



Mavenir Systems, Inc

TR44KA Base Station

FCC 25:2022

L-band ATC Base Station

Report: MASY0006 Rev. 2, Issue Date: September 26, 2022



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CERTIFICATE OF TEST



Last Date of Test: August 12, 2022
Mavenir Systems, Inc
EUT: TR44KA Base Station

Radio Equipment Testing

Standards

Specification	Method
FCC 25:2022	ANSI C63.26:2015, KDB 273109 D01

Results

Test Description	Result	Specification Section(s)	Method Section(s)	Comments
Average Power	Pass	2.1046,	5.2.4.2	Client provided Waiver Document FCC-20-48A1 was considered for the Licensed Band of Operation.
Power Spectral Density	Pass	2.1046, 25.253(d)(1)	5.2.3.5	
Peak and Average (PAPR) CCDF	N/A	2.1046	5.2.3.4	
Frequency Stability	Pass	2.1055 25.202 (d)	5.6	
Modulation Characteristics	N/A	2.1047(d)	N/A	Not required as the device only uses digital modulation
Occupied Bandwidth	Pass	2.1049	5.4	
Radiated Spurious Emissions	Pass	2.1053, 25.202(f), 25.253(d)(9)	5.5	Client provided Waiver Document FCC-20-48A1 was considered for the Licensed Band of Operation
Spurious Emissions at the Antenna Terminals	Pass	2.1051, 25.202(f)	5.7	
Spurious Emissions at the Antenna Terminals - Emissions Mask	Pass	2.1051, 25.202(f)	5.7	
Spurious Emissions at the Antenna Terminals Band Edge	Pass	2.1053, 25.253(b)	5.7	
Spurious Emissions at the Antenna Terminals in the Restricted Bands	Pass	2.1051, 25.253(d)(9)	5.7	Client provided Waiver Document FCC-20-48A1 was considered for the Licensed Band of Operation

Deviations From Test Standards

None

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

CERTIFICATE OF TEST



Approved By:

Adam Bruno, Operations Manager

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REVISION HISTORY

Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Changed from cellular to L-band ATC Base Station	2022-09-18	1
	RRH is now defined in the Product Description and the additional information has been added.	2022-09-18	11
	Testing objective updated	2022-09-18	11
	Removed the waiver from the Specifications column. Changed the 25.243 to 25.253 which is correct.	2022-09-18	2
	Updated configurations to reflect both an attenuator and Notch filter.	2022-09-18	14-21
	Port 3 comment replaced with worst case mode QPSK 5MHz for the All ports modules. Mimo reworked to point out Mimo tables are in the tabular data for all related calculations.	2022-09-18	All 'all ports' modules
	Updated test description	2022-09-18	77, 171
	All modular headers were changed to reflect .1%	2022-09-18	77-116
	Added substitution equipment to the equipment list.	2022-09-18	423, 426
02	No Retesting was required, just a value change.	2022-09-26	429-492

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

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FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-11 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
A2LA				
Lab Code: 3310.04	Lab Code: 3310.05	Lab Code: 3310.02	Lab Code: 3310.03	Lab Code: 3310.06
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.1 dB	-3.1 dB

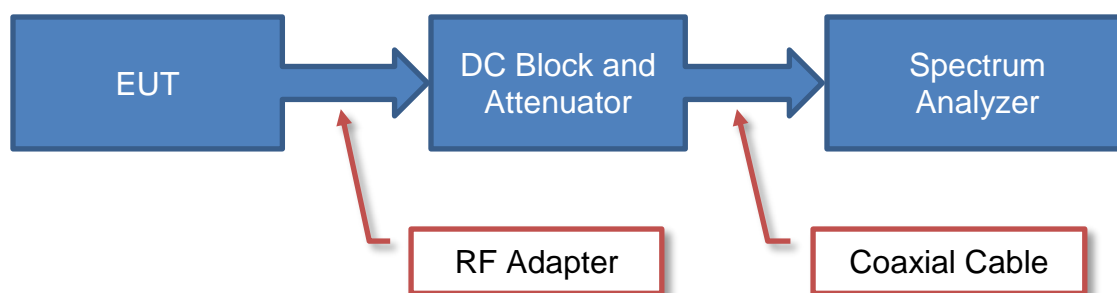
TEST SETUP BLOCK DIAGRAMS

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

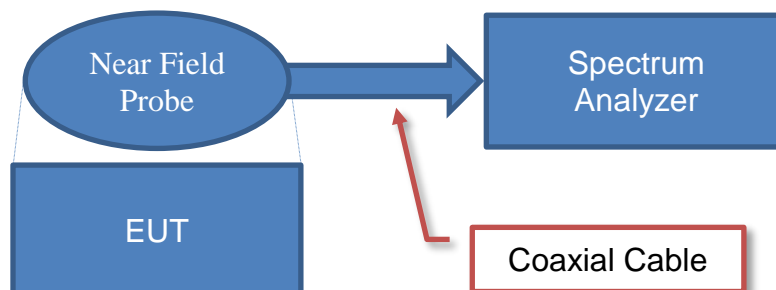
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

Near Field Test Fixture Measurements



Sample Calculation (logarithmic units)

Measured Value		Measured Level		Reference Level Offset
71.2	=	42.6	+	28.6

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)	Factor			Distance Adjustment Factor	External Attenuation	Field Strength
	Antenna Factor	Cable Factor	Amplifier Gain			
42.6	28.6	3.1	40.8	0.0	0.0	33.5

Conducted Emissions:

Measured Level (Amplitude)	Factor		External Attenuation	Adjusted Level
	Transducer Factor	Cable Factor		
26.7	0.3	0.1	20.0	47.1

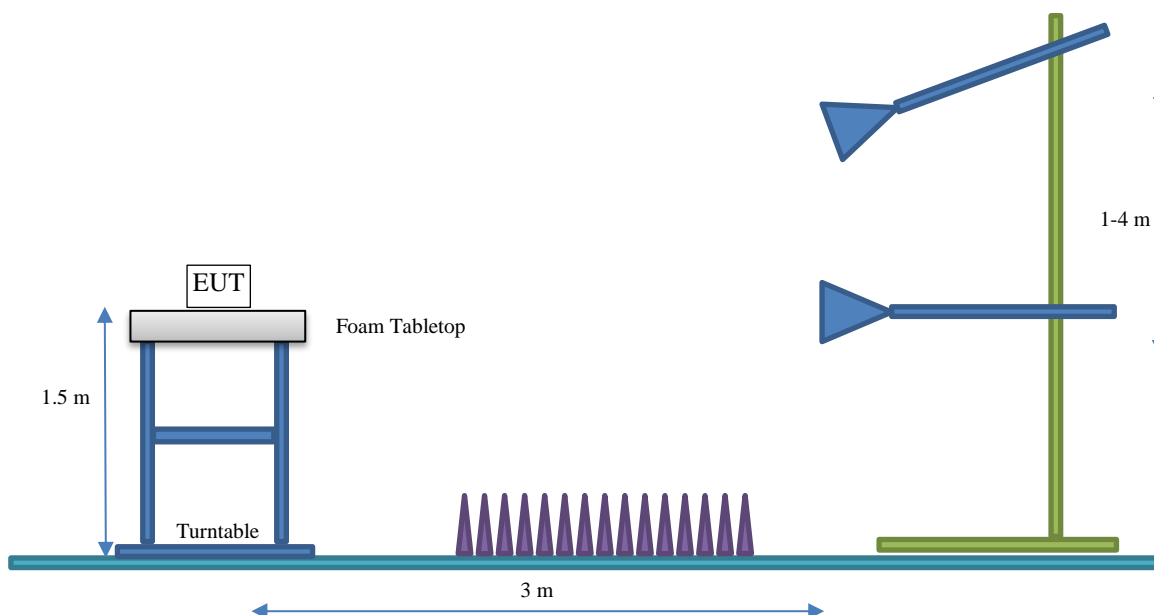
Radiated Power (ERP/EIRP) – Substitution Method:

Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION



Client and Equipment under Test (EUT) Information

Company Name:	Mavenir Systems, Inc
Address:	1700 International Parkway Suite 200
City, State, Zip:	Richardson, TX 75081
Test Requested By:	Jean-Pierre Botha
EUT:	TR44KA Base Station
First Date of Test:	July 29, 2022
Last Date of Test:	August 12, 2022
Receipt Date of Samples:	June 16, 2022
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Mavenir TR44KA Remote Radio Head (RRH) or Base Station is a 4T4R 4x4 MIMO 5G NR digital transport platform supporting cellular and wideband public safety technologies on fibre optic cable using the CPRI protocol. The power amplifier technology adopts Digital Pre-Distortion, allowing for a significant improvement in power consumption compared with analogue technology. This platform is ideal for multi-operator multi-band deployments of cellular services into underground tunnels & outdoor coverage areas. Additional Information includes FCC ID: 2WAS910-00130, Equipment Class: Licensed non-broadcast transmitter.

Testing Objective:

To demonstrate compliance of the ATC Base Station operating in the forward-band mode on the L-band to FCC part 25 requirements under FCC waiver: FCC-20-48A1.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
L-Band 4T4R	ACE Technologies	1526-1680	3

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☐ Test software settings Test software/firmware installed on EUT: Please See Configurations
☒ Rated gain settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Bandwidths	Modulation Types	Channels	UL Frequency Range (MHz)	DL Frequency Range (MHz)	Gain Setting
5	QPSK, 16-QAM, 64-QAM, 256-QAM	Low, High	1627.5-1637.5, 1646.5-1656.5	1526-1536	42
10	QPSK, 16-QAM, 64-QAM, 256-QAM	Mid	1627.5-1637.5, 1646.5-1656.5	1526-1536	42

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ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
L-Band 4T4R	ACE Technologies	1526-1680	16

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- ☐ Test software settings Test software/firmware installed on EUT: Please See Configurations
☒ Rated gain settings

SETTINGS FOR ALL TESTS IN THIS REPORT

Bandwidths	Modulation Types	Channels	UL Frequency Range (MHz)	DL Frequency Range (MHz)	Gain Setting
5	QPSK, 16-QAM, 64-QAM, 256-QAM	Low, High	1627.5-1637.5, 1646.5-1656.5	1526-1536	29
10	QPSK, 16-QAM, 64-QAM, 256-QAM	Mid	1627.5-1637.5, 1646.5-1656.5	1526-1536	29

CONFIGURATIONS

Configuration MASY0006- 1

Software/Firmware Running During Test	
Description	Version
U504A Open RAN studio	1.3.10702.0
webomt web interface	1.0.0.0
Tera Term	4.104
Windows 10 Pro	21H2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
TR44KA Base Station	Mavenir Systems, Inc	910-00130-01	SV2146TR44KA000001

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
4.3 to N-Type Adapter x3	CentricRF	C8510	None
N-Type Termination, 5 Watt to 18 GHz x3	Fairview Microwave	ST18N531	None
DC Power Supply	BK PRECISION	1902B	476G20102
Distributed Unit (DU)	BITTWARE	TRBX-1000	SQEGNYW00008
GPS 10MHz Source	QULSAR	100-825-02	48207
Keyboard	Logitech	820-008207	1914MR22FCF8
Monitor	Dell	P2212Hb	CN-0NDMRP-74261-29F-1F4U
Mouse	Dell	M-UVDEL4	NCM43708
10dB Attenuator	None	None	None
30dB Attenuator	CentricRF	64671	None
8 Channel Clock Distribution Accessory	NATIONAL INSTRUMENTS	CDA-2990	3208F4A
AC/DC Adapter (Distribution Accessory)	CUI INC	AT5024T-W061V	NEBA-P10-C1
AC/DC Adapter (GPS Clock Source)	SL POWER and AULT	ME20A4803F01	None
Portable Camera	Logitech	None	None
Wi-Fi USB Antenna	tp-link	AC1300	221A239000366
USB to Ethernet Adapter	tp-link	UE300	22143C9003563
USB to USB Slitter	SIIG	BUB1731X	JU-H40F12-S1

CONFIGURATIONS

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable (Base Station)	Yes	2.4m	No	Base Station	DC Power Supply
GPS Antenna Cable	Yes	30.0m	No	GPS Antenna	GPS Clock Source
Portable Camera USB Cable	Yes	2.0m	No	DU	Portable Camera
AC Power Cable (DC Power Supply)	No	2.5m	No	DC Power Supply	AC Mains
Keyboard USB Cable	Yes	2.0m	No	DU	Keyboard
VGA Cable (Monitor)	Yes	2.3m	Yes	Monitor	DU
Mouse USB Cable	Yes	2.0m	No	DU	Mouse
AC Power Cable (Adapter Distribution Accessory)	No	1.5m	No	Adapter	AC Mains
DC Power Cable (Adapter Distribution Accessory)	No	3.0m	No	Adapter	Distribution Accessory
AC Power Cable (Adapter GPS Clock Source)	No	2.0m	No	Adapter	AC Mains
DC Power Cable (Adapter GPS Clock Source)	No	2.5m	No	Adapter	GPS Clock Source
AC Power Cable (Distribution Unit)	No	2.1m	No	DU	AC Mains
AC Power Cable (Monitor)	No	2.1m	No	Monitor	AC Mains
USB to Ethernet Cable length	Yes	0.1m	No	DU	Ethernet Cable
Fiber Optic Cable	No	3.0m	No	DU	Base Station
Ethernet Cable	Yes	2.2m	No	USB to Ethernet Adapter	Base Station
Client Cable	Yes	0.5m	No	30dB attenuator	Base station

CONFIGURATIONS

Configuration MASY0006- 2

Software/Firmware Running During Test	
Description	Version
U504A Open RAN studio	1.3.10702.0
webomt web interface	1.0.0.0
Tera Term	4.104
Windows 10 Pro	21H2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
TR44KA Base Station	Mavenir Systems, Inc	910-00130-01	SV2146TR44KA000001

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
4.3 to N-Type Adapter x3	CentricRF	C8510	None
N-Type Termination, 5 Watt to 18 GHz x3	Fairview Microwave	ST18N531	None
DC Power Supply	BK PRECISION	1902B	476G20102
Distributed Unit (DU)	BITTWARE	TRBX-1000	SQEGNYW00008
GPS 10MHz Source	QULSAR	100-825-02	48207
Keyboard	Logitech	820-008207	1914MR22FCF8
Monitor	Dell	P2212Hb	CN-0NDMRP-74261-29F-1F4U
Mouse	Dell	M-UVDEL4	NCM43708
Notch Filter 1 - 2GHz	SUNWAVE	SW-BRF-1526-10-S01	SW142211106021
N-Type Termination, 10 Watt	CentricRF	C6N10	None
3 Port Slitter	None	None	None
8 Channel Clock Distribution Accessory	NATIONAL INSTRUMENTS	CDA-2990	3208F4A
AC/DC Adapter (Distribution Accessory)	CUI INC	AT5024T-W061V	NEBA-P10-C1
AC/DC Adapter (GPS Clock Source)	SL POWER and AULT	ME20A4803F01	None
Portable Camera	Logitech	None	None
Wi-Fi USB Antenna	tp-link	AC1300	221A239000366
USB to Ethernet Adapter	tp-link	UE300	22143C9003563
USB to USB Slitter	SIIG	BUB1731X	JU-H40F12-S1

CONFIGURATIONS

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable (Base Station)	Yes	2.4m	No	Base Station	DC Power Supply
GPS Antenna Cable	Yes	30.0m	No	GPS Antenna	GPS Clock Source
Portable Camera USB Cable	Yes	2.0m	No	DU	Portable Camera
AC Power Cable (DC Power Supply)	No	2.5m	No	DC Power Supply	AC Mains
Keyboard USB Cable	Yes	2.0m	No	DU	Keyboard
VGA Cable (Monitor)	Yes	2.3m	Yes	Monitor	DU
Mouse USB Cable	Yes	2.0m	No	DU	Mouse
AC Power Cable (Adapter Distribution Accessory)	No	1.5m	No	Adapter	AC Mains
DC Power Cable (Adapter Distribution Accessory)	No	3.0m	No	Adapter	Distribution Accessory
AC Power Cable (Adapter GPS Clock Source)	No	2.0m	No	Adapter	AC Mains
DC Power Cable (Adapter GPS Clock Source)	No	2.5m	No	Adapter	GPS Clock Source
AC Power Cable (Distribution Unit)	No	2.1m	No	DU	AC Mains
AC Power Cable (Monitor)	No	2.1m	No	Monitor	AC Mains
USB to Ethernet Cable length	Yes	0.1m	No	DU	Ethernet Cable
Fiber Optic Cable	No	3.0m	No	DU	Base Station
Ethernet Cable	Yes	2.2m	No	USB to Ethernet Adapter	Base Station
Client Cable	Yes	0.5m	No	30dB attenuator	Base station

CONFIGURATIONS



Configuration MASY0006- 3

Software/Firmware Running During Test	
Description	Version
U504A Open RAN studio	1.3.10702.0
webomt web interface	1.0.0.0
Tera Term	4.104
Windows 10 Pro	21H2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
TR44KA Base Station	Mavenir Systems, Inc	910-00130-01	SV2146TR44KA000001

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
4.3 to N-Type Adapter x3	CentricRF	C8510	None
N-Type Termination, 5 Watt to 18 GHz x3	Fairview Microwave	ST18N531	None
DC Power Supply	BK PRECISION	1902B	476G20102
Distributed Unit (DU)	BITTWARE	TRBX-1000	SQEGNYW00008
GPS 10MHz Source	QULSAR	100-825-02	48207
Keyboard	Logitech	820-008207	1914MR22FCF8
Monitor	Dell	P2212Hb	CN-0NDMRP-74261-29F-1F4U
Mouse	Dell	M-UVDEL4	NCM43708
10dB Attenuator	None	None	None
30dB Attenuator	CentricRF	64671	None
8 Channel Clock Distribution Accessory	NATIONAL INSTRUMENTS	CDA-2990	3208F4A
AC/DC Adapter (Distribution Accessory)	CUI INC	AT5024T-W061V	NEBA-P10-C1
AC/DC Adapter (GPS Clock Source)	SL POWER and AULT	ME20A4803F01	None
Portable Camera	Logitech	None	None
Wi-Fi USB Antenna	tp-link	AC1300	221A239000366
USB to Ethernet Adapter	tp-link	UE300	22143C9003563
USB to USB Slitter	SIIG	BUB1731X	JU-H40F12-S1

CONFIGURATIONS

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable (Base Station)	Yes	2.4m	No	Base Station	DC Power Supply
GPS Antenna Cable	Yes	30.0m	No	GPS Antenna	GPS Clock Source
DC Multi Meter Leads	No	0.5m	No	DC Multi Meter	DC Power Supply
Portable Camera USB Cable	Yes	2.0m	No	DU	Portable Camera
AC Power Cable (DC Power Supply)	No	2.5m	No	DC Power Supply	AC Mains
Keyboard USB Cable	Yes	2.0m	No	DU	Keyboard
VGA Cable (Monitor)	Yes	2.3m	Yes	Monitor	DU
Mouse USB Cable	Yes	2.0m	No	DU	Mouse
AC Power Cable (Adapter Distribution Accessory)	No	1.5m	No	Adapter	AC Mains
DC Power Cable (Adapter Distribution Accessory)	No	3.0m	No	Adapter	Distribution Accessory
AC Power Cable (Adapter GPS Clock Source)	No	2.0m	No	Adapter	AC Mains
DC Power Cable (Adapter GPS Clock Source)	No	2.5m	No	Adapter	GPS Clock Source
AC Power Cable (Distribution Unit)	No	2.1m	No	DU	AC Mains
AC Power Cable (Monitor)	No	2.1m	No	Monitor	AC Mains
USB to Ethernet Cable length	Yes	0.1m	No	DU	Ethernet Cable
Fiber Optic Cable	No	3.0m	No	DU	Base Station
Ethernet Cable	Yes	2.2m	No	USB to Ethernet Adapter	Base Station
Client Cable	Yes	0.5m	No	30dB attenuator	Base station

CONFIGURATIONS

Configuration MASY0006- 4

Software/Firmware Running During Test	
Description	Version
U504A Open RAN studio	1.3.10702.0
webomt web interface	1.0.0.0
Tera Term	4.104
Windows 10 Pro	21H2

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
TR44KA Base Station	Mavenir Systems, Inc	910-00130-01	SV2146TR44KA000001

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
4.3 to N-Type Adapter x3	CentricRF	C8510	None
N-Type Termination, 5 Watt to 18 GHz x3	Fairview Microwave	ST18N531	None
N-Type Termination, 5 Watt to 18 GHz x4	Fairview Microwave	ST18N531	None
DC Power Supply	BK PRECISION	1902B	476G20102

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Distributed Unit (DU)	BITTWARE	TRBX-1000	SQEGNYW00008
GPS 10MHz Source	QULSAR	100-825-02	48207
Keyboard	Logitech	820-008207	1914MR22FCF8
Monitor	Dell	P2212Hb	CN-0NDMRP-74261-29F-1F4U
Mouse	Dell	M-UVDEL4	NCM43708
8 Channel Clock Distribution Accessory	NATIONAL INSTRUMENTS	CDA-2990	3208F4A
AC/DC Adapter (Distribution Accessory)	CUI INC	AT5024T-W061V	NEBA-P10-C1
AC/DC Adapter (GPS Clock Source)	SL POWER and AULT	ME20A4803F01	None
Portable Camera	Logitech	None	None
Wi-Fi USB Antenna	tp-link	AC1300	221A239000366
USB to Ethernet Adapter	tp-link	UE300	22143C9003563
USB to USB Slitter	SIIG	BUB1731X	JU-H40F12-S1

CONFIGURATIONS

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable (Base Station)	Yes	2.4m	No	Base Station	DC Power Supply
AC Power Cable (DC Power Supply)	No	2.5m	No	DC Power Supply	AC Mains
Fiber Optic Cable	No	10.0m	No	DU	Base Station
Ethernet Cable	Yes	10.0m	No	USB to Ethernet Adapter	Base Station
Client Cable	Yes	0.5m	No	30dB attenuator	Base station
Fiber Optic Cable	No	3.0m	No	Unterminated	Base station

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2022-07-29	Spurious Emissions at the Antenna Terminals	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2022-07-29	Restricted Bands	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2022-08-09	Spurious Emissions at the Antenna Terminals – Band Edge	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2022-08-09	Spurious Emissions at the Antenna Terminals – Emission Mask	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2022-08-10	Peak and Average (PAPR) CCDF	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2022-08-11	Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2022-08-11	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2022-08-11	Average Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2022-08-12	Radiated Spurious Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

AVERAGE POWER - 3dBi

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Fairview Microwave	SD3235-2148	ANF	2022-05-27	2023-05-27
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFN	2022-01-19	2023-01-19
Cable	UtiFlex Micro-Coax	UFD1150A-1-0720-200200	TXK	2021-09-13	2022-09-13
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

The method in section 5.2.4.4 of ANSI C63.26 was used to make the measurements. This method uses trace averaging across the ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1/D)]$, where D is the duty cycle in decimal, to the measured power to compute the average power during the actual transmission times.

The Remote Radio Head (RRH) may operate as a 4 port MIMO transmitter with transmitter outputs connected to two cross-polarized antennas [two transmitter outputs are connected to (+) radiators and two transmitter outputs are connected to (-) radiators]. The measurement is adjusted to +3dB $[10 \log (2)]$ per FCC KDB 662911D01 v02r01, ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

RF conducted emissions testing was performed only on one port. The Remote Radio Head (RRH) antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown during 4 port output power testing) and antenna port 3 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.


The total average transmit power of all antenna ports was determined per ANSI C63.26-2015 paragraph 6.4.3.1.

The EIRP limit is defined by the FCC-20-48A1 waiver document as 9.8dBW converted to 39.8dBm.

AVERAGE POWER - 3dBi



Tb/Tx 2022.06.03.0 XMM 2022.02.07.0

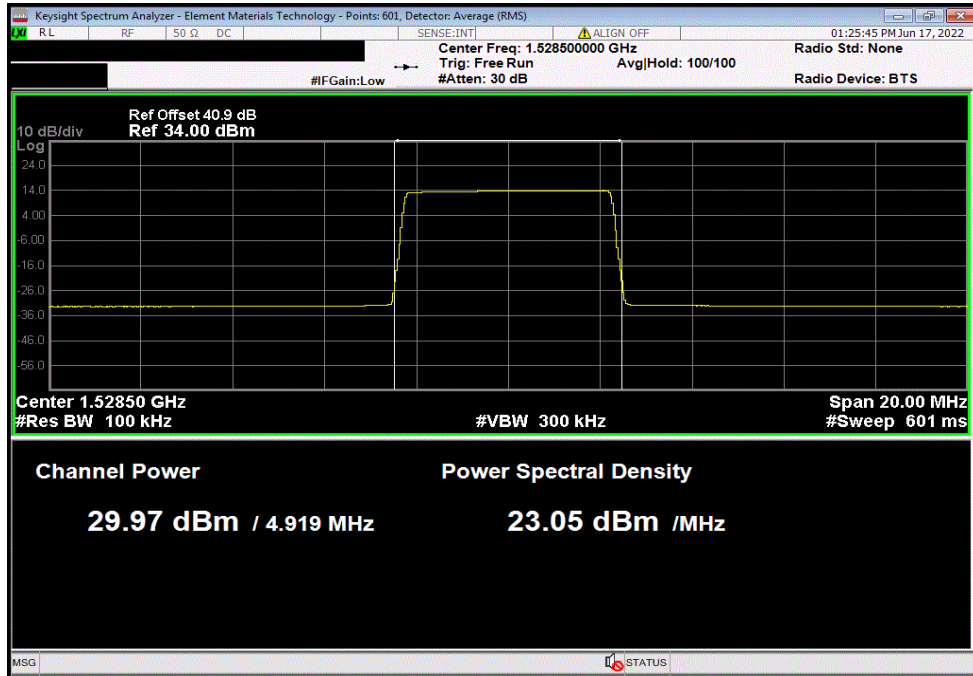
EUT: TR44KA Base Station		Work Order: MASY0006						
Serial Number: SV2146TR44KA000001		Date: 10-Aug-22						
Customer: Mavenir Systems, Inc		Temperature: 21.3 °C						
Attendees: None		Humidity: 55.9% RH						
Project: None		Barometric Pres.: 1020 mbar						
Tested by: Brandon Hobbs		Power: 48 VDC	Job Site: TX09					
TEST SPECIFICATIONS		Test Method						
FCC 25:2022		ANSI C63.26:2015						
COMMENTS								
All conducted path losses were accounted for: cables, attenuators, adapters, DC block and notch filter. The PA gain was adjusted for a 3dBi antenna (Final software value of 42). The output power was measured for a single carrier channel bandwidth on the worst case port 3. The total output power for multiport (2x2 MIMO and 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 Log Nout). After the cross polarization antenna considerations, the total output power for two port operation is single port power + 0dB [i.e.: 10 Log(1)]. The total output power for four port operation is single port power + 3dB [i.e.: 10 Log(2)]. All available Resource Block / Offset configurations were used for each bandwidth. The operating duty cycle was set at 100%.								
DEVIATIONS FROM TEST STANDARD								
None								
Configuration #	1	Signature 						
		Initial Value dBm/Carrier BW	Antenna Gain (dBi)	Duty Cycle Factor (dB)	2 Port (2x2 MIMO) dBm/Carrier BW	4 Port (4x4 MIMO) dBm/Carrier BW	Limit (dBm)	Results
5G NR, Band n24, SCS 15kHz								
5 MHz Bandwidth								
QPSK Modulation								
Low Channel 1528.5 MHz								
25 RB/0 Offset		29.966	3	0.0	33.0	36.0	39.8	Pass
High Channel 1533.5 MHz								
25 RB/0 Offset		29.976	3	0.0	33.0	36.0	39.8	Pass
16-QAM Modulation								
Low Channel 1528.5 MHz								
25 RB/0 Offset		29.919	3	0.0	32.9	35.9	39.8	Pass
High Channel 1533.5 MHz								
25 RB/0 Offset		30.025	3	0.0	33.0	36.0	39.8	Pass
64-QAM Modulation								
Low Channel 1528.5 MHz								
25 RB/0 Offset		29.858	3	0.0	32.9	35.9	39.8	Pass
High Channel 1533.5 MHz								
25 RB/0 Offset		29.941	3	0.0	32.9	35.9	39.8	Pass
256-QAM Modulation								
Low Channel 1528.5 MHz								
25 RB/0 Offset		29.867	3	0.0	32.9	35.9	39.8	Pass
High Channel 1533.5 MHz								
25 RB/0 Offset		30.001	3	0.0	33.0	36.0	39.8	Pass
10 MHz Bandwidth								
QPSK Modulation								
Mid Channel 1531 MHz								
25 RB/0 Offset		24.566	3	0.0	27.6	30.6	39.8	Pass
25 RB/13 Offset		26.802	3	0.0	29.8	32.8	39.8	Pass
25 RB/27 Offset		24.679	3	0.0	27.7	30.7	39.8	Pass
40 RB/0 Offset		26.670	3	0.0	29.7	32.7	39.8	Pass
40 RB/6 Offset		26.441	3	0.0	29.4	32.4	39.8	Pass
40 RB/12 Offset		26.602	3	0.0	29.6	32.6	39.8	Pass
52 RB/0 Offset		28.221	3	0.0	31.2	34.2	39.8	Pass
16-QAM Modulation								
Mid Channel 1531 MHz								
25 RB/0 Offset		26.564	3	0.0	29.6	32.6	39.8	Pass
25 RB/13 Offset		26.803	3	0.0	29.8	32.8	39.8	Pass
25 RB/27 Offset		26.694	3	0.0	29.7	32.7	39.8	Pass
40 RB/0 Offset		26.620	3	0.0	29.6	32.6	39.8	Pass
40 RB/6 Offset		26.383	3	0.0	29.4	32.4	39.8	Pass
40 RB/12 Offset		26.610	3	0.0	29.6	32.6	39.8	Pass
52 RB/0 Offset		30.065	3	0.0	33.1	36.1	39.8	Pass
64-QAM Modulation								
Mid Channel 1531 MHz								
25 RB/0 Offset		24.543	3	0.0	27.5	30.5	39.8	Pass
25 RB/13 Offset		26.758	3	0.0	29.8	32.8	39.8	Pass
25 RB/27 Offset		24.688	3	0.0	27.7	30.7	39.8	Pass
40 RB/0 Offset		26.629	3	0.0	29.6	32.6	39.8	Pass
40 RB/6 Offset		26.332	3	0.0	29.3	32.3	39.8	Pass
40 RB/12 Offset		26.561	3	0.0	29.6	32.6	39.8	Pass
52 RB/0 Offset		30.007	3	0.0	33.0	36.0	39.8	Pass
256-QAM Modulation								
Mid Channel 1531 MHz								
25 RB/0 Offset		26.532	3	0.0	29.5	32.5	39.8	Pass
25 RB/13 Offset		24.777	3	0.0	27.8	30.8	39.8	Pass
25 RB/27 Offset		24.710	3	0.0	27.7	30.7	39.8	Pass
40 RB/0 Offset		26.640	3	0.0	29.6	32.6	39.8	Pass
40 RB/6 Offset		26.366	3	0.0	29.4	32.4	39.8	Pass
40 RB/12 Offset		26.597	3	0.0	29.6	32.6	39.8	Pass
52 RB/0 Offset		29.986	3	0.0	33.0	36.0	39.8	Pass

AVERAGE POWER - 3dBi

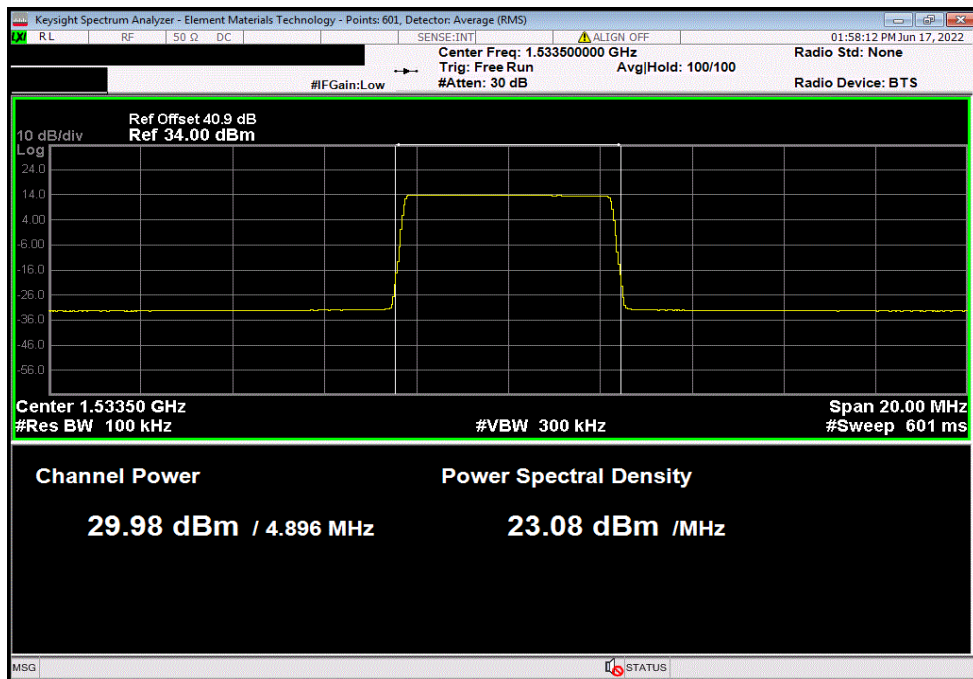


TbTx 2022.06.03.0 XMt 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel 1528.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
29.966	3	0	32.966	35.966	39.8	Pass	



5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, QPSK Modulation, High Channel 1533.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
29.976	3	0	32.976	35.976	39.8	Pass	

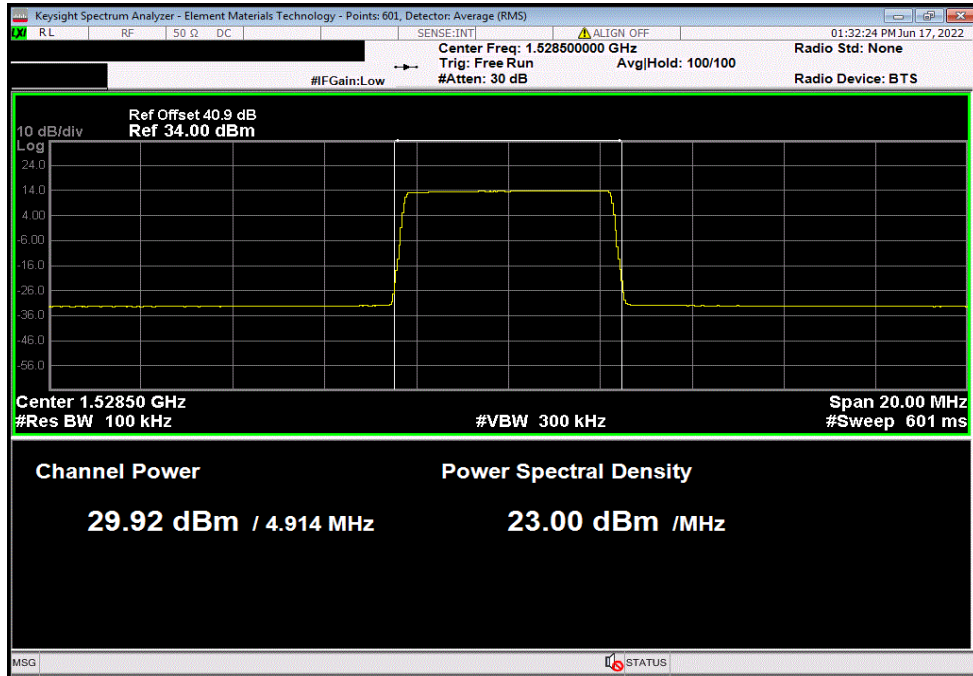


AVERAGE POWER - 3dBi

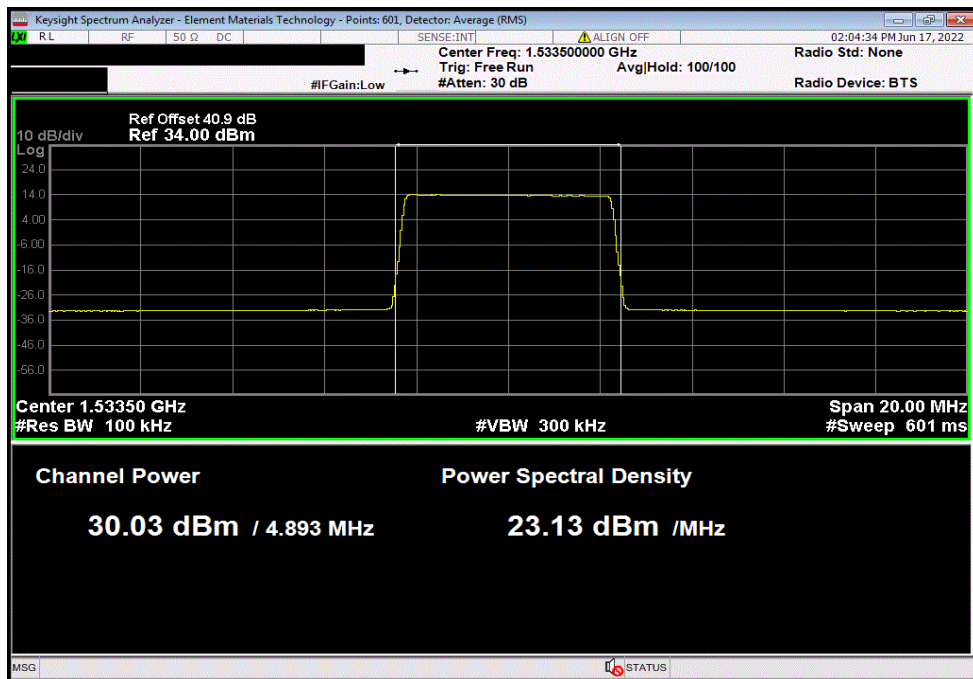


TbTx 2022.06.03.0 XMM 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 16-QAM Modulation, Low Channel 1528.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
29.919	3	0	32.919	35.919	39.8	Pass	



5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 16-QAM Modulation, High Channel 1533.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
30.025	3	0	33.025	36.025	39.8	Pass	

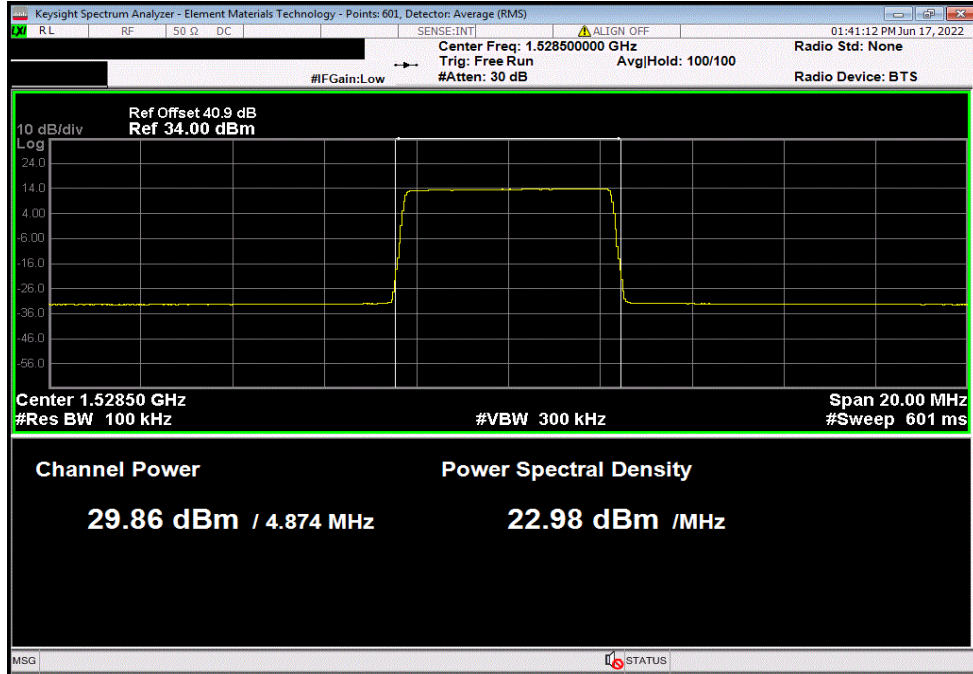


AVERAGE POWER - 3dBi

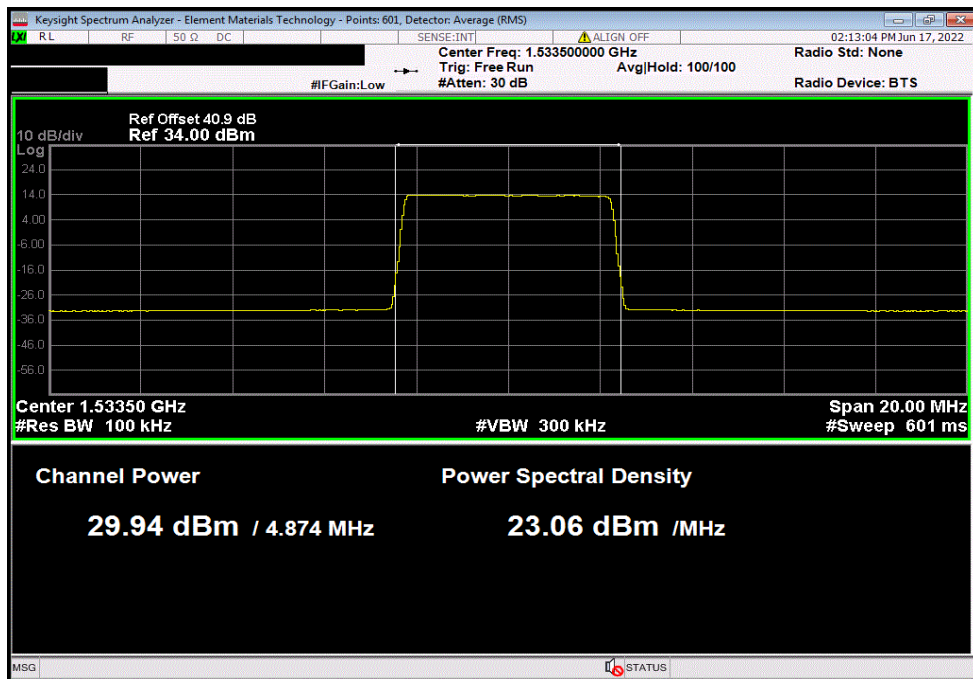


TbTx 2022.06.03.0 XMt 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 64-QAM Modulation, Low Channel 1528.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
29.858	3	0	32.858	35.858	39.8	Pass	



5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 64-QAM Modulation, High Channel 1533.5 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
29.941	3	0	32.941	35.941	39.8	Pass	

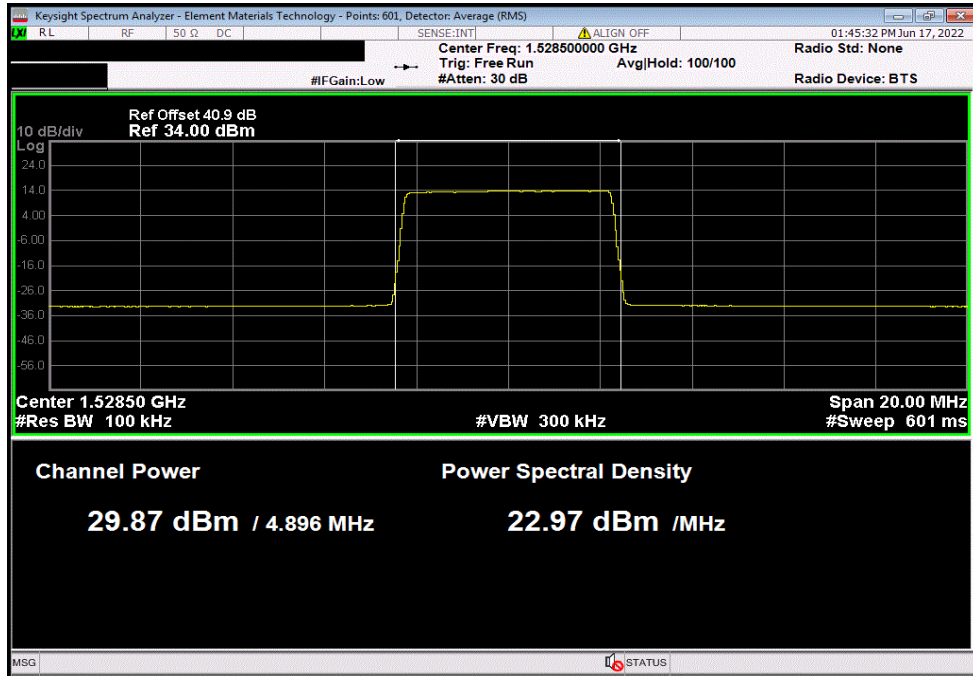


AVERAGE POWER - 3dBi

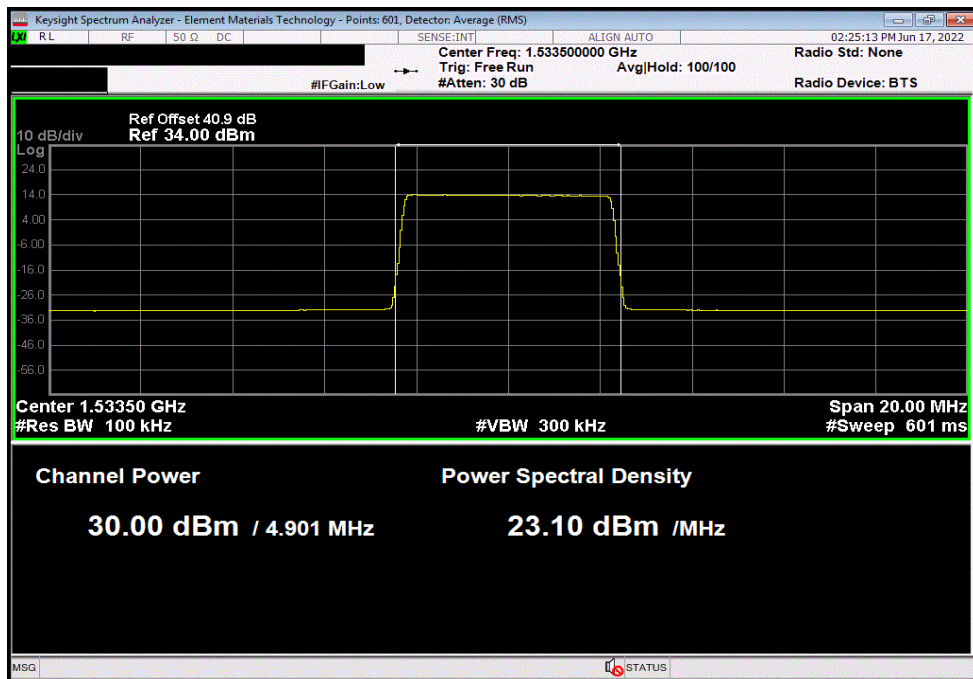


Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 256-QAM Modulation, Low Channel 1528.5 MHz, 25 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
29.867	3	0	32.867	35.867	39.8	Pass



5G NR, Band n24, SCS 15kHz, 5 MHz Bandwidth, 256-QAM Modulation, High Channel 1533.5 MHz, 25 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
30.001	3	0	33.001	36.001	39.8	Pass

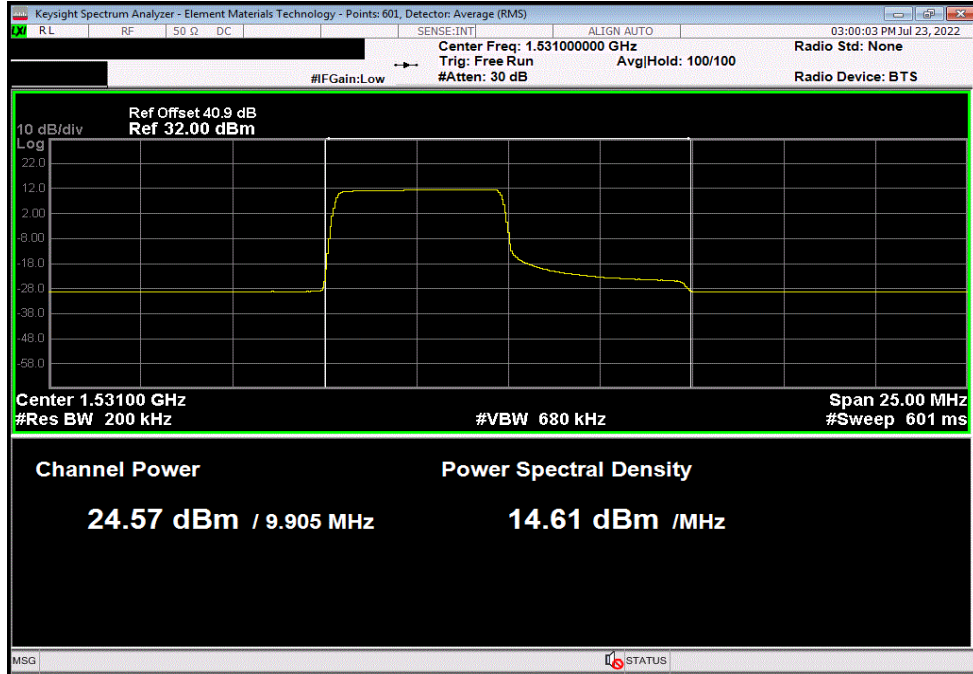


AVERAGE POWER - 3dBi

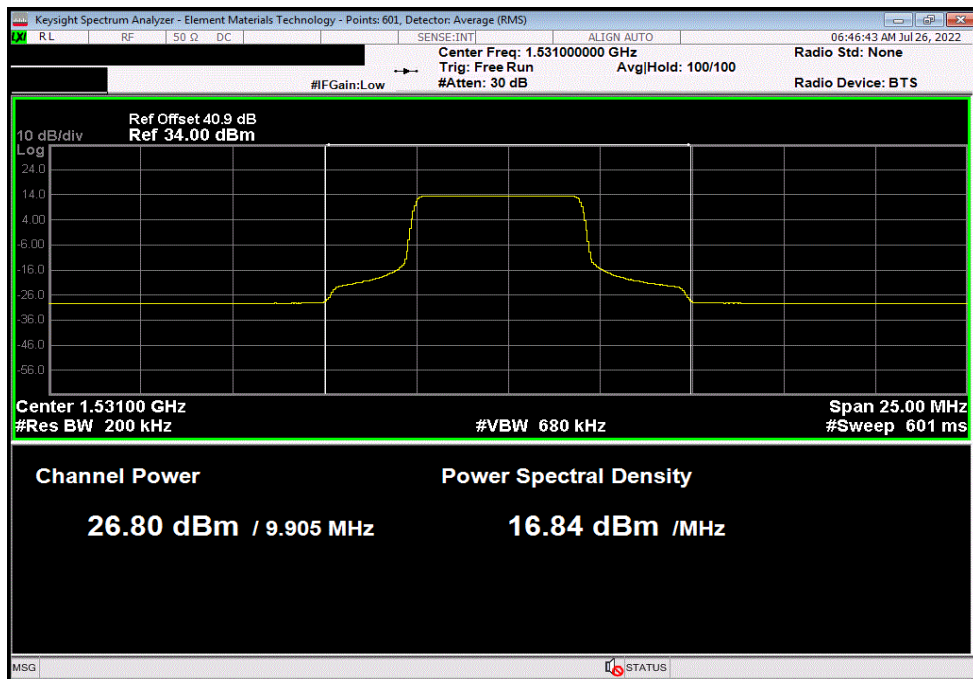


Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 25 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.566	3	0	27.566	30.566	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 25 RB/13 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.802	3	0	29.802	32.802	39.8	Pass

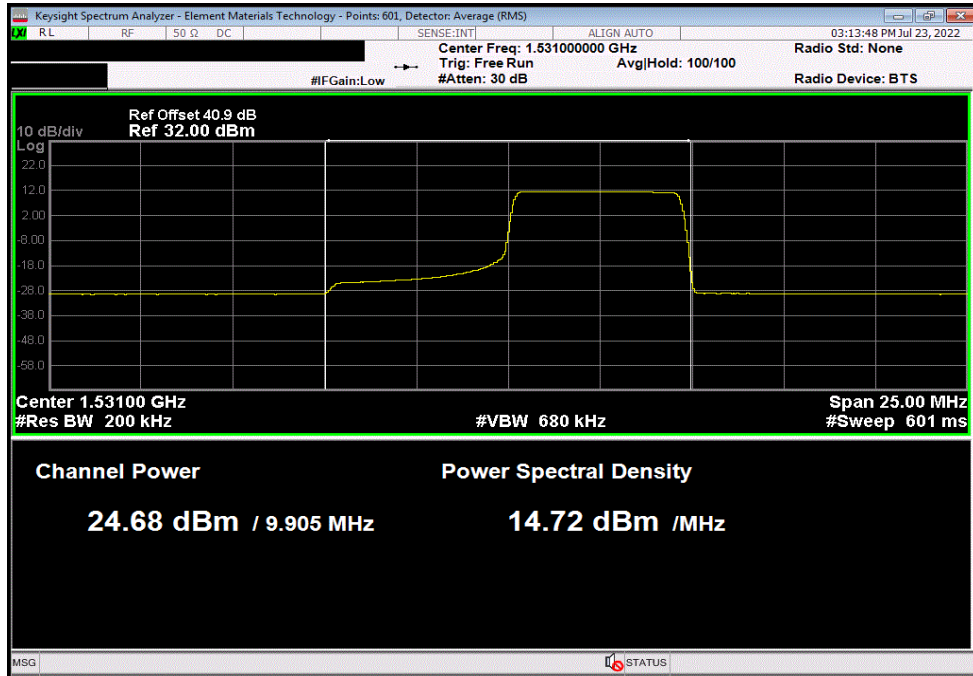


AVERAGE POWER - 3dBi

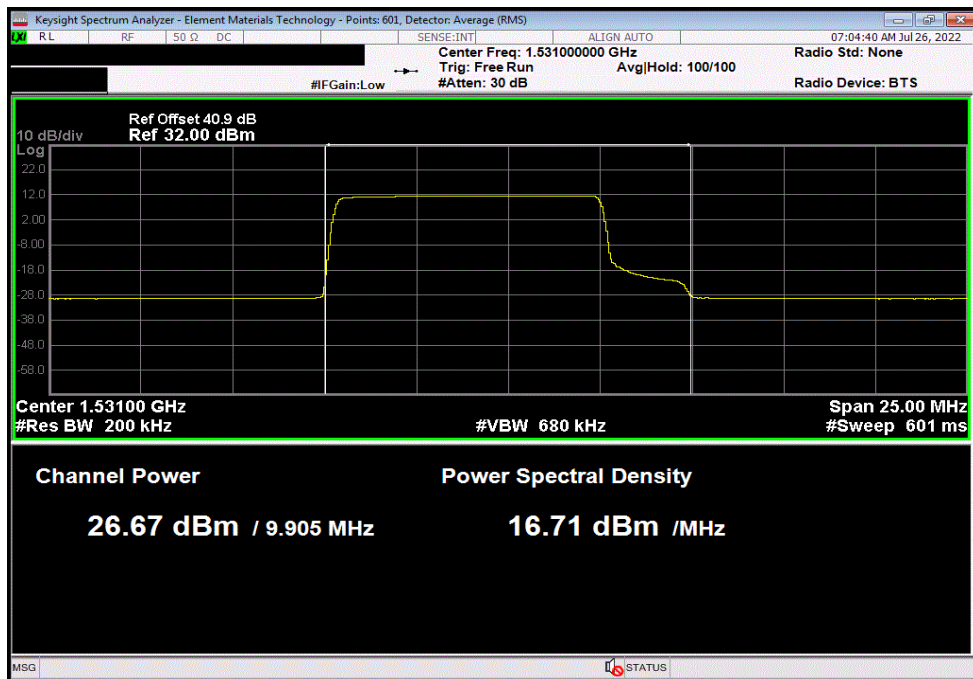


TbTx 2022.06.03.0 XMM 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 25 RB/27 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.679	3	0	27.679	30.679	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 40 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.67	3	0	29.67	32.67	39.8	Pass

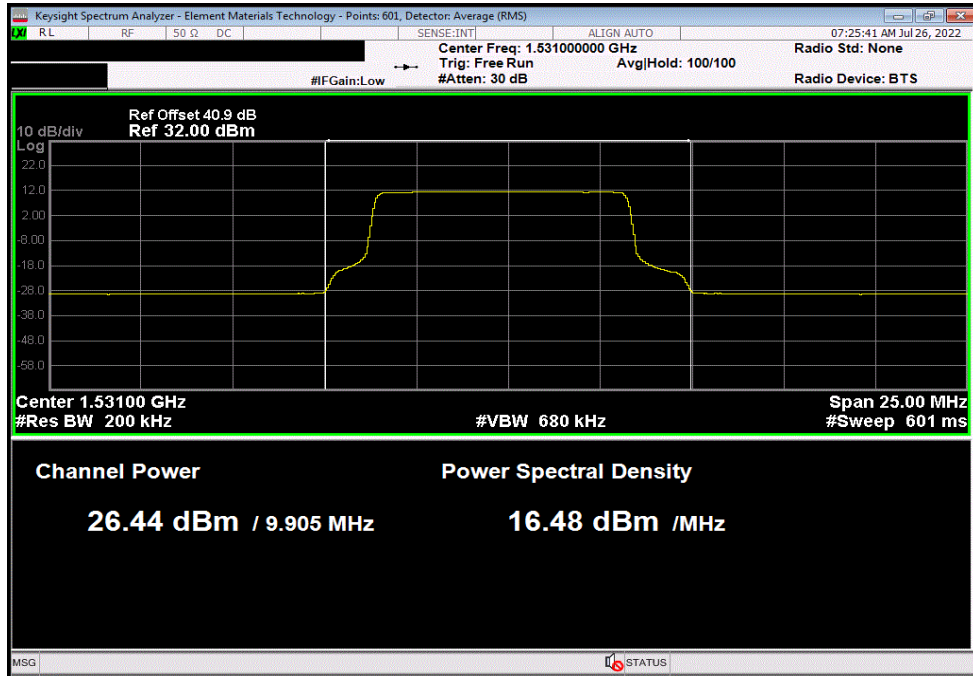


AVERAGE POWER - 3dBi

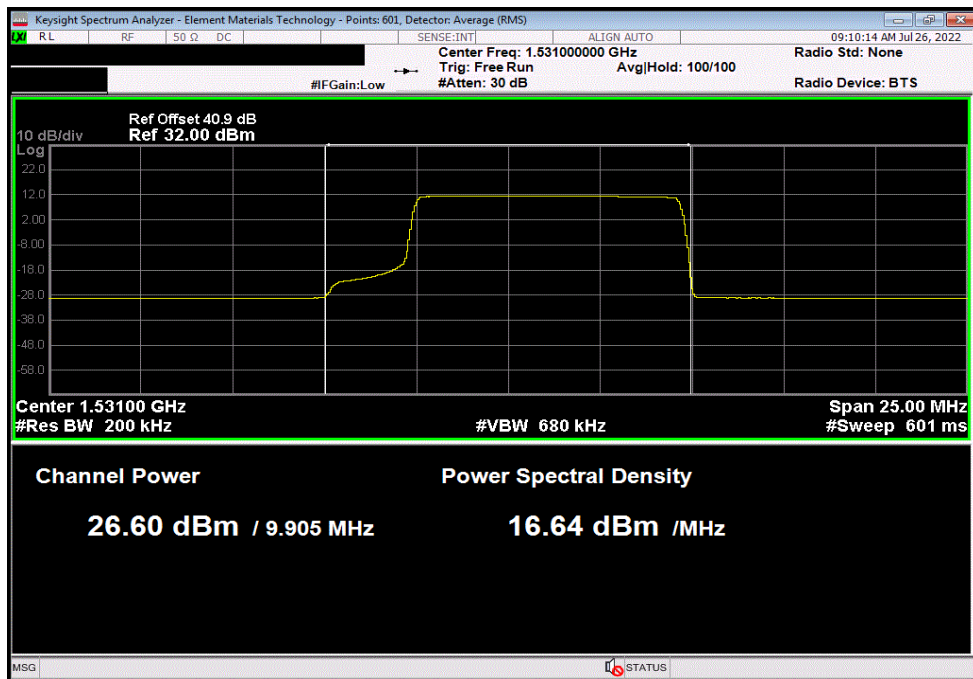


TbTx 2022.06.03.0 XMM 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 40 RB/6 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.441	3	0	29.441	32.441	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 40 RB/12 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.602	3	0	29.602	32.602	39.8	Pass

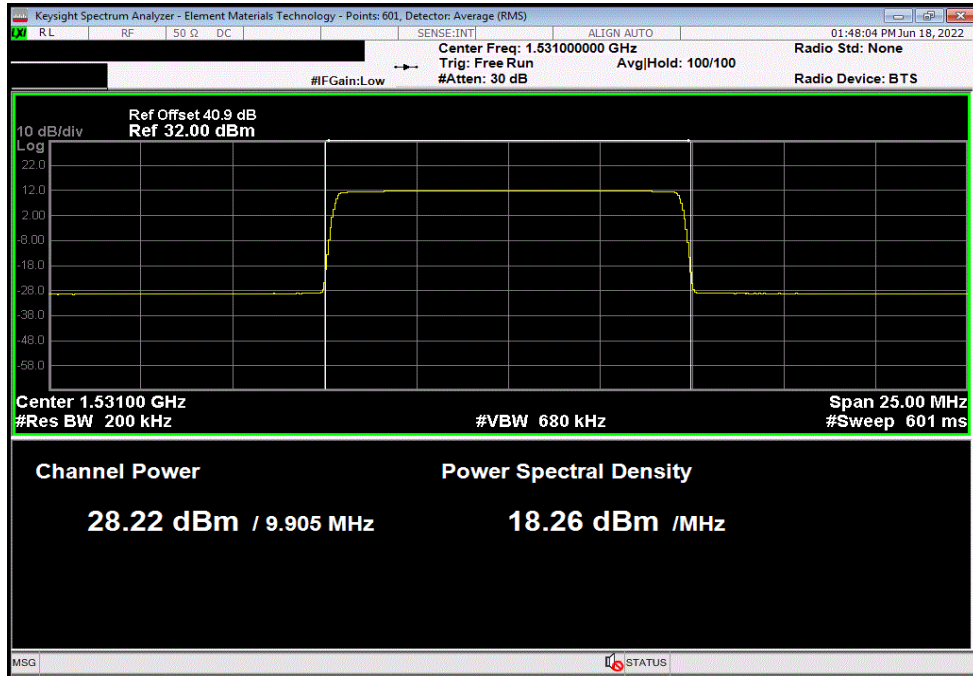


AVERAGE POWER - 3dBi

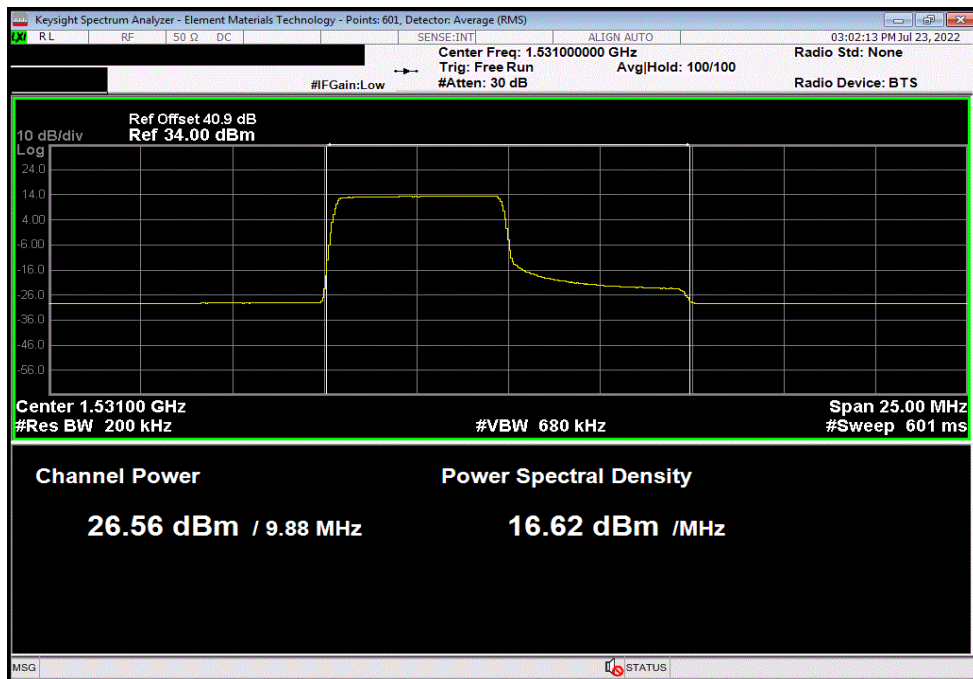


Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, QPSK Modulation, Mid Channel 1531 MHz, 52 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
28.221	3	0	31.221	34.221	39.8	Pass	



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 25 RB/0 Offset							
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results	
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)		
26.564	3	0	29.564	32.564	39.8	Pass	

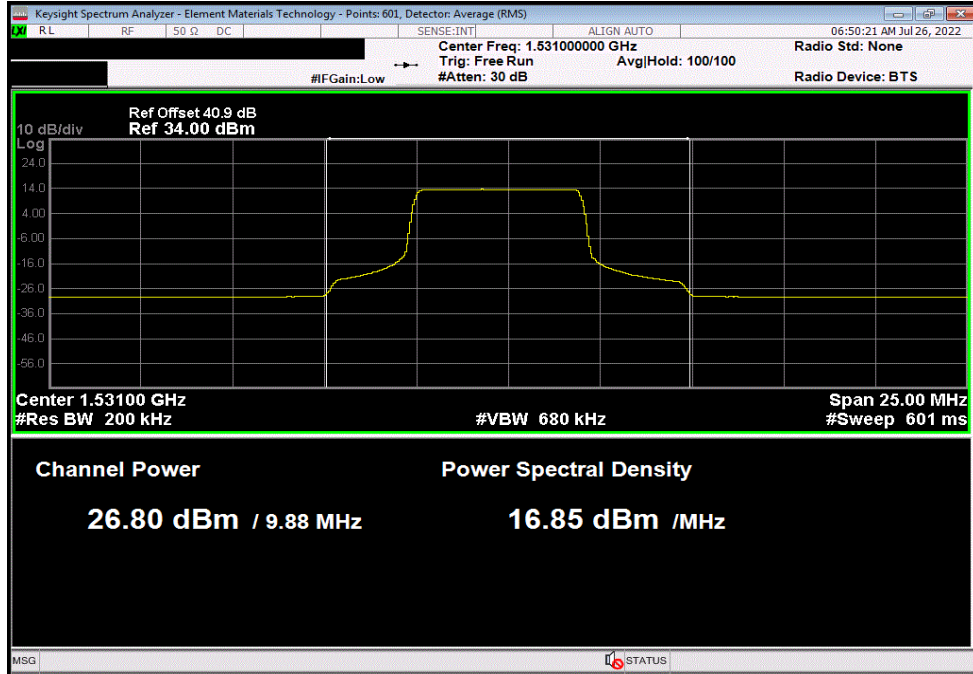


AVERAGE POWER - 3dBi

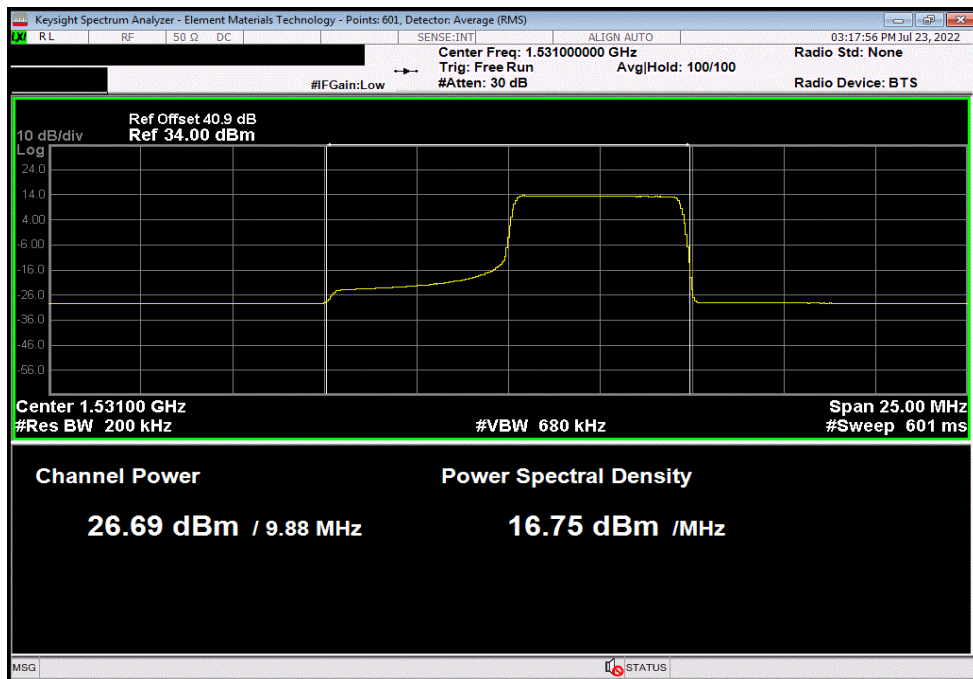


Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 25 RB/13 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.803	3	0	29.803	32.803	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 25 RB/27 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.694	3	0	29.694	32.694	39.8	Pass

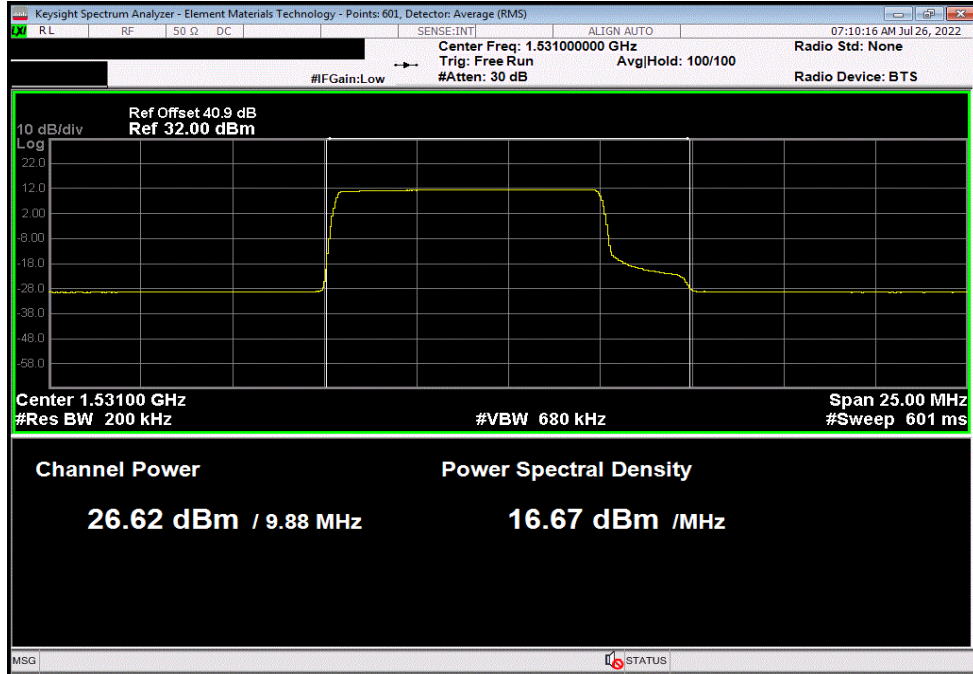


AVERAGE POWER - 3dBi

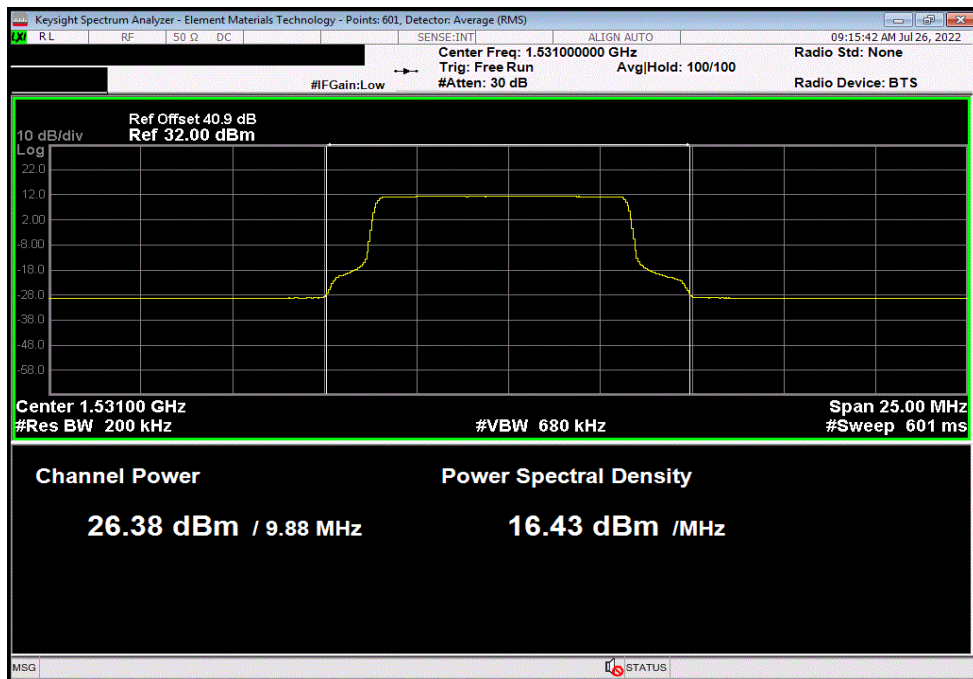


TbTx 2022.06.03.0 XMM 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 40 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.62	3	0	29.62	32.62	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 40 RB/6 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.383	3	0	29.383	32.383	39.8	Pass

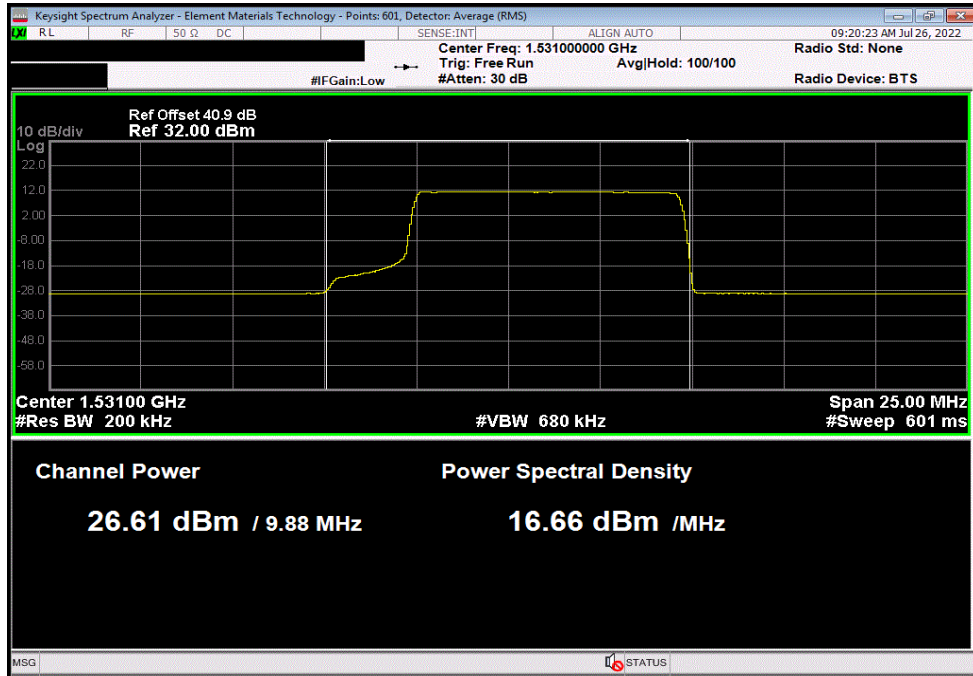


AVERAGE POWER - 3dBi

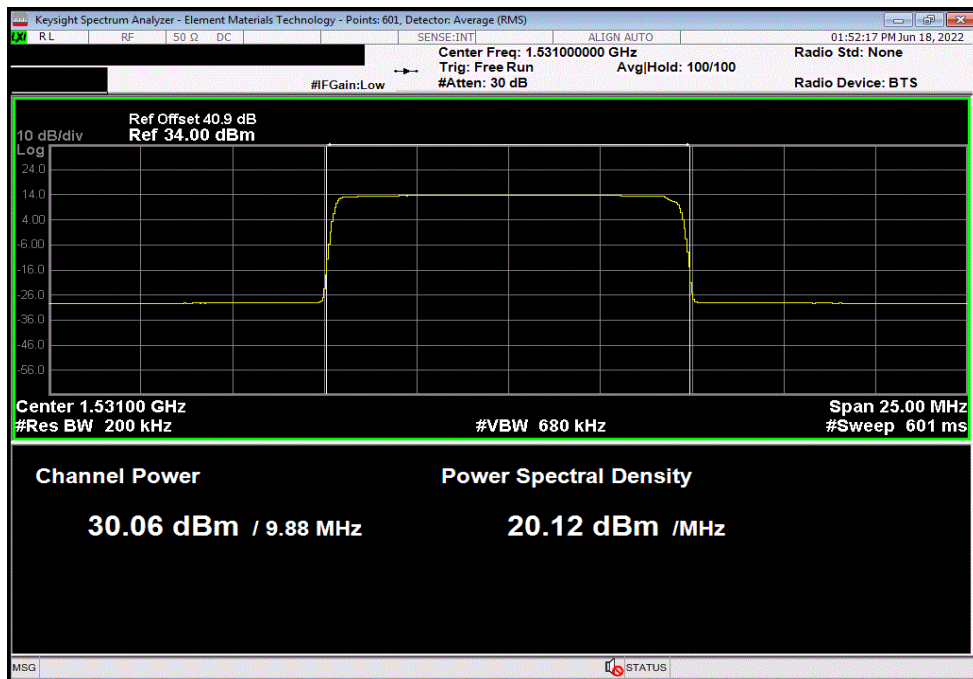


TbTx 2022.06.03.0 XMt 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 40 RB/12 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.61	3	0	29.61	32.61	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1531 MHz, 52 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
30.065	3	0	33.065	36.065	39.8	Pass

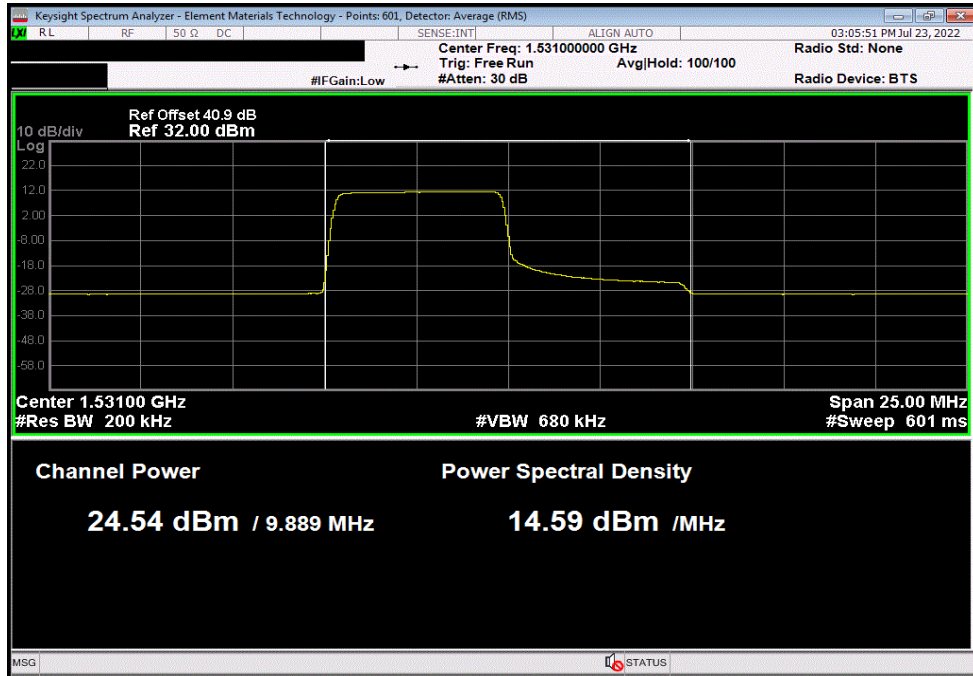


AVERAGE POWER - 3dBi

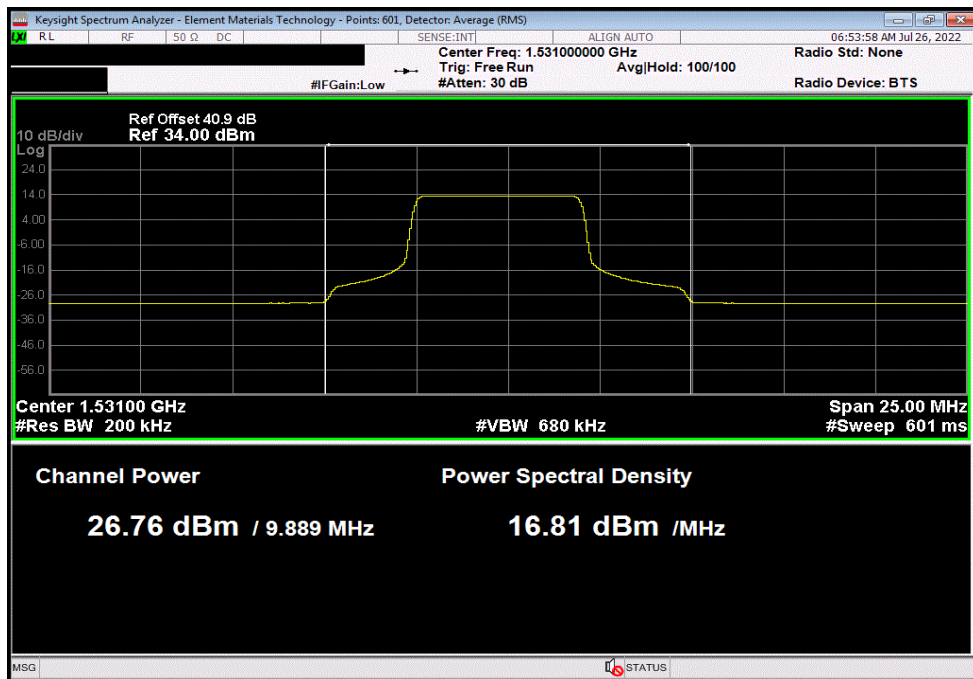


Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 25 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.543	3	0	27.543	30.543	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 25 RB/13 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.758	3	0	29.758	32.758	39.8	Pass

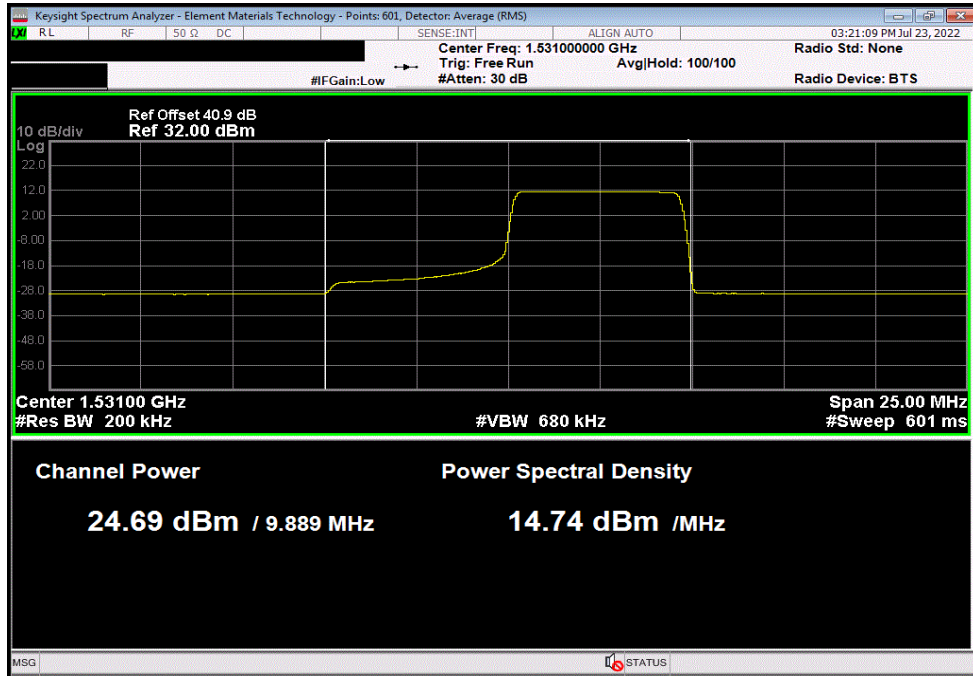


AVERAGE POWER - 3dBi

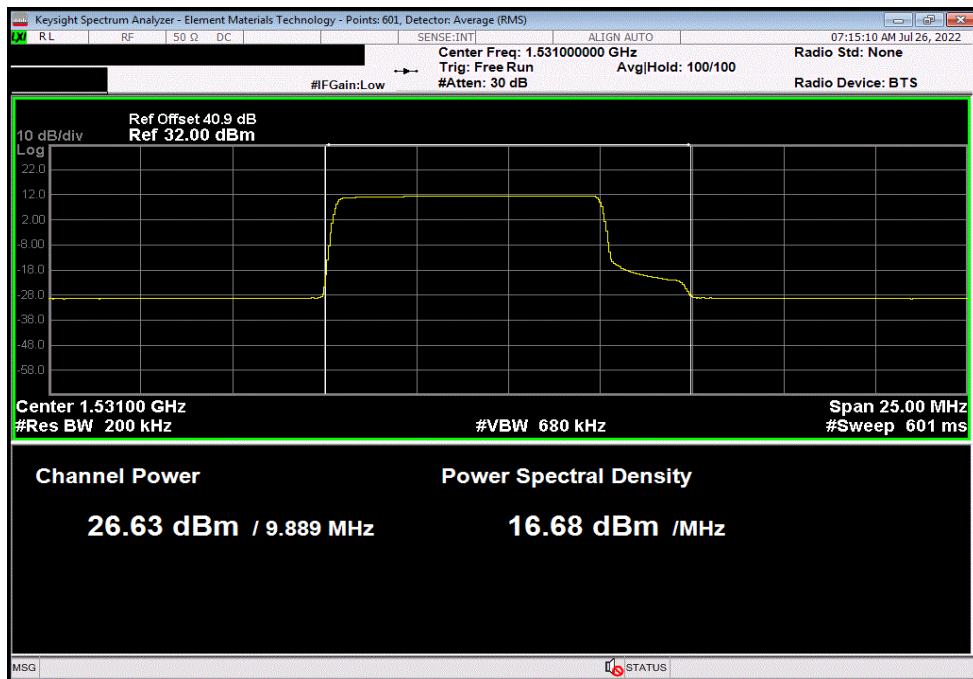


TbTx 2022.06.03.0 XMin 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 25 RB/27 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.688	3	0	27.688	30.688	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 40 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.629	3	0	29.629	32.629	39.8	Pass

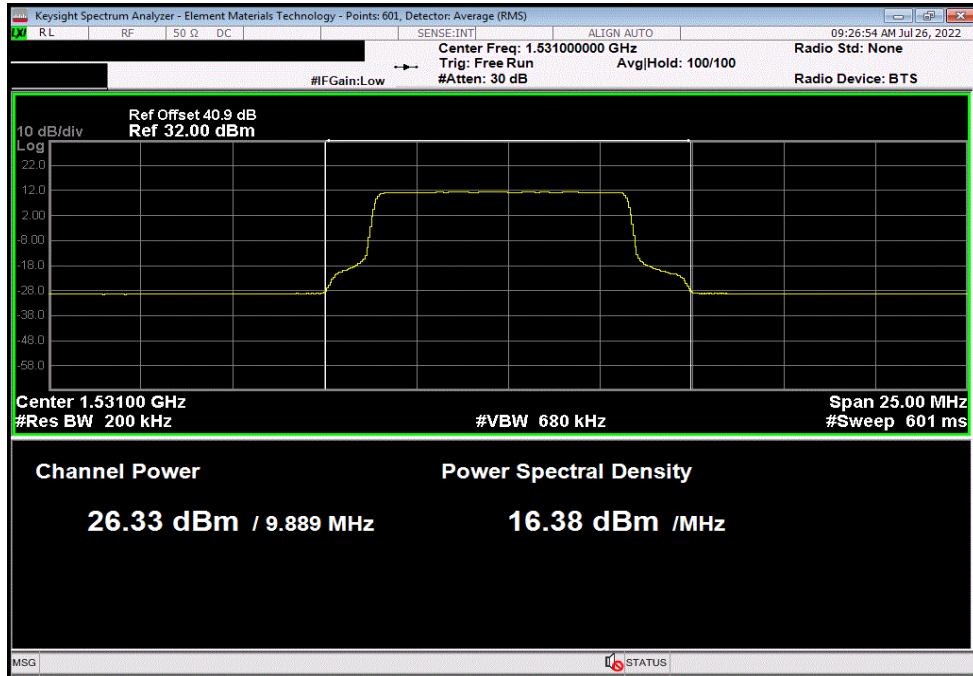


AVERAGE POWER - 3dBi

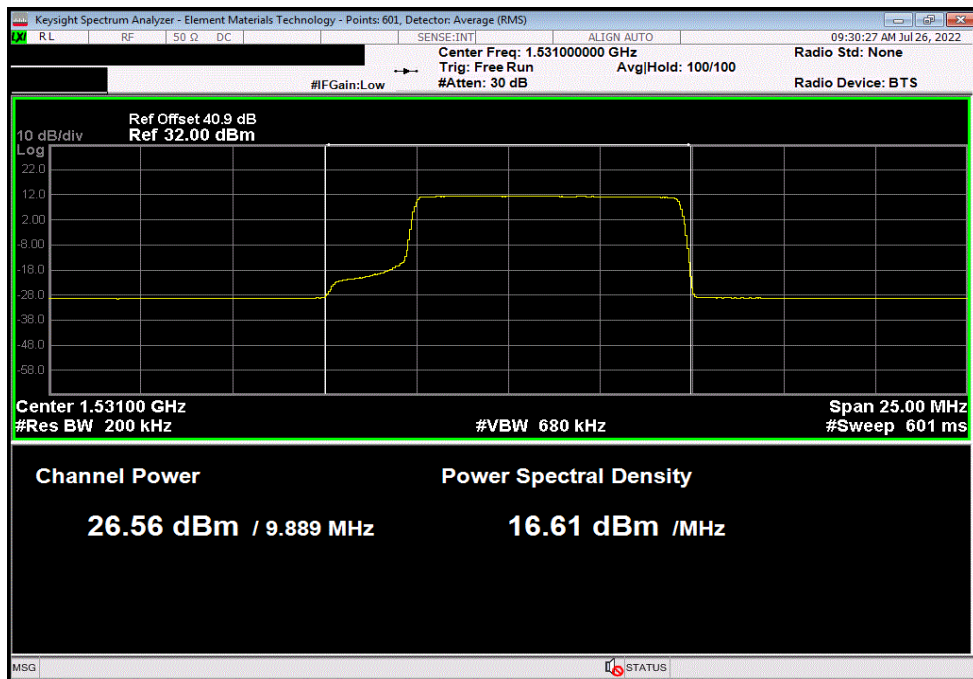


TbTx 2022.06.03.0 XMin 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 40 RB/6 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.332	3	0	29.332	32.332	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 40 RB/12 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.561	3	0	29.561	32.561	39.8	Pass

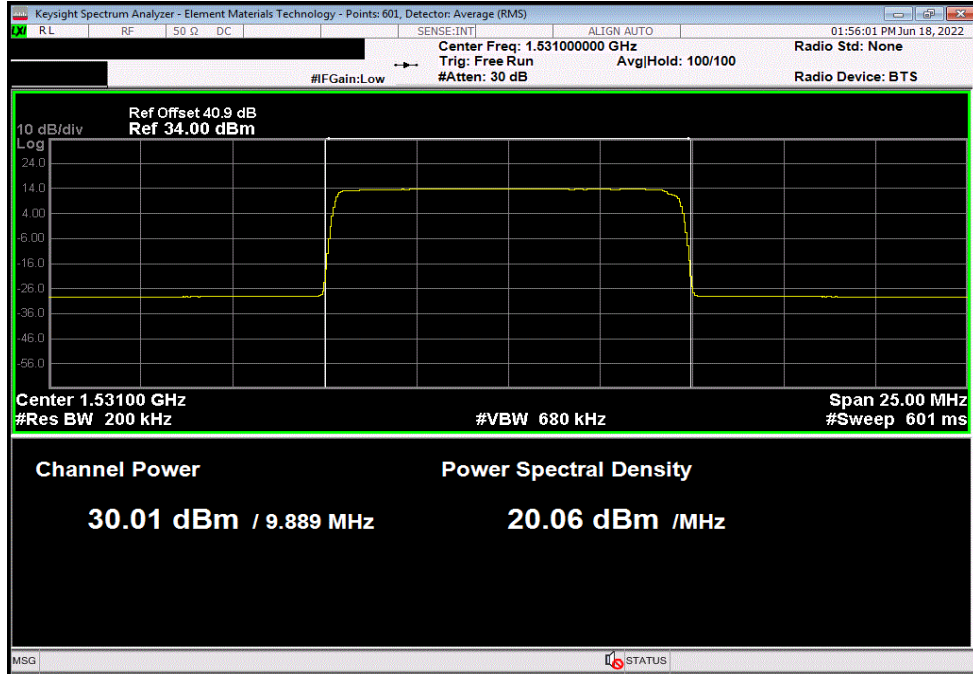


AVERAGE POWER - 3dBi

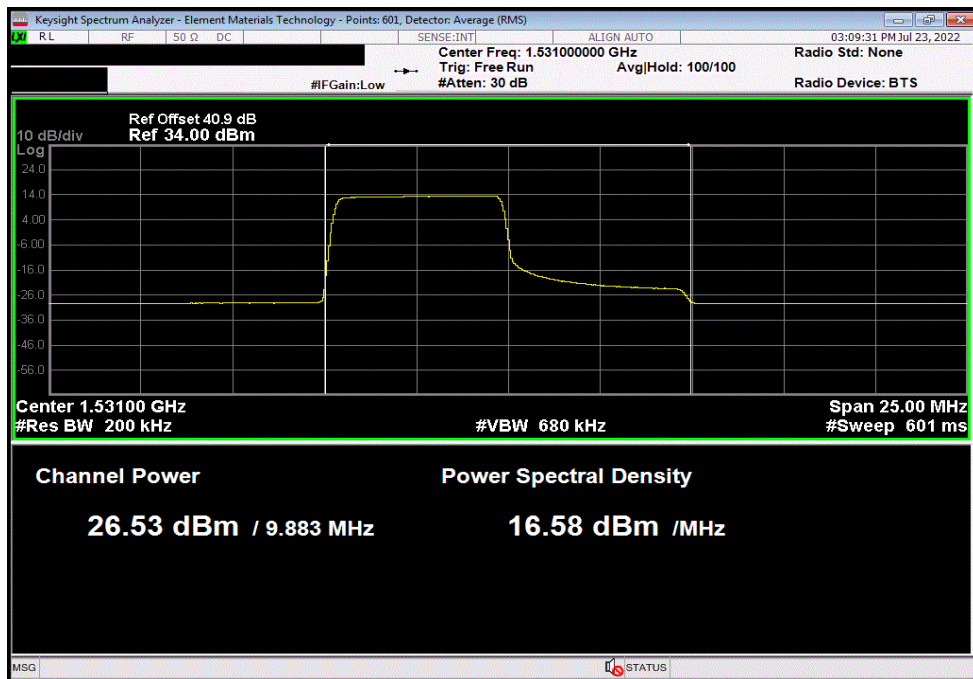


TbTx 2022.06.03.0 XMin 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1531 MHz, 52 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
30.007	3	0	33.007	36.007	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 25 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.532	3	0	29.532	32.532	39.8	Pass

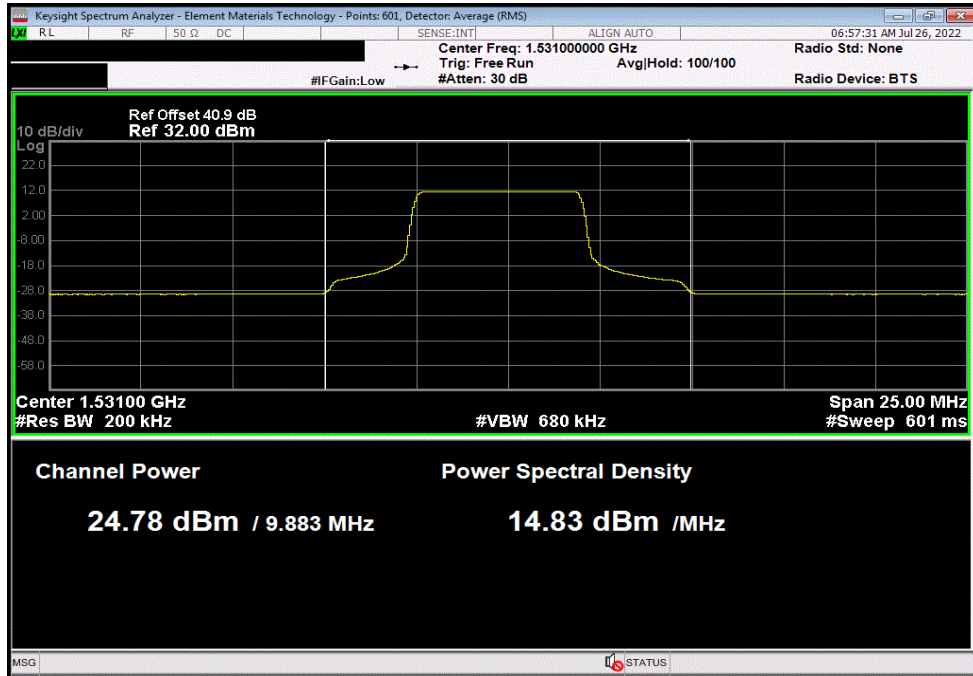


AVERAGE POWER - 3dBi

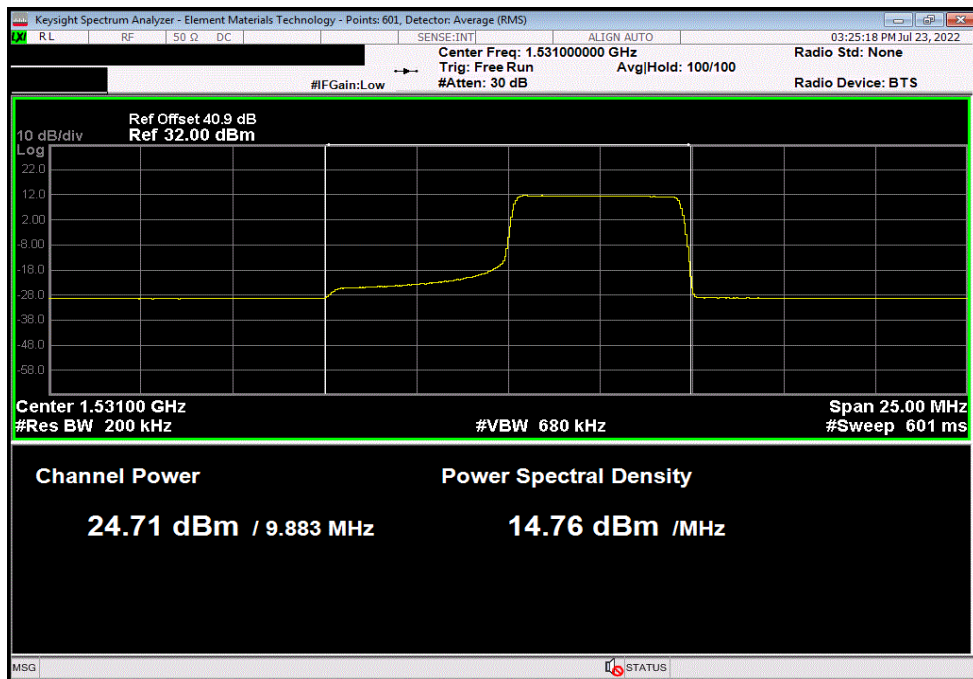


TbTx 2022.06.03.0 XMM 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 25 RB/13 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.777	3	0	27.777	30.777	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 25 RB/27 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
24.71	3	0	27.71	30.71	39.8	Pass

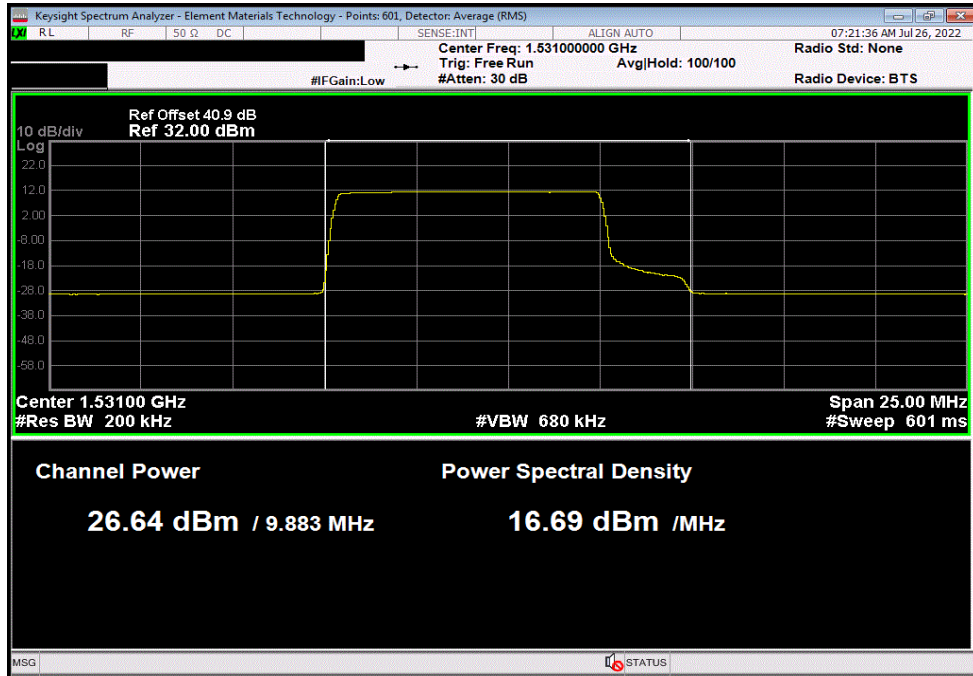


AVERAGE POWER - 3dBi

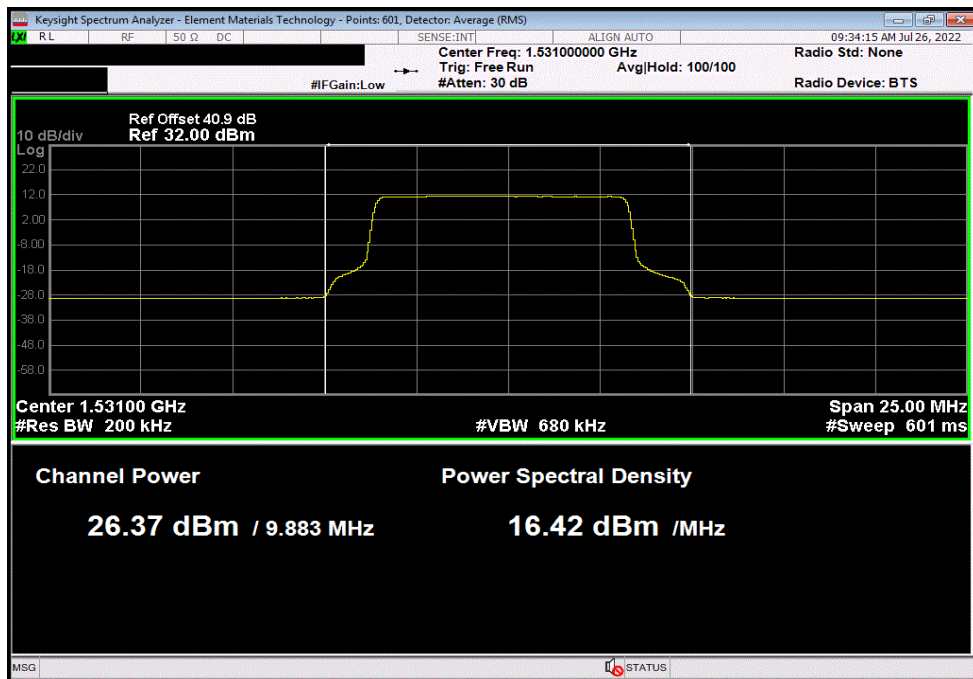


TbTx 2022.06.03.0 XMt 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 40 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.64	3	0	29.64	32.64	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 40 RB/6 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.366	3	0	29.366	32.366	39.8	Pass

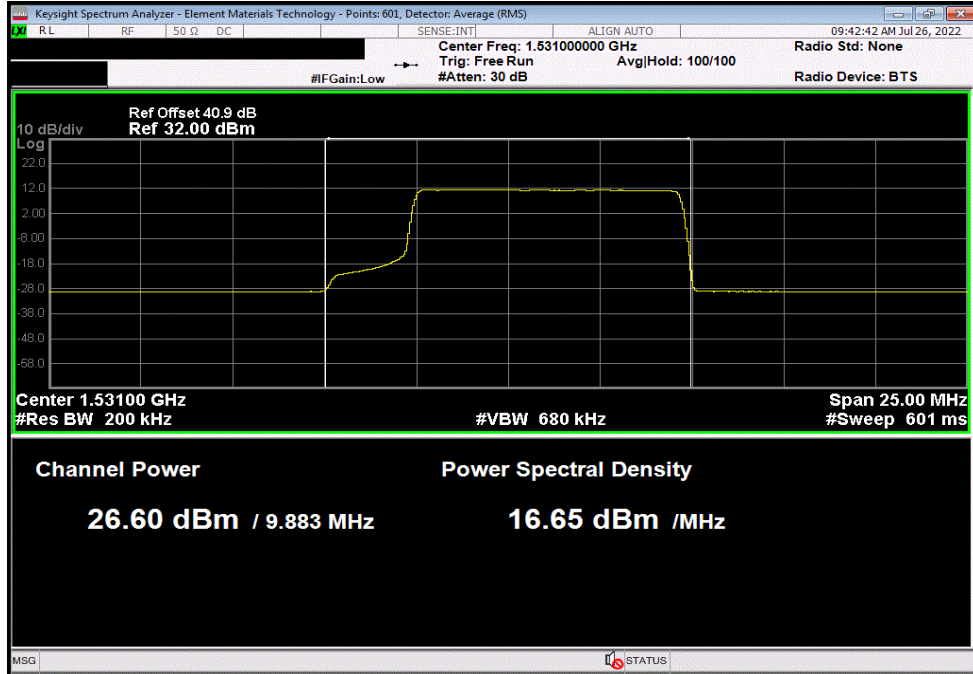


AVERAGE POWER - 3dBi



Tel: 2022.06.03.0 XM: 2022.02.07.0

5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 40 RB/12 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
26.597	3	0	29.597	32.597	39.8	Pass



5G NR, Band n24, SCS 15kHz, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1531 MHz, 52 RB/0 Offset						
Initial Value	Antenna	Duty Cycle	2 Port (2x2 MIMO)	4 Port (4x4 MIMO)	Limit	Results
dBm/Carrier BW	Gain (dBi)	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	(dBm)	
29.986	3	0	32.986	35.986	39.8	Pass

