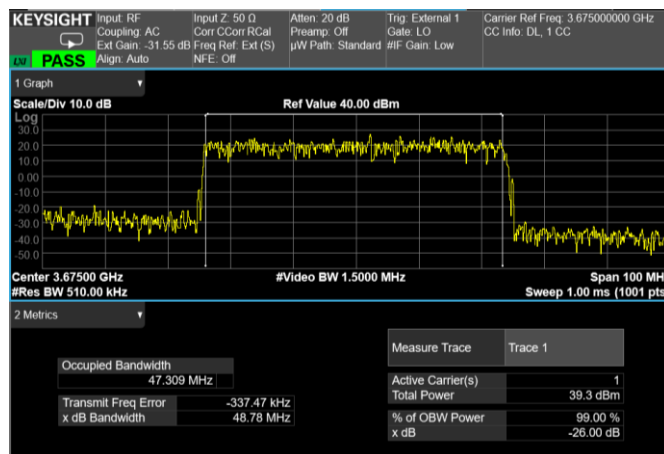
Channel: TOP, Modulation: 64QAM,
 BW=40MHz



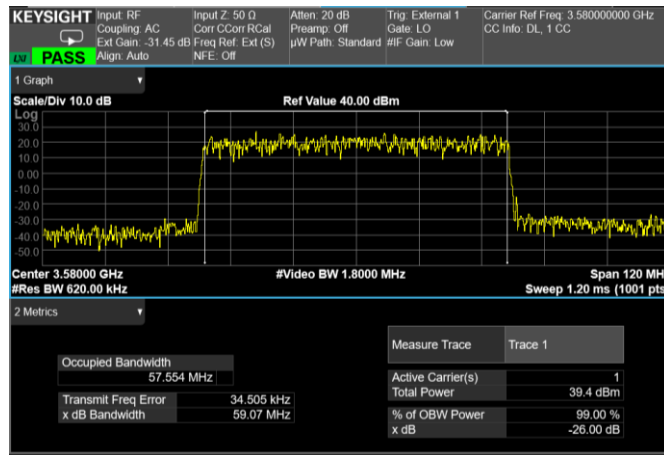
Channel: BOTTOM, Modulation: 64QAM,
BW=50MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=50MHz



Channel: TOP, Modulation: 64QAM,
BW=50MHz



Channel: BOTTOM, Modulation: 64QAM,
BW=60MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=60MHz



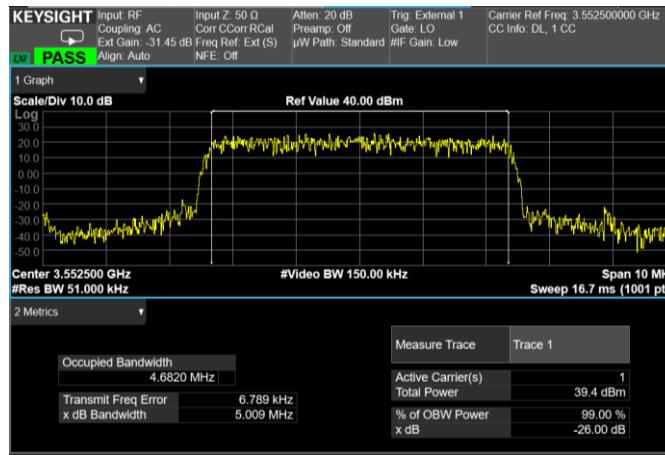
Channel: TOP, Modulation: 64QAM,
BW=60MHz

RF PORT 2

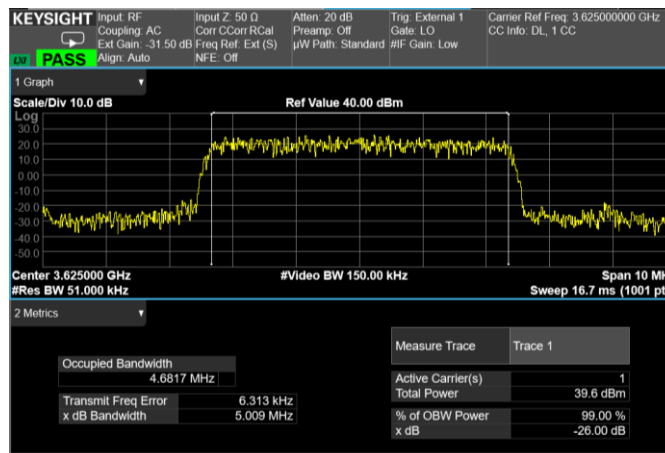
Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 5MHz (QPSK)	3552.5	4.68
Down-link	5G NR 5MHz (QPSK)	3625	4.68
Down-link	5G NR 5MHz (QPSK)	3697.5	4.68
Down-link	5G NR 5MHz (16QAM)	3552.5	4.68
Down-link	5G NR 5MHz (16QAM)	3625	4.68
Down-link	5G NR 5MHz (16QAM)	3697.5	4.68
Down-link	5G NR 5MHz (64QAM)	3552.5	4.68
Down-link	5G NR 5MHz (64QAM)	3625	4.68
Down-link	5G NR 5MHz (64QAM)	3697.5	4.68
Down-link	5G NR 5MHz (256QAM)	3552.5	4.68
Down-link	5G NR 5MHz (256QAM)	3625	4.68
Down-link	5G NR 5MHz (256QAM)	3697.5	4.68
Down-link	5G NR 10MHz (QPSK)	3555	8.61
Down-link	5G NR 10MHz (QPSK)	3625	8.61
Down-link	5G NR 10MHz (QPSK)	3695	8.61
Down-link	5G NR 10MHz (16QAM)	3555	8.61
Down-link	5G NR 10MHz (16QAM)	3625	8.61
Down-link	5G NR 10MHz (16QAM)	3695	8.61
Down-link	5G NR 10MHz (64QAM)	3555	8.61
Down-link	5G NR 10MHz (64QAM)	3625	8.61
Down-link	5G NR 10MHz (64QAM)	3695	8.61
Down-link	5G NR 10MHz (256QAM)	3555	8.61
Down-link	5G NR 10MHz (256QAM)	3625	8.61
Down-link	5G NR 10MHz (256QAM)	3695	8.61
Down-link	5G NR 15MHz (QPSK)	3557.5	13.48
Down-link	5G NR 15MHz (QPSK)	3625	13.49
Down-link	5G NR 15MHz (QPSK)	3692.5	13.48
Down-link	5G NR 15MHz (16QAM)	3557.5	13.48
Down-link	5G NR 15MHz (16QAM)	3625	13.48
Down-link	5G NR 15MHz (16QAM)	3692.5	13.49
Down-link	5G NR 15MHz (64QAM)	3557.5	13.48
Down-link	5G NR 15MHz (64QAM)	3625	13.48
Down-link	5G NR 15MHz (64QAM)	3692.5	13.48
Down-link	5G NR 15MHz (256QAM)	3557.5	13.49
Down-link	5G NR 15MHz (256QAM)	3625	13.49
Down-link	5G NR 15MHz (256QAM)	3692.5	13.48
Down-link	5G NR 20MHz (QPSK)	3560	18.21
Down-link	5G NR 20MHz (QPSK)	3625	18.20
Down-link	5G NR 20MHz (QPSK)	3690	18.20
Down-link	5G NR 20MHz (16QAM)	3560	18.21
Down-link	5G NR 20MHz (16QAM)	3625	18.20
Down-link	5G NR 20MHz (16QAM)	3690	18.20
Down-link	5G NR 20MHz (64QAM)	3560	18.21
Down-link	5G NR 20MHz (64QAM)	3625	18.20
Down-link	5G NR 20MHz (64QAM)	3690	18.20
Down-link	5G NR 20MHz (256QAM)	3560	18.21
Down-link	5G NR 20MHz (256QAM)	3625	18.20
Down-link	5G NR 20MHz (256QAM)	3690	18.20

Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 25MHz (QPSK)	3562.5	22.95
Down-link	5G NR 25MHz (QPSK)	3625	22.96
Down-link	5G NR 25MHz (QPSK)	3687.5	22.95
Down-link	5G NR 25MHz (16QAM)	3562.5	22.95
Down-link	5G NR 25MHz (16QAM)	3625	22.96
Down-link	5G NR 25MHz (16QAM)	3687.5	22.95
Down-link	5G NR 25MHz (64QAM)	3562.5	22.95
Down-link	5G NR 25MHz (64QAM)	3625	22.96
Down-link	5G NR 25MHz (64QAM)	3687.5	22.96
Down-link	5G NR 25MHz (256QAM)	3562.5	22.95
Down-link	5G NR 25MHz (256QAM)	3625	22.96
Down-link	5G NR 25MHz (256QAM)	3687.5	22.96
Down-link	5G NR 30MHz (QPSK)	3565	27.83
Down-link	5G NR 30MHz (QPSK)	3625	27.90
Down-link	5G NR 30MHz (QPSK)	3685	27.90
Down-link	5G NR 30MHz (16QAM)	3565	27.84
Down-link	5G NR 30MHz (16QAM)	3625	27.91
Down-link	5G NR 30MHz (16QAM)	3685	27.85
Down-link	5G NR 30MHz (64QAM)	3565	27.83
Down-link	5G NR 30MHz (64QAM)	3625	27.89
Down-link	5G NR 30MHz (64QAM)	3685	27.88
Down-link	5G NR 30MHz (256QAM)	3565	27.84
Down-link	5G NR 30MHz (256QAM)	3625	27.91
Down-link	5G NR 30MHz (256QAM)	3685	27.90
Down-link	5G NR 40MHz (QPSK)	3570	38.07
Down-link	5G NR 40MHz (QPSK)	3625	37.65
Down-link	5G NR 40MHz (QPSK)	3680	37.80
Down-link	5G NR 40MHz (16QAM)	3570	38.06
Down-link	5G NR 40MHz (16QAM)	3625	37.67
Down-link	5G NR 40MHz (16QAM)	3680	37.83
Down-link	5G NR 40MHz (64QAM)	3570	38.05
Down-link	5G NR 40MHz (64QAM)	3625	37.67
Down-link	5G NR 40MHz (64QAM)	3680	38.01
Down-link	5G NR 40MHz (256QAM)	3570	38.06
Down-link	5G NR 40MHz (256QAM)	3625	37.67
Down-link	5G NR 40MHz (256QAM)	3680	37.83
Down-link	5G NR 50MHz (QPSK)	3575	47.26
Down-link	5G NR 50MHz (QPSK)	3625	47.33
Down-link	5G NR 50MHz (QPSK)	3675	47.30
Down-link	5G NR 50MHz (16QAM)	3575	47.27
Down-link	5G NR 50MHz (16QAM)	3625	47.33
Down-link	5G NR 50MHz (16QAM)	3675	47.29
Down-link	5G NR 50MHz (64QAM)	3575	47.26
Down-link	5G NR 50MHz (64QAM)	3625	47.33
Down-link	5G NR 50MHz (64QAM)	3675	47.29
Down-link	5G NR 50MHz (256QAM)	3575	47.26
Down-link	5G NR 50MHz (256QAM)	3625	47.33
Down-link	5G NR 50MHz (256QAM)	3675	47.29
Down-link	5G NR 60MHz (QPSK)	3580	57.54

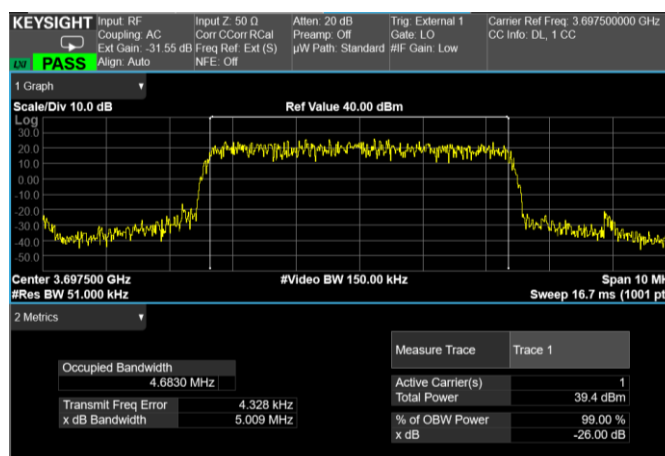
Test data			
Direction	Modulation	Frequency (MHz)	OBW (MHz)
Down-link	5G NR 60MHz (QPSK)	3625	57.58
Down-link	5G NR 60MHz (QPSK)	3670	57.60
Down-link	5G NR 60MHz (16QAM)	3580	57.58
Down-link	5G NR 60MHz (16QAM)	3625	57.59
Down-link	5G NR 60MHz (16QAM)	3670	57.54
Down-link	5G NR 60MHz (64QAM)	3580	57.58
Down-link	5G NR 60MHz (64QAM)	3625	57.64
Down-link	5G NR 60MHz (64QAM)	3670	57.55
Down-link	5G NR 60MHz (256QAM)	3580	57.53
Down-link	5G NR 60MHz (256QAM)	3625	57.59
Down-link	5G NR 60MHz (256QAM)	3670	57.60



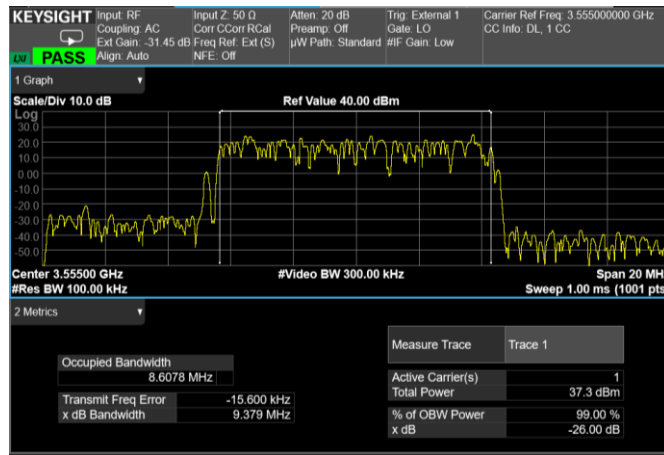
Channel: BOTTOM, Modulation: 64QAM,
BW=5MHz



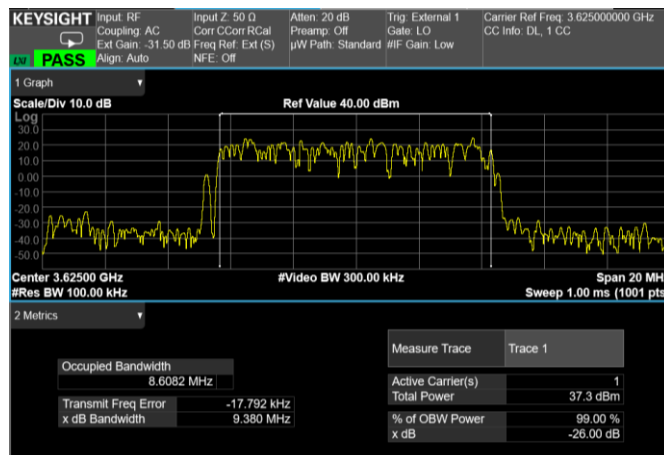
Channel: MIDDLE, Modulation: 64QAM,
BW=5MHz



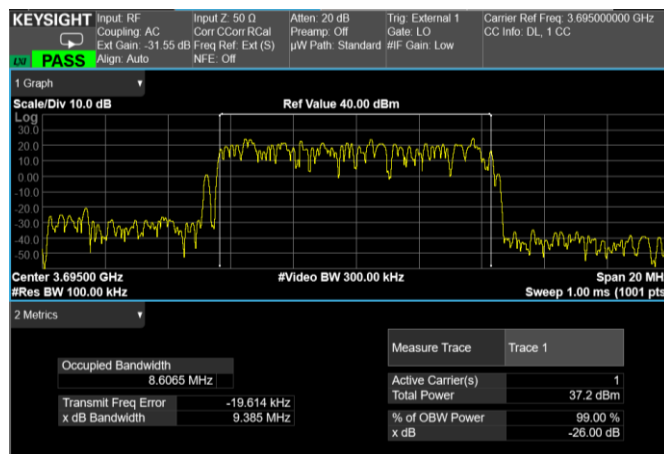
Channel: TOP, Modulation: 64QAM,
BW=5MHz



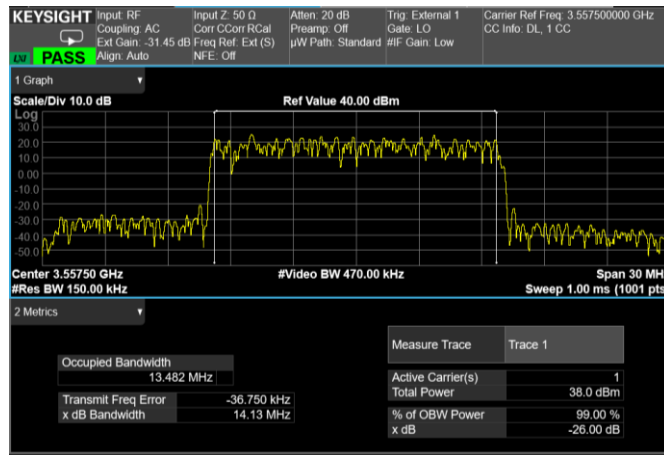
Channel: BOTTOM, Modulation: 64QAM, BW=10MHz



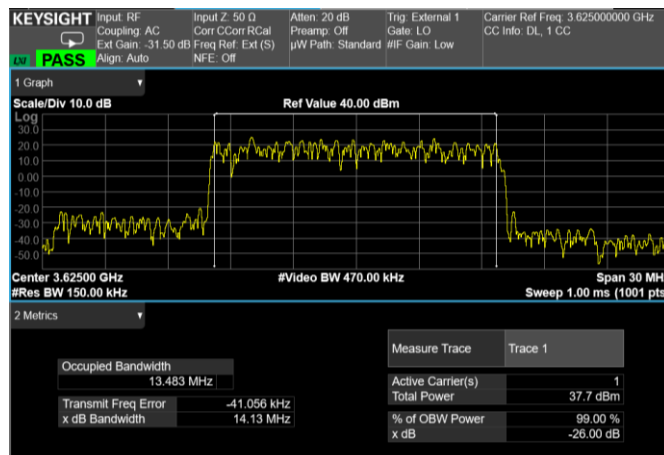
Channel: MIDDLE, Modulation: 64QAM, BW=10MHz



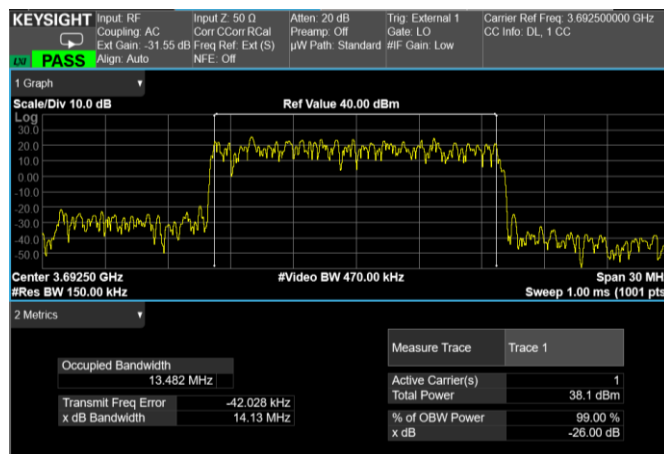
Channel: TOP, Modulation: 64QAM, BW=10MHz



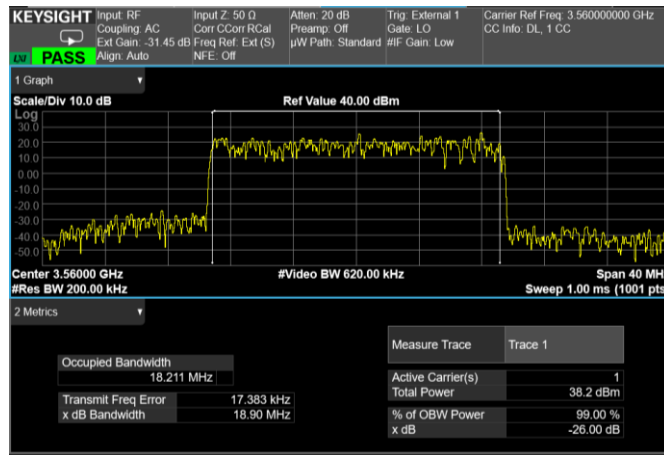
Channel: BOTTOM, Modulation: 64QAM, BW=15MHz



Channel: MIDDLE, Modulation: 64QAM, BW=15MHz



Channel: TOP, Modulation: 64QAM, BW=15MHz



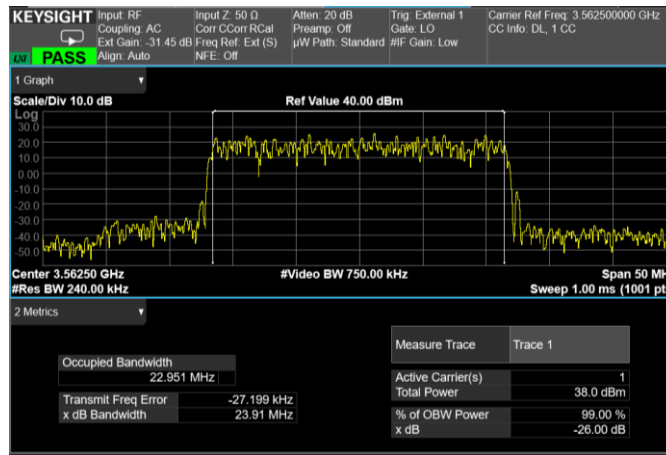
Channel: BOTTOM, Modulation: 64QAM,
BW=20MHz



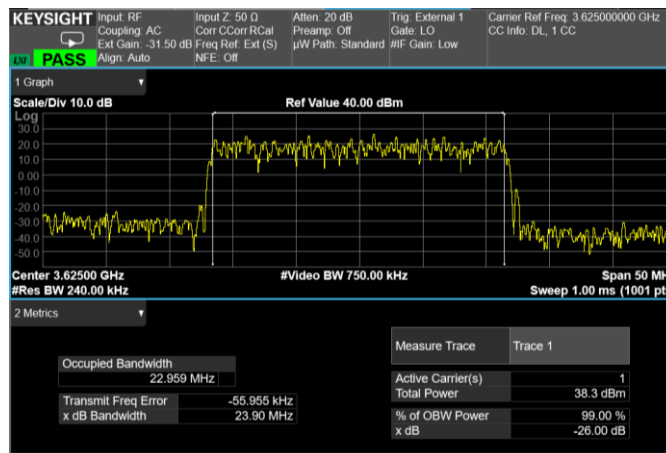
Channel: MIDDLE, Modulation: 64QAM,
BW=20MHz



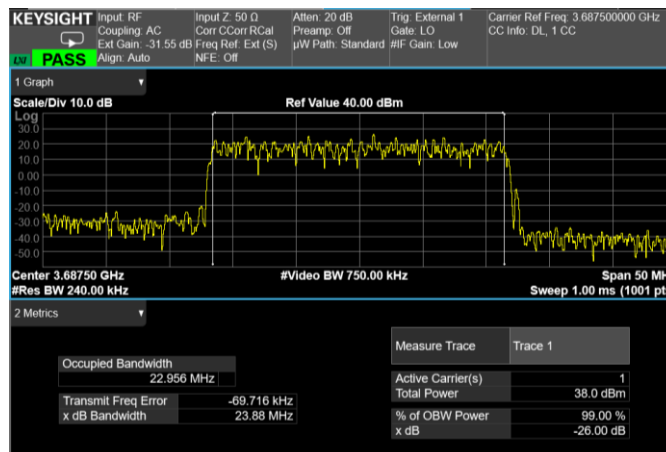
Channel: TOP, Modulation: 64QAM,
BW=20MHz



Channel: BOTTOM, Modulation: 64QAM,
BW=25MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=25MHz



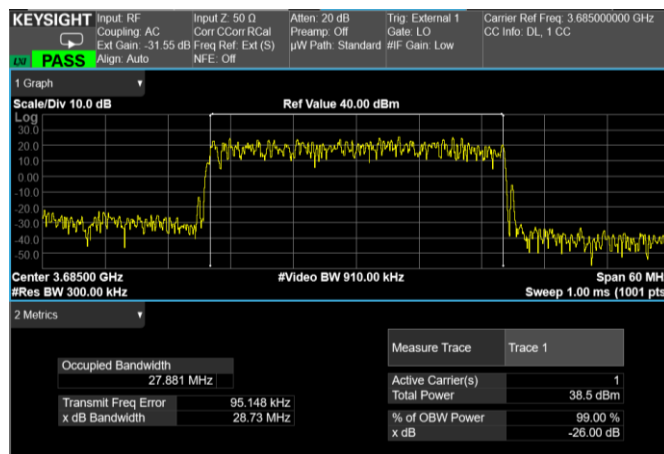
Channel: TOP, Modulation: 64QAM,
BW=25MHz



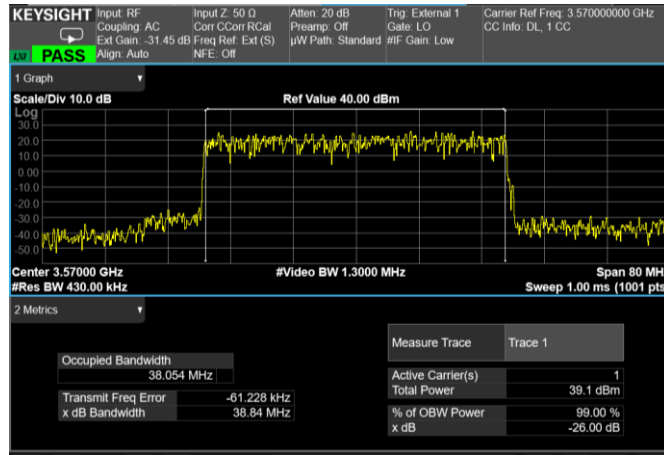
Channel: BOTTOM, Modulation: 64QAM,
 BW=30MHz



Channel: MIDDLE, Modulation: 64QAM,
 BW=30MHz



Channel: TOgP, Modulation: 64QAM,
 BW=30MHz



Channel: BOTTOM, Modulation: 64QAM, BW=40MHz



Channel: MIDDLE, Modulation: 64QAM, BW=40MHz



Channel: TOP, Modulation: 64QAM, BW=40MHz



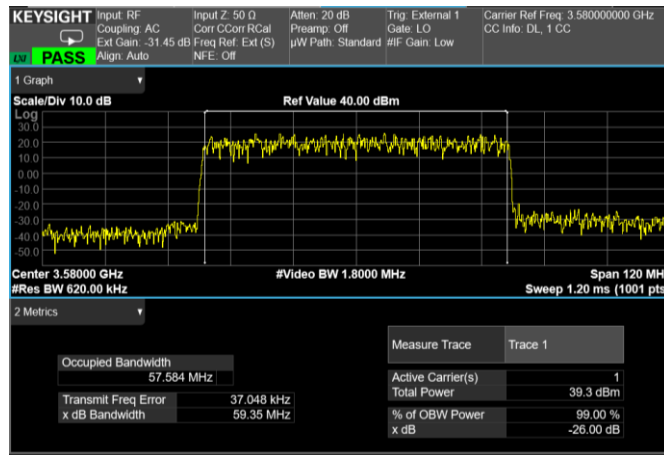
Channel: BOTTOM, Modulation: 64QAM, BW=50MHz



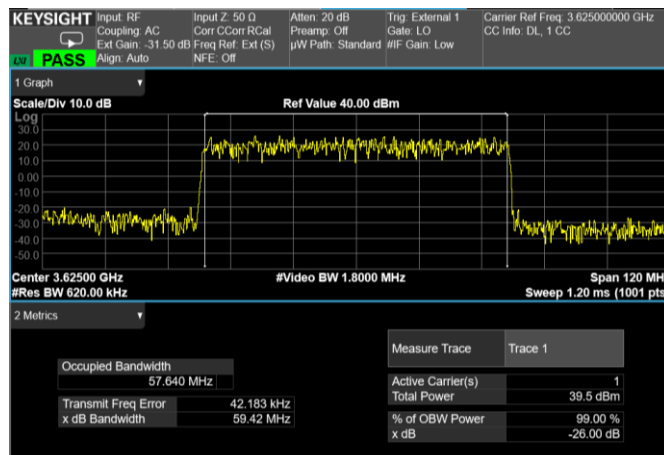
Channel: MIDDLE, Modulation: 64QAM, BW=50MHz



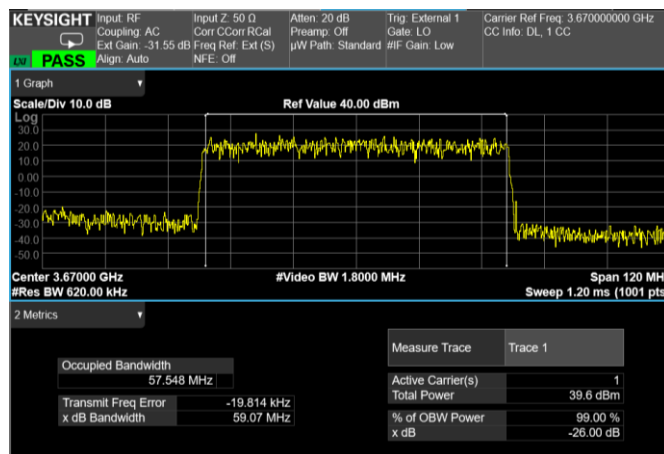
Channel: TOP, Modulation: 64QAM, BW=50MHz



Channel: BOTTOM, Modulation: 64QAM,
BW=60MHz



Channel: MIDDLE, Modulation: 64QAM,
BW=60MHz



Channel: TOP, Modulation: 64QAM,
BW=60MHz

Clause 96.41(b)(g) Peak output power at RF antenna connector

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

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

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

Test date: 10/12/2022 to 11/04/2022

Test results: Pass

Special notes

Measurements were performed for all modulation types. As an example, only measurements for 64 QAM modulation type are reported.

Test equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.
Spectrum Analyzer	Keysight	N9030B PXA	MY61330632
Spectrum Analyzer	Keysight	N9041B UXA	US57220208

Clause 96.41(b)(d) Peak output power at RF antenna connector

Test data

RF PORT 1

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 5MHz (QPSK)	3552.5	37.3	5.395	-29.7	30.3	8.9
Down-link	5G NR 5MHz (QPSK)	3625	37.0	5.023	-30.0	30.0	8.5
Down-link	5G NR 5MHz (QPSK)	3697.5	36.6	4.613	-30.4	29.7	8.8
Down-link	5G NR 5MHz (16QAM)	3552.5	37.3	5.408	-29.7	30.3	8.5
Down-link	5G NR 5MHz (16QAM)	3625	37.1	5.070	-29.9	30.1	8.7
Down-link	5G NR 5MHz (16QAM)	3697.5	36.7	4.634	-30.3	29.7	8.5
Down-link	5G NR 5MHz (64QAM)	3552.5	37.5	5.585	-29.5	30.5	8.7
Down-link	5G NR 5MHz (64QAM)	3625	37.0	5.047	-30.0	30.0	8.5
Down-link	5G NR 5MHz (64QAM)	3697.5	36.8	4.764	-30.2	29.8	8.7
Down-link	5G NR 5MHz (256QAM)	3552.5	37.3	5.408	-29.7	30.3	8.7
Down-link	5G NR 5MHz (256QAM)	3625	37.0	5.058	-30.0	30.1	8.5
Down-link	5G NR 5MHz (256QAM)	3697.5	36.7	4.624	-30.3	29.7	8.5
Down-link	5G NR 10MHz (QPSK)	3555	37.0	4.977	-33.0	27.0	8.7
Down-link	5G NR 10MHz (QPSK)	3625	36.9	4.920	-33.1	26.9	8.5
Down-link	5G NR 10MHz (QPSK)	3695	36.7	4.634	-33.3	26.7	8.6
Down-link	5G NR 10MHz (16QAM)	3555	37.0	4.989	-33.0	27.0	8.7
Down-link	5G NR 10MHz (16QAM)	3625	37.0	4.955	-33.1	27.0	8.6
Down-link	5G NR 10MHz (16QAM)	3695	36.7	4.710	-33.3	26.7	8.6
Down-link	5G NR 10MHz (64QAM)	3555	36.9	4.887	-33.1	26.9	8.7
Down-link	5G NR 10MHz (64QAM)	3625	36.9	4.943	-33.1	26.9	8.6
Down-link	5G NR 10MHz (64QAM)	3695	36.7	4.710	-33.3	26.7	8.6

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 10MHz (256QAM)	3555	36.9	4.898	-33.1	26.9	8.7
Down-link	5G NR 10MHz (256QAM)	3625	37.0	4.977	-33.0	27.0	8.6
Down-link	5G NR 10MHz (256QAM)	3695	36.7	4.634	-33.3	26.7	8.6
Down-link	5G NR 15MHz (QPSK)	3557.5	37.1	5.152	-34.6	25.4	8.7
Down-link	5G NR 15MHz (QPSK)	3625	37.1	5.070	-34.7	25.3	8.5
Down-link	5G NR 15MHz (QPSK)	3692.5	37.0	4.989	-34.8	25.2	8.7
Down-link	5G NR 15MHz (16QAM)	3557.5	37.1	5.105	-34.7	25.3	8.6
Down-link	5G NR 15MHz (16QAM)	3625	37.1	5.117	-34.7	25.3	8.7
Down-link	5G NR 15MHz (16QAM)	3692.5	37.0	5.000	-34.8	25.2	8.7
Down-link	5G NR 15MHz (64QAM)	3557.5	37.1	5.105	-34.7	25.3	8.5
Down-link	5G NR 15MHz (64QAM)	3625	37.0	5.047	-34.7	25.3	8.5
Down-link	5G NR 15MHz (64QAM)	3692.5	36.9	4.943	-34.8	25.2	8.7
Down-link	5G NR 15MHz (256QAM)	3557.5	37.1	5.105	-34.7	25.3	8.6
Down-link	5G NR 15MHz (256QAM)	3625	37.0	5.058	-34.7	25.3	8.7
Down-link	5G NR 15MHz (256QAM)	3692.5	36.9	4.943	-34.8	25.2	8.7
Down-link	5G NR 20MHz (QPSK)	3560	37.3	5.321	-35.8	24.3	8.6
Down-link	5G NR 20MHz (QPSK)	3625	37.2	5.297	-35.8	24.2	8.5
Down-link	5G NR 20MHz (QPSK)	3690	37.2	5.284	-35.8	24.2	8.7
Down-link	5G NR 20MHz (16QAM)	3560	37.3	5.333	-35.7	24.3	8.6
Down-link	5G NR 20MHz (16QAM)	3625	37.2	5.284	-35.8	24.2	8.5
Down-link	5G NR 20MHz (16QAM)	3690	37.2	5.284	-35.8	24.2	8.7
Down-link	5G NR 20MHz (64QAM)	3560	37.3	5.321	-35.8	24.3	8.6
Down-link	5G NR 20MHz (64QAM)	3625	37.2	5.297	-35.8	24.2	8.5
Down-link	5G NR 20MHz (64QAM)	3690	37.2	5.272	-35.8	24.2	8.7

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 20MHz (256QAM)	3560	37.3	5.333	-35.7	24.3	8.6
Down-link	5G NR 20MHz (256QAM)	3625	37.2	5.297	-35.8	24.2	8.5
Down-link	5G NR 20MHz (256QAM)	3690	37.2	5.272	-35.8	24.2	8.7
Down-link	5G NR 25MHz (QPSK)	3562.5	37.2	5.212	-36.8	23.2	8.7
Down-link	5G NR 25MHz (QPSK)	3625	37.1	5.117	-36.9	23.1	8.6
Down-link	5G NR 25MHz (QPSK)	3687.5	37.0	4.989	-37.0	23.0	8.8
Down-link	5G NR 25MHz (16QAM)	3562.5	37.2	5.224	-36.8	23.2	8.6
Down-link	5G NR 25MHz (16QAM)	3625	37.1	5.152	-36.9	23.1	8.6
Down-link	5G NR 25MHz (16QAM)	3687.5	37.0	5.012	-37.0	23.0	8.8
Down-link	5G NR 25MHz (64QAM)	3562.5	37.2	5.212	-36.8	23.2	8.6
Down-link	5G NR 25MHz (64QAM)	3625	37.1	5.164	-36.9	23.2	8.6
Down-link	5G NR 25MHz (64QAM)	3687.5	37.0	4.977	-37.0	23.0	8.8
Down-link	5G NR 25MHz (256QAM)	3562.5	37.2	5.212	-36.8	23.2	8.6
Down-link	5G NR 25MHz (256QAM)	3625	37.1	5.152	-36.9	23.1	8.6
Down-link	5G NR 25MHz (256QAM)	3687.5	37.0	4.989	-37.0	23.0	8.8
Down-link	5G NR 30MHz (QPSK)	3565	37.1	5.152	-37.7	22.4	8.8
Down-link	5G NR 30MHz (QPSK)	3625	37.1	5.070	-37.7	22.3	8.6
Down-link	5G NR 30MHz (QPSK)	3685	36.9	4.932	-37.8	22.2	8.9
Down-link	5G NR 30MHz (16QAM)	3565	37.1	5.176	-37.6	22.4	8.8
Down-link	5G NR 30MHz (16QAM)	3625	37.1	5.070	-37.7	22.3	8.6
Down-link	5G NR 30MHz (16QAM)	3685	36.9	4.920	-37.9	22.2	8.9
Down-link	5G NR 30MHz (64QAM)	3565	37.1	5.117	-37.7	22.3	9.0
Down-link	5G NR 30MHz (64QAM)	3625	37.0	5.047	-37.7	22.3	8.6
Down-link	5G NR 30MHz (64QAM)	3685	36.9	4.875	-37.9	22.1	8.9

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 30MHz (256QAM)	3565	37.1	5.129	-37.7	22.3	8.8
Down-link	5G NR 30MHz (256QAM)	3625	37.1	5.070	-37.7	22.3	8.6
Down-link	5G NR 30MHz (256QAM)	3685	36.9	4.887	-37.9	22.1	8.9
Down-link	5G NR 40MHz (QPSK)	3570	37.2	5.200	-38.9	21.1	9.0
Down-link	5G NR 40MHz (QPSK)	3625	37.2	5.188	-38.9	21.1	8.7
Down-link	5G NR 40MHz (QPSK)	3680	36.8	4.742	-39.3	20.7	9.1
Down-link	5G NR 40MHz (16QAM)	3570	37.1	5.129	-38.9	21.1	9.0
Down-link	5G NR 40MHz (16QAM)	3625	37.2	5.200	-38.9	21.1	8.7
Down-link	5G NR 40MHz (16QAM)	3680	36.8	4.808	-39.2	20.8	9.1
Down-link	5G NR 40MHz (64QAM)	3570	37.2	5.200	-38.9	21.1	9.0
Down-link	5G NR 40MHz (64QAM)	3625	37.2	5.224	-38.8	21.2	8.7
Down-link	5G NR 40MHz (64QAM)	3680	36.8	4.753	-39.3	20.7	9.1
Down-link	5G NR 40MHz (256QAM)	3570	37.1	5.117	-38.9	21.1	9.0
Down-link	5G NR 40MHz (256QAM)	3625	37.2	5.188	-38.9	21.1	8.7
Down-link	5G NR 40MHz (256QAM)	3680	36.8	4.797	-39.2	20.8	9.1
Down-link	5G NR 50MHz (QPSK)	3575	37.1	5.152	-39.9	20.1	9.2
Down-link	5G NR 50MHz (QPSK)	3625	37.0	5.023	-40.0	20.0	8.8
Down-link	5G NR 50MHz (QPSK)	3675	37.1	5.140	-39.9	20.1	9.1
Down-link	5G NR 50MHz (16QAM)	3575	37.1	5.164	-39.9	20.1	9.2
Down-link	5G NR 50MHz (16QAM)	3625	37.1	5.070	-39.9	20.1	8.8
Down-link	5G NR 50MHz (16QAM)	3675	37.1	5.129	-39.9	20.1	9.1
Down-link	5G NR 50MHz (64QAM)	3575	37.1	5.176	-39.9	20.2	9.2
Down-link	5G NR 50MHz (64QAM)	3625	37.0	5.058	-40.0	20.1	8.8
Down-link	5G NR 50MHz (64QAM)	3675	37.0	5.012	-40.0	20.0	9.1

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 50MHz (256QAM)	3575	37.1	5.164	-39.9	20.1	9.2
Down-link	5G NR 50MHz (256QAM)	3625	37.0	5.047	-40.0	20.0	8.8
Down-link	5G NR 50MHz (256QAM)	3675	37.1	5.105	-39.9	20.1	9.1
Down-link	5G NR 60MHz (QPSK)	3580	37.0	5.023	-40.8	19.2	9.1
Down-link	5G NR 60MHz (QPSK)	3625	37.0	5.047	-40.8	19.3	8.8
Down-link	5G NR 60MHz (QPSK)	3670	37.0	5.047	-40.8	19.3	9.0
Down-link	5G NR 60MHz (16QAM)	3580	37.0	5.047	-40.8	19.3	9.1
Down-link	5G NR 60MHz (16QAM)	3625	37.0	5.012	-40.8	19.2	8.8
Down-link	5G NR 60MHz (16QAM)	3670	37.1	5.105	-40.7	19.3	9.1
Down-link	5G NR 60MHz (64QAM)	3580	37.1	5.082	-40.7	19.3	9.1
Down-link	5G NR 60MHz (64QAM)	3625	37.0	5.000	-40.8	19.2	8.8
Down-link	5G NR 60MHz (64QAM)	3670	37.0	5.035	-40.8	19.2	9.1
Down-link	5G NR 60MHz (256QAM)	3580	37.0	5.035	-40.8	19.2	9.1
Down-link	5G NR 60MHz (256QAM)	3625	37.1	5.070	-40.7	19.3	9.0
Down-link	5G NR 60MHz (256QAM)	3670	37.0	5.047	-40.8	19.3	9.1

Special notes

Remark: MIMO application where only cross-polarized antennas are allowed (KDB “662911 D01 Multiple Transmitter Output v02r01”, chapter F, paragraph 2), letter c), item (i)).

Please note that the case with cross-polarized antennas (the only allowed, as stated in the User Manual), with a pair of antennas ($N_{ANT} = 2$) and two outputs ports driving the antennas, has been considered as worst case; therefore the directional gain is the gain of an individual antenna.

Compliance to Category A limits

Maximum EIRP ≤ 30 dBm/10MHz

Maximum PSD eirp ≤ 20 dBm/1MHz

5 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 30.5 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-30.5+N) = N - 10.5$ dBi

10 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 27 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-27+N) = N - 7$ dBi

15 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 25.4 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-25.4+N) = N - 5.4$ dBi

20 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 24.3 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-24.3+N) = N - 4.3$ dBi

25 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 23.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-23.2+N) = N - 3.2$ dBi

30 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 22.4 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-22.4+N) = N - 2.4$ dBi

40 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 21.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-21.2+N) = N - 1.2$ dBi

50 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 20.1 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-20.1+N) = N - 0.1$ dBi

60 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 19.3 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-19.3+N) = N + 0.7$ dBi

Compliance to Category B limits

Maximum EIRP ≤ 47 dBm/10MHz

Maximum PSD eirp ≤ 37 dBm/1MHz

5 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 30.5 - N + G_{max} \leq 37$

The allowed max antenna gain is calculated as: $G_{max} \leq (37-30.5+N) = N + 6.5$ dBi

10 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 27 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-27+N) = N + 10$ dBi

15 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 25.4 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-25.4+N) = N + 11.6$ dBi

20 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 24.3 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-24.3+N) = N + 12.7$ dBi

25 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 23.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-23.2+N) = N + 13.8$ dBi

30 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 22.4 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-22.4+N) = N + 14.6$ dBi

40 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 21.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-21.2+N) = N + 15.8$ dBi

50 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 20.1 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-20.1+N) = N + 16.9$ dBi

60 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 19.3 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37-19.3+N) = N + 17.7$ dBi

Where:

- PSD_{max} is the maximum PSD value measured on the antenna connector of the equipment and it depends on the LTE bandwidth signal
- N is system path loss (in dB) due to cable insertion, splitter, etc....
- G_{max} is the maximum antenna gain (in dBi)