AVERAGE POWER

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The AEQU antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Average Power - All Ports" report section of this report). Antenna port 1 was selected to perform this testing as allowed by ANSI C63.26 paragraphs 5.2.5.3, 5.7.2i and 6.4.

All Measurements were synchronized with the measurement receiver - gated with external trigger input frame clock (100Hz) provided by the system module). Duty cycle correction is not needed for this testing since the transmit “on” time is synchronized with the measurement receiver.

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 RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified in this report.

The RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4.

The output power was measured for a single carrier over the carrier channel bandwidth. The total output power for multiport (64x64 MIMO) operations was determined based per ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for Sixty-Four port operation is single power +18.1 dB [i.e. 10*log(64)].

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight Technologies	N9030B	AGA	2025-06-09	2026-06-09
Block - DC	Centric RF	C0140	ANJ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07

Note: The RF Test Setup/ Network (RF cables/Attenuators/filter/etc.) is defined in the configurations section for each test. The RF Test Setup/Network is calibrated using the signal generator and spectrum analyzer prior to test. The RF insertion loss of the RF Test Setup/Network is accounted for by the spectrum analyzer's reference level offset during the RF conducted testing.

AVERAGE POWER

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AEQU	Work Order:	NOKI0091
Serial Number:	DH224002609	Date:	2025-12-12
Customer:	Nokia Solutions and Networks	Temperature:	28.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	31.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT01
Power:	54 VDC	Configuration:	NOKI0091-2

COMMENTS

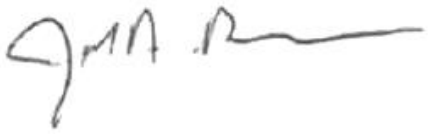
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

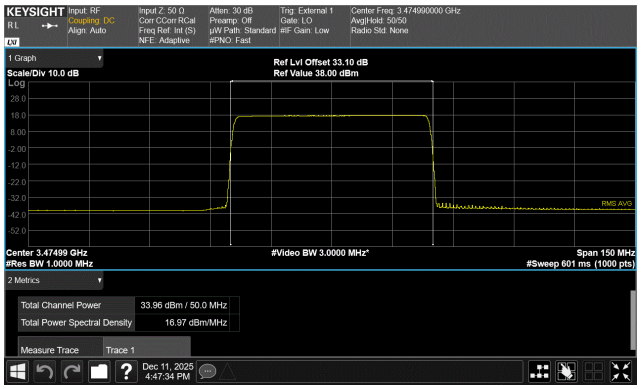
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Sixty-four Port (64x64 MIMO) dBm/carrier BW
Port 1				
50 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 3474.99 MHz	33.962	0	34	52.1
Middle Channel, 3500.01 MHz	33.763	0	33.8	51.9
High Channel, 3525.00 MHz	33.825	0	33.8	51.9
16QAM Modulation				
Middle Channel, 3500.01 MHz	33.741	0	33.7	51.8
64QAM Modulation				
Middle Channel, 3500.01 MHz	33.744	0	33.7	51.8
256QAM Modulation				
Middle Channel, 3500.01 MHz	33.749	0	33.7	51.8
60 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 3480.00 MHz	33.827	0	33.8	51.9
Middle Channel, 3500.01 MHz	33.717	0	33.7	51.8
High Channel, 3519.99 MHz	33.799	0	33.8	51.9
70 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 3485.01 MHz	33.768	0	33.8	51.9
Middle Channel, 3500.01 MHz	33.635	0	33.6	51.7
High Channel, 3514.98 MHz	33.839	0	33.8	51.9
80 MHz Channel Bandwidth				

AVERAGE POWER

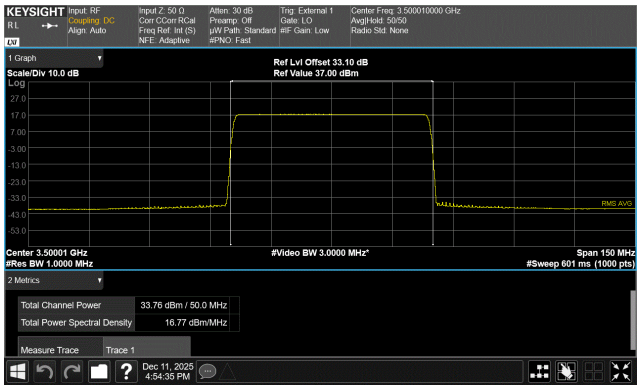
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Sixty-four Port (64x64 MIMO) dBm/carrier BW
QPSK Modulation				
Low Channel, 3489.99 MHz	33.774	0	33.8	51.9
Middle Channel, 3500.01 MHz	33.733	0	33.7	51.8
High Channel, 3510.00 MHz	33.718	0	33.7	51.8
90 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 3495.00 MHz	33.761	0	33.8	51.9
Middle Channel, 3500.01 MHz	33.68	0	33.7	51.8
High Channel, 3504.99 MHz	33.742	0	33.7	51.8
100 MHz Channel Bandwidth				
QPSK Modulation				
Middle Channel, 3500.01 MHz	33.604	0	33.6	51.7

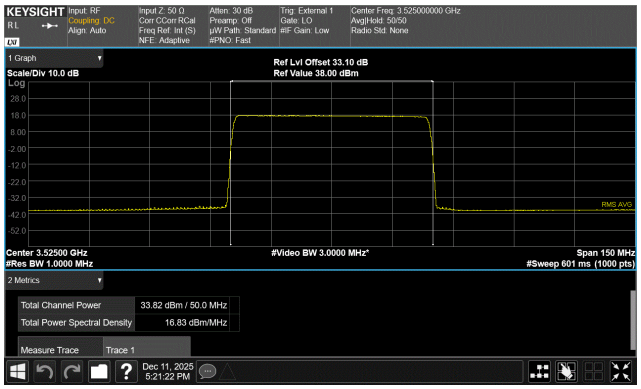
AVERAGE POWER



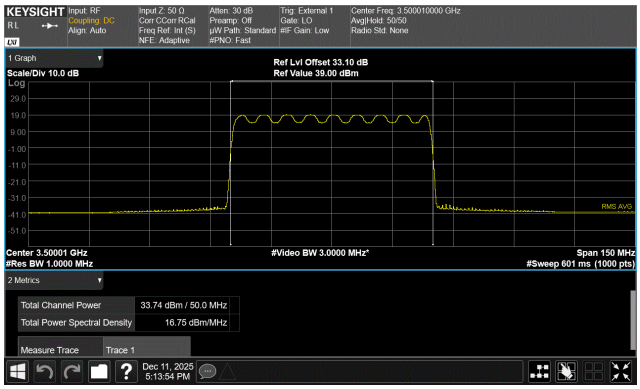
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3474.99 MHz



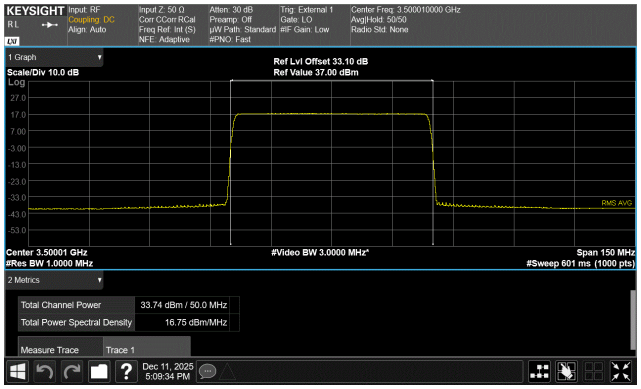
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



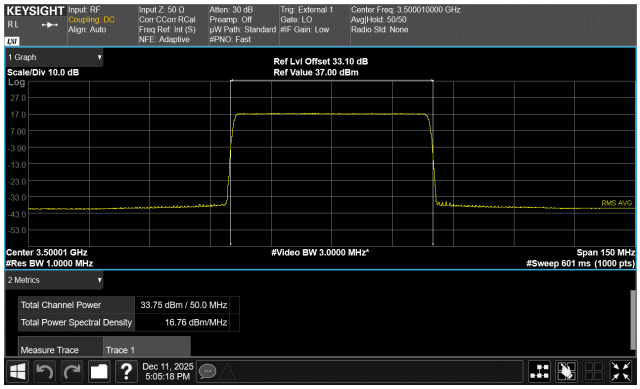
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3525.00 MHz



Port 1
50 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
50 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
50 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

AVERAGE POWER

element
TbtTx 2025.05.09.1
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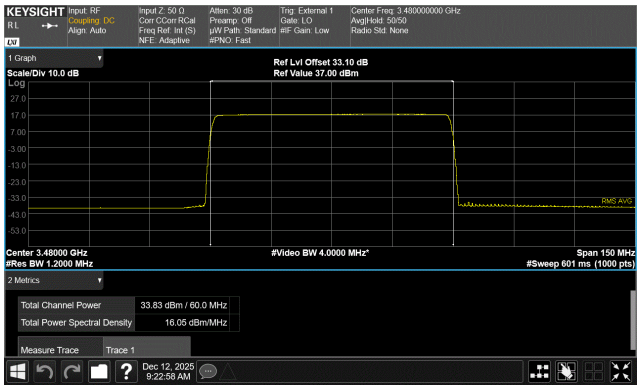
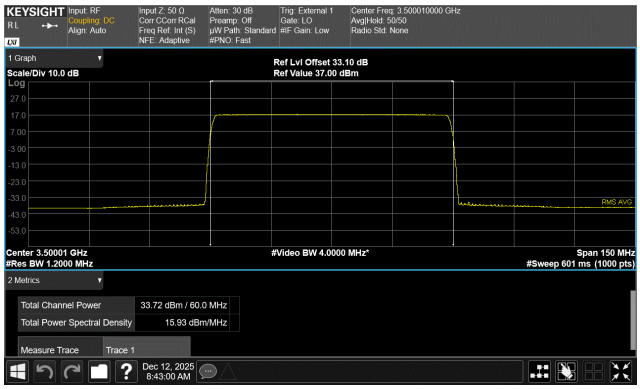
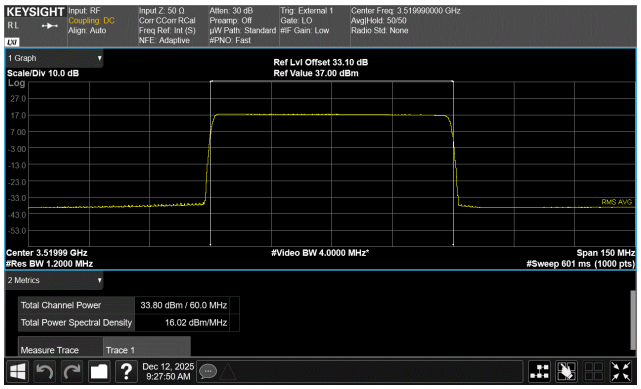


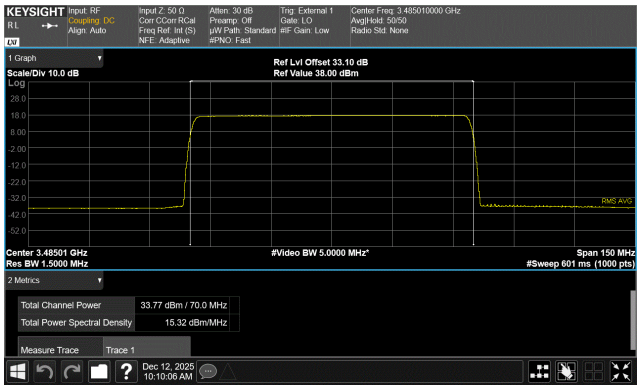
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3480.00 MHz



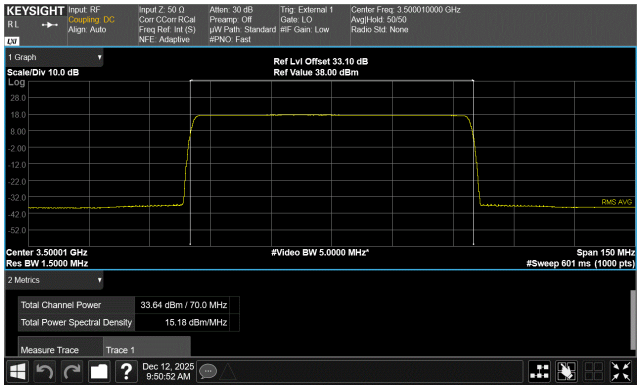
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



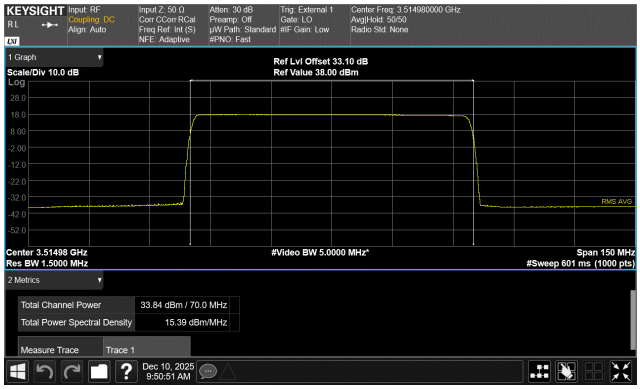
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3519.99 MHz



Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3485.01 MHz

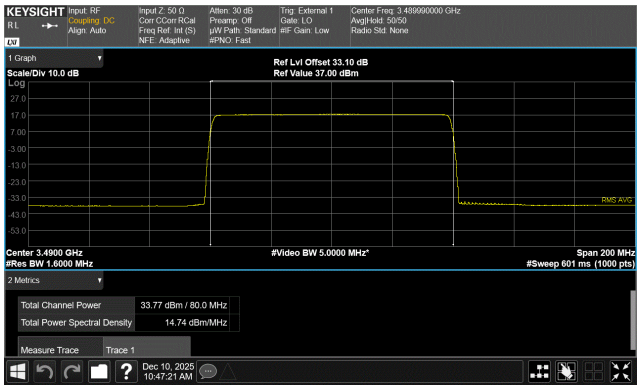


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz

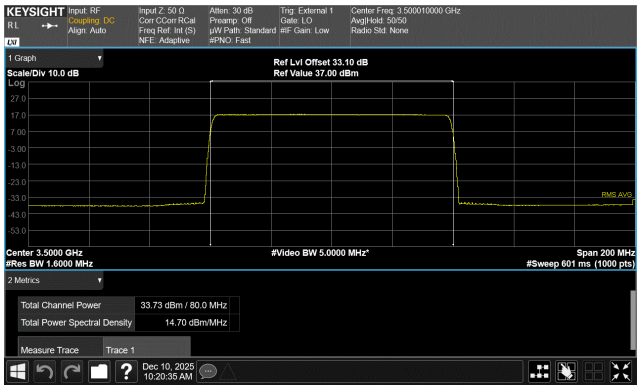


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3514.98 MHz

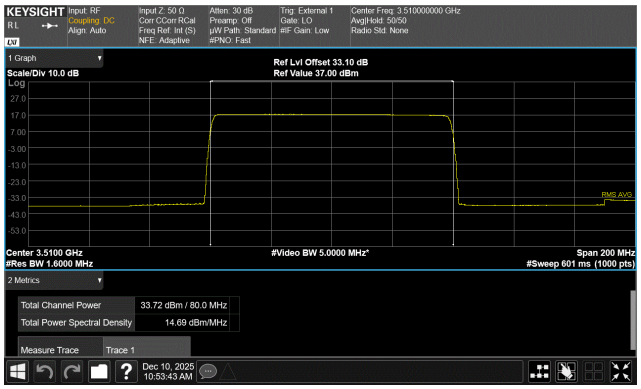
AVERAGE POWER



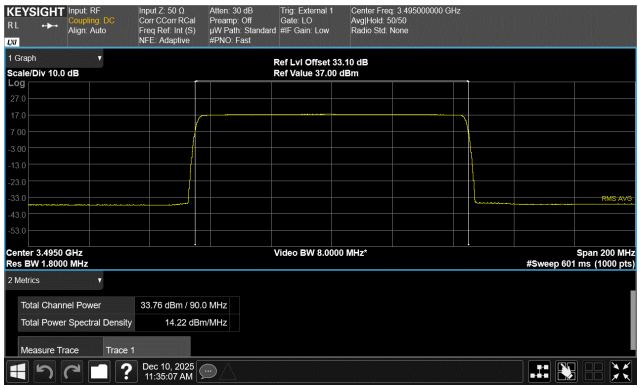
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3489.99 MHz



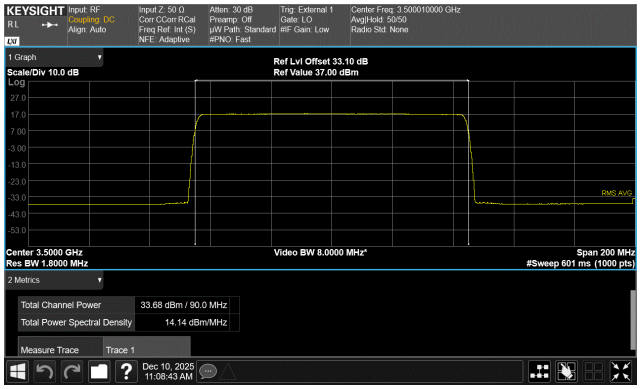
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



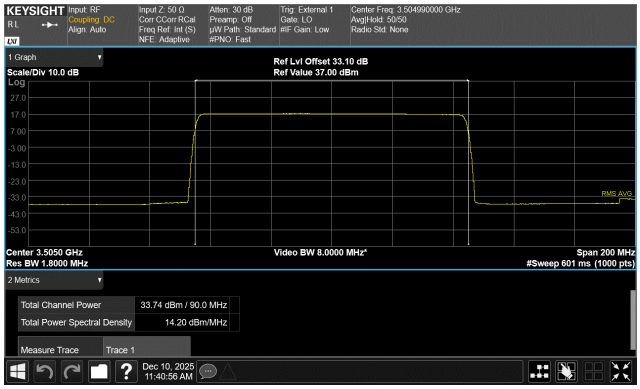
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3510.00 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3495.00 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3504.99 MHz

AVERAGE POWER

element
TbtTx 2025.05.09.1
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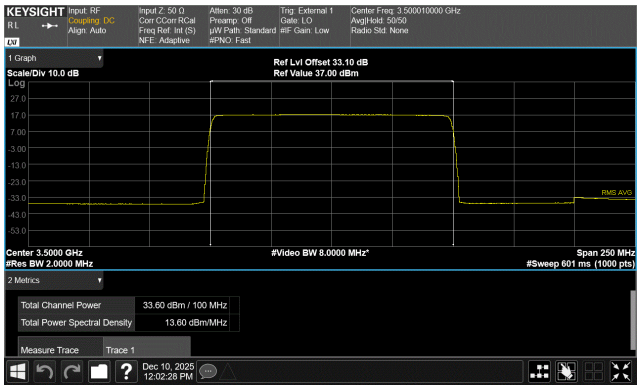

Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz

AVERAGE POWER - MULTICARRIER

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The AEQU antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Average Power - All Ports" report section of this report). Antenna port 1 was selected to perform this testing as allowed by ANSI C63.26 paragraphs 5.2.5.3, 5.7.2i and 6.4.

All Measurements were synchronized with the measurement receiver - gated with external trigger input frame clock (100Hz) provided by the system module). Duty cycle correction is not needed for this testing since the transmit “on” time is synchronized with the measurement receiver.

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 RMS average power measurement method for FCC is detailed in section 5.2 of KDB 971168 D01v03r01 and ANSI C63.26-2015 section 5.2.4.4. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified in this report.

The output power was measured for a single carrier over the carrier channel bandwidth. The total output power for multiport (64x64 MIMO) operations was determined based per ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for Sixty-Four port operation is single power +18.1 dB [i.e. 10*log(64)].

Multicarrier test cases have been developed as shown below:

a) *Multicarrier Test Case 1:* Two Non-contiguous carriers with one NR20 Carrier (3459.99MHz) (ARFCN=630666) at the bottom channel and one NR20 Carrier (3540MHz) (ARFCN=636000) at the top channel (maximum spacing between carriers). All carriers at the same power level (100W/carrier). The total power per carrier is set to [31.9dBm] (100W/carrier). The total radio power is 200 watts.

b) *Multicarrier Test Case 2:* Two contiguous carriers with one NR20 Carrier at (3459.99MHz) (ARFCN=630666) using 30.4dBm (1.1Watts) and one 40MHz carrier at (3489.99MHz) (ARFCN=632666) using 33.0dBm (2.0Watts) at the lower band edge. The total radio power is 200 watts.

c) *Multicarrier Test Case 3:* Two contiguous carriers with one NR20 Carrier (3540MHz) (ARFCN=636000) using 30.4dBm (1.1Watts) and one NR40 Carrier (3510MHz) (ARFCN=634000) 33.0dBm (2.0Watts) at the top band edge (maximum spacing between carriers). The total radio power is 200 watts.

d) *Multicarrier Test Case 4:* Two non-contiguous carriers with one NR40 Carrier (3470.01MHz) (ARFCN=631334) and one NR40 Carrier (3529.98Hz) (ARFCN=635332) at the top channel (maximum spacing between carriers). All carriers at the same power level (100W/carrier), (31.9dBm/port). The total radio power is 200 watts.

AVERAGE POWER - MULTICARRIER

element
TbtTx 2025.05.09.1
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TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight Technologies	N9030B	AGA	2025-06-09	2026-06-09
Block - DC	Centric RF	C0140	ANJ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07

Note: The RF Test Setup/ Network (RF cables/Attenuators/filter/etc.) is defined in the configurations section for each test. The RF Test Setup/Network is calibrated using the signal generator and spectrum analyzer prior to test. The RF insertion loss of the RF Test Setup/Network is accounted for by the spectrum analyzer's reference level offset during the RF conducted testing.

AVERAGE POWER - MULTICARRIER

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AEQU	Work Order:	NOKI0091
Serial Number:	DH224002609	Date:	2025-12-11
Customer:	Nokia Solutions and Networks	Temperature:	28.8°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	32.4%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT01
Power:	54 VDC	Configuration:	NOKI0091-2

COMMENTS

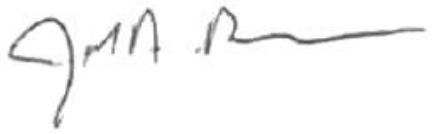
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



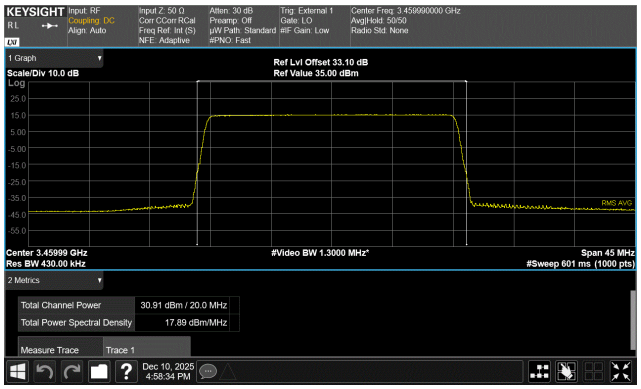
Tested By

TEST RESULTS

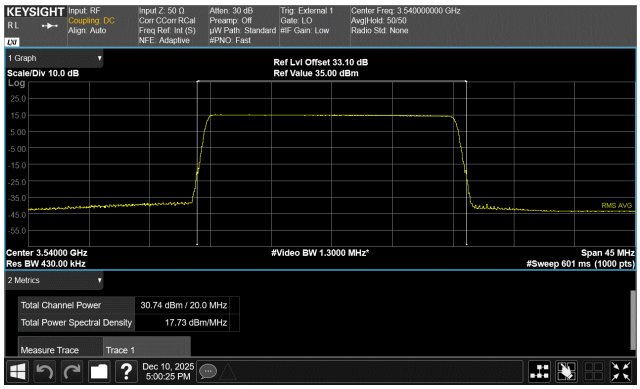
	Avg Cond Pwr (dBm)	Duty Cycle Factor (dB)	Value (dBm)	Limit (dBm)
Port 1				
QPSK Modulation				
Test Case 1				
3459.99 MHz, NR20	30.905	0	30.9	49.0
3540.00 MHz, NR20	30.744	0	30.7	48.8
Test Case 2				
3459.99 MHz, NR20	29.306	0	29.3	47.4
3489.99 MHz, NR40	32.303	0	32.3	50.4
Test Case 3				
3540.00 MHz, NR20	29.225	0	29.2	47.3
3510.00 MHz, NR40	32.327	0	32.3	50.4
Test Case 4				
3470.01 MHz, NR40	31.114	0	31.1	49.2
3529.98 MHz, NR40	31.023	0	31	49.1

AVERAGE POWER - MULTICARRIER

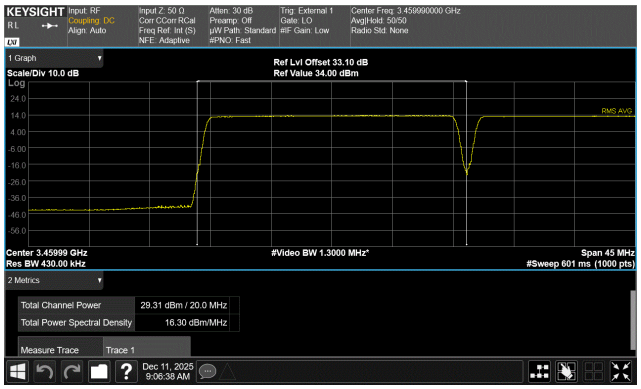
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



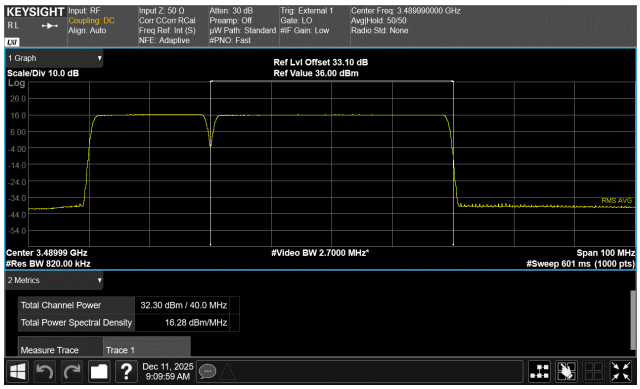
Port 1
QPSK Modulation
Test Case 1
3459.99 MHz, NR20



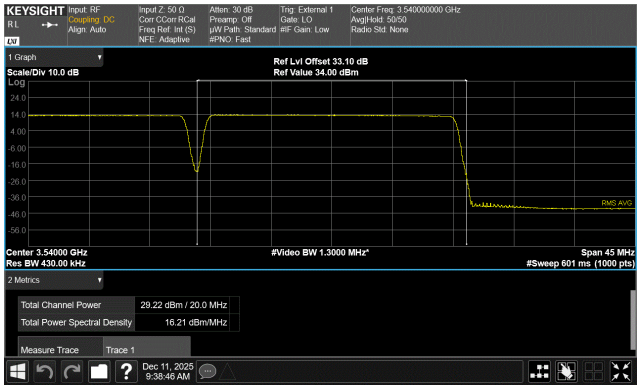
Port 1
QPSK Modulation
Test Case 1
3540.00 MHz, NR20



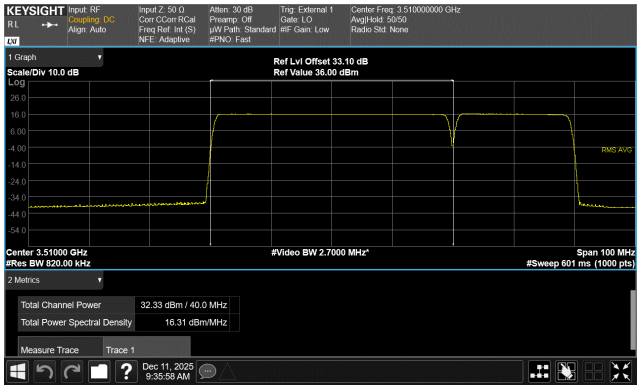
Port 1
QPSK Modulation
Test Case 2
3459.99 MHz, NR20



Port 1
QPSK Modulation
Test Case 2
3489.99 MHz, NR40



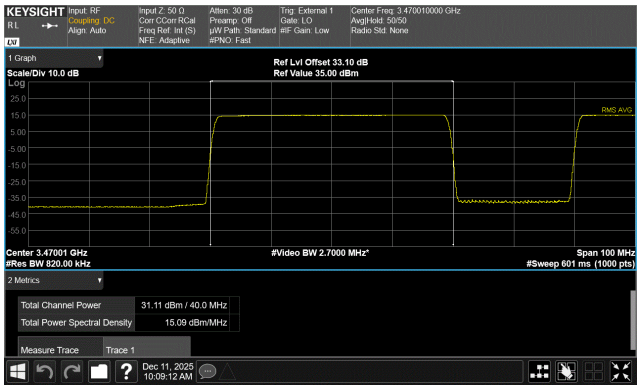
Port 1
QPSK Modulation
Test Case 3
3540.00 MHz, NR20



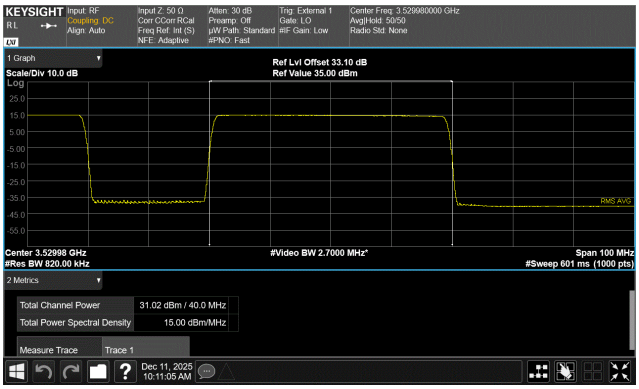
Port 1
QPSK Modulation
Test Case 3
3510.00 MHz, NR40

AVERAGE POWER - MULTICARRIER

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



Port 1
QPSK Modulation
Test Case 4
3470.01 MHz, NR40



Port 1
QPSK Modulation
Test Case 4
3529.98 MHz, NR40

POWER SPECTRAL DENSITY

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The AEQU antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Average Power - All Ports" report section of this report). Antenna port 1 was selected to perform this testing as allowed by ANSI C63.26 paragraphs 5.2.5.3, 5.7.2i and 6.4.

All Measurements were synchronized with the measurement receiver - gated with external trigger input frame clock (100Hz) provided by the system module. Duty cycle correction is not needed for this testing since the transmit “on” time is synchronized with the measurement receiver.

The fundamental emission Power Spectral Density (PSD) was measured using the channels and modes as called out on the following data sheets.

The total PSD for multiport (64x64 MIMO) operations was determined based per ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for Sixty-Four port operation is single power +18.1 dB [i.e. 10*log(64)].

The EIRP calculations are based upon ANSI C63.26-2015 paragraphs 6.4 for a sixty-four port MIMO base station.

FCC Requirements: §27.50 Power limits and duty cycle.

27.50 (k) The following power requirements apply to stations transmitting in the 3450-3550 MHz band:

(1) The power of each fixed or base station transmitting in the 3450-3550 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to an equivalent isotropically radiated power (EIRP) of 3280 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

(2) The power of each fixed or base station transmitting in the 3450-3550 MHz band and situated in any geographic location other than that described in paragraph (k)(1) of this section is limited to an EIRP of 1640 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

POWER SPECTRAL DENSITY

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

5G NR EIRP Calculations for Sixty-Four Port MIMO Operations

EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements. Each cell site installation needs to consider the power measurements in the radio certification report as well as site specific regulatory requirements (such as antenna height, population density, etc.), site installation parameters (line loss between antenna and radio, antenna parameters, etc.) and base station operational parameters (MIMO operational setup, carrier power level, channel bandwidth, modulation type, etc.) to optimize performance. Transmitter output power may be reduced (from maximum) by base station setup parameters.

The AEQU antenna assembly has an array of 4 rows and 8 columns of (±45°) cross-polarized (orthogonal) radiators. This antenna assembly has a beamforming gain of 24.5dBi ± 1.0dB. The sixty-four AEQU transmitter outputs are connected to the antenna array (thirty-two are connected to +45° radiators/antennas and thirty-two are connected to the -45° radiators/antennas).

Equivalent Isotropically Radiated Power (EIRP) is calculated (as specified in ANSI C63.26-2015 section 6.4 for a system of correlated output signals) from the results of power measurements (highest measured PSD for each channel bandwidth type). The maximum antenna assembly beamforming gain was used for this calculation. Calculations of worst-case EIRP for sixty-four port MIMO are as follows:

Parameter	50 MHz Ch BW	60 MHz Ch BW	70 MHz Ch BW	80 MHz Ch BW	90 MHz Ch BW	100 MHz Ch BW
Worst Case PSD/Antenna Port	19.2 dBm/MHz	18.4dBm/MHz	17.8 dBm/MHz	17.3 dBm/MHz	16.7 dBm/MHz	16.4 dBm/MHz
Cable Loss	0 dB	0 dB	0 dB	0 dB	0 dB	0 dB
Number of Ant Ports per Polarization	32	32	32	32	32	32
Total PSD per Polarization 10 Log 32 = +15.1 dB	34.3 dBm/MHz	33.5 dBm/MHz	32.9 dBm/MHz	32.4 dBm/MHz	31.8 dBm/MHz	31.5 dBm/MHz
Maximum Antenna Beamforming Gain per Polarization	25.5 dBi	25.5 dBi	25.5 dBi	25.5 dBi	25.5 dBi	25.5 dBi
EIRP per Polarization	59.8 dBm/MHz	59.0 dBm/MHz	58.4 dBm/MHz	57.9 dBm/MHz	57.3 dBm/MHz	57.0 dBm/MHz
Number of Polarizations	2	2	2	2	2	2
EIRP Total (See Note 1)	59.8 dBm/MHz	59.0 dBm/MHz	58.4 dBm/MHz	57.9 dBm/MHz	57.3 dBm/MHz	57.0 dBm/MHz
Passing EIRP Limit	62.15 dBm/MHz and 65.16 dBm/MHz	62.15 dBm/MHz and 65.16 dBm/MHz	62.15 dBm/MHz and 65.16 dBm/MHz	62.15 dBm/MHz and 65.16 dBm/MHz	62.15 dBm/MHz and 65.16 dBm/MHz	62.15 dBm/MHz and 65.16 dBm/MHz

Note 1: The EIRP per antenna polarization is required to be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the two transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Calculation Summary

(1) The worst case AEQU sixty-four port MIMO EIRP levels for all 5G NR channel bandwidths (50, 60, 70, 80, 90, 100MHz) are less than the 3280 W/MHz (65.16 dBm/MHz) FCC regulatory limit.

(2) The worst case AEQU sixty-four port MIMO EIRP levels for the 5G NR (50, 60, 70, 80, 90, 100MHz) channel bandwidths are less than the 1640 W/MHz (62.15 dBm/MHz) FCC regulatory limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight Technologies	N9030B	AGA	2025-06-09	2026-06-09
Block - DC	Centric RF	C0140	ANJ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07

Note: The RF Test Setup/ Network (RF cables/Attenuators/filter/etc.) is defined in the configurations section for each test. The RF Test Setup/Network is calibrated using the signal generator and spectrum analyzer prior to test. The RF insertion loss of the RF Test Setup/Network is accounted for by the spectrum analyzer's reference level offset during the RF conducted testing.

POWER SPECTRAL DENSITY

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AEQU	Work Order:	NOKI0091
Serial Number:	DH224002609	Date:	2025-12-10
Customer:	Nokia Solutions and Networks	Temperature:	28.9°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	32%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT01
Power:	54 VDC	Configuration:	NOKI0091-2

COMMENTS

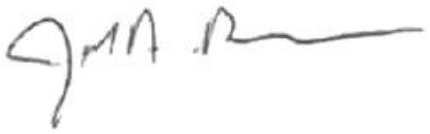
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

	Initial Value dBm/1MHz	Single Port dBm/1MHz	Sixty-four Port (64x64 MIMO) dBm/1MHz	Result
Port 1				
50 MHz Channel Bandwidth				
QPSK Modulation				
Low Channel, 3474.99 MHz	17.753	17.8	35.8	Pass
Middle Channel, 3500.01 MHz	17.564	17.6	35.6	Pass
High Channel, 3525.00 MHz	17.709	17.7	35.8	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	19.223	19.2	37.3	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	17.681	17.7	35.7	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	17.764	17.8	35.8	Pass
60 MHz Channel Bandwidth				
QPSK Modulation				
Middle Channel, 3500.01 MHz	16.583	16.6	34.6	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	18.362	18.4	36.4	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	16.692	16.7	34.8	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	16.808	16.8	34.9	Pass
70 MHz Channel Bandwidth				
QPSK Modulation				

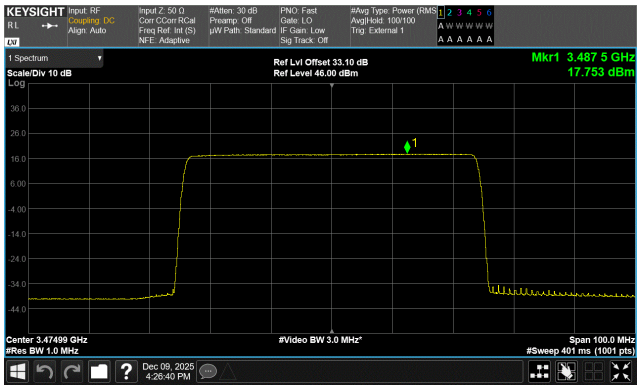
POWER SPECTRAL DENSITY

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

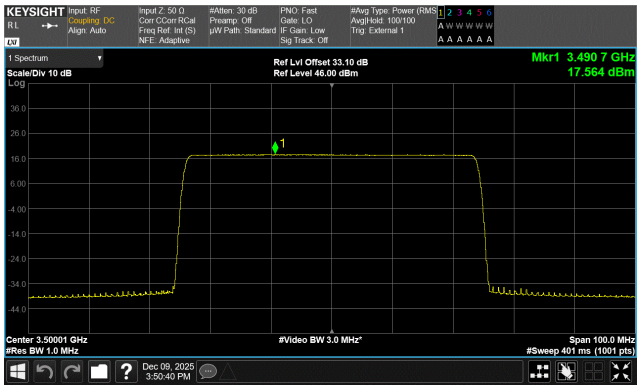
	Initial Value dBm/1MHz	Single Port dBm/1MHz	Sixty-four Port (64x64 MIMO) dBm/1MHz	Result
Middle Channel, 3500.01 MHz	15.926	15.9	34.0	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	17.82	17.8	35.9	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	16.03	16.0	34.1	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	16.075	16.1	34.1	Pass
80 MHz Channel Bandwidth				
QPSK Modulation				
Middle Channel, 3500.01 MHz	15.411	15.4	33.5	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	17.287	17.3	35.3	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	15.643	15.6	33.7	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	15.555	15.6	33.6	Pass
90 MHz Channel Bandwidth				
QPSK Modulation				
Middle Channel, 3500.01 MHz	14.893	14.9	33.0	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	16.707	16.7	34.8	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	15.015	15.0	33.1	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	14.972	15.0	33.0	Pass
100 MHz Channel Bandwidth				
QPSK Modulation				
Middle Channel, 3500.01 MHz	14.331	14.3	32.4	Pass
16QAM Modulation				
Middle Channel, 3500.01 MHz	16.357	16.4	34.4	Pass
64QAM Modulation				
Middle Channel, 3500.01 MHz	14.429	14.4	32.5	Pass
256QAM Modulation				
Middle Channel, 3500.01 MHz	14.494	14.5	32.6	Pass

POWER SPECTRAL DENSITY

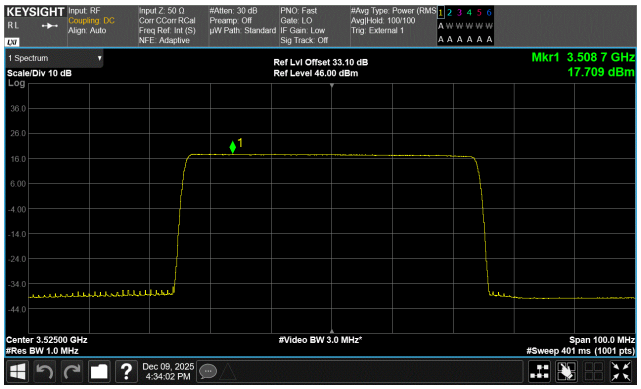
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



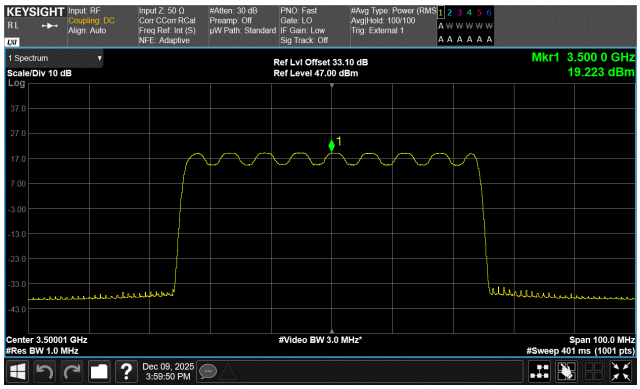
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3474.99 MHz



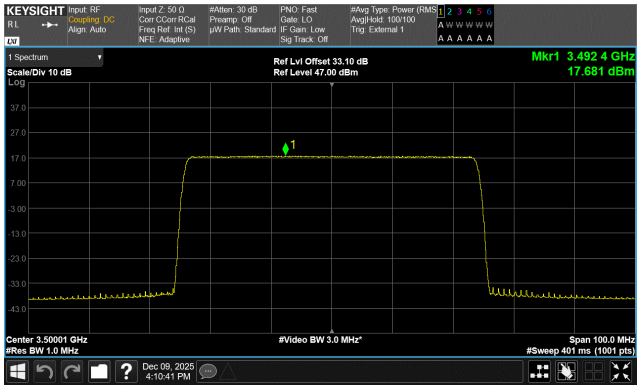
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



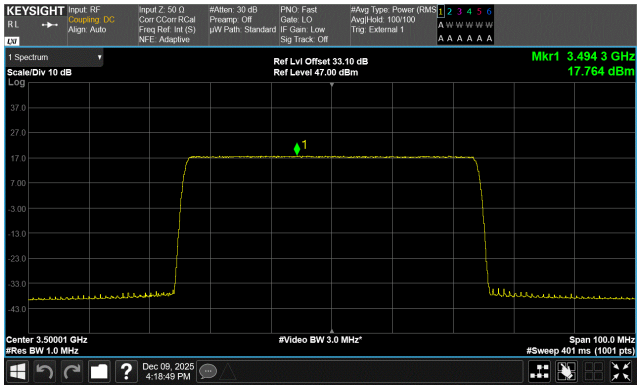
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3525.00 MHz



Port 1
50 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz

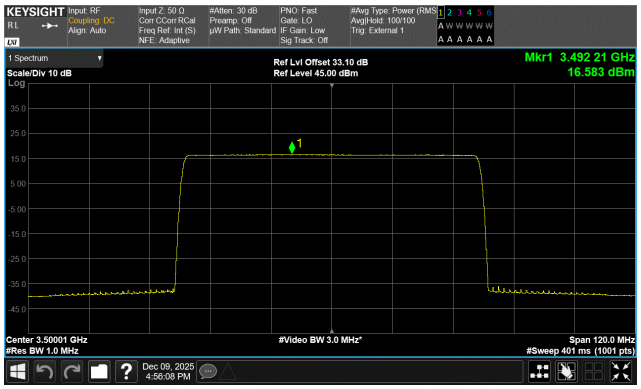


Port 1
50 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz

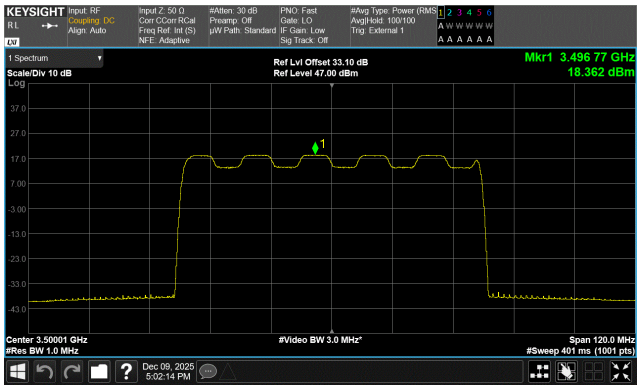


Port 1
50 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

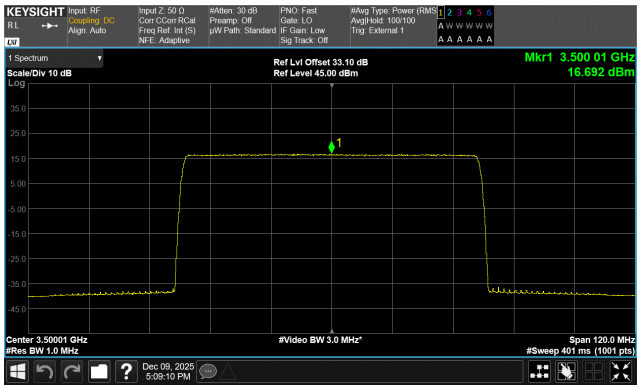
POWER SPECTRAL DENSITY



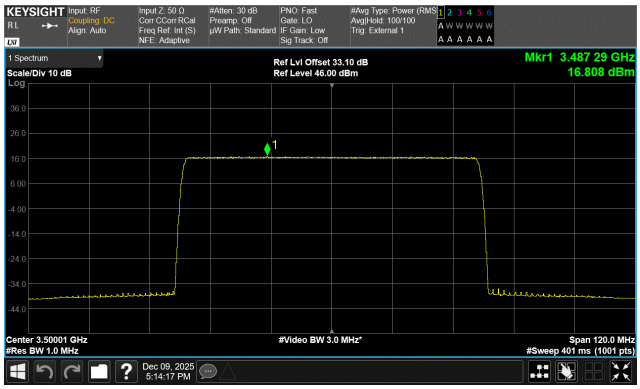
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



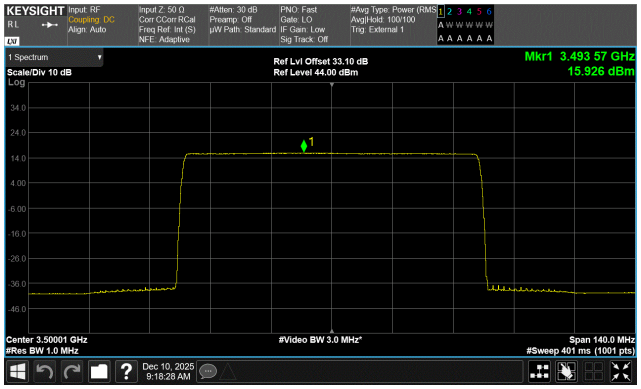
Port 1
60 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
60 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
60 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

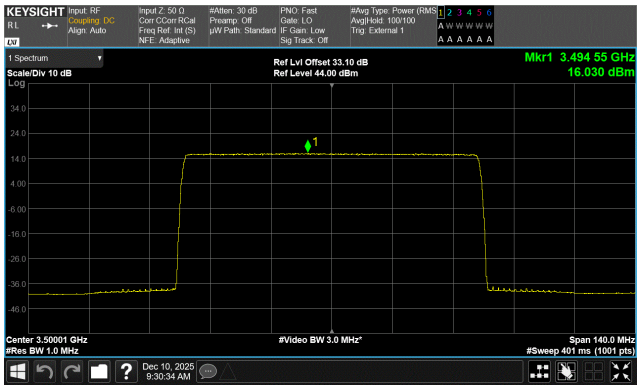


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz

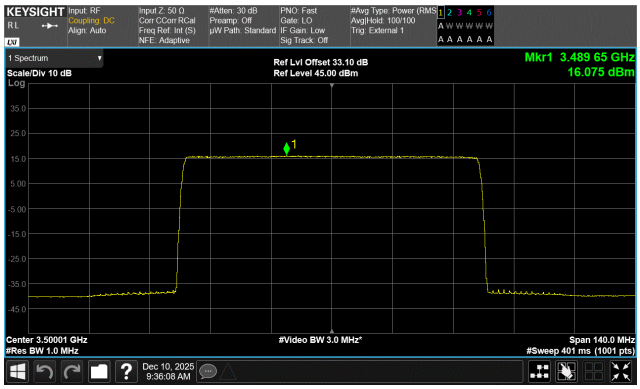
Port 1
70 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz

POWER SPECTRAL DENSITY

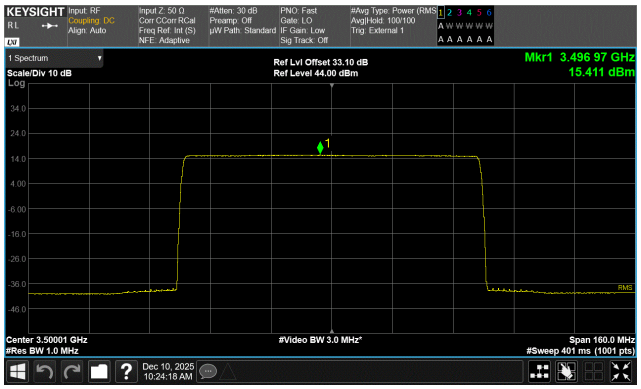
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



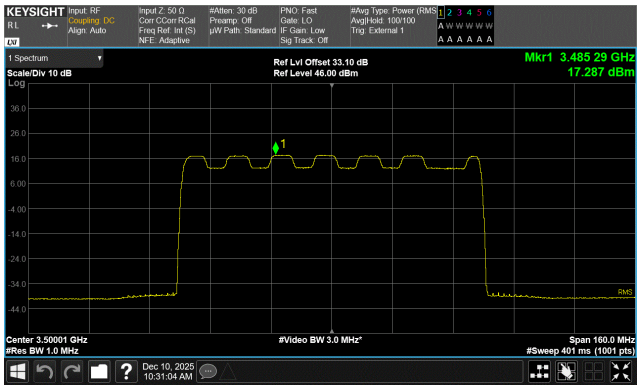
Port 1
70 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



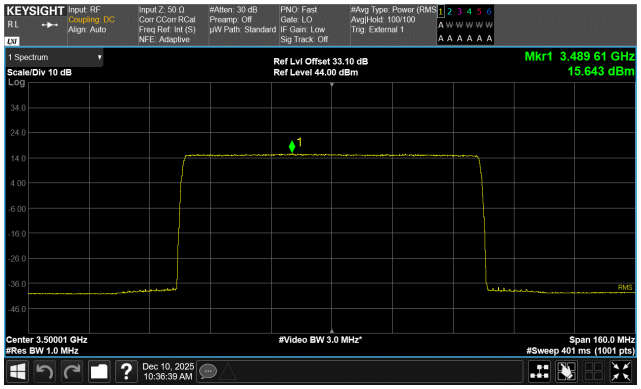
Port 1
70 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz



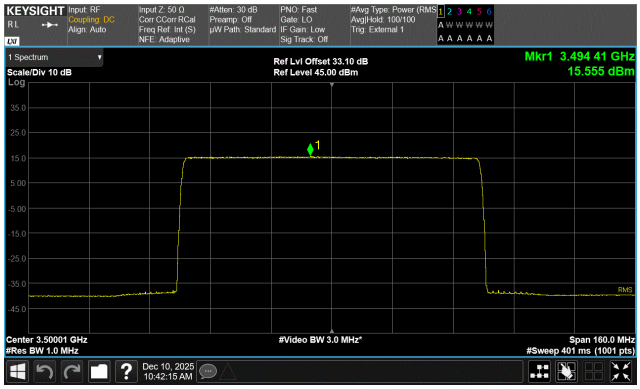
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



Port 1
80 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz



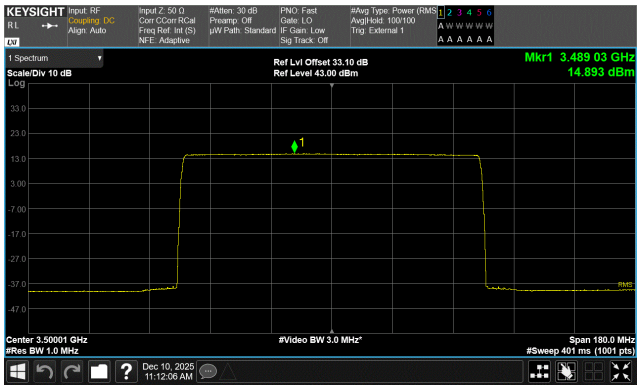
Port 1
80 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



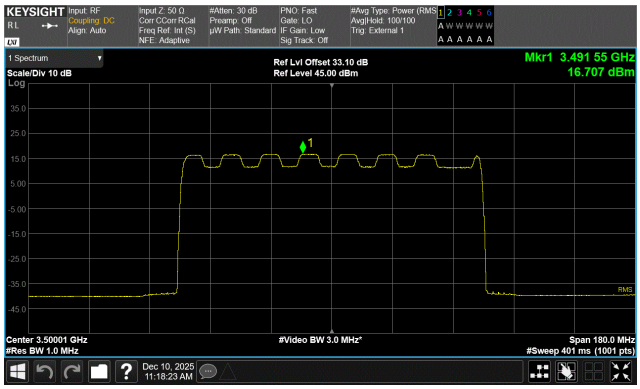
Port 1
80 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

POWER SPECTRAL DENSITY

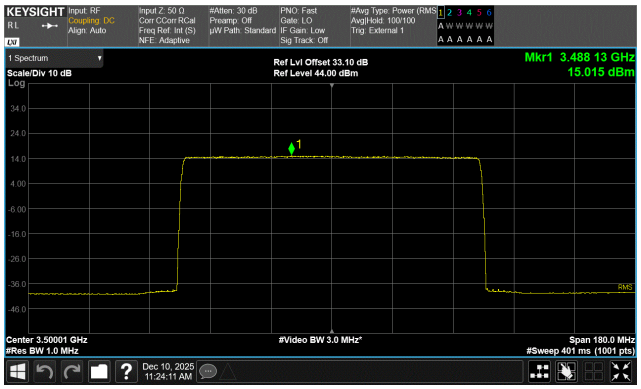
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



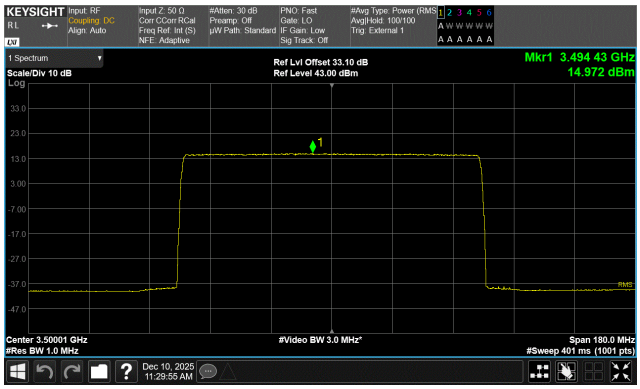
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



Port 1
90 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz

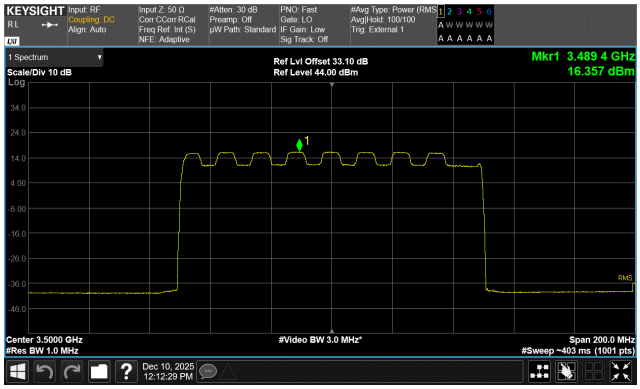


Port 1
90 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
90 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

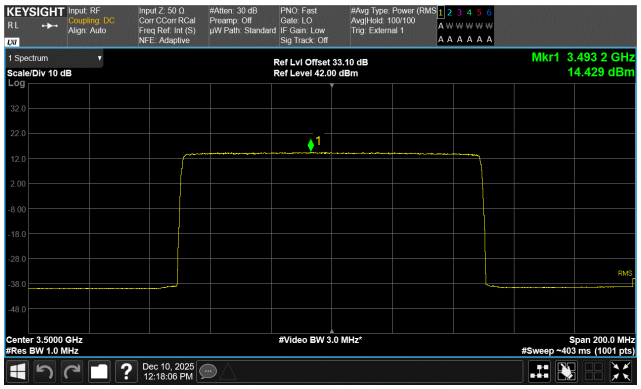
Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



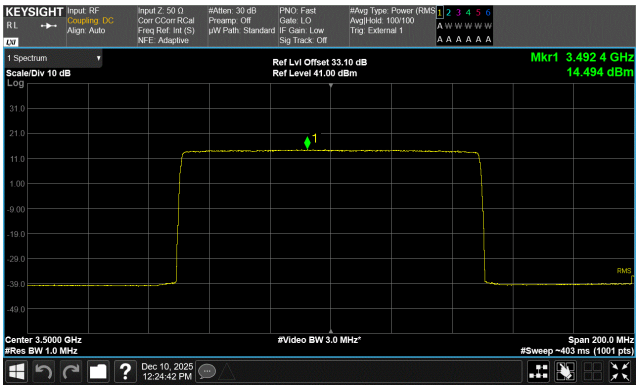
Port 1
100 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz

POWER SPECTRAL DENSITY

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



Port 1
100 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



Port 1
100 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The AEQU antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Average Power - All Ports" report section of this report). Antenna port 1 was selected to perform this testing as allowed by ANSI C63.26 paragraphs 5.2.5.3, 5.7.2i and 6.4.

All Measurements were synchronized with the measurement receiver - gated with external trigger input (frame clock (100Hz) provided by the system module. Duty cycle correction is not needed for this testing since the transmit “on” time is synchronized with the measurement receiver.

The fundamental emission Peak to Average 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.

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.

The PAPR was measured using the CCDF function of the spectrum analyzer.

The peak-to-average power ratio (PAPR) shall not exceed 13dB. The CCDF measurement method for FCC/IC is detailed in section 5.7.2 of KDB971168 D01v03r01 and ANSI C63.26-2015 section 5.2.3.4.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight Technologies	N9030B	AGA	2025-06-09	2026-06-09
Block - DC	Centric RF	C0140	ANJ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07

Note: The RF Test Setup/ Network (RF cables/Attenuators/filter/etc.) is defined in the configurations section for each test. The RF Test Setup/Network is calibrated using the signal generator and spectrum analyzer prior to test. The RF insertion loss of the RF Test Setup/Network is accounted for by the spectrum analyzer's reference level offset during the RF conducted testing.

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AEQU	Work Order:	NOKI0091
Serial Number:	DH224002609	Date:	2025-12-10
Customer:	Nokia Solutions and Networks	Temperature:	28.6°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	31.6%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT01
Power:	54 VDC	Configuration:	NOKI0091-2

COMMENTS

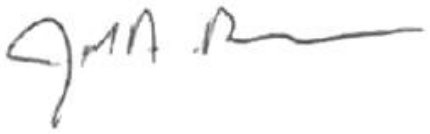
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

	0.1% PAPR Value (dB)	0.1% PAPR Limit (dB)	Results
Port 1			
50 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 3474.99 MHz	8.1	13	Pass
Middle Channel, 3500.01 MHz	8.07	13	Pass
High Channel, 3525.00 MHz	8.09	13	Pass
16QAM Modulation			
Middle Channel, 3500.01 MHz	8.09	13	Pass
64QAM Modulation			
Middle Channel, 3500.01 MHz	8.06	13	Pass
256QAM Modulation			
Middle Channel, 3500.01 MHz	8.05	13	Pass
60 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 3480.00 MHz	8.18	13	Pass
Middle Channel, 3500.01 MHz	8.12	13	Pass
High Channel, 3519.99 MHz	8.16	13	Pass
70 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 3485.01 MHz	8.17	13	Pass
Middle Channel, 3500.01 MHz	8.14	13	Pass
High Channel, 3514.98 MHz	8.17	13	Pass
80 MHz Channel Bandwidth			

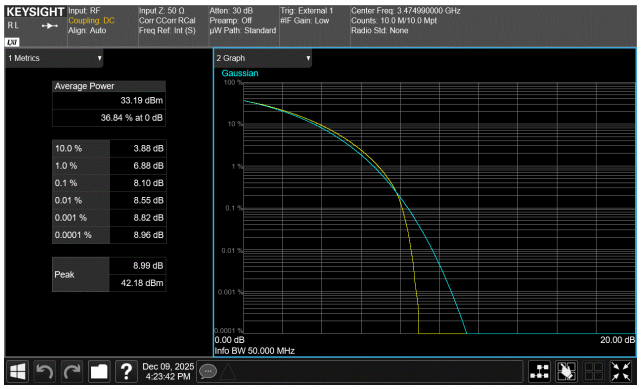
PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

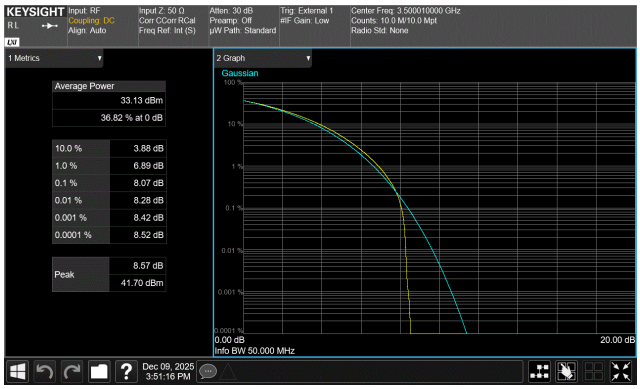
	0.1% PAPR Value (dB)	0.1% PAPR Limit (dB)	Results
QPSK Modulation			
Low Channel, 3489.99 MHz	8.14	13	Pass
Middle Channel, 3500.01 MHz	8.13	13	Pass
High Channel, 3510.00 MHz	8.19	13	Pass
90 MHz Channel Bandwidth			
QPSK Modulation			
Low Channel, 3495.00 MHz	8.14	13	Pass
Middle Channel, 3500.01 MHz	8.14	13	Pass
High Channel, 3504.99 MHz	8.15	13	Pass
100 MHz Channel Bandwidth			
QPSK Modulation			
Middle Channel, 3500.01 MHz	8.25	13	Pass

PEAK AND AVERAGE (PAPR) CCDF

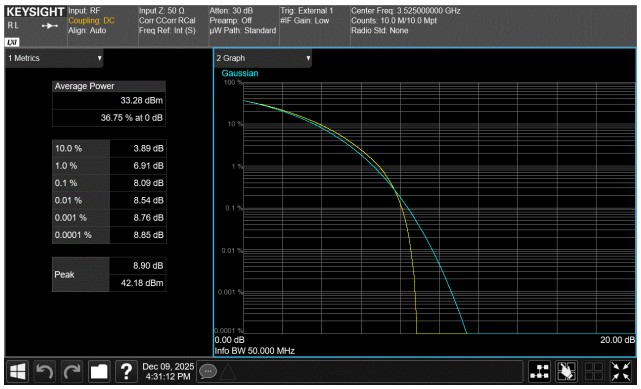
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



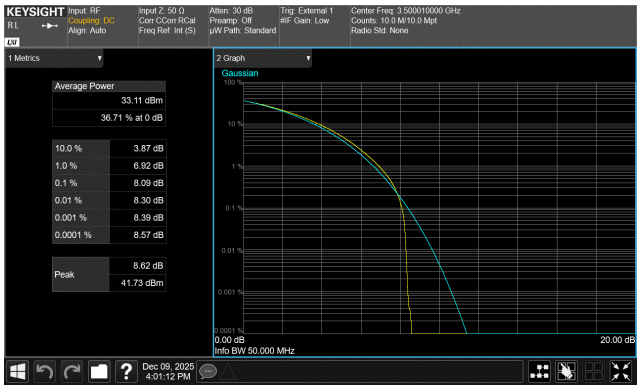
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3474.99 MHz



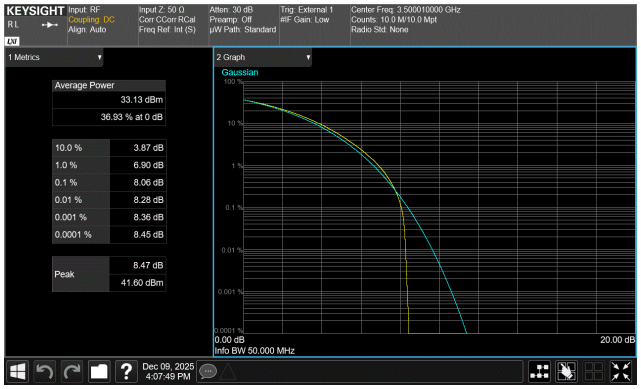
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



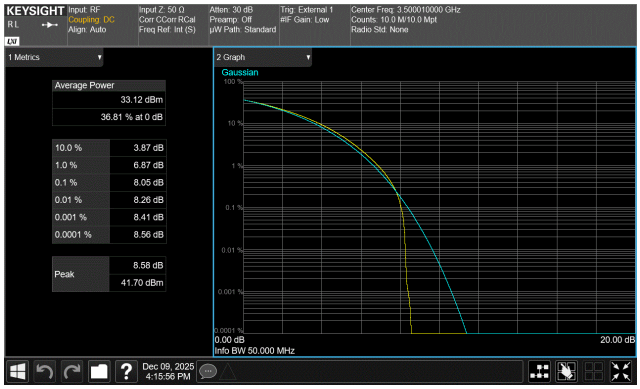
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3525.00 MHz



Port 1
50 MHz Channel Bandwidth
16QAM Modulation
Middle Channel, 3500.01 MHz



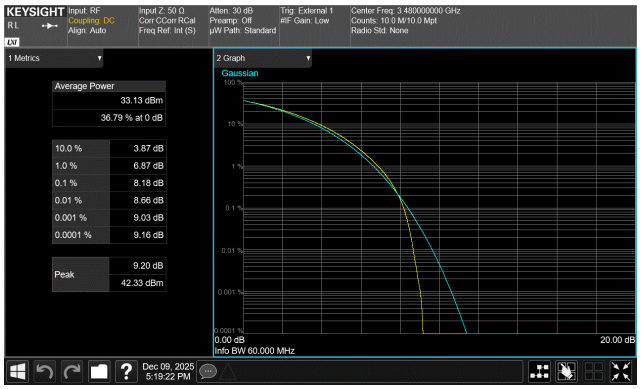
Port 1
50 MHz Channel Bandwidth
64QAM Modulation
Middle Channel, 3500.01 MHz



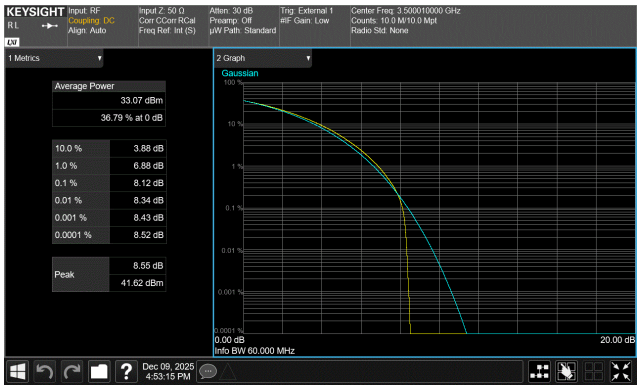
Port 1
50 MHz Channel Bandwidth
256QAM Modulation
Middle Channel, 3500.01 MHz

PEAK AND AVERAGE (PAPR) CCDF

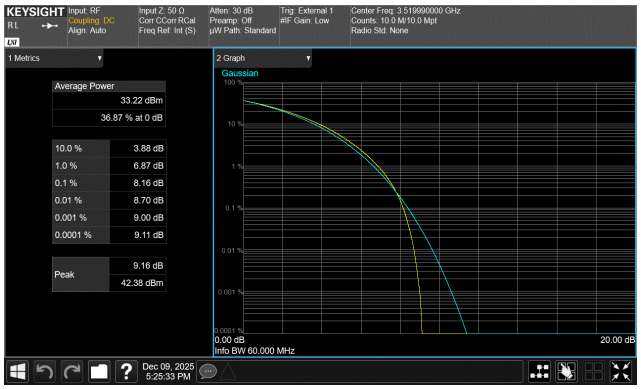
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



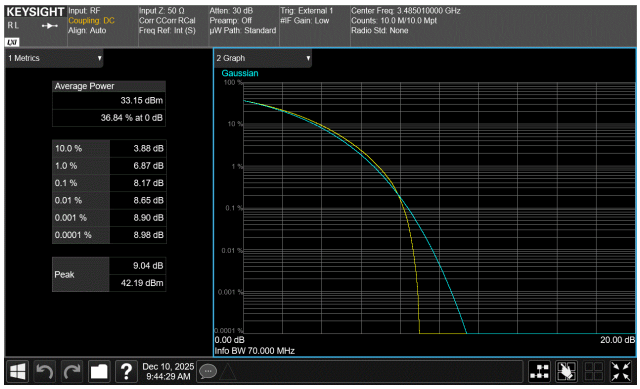
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3480.00 MHz



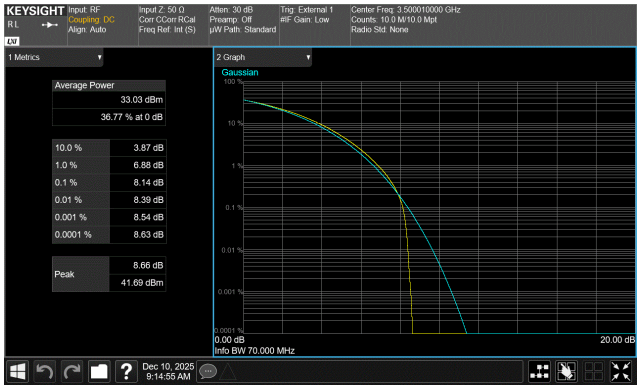
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



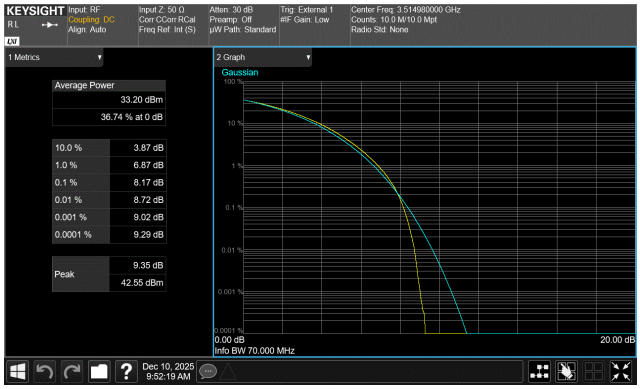
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3519.99 MHz



Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3485.01 MHz



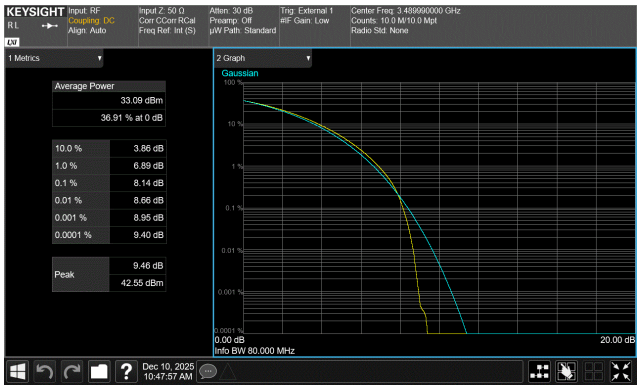
Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



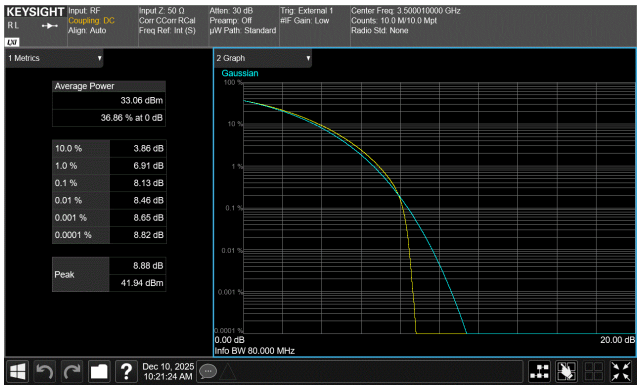
Port 1
70 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3514.98 MHz

PEAK AND AVERAGE (PAPR) CCDF

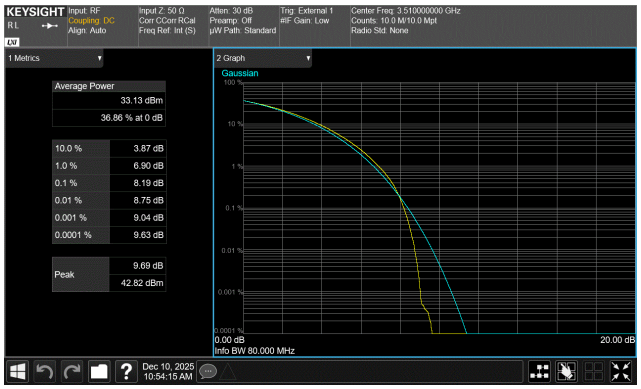
element
TbtTx 2025.05.09.1
WTD.2025.08.28.0



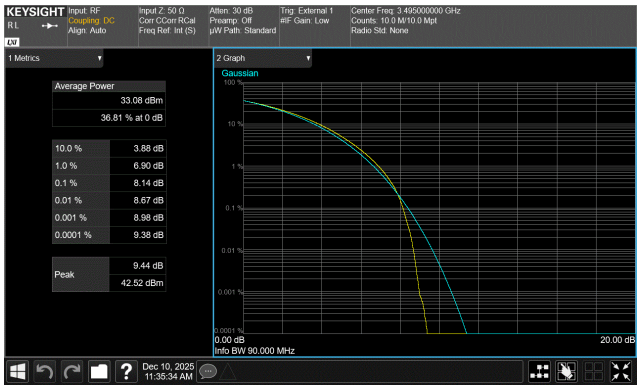
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3489.99 MHz



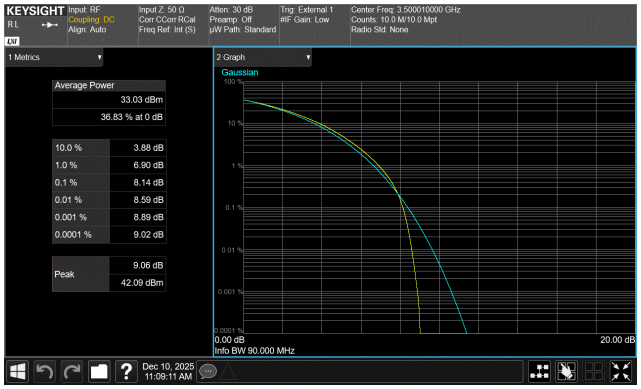
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



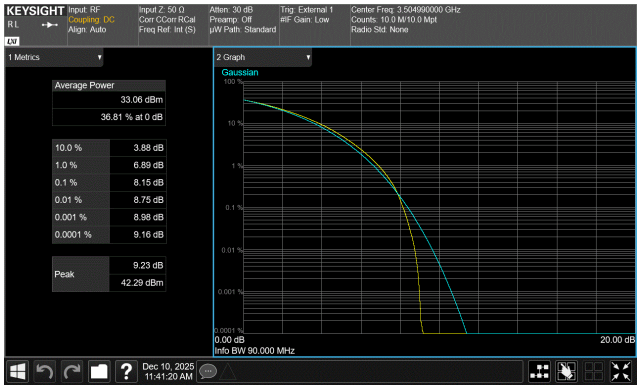
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3510.00 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Low Channel, 3495.00 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
High Channel, 3504.99 MHz

PEAK AND AVERAGE (PAPR) CCDF

element
TbtTx 2025.05.09.1
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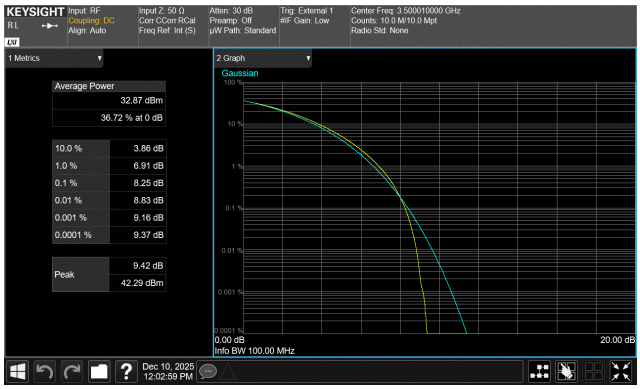

Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Middle Channel, 3500.01 MHz

OCCUPIED BANDWIDTH

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST DESCRIPTION

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.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The AEQU antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Average Power- All Ports" report section of this report). Antenna port 1 was selected to perform this testing as allowed by ANSI C63.26 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The 26dB emission bandwidth is measured in accordance with section 4 of FCC KDB 971168 D01v03r01 and ANSI C63.26 section 5.4. FCC 2.1049 requires an emission bandwidth measurement. FCC 27.53(n)(1) defines the emission bandwidth to be used as 26 dB down.

The spectrum analyzer settings were as follows:

- RBW is 1% - 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

FCC 5G Emission Designators for 3.45G Band (3450MHz to 3550MHz)					
Channel Bandwidth	**Radio Channel**	**5G-NR: QPSK**	**5G-NR: 16QAM**	**5G-NR: 64QAM**	**5G-NR: 256QAM**
50MHz	Low	50M4G7W			
	Mid	50M5G7W	50M3G7W	50M4G7W	50M4G7W
	High	50M5G7W			
60MHz	Low	61M0G7W			
	Mid	60M9G7W	60M9G7W	60M9G7W	60M9G7W
	High	60M9G7W			
70MHz	Low	71M2G7W			
	Mid	71M2G7W	71M3G7W	71M3G7W	71M3G7W
	High	71M2G7W			
80MHz	Low	81M4G7W			
	Mid	81M5G7W	81M4G7W	81M5G7W	81M5G7W
	High	81M6G7W			
90MHz	Low	92M0G7W			
	Mid	92M1G7W	92M0G7W	92M1G7W	92M1G7W
	High	92M1G7W			
100MHz					
	Mid	102MG7W	102MG7W	102MG7W	102MG7W
Note: FCC emission designators are based on 26dB emission bandwidth measurement data.					

OCCUPIED BANDWIDTH

element
TbtTx 2025.05.09.1
WTD.2025.08.28.0

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight Technologies	N9030B	AGA	2025-06-09	2026-06-09
Block - DC	Centric RF	C0140	ANJ	NCR	NCR
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07

Note: The RF Test Setup/ Network (RF cables/Attenuators/filter/etc.) is defined in the configurations section for each test. The RF Test Setup/Network is calibrated using the signal generator and spectrum analyzer prior to test. The RF insertion loss of the RF Test Setup/Network is accounted for by the spectrum analyzer's reference level offset during the RF conducted testing.