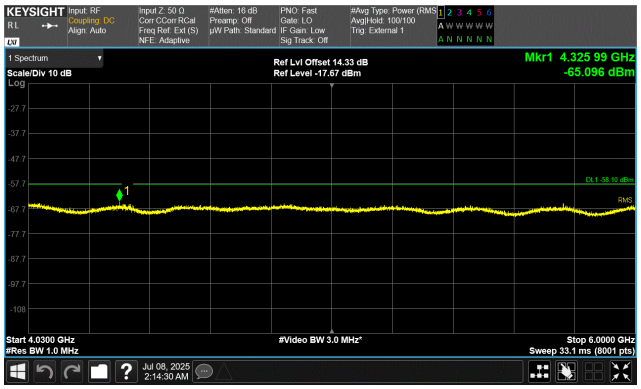
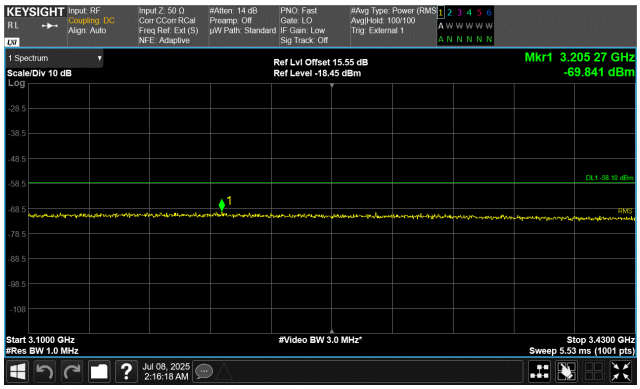
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3400 BAND

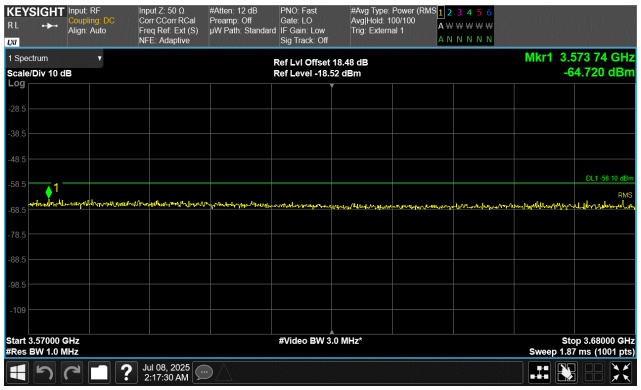
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



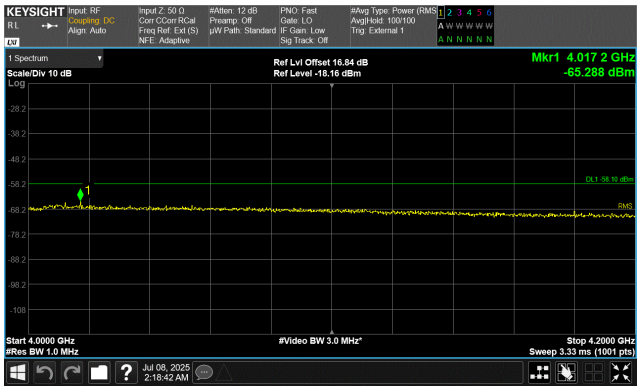
Test Case D
4030 MHz to 6000 MHz



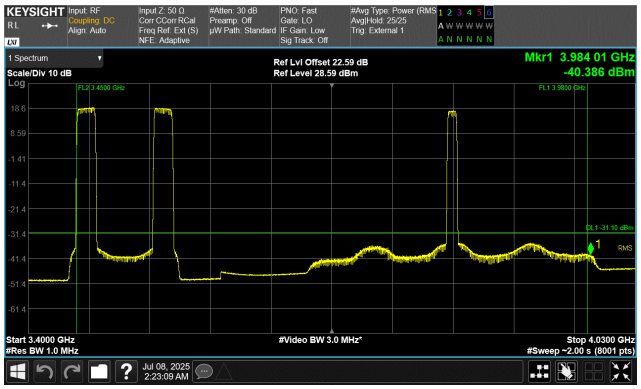
Test Case D
3100 MHz to 3430 MHz



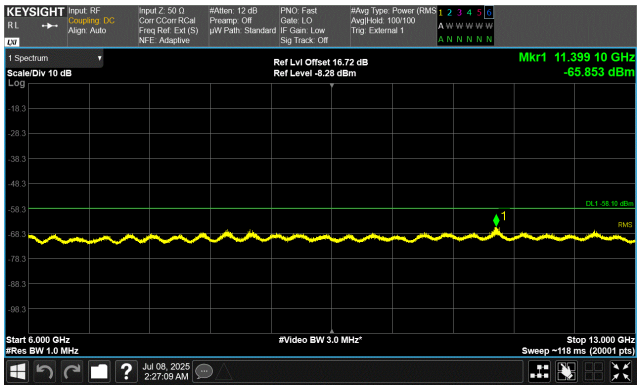
Test Case D
3570 MHz to 3680 MHz



Test Case D
4000 MHz to 4200 MHz



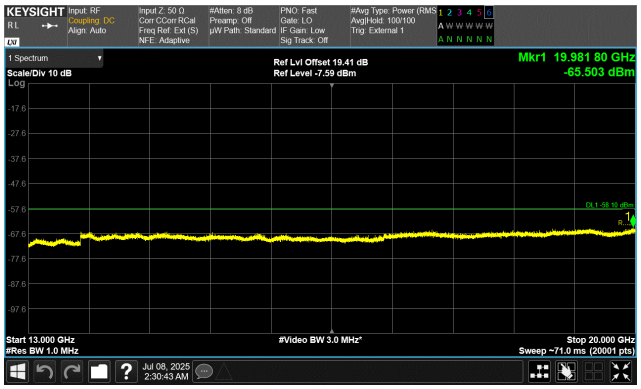
Test Case D
3400 MHz to 4030 MHz



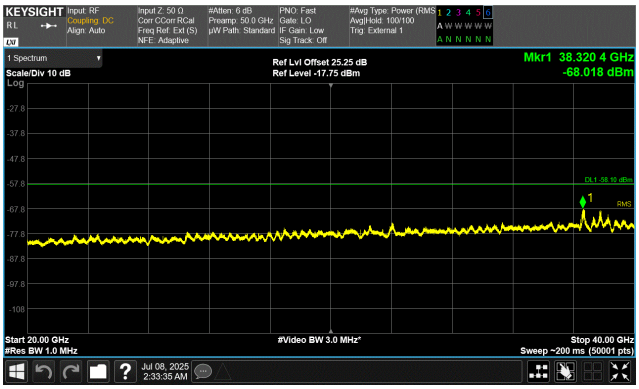
Test Case D
6 GHz to 13 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3400 BAND

element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



Test Case D
13 GHz to 20 GHz



Test Case D
20 GHz to 40 GHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
TbtTx 2024.05.24.1
WTD.2025.03.25.0

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 antenna port spurious emissions were measured at the RF output terminal of the EUT through five different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth defined by ANSI C63.2 were made from 9 kHz to 40 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in output power testing) and antenna port 1 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 measurement methods for FCC measurements are detailed in KDB971168 D01v03 section 6 and ANSI C63.26-2015. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified by the compliance lab. These measurements are for frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block. Per FCC 2.1057(a)(1), the upper level of measurement is the 10^{th} harmonic of the highest fundamental frequency. As such, the upper level of the measurement is approximately 40 GHz (3980 MHz * 10) for the AVQQA.

Per section 27.53(l)(1), For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. This limit is adjusted to -31.1 dBm [-13 dBm - 10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be > 1MHz per FCC 27.53(l)(1)

Per ITU-R SM.329-10 section 4.1, measurement resolution bandwidth (RBW) 1KHz and 10KHz “Reference bandwidth” limit scaling/adjustment is not required.

The spurious emission testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

All Measurements were synchronized with the measurement receiver - gated with external trigger input (frame clock (100Hz) provided by the system module.

In 3.7GHz band single carrier operating mode - carriers were enabled at maximum power levels.

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.

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
TbtTx 2024.05.24.1
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EUT:	Airscale Base Transceiver Station Radio Unit Model AVQQA	Work Order:	NOKI0086
Serial Number:	L1242501908	Date:	2025-07-14
Customer:	Nokia Solutions and Networks	Temperature:	24.2°C
Attendees:	John Rattanavong, Mitch Hill	Relative Humidity:	51%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54 VDC	Configuration:	NOKI0086-3

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
10 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 3840.00 MHz	9 kHz to 150 kHz	0.135	-70.508	-31.1	Pass
	150 kHz to 30 MHz	0.157	-75.165	-31.1	Pass
	30 MHz to 3400 MHz	3173.8	-65.576	-31.1	Pass
	3400 MHz to 6000 MHz	4326.25	-44.625	-31.1	Pass
	6 GHz to 13 GHz	11406.1	-66.092	-31.1	Pass
	13 GHz to 20 GHz	19478.5	-65.463	-31.1	Pass
	20 GHz to 40 GHz	38355.6	-52.401	-31.1	Pass
30 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 3840.00 MHz	9 kHz to 150 kHz	0.135	-70.207	-31.1	Pass
	150 kHz to 30 MHz	0.172	-75.968	-31.1	Pass
	30 MHz to 3400 MHz	3197.4	-65.95	-31.1	Pass
	3400 MHz to 6000 MHz	4326.639	-44.465	-31.1	Pass
	6 GHz to 13 GHz	11379.5	-64.904	-31.1	Pass
	13 GHz to 20 GHz	19991.25	-65.362	-31.1	Pass
	20 GHz to 40 GHz	38349.2	-52.22	-31.1	Pass
50 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 3840.00 MHz	9 kHz to 150 kHz	0.135	-69.577	-31.1	Pass
	150 kHz to 30 MHz	0.213	-76.149	-31.1	Pass
	30 MHz to 3400 MHz	3183.5	-65.732	-31.1	Pass
	3400 MHz to 6000 MHz	4322.414	-44.323	-31.1	Pass
	6 GHz to 13 GHz	11393.5	-65.859	-31.1	Pass
	13 GHz to 20 GHz	19483.75	-65.066	-31.1	Pass
	20 GHz to 40 GHz	38352.8	-52.53	-31.1	Pass

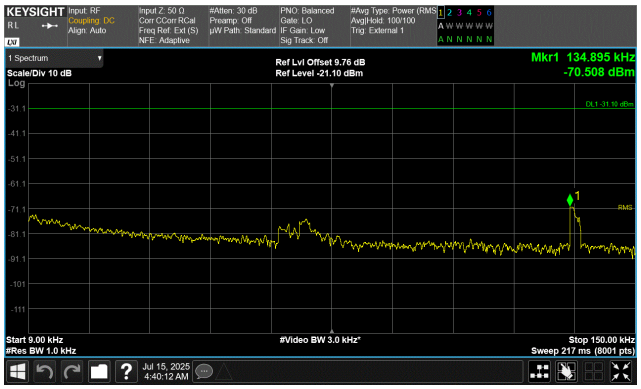
SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
TbtTx 2024.05.24.1
WTD.2025.03.25.0

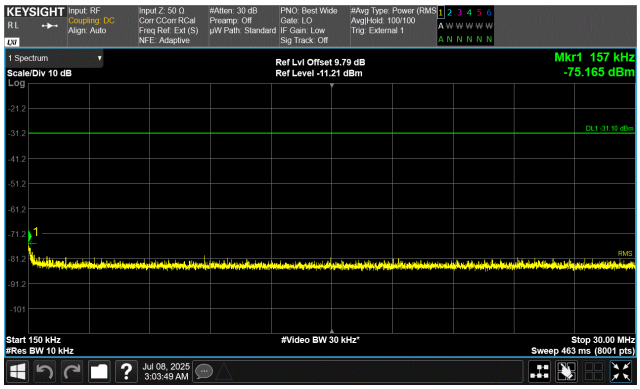
	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
70 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 3840.00 MHz	9 kHz to 150 kHz	0.135	-69.737	-31.1	Pass
	150 kHz to 30 MHz	0.157	-75.781	-31.1	Pass
	30 MHz to 3400 MHz	3142.2	-65.795	-31.1	Pass
	3400 MHz to 6000 MHz	4333.139	-44.256	-31.1	Pass
	6 GHz to 13 GHz	11402.95	-66.281	-31.1	Pass
	13 GHz to 20 GHz	19494.25	-65.302	-31.1	Pass
	20 GHz to 40 GHz	38899.6	-52.432	-31.1	Pass
90 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 3840.00 MHz	9 kHz to 150 kHz	0.135	-69.575	-31.1	Pass
	150 kHz to 30 MHz	0.206	-75.931	-31.1	Pass
	30 MHz to 3400 MHz	3187.7	-65.892	-31.1	Pass
	3400 MHz to 6000 MHz	4330.539	-44.309	-31.1	Pass
	6 GHz to 13 GHz	8558.15	-65.823	-31.1	Pass
	13 GHz to 20 GHz	19997.2	-65.264	-31.1	Pass
	20 GHz to 40 GHz	38851.2	-52.43	-31.1	Pass

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

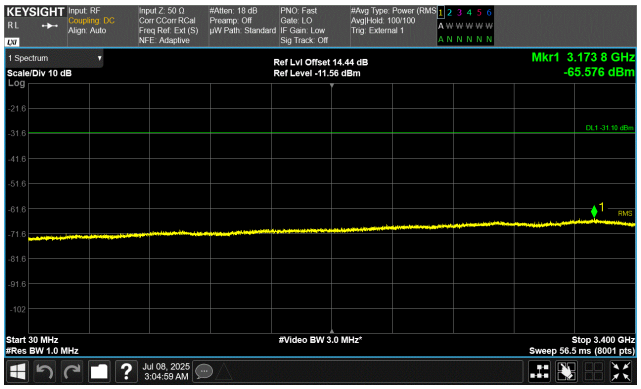
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



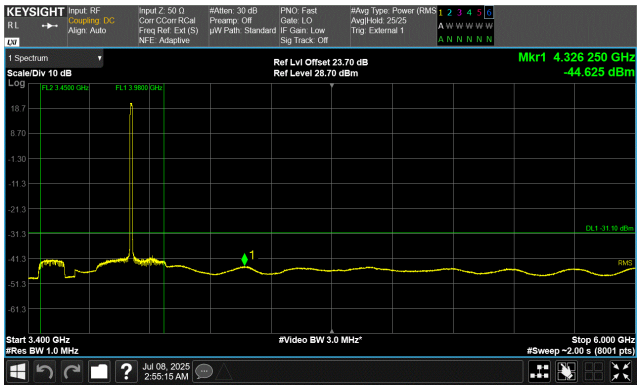
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
9 kHz to 150 kHz



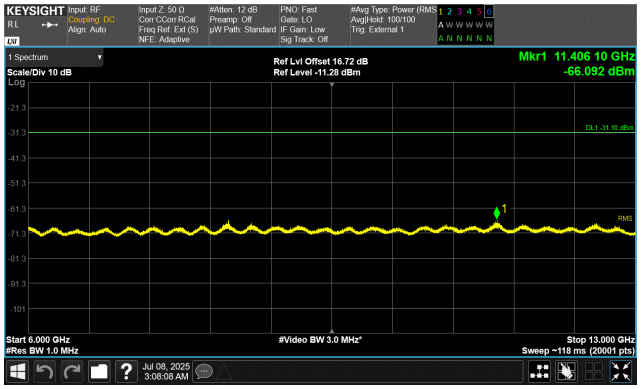
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
150 kHz to 30 MHz



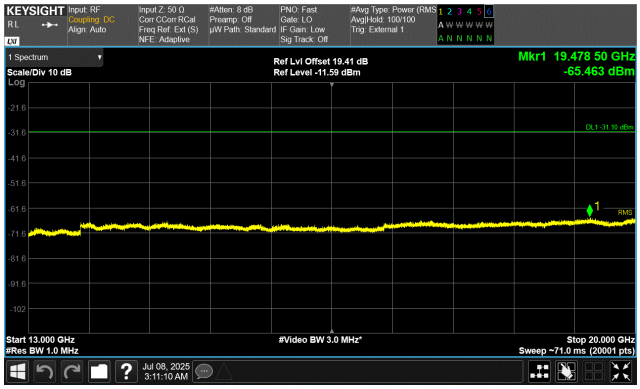
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
30 MHz to 3400 MHz



10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
3400 MHz to 6000 MHz



10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
6 GHz to 13 GHz



10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
13 GHz to 20 GHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
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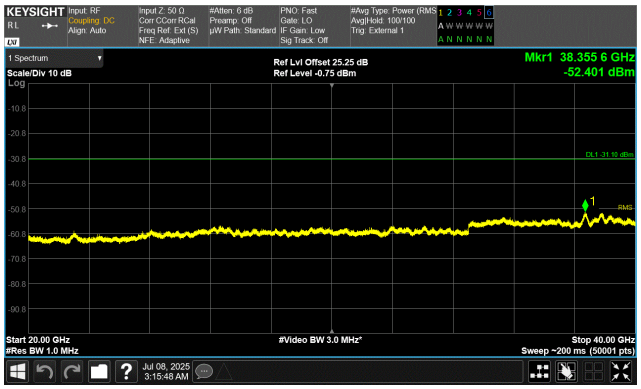
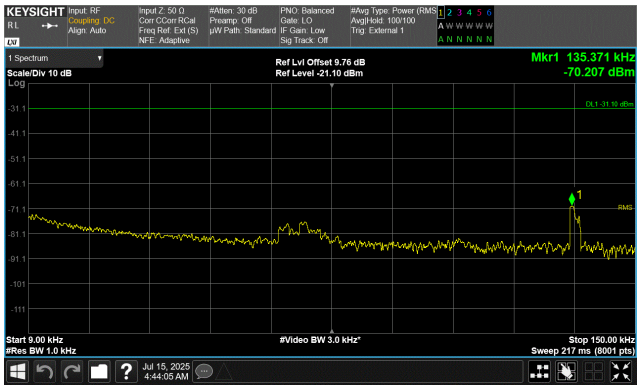
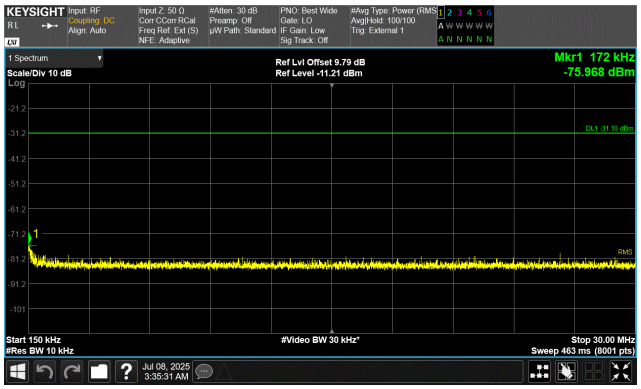
WTD.2025.03.25.0



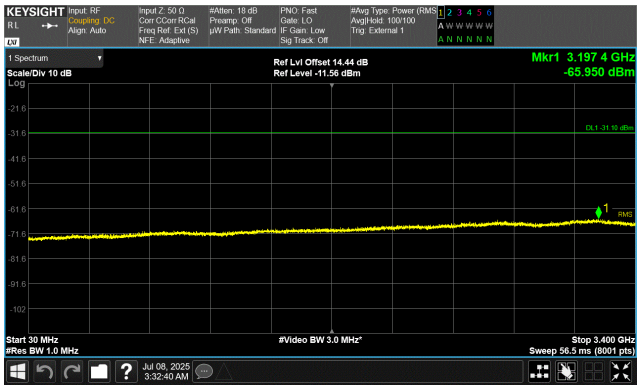
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
20 GHz to 40 GHz



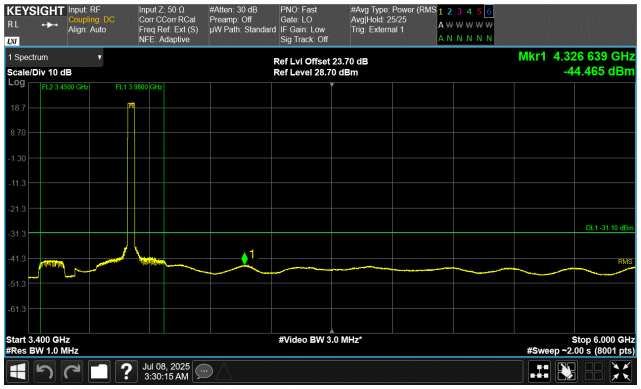
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
9 kHz to 150 kHz



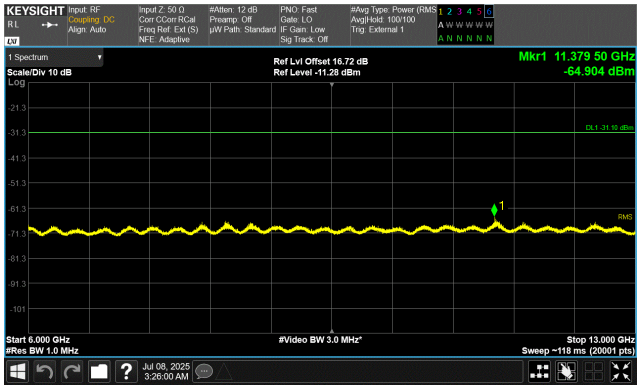
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
150 kHz to 30 MHz



30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
30 MHz to 3400 MHz



30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
3400 MHz to 6000 MHz



30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
6 GHz to 13 GHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
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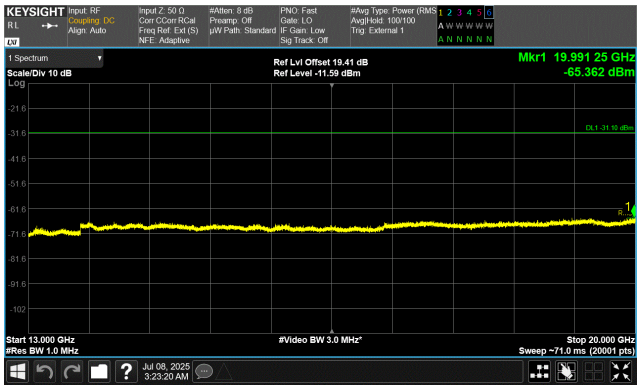
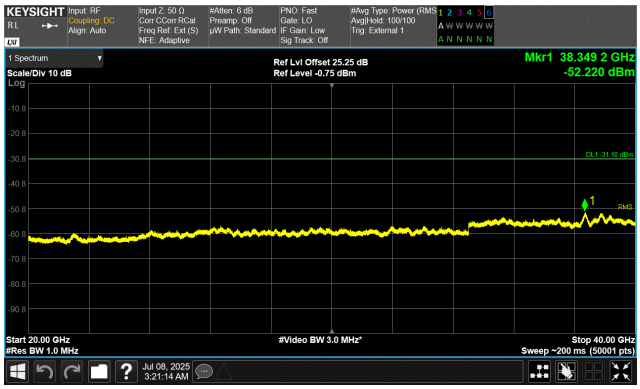
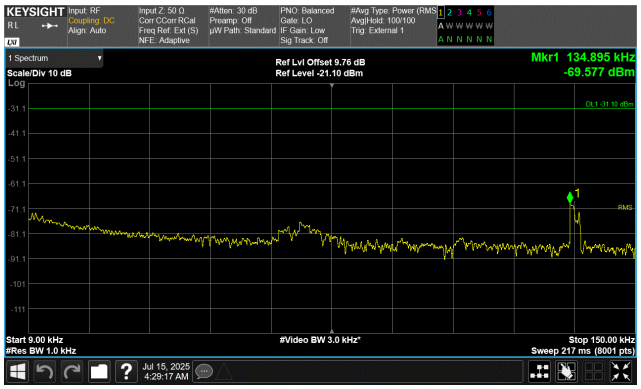
WTD.2025.03.25.0



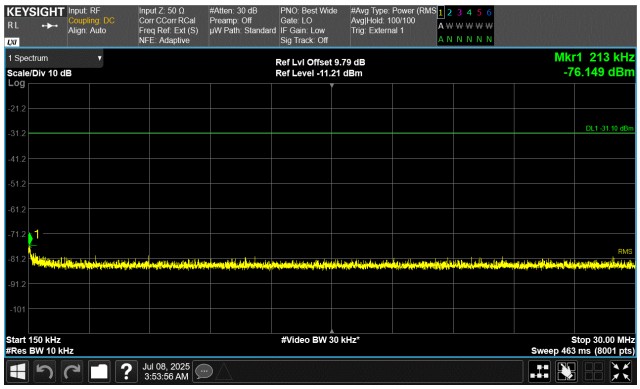
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
13 GHz to 20 GHz



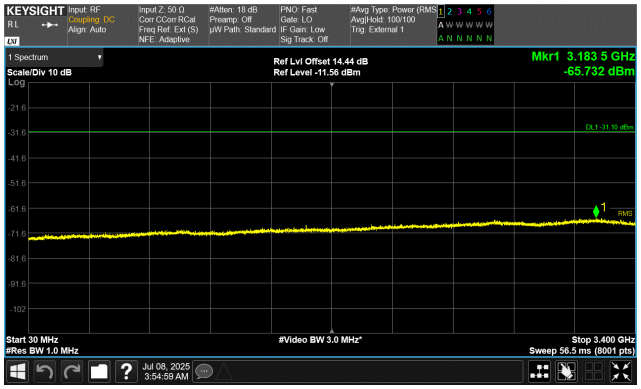
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
20 GHz to 40 GHz



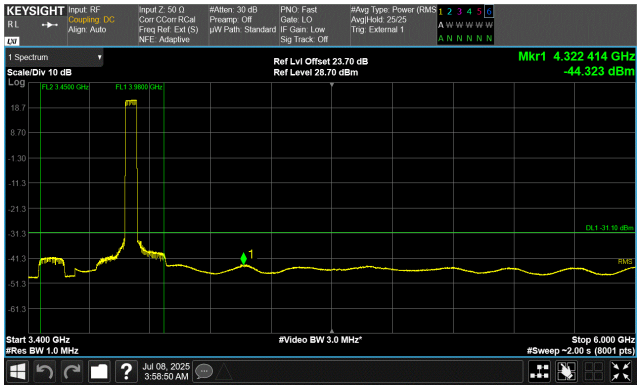
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
9 kHz to 150 kHz



50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
150 kHz to 30 MHz



50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
30 MHz to 3400 MHz



50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
3400 MHz to 6000 MHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
TbtTx 2024.05.24.1
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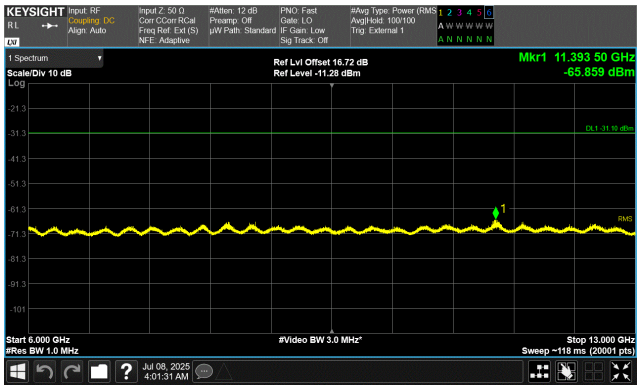
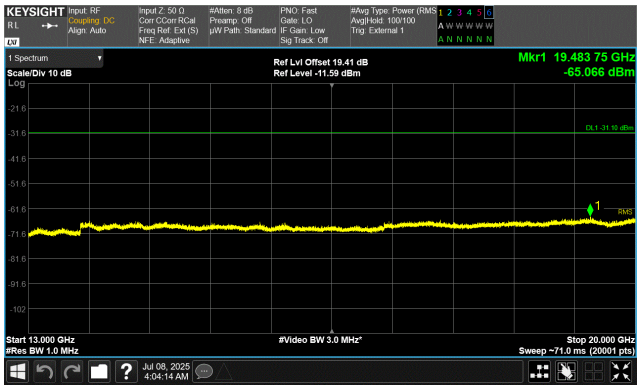
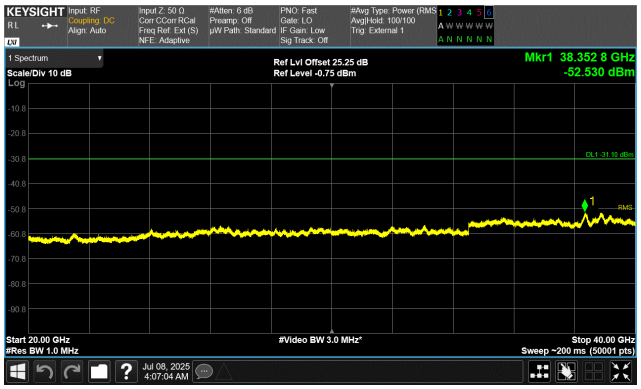


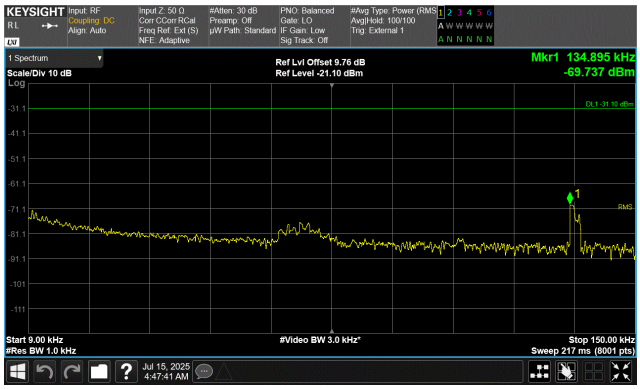
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
6 GHz to 13 GHz



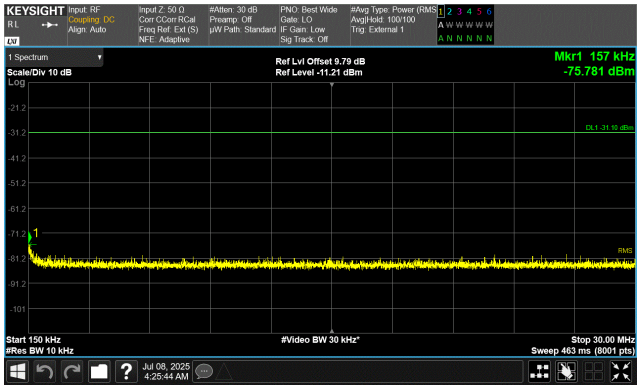
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
13 GHz to 20 GHz



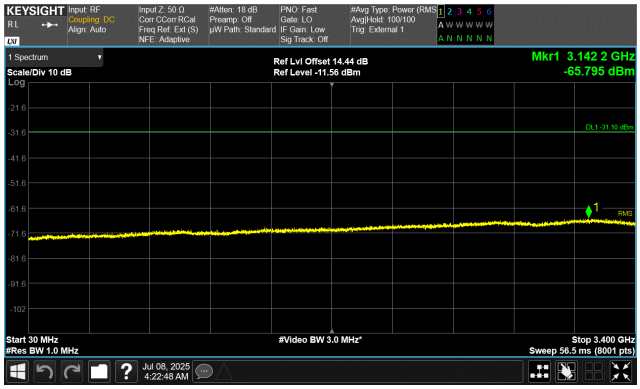
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
20 GHz to 40 GHz



70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
9 kHz to 150 kHz



70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
150 kHz to 30 MHz



70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
30 MHz to 3400 MHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

element
TbtTx 2024.05.24.1
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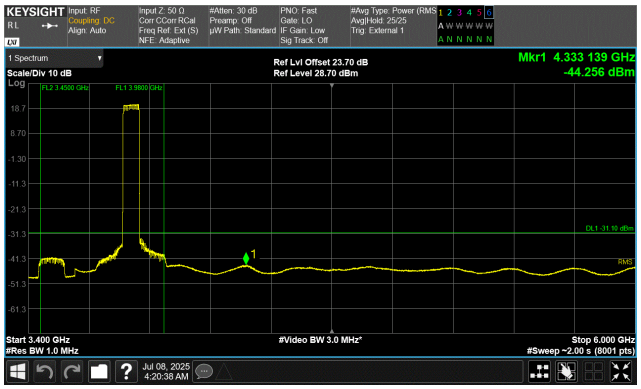
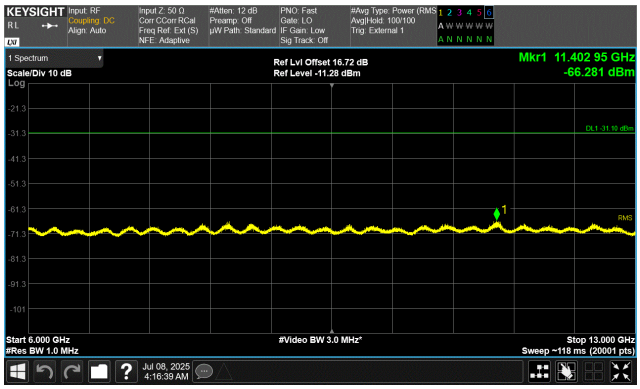
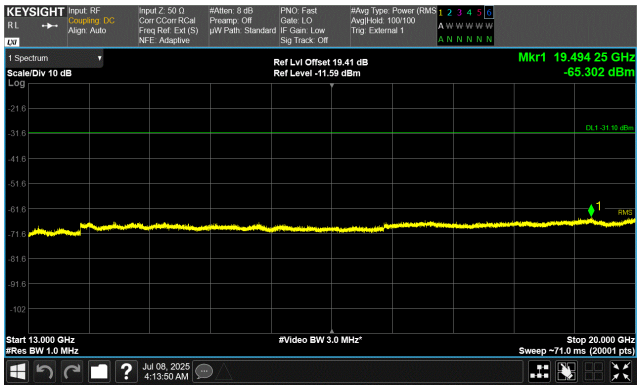


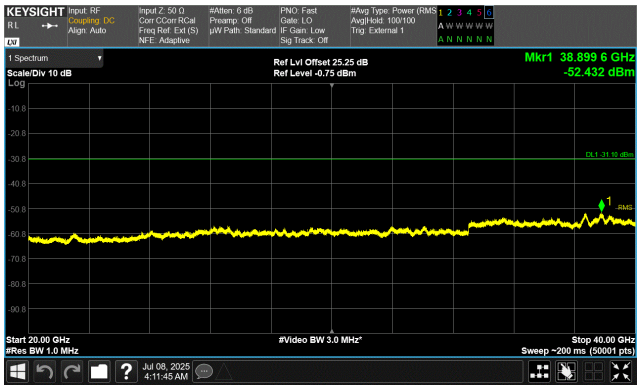
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
3400 MHz to 6000 MHz



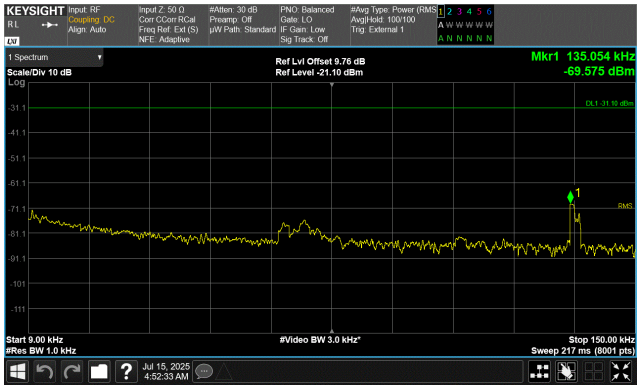
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
6 GHz to 13 GHz



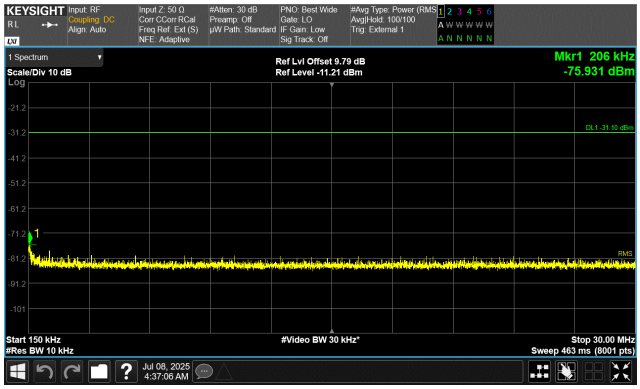
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
13 GHz to 20 GHz



70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
20 GHz to 40 GHz



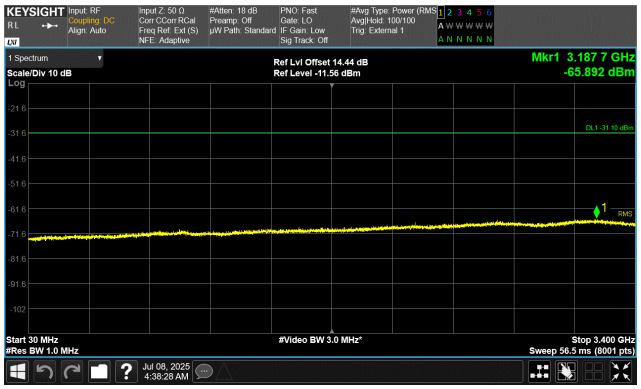
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
9 kHz to 150 kHz



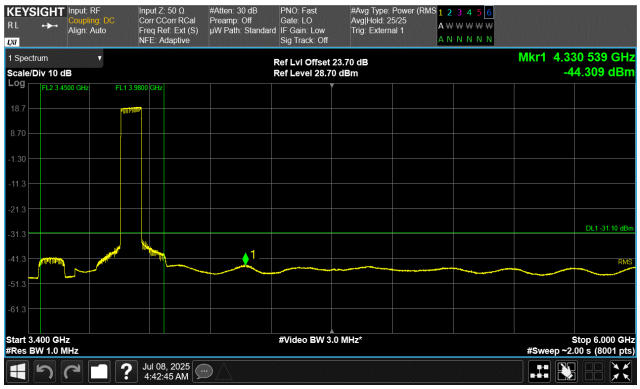
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
150 kHz to 30 MHz

SPURIOUS CONDUCTED EMISSIONS - 3700 BAND

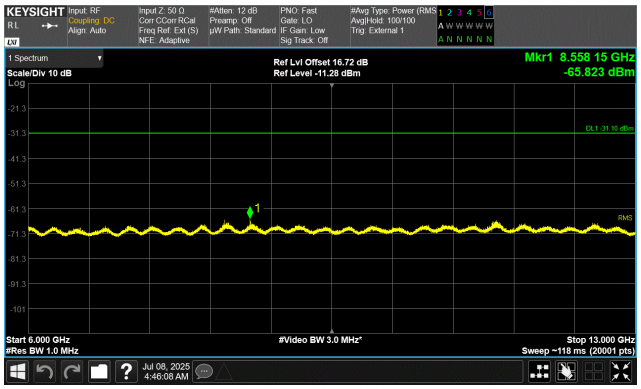
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



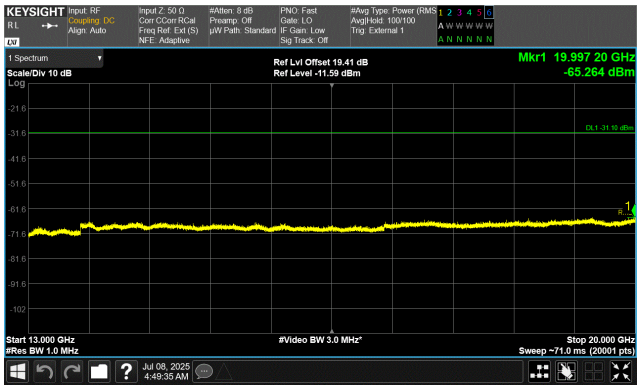
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
30 MHz to 3400 MHz



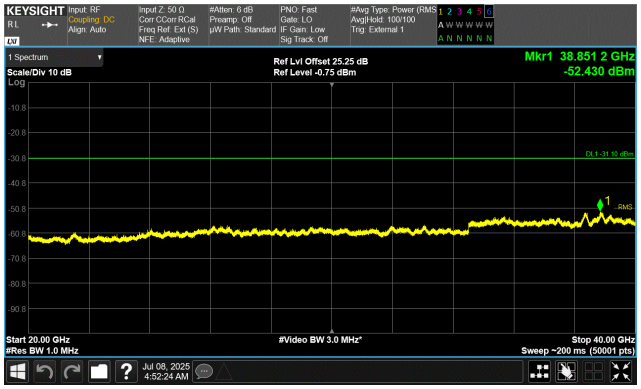
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
3400 MHz to 6000 MHz



90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
6 GHz to 13 GHz



90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
13 GHz to 20 GHz



90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 3840.00 MHz
20 GHz to 40 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

element
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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 antenna port spurious emissions were measured at the RF output terminal of the EUT through four different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth defined by ANSI C63.2 were made from 9 kHz to 40 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in output power testing) and antenna port 1 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 measurement methods for FCC measurements are detailed in KDB971168 D01v03 section 6 and ANSI C63.26-2015. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified by the compliance lab. These measurements are for frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

Per FCC 2.1057(a)(1), the upper level of measurement is the 10^{th} harmonic of the highest fundamental frequency. As such, the upper level of the measurement is approximately 40 GHz (3980 MHz * 10) for the AVQQA 3.7G Band.

Per section 27.53(l)(1), For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. This limit is adjusted to -31.1 dBm [-13 dBm - 10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be > 1MHz per FCC 27.53(l)(1)

Per ITU-R SM.329-10 section 4.1, measurement resolution bandwidth (RBW) 1KHz and 10KHz “Reference bandwidth” limit scaling/adjustment is not required.

The spurious emission testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

All Measurements were synchronized with the measurement receiver - gated with external trigger input (frame clock (100Hz) provided by the system module.

In 3.7GHz band multi carrier operating mode - carriers were enabled at maximum power levels.

Multicarrier test cases have been developed as shown below:

a) 3.7GHz Band Multicarrier: Two non-contiguous NR50 carriers with maximum spacing between carrier frequencies at the lower band edges (3725.01 & 3874.98MHz). The highest spectral density channel bandwidth is selected to maximize available PSD and occupied bandwidth. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

b) 3.7GHz Band Multicarrier: Two non-contiguous NR50 carriers with maximum spacing between carrier frequencies at the Upper band edges (3805.02 & 3954.99MHz). The highest spectral density channel bandwidth is selected to

maximize available PSD and occupied bandwidth. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

c) 3.7GHz Band Multicarrier: Two contiguous NR50 carriers with minimum spacing between carrier frequencies at the lower band edges (3725.01 & 3774.99MHz). The highest spectral density channel bandwidth is selected to maximize available PSD. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

d) 3.7GHz Band Multicarrier: Two contiguous NR50 carriers with minimum spacing between carrier frequencies at the upper band edges (3905.01 & 3954.99MHz). The highest spectral density channel bandwidth is selected to maximize available PSD. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

e) 3.7GHz Band Multicarrier: Two contiguous NR100 carriers with minimum spacing between carrier frequencies at the lower band edges (3750.00 & 3849.99MHz). The largest channel bandwidth is selected to maximize radio power and occupied bandwidth. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

f) 3.7GHz Band Multicarrier: Two contiguous NR100 carriers with minimum spacing between carrier frequencies at the Upper band edges (3830.01 & 3930.00MHz). The largest channel bandwidth is selected to maximize radio power and occupied bandwidth. The carriers are operated at maximum power (~2.65W/carrier) with a total radio power of 340 watts

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.

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

element
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EUT:	Airscale Base Transceiver Station Radio Unit Model AVQQA	Work Order:	NOKI0086
Serial Number:	L1242501908	Date:	2025-07-14
Customer:	Nokia Solutions and Networks	Temperature:	24.5°C
Attendees:	John Rattanavong, Mitch Hill	Relative Humidity:	49%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54 VDC	Configuration:	NOKI0086-3

COMMENTS

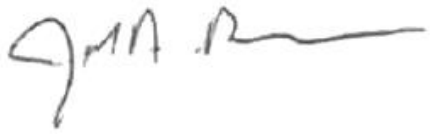
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
QPSK Modulation					
Test Case A					
NR50, 3725.01 MHz & NR50, 3874.98 MHz	9 kHz to 150 kHz	0.135	-69.572	-31.1	Pass
	150 kHz to 30 MHz	0.213	-75.758	-31.1	Pass
	30 MHz to 3400 MHz	3132.1	-65.909	-31.1	Pass
	3400 MHz to 6000 MHz	4334.764	-44.046	-31.1	Pass
	6 GHz to 13 GHz	11414.15	-65.656	-31.1	Pass
	13 GHz to 20 GHz	19980.05	-65.295	-31.1	Pass
	20 GHz to 40 GHz	38269.1	-52.154	-31.1	Pass
Test Case B					
NR50, 3805.02 MHz & NR50, 3954.99 MHz	9 kHz to 150 kHz	0.135	-69.743	-31.1	Pass
	150 kHz to 30 MHz	0.15	-75.919	-31.1	Pass
	30 MHz to 3400 MHz	3202	-66.056	-31.1	Pass
	3400 MHz to 6000 MHz	4327.614	-44.601	-31.1	Pass
	6 GHz to 13 GHz	8281.65	-66.387	-31.1	Pass
	13 GHz to 20 GHz	19050.1	-65.581	-31.1	Pass
	20 GHz to 40 GHz	38890	-51.509	-31.1	Pass
Test Case C					
NR50, 3725.01 MHz & NR50, 3774.99 MHz	9 kHz to 150 kHz	0.135	-69.754	-31.1	Pass
	150 kHz to 30 MHz	0.157	-76.063	-31.1	Pass
	30 MHz to 3400 MHz	3181.4	-65.713	-31.1	Pass
	3400 MHz to 6000 MHz	4329.239	-44.619	-31.1	Pass
	6 GHz to 13 GHz	11382.3	-65.507	-31.1	Pass
	13 GHz to 20 GHz	19387.5	-65.541	-31.1	Pass
	20 GHz to 40 GHz	38381.6	-52.525	-31.1	Pass

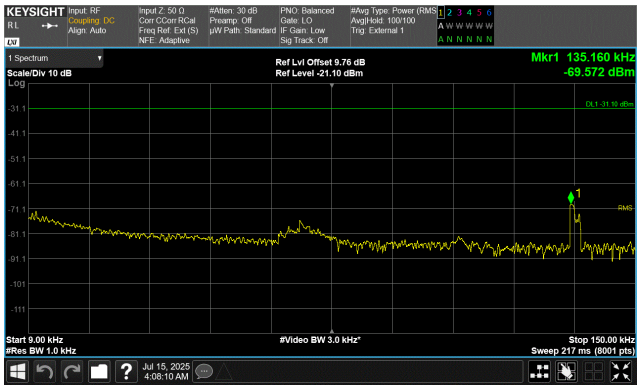
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

element
TbtTx 2024.05.24.1
WTD.2025.03.25.0

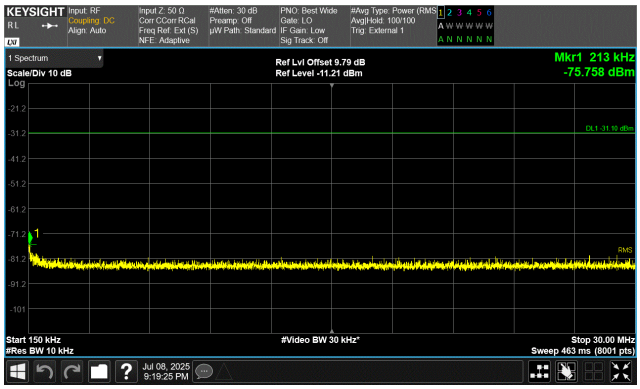
	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Test Case D					
NR50, 3905.01 MHz & NR50, 3954.99 MHz	9 kHz to 150 kHz	0.135	-69.651	-31.1	Pass
	150 kHz to 30 MHz	0.165	-76.643	-31.1	Pass
	30 MHz to 3400 MHz	3198.6	-65.549	-31.1	Pass
	3400 MHz to 6000 MHz	4334.76	-44.155	-31.1	Pass
	6 GHz to 13 GHz	8295.65	-65.406	-31.1	Pass
	13 GHz to 20 GHz	19486.55	-65.286	-31.1	Pass
	20 GHz to 40 GHz	38859.2	-52.105	-31.1	Pass
Test Case E					
NR100, 3750.00 MHz & NR100, 3849.99 MHz	9 kHz to 150 kHz	0.135	-69.608	-31.1	Pass
	150 kHz to 30 MHz	0.15	-76.413	-31.1	Pass
	30 MHz to 3400 MHz	3206.2	-65.753	-31.1	Pass
	3400 MHz to 6000 MHz	4325.664	-44.497	-31.1	Pass
	6 GHz to 13 GHz	11397.7	-66.022	-31.1	Pass
	13 GHz to 20 GHz	19959.75	-65.689	-31.1	Pass
	20 GHz to 40 GHz	38870.4	-52.46	-31.1	Pass
Test Case F					
NR100, 3830.01 MHz & NR100, 3930.00 MHz	9 kHz to 150 kHz	0.135	-69.752	-31.1	Pass
	150 kHz to 30 MHz	0.15	-75.115	-31.1	Pass
	30 MHz to 3400 MHz	3226.9	-65.779	-31.1	Pass
	3400 MHz to 6000 MHz	4326.639	-44.685	-31.1	Pass
	6 GHz to 13 GHz	11391.4	-65.818	-31.1	Pass
	13 GHz to 20 GHz	19951.7	-65.695	-31.1	Pass
	20 GHz to 40 GHz	38362.4	-52.3	-31.1	Pass

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

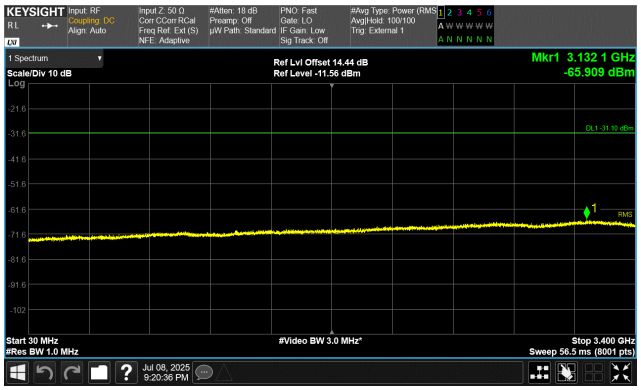
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



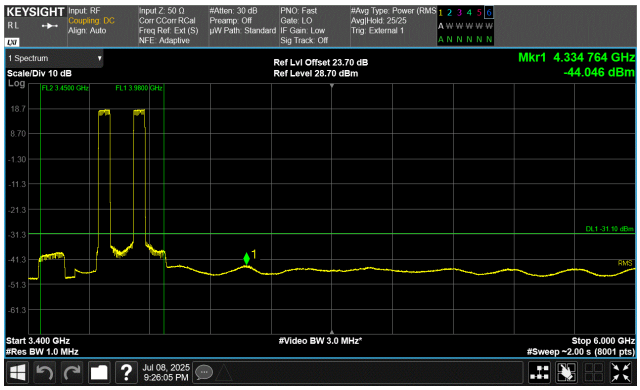
Test Case A
9 kHz to 150 kHz



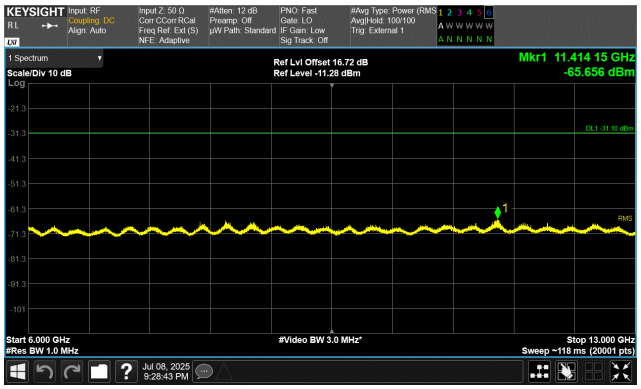
Test Case A
150 kHz to 30 MHz



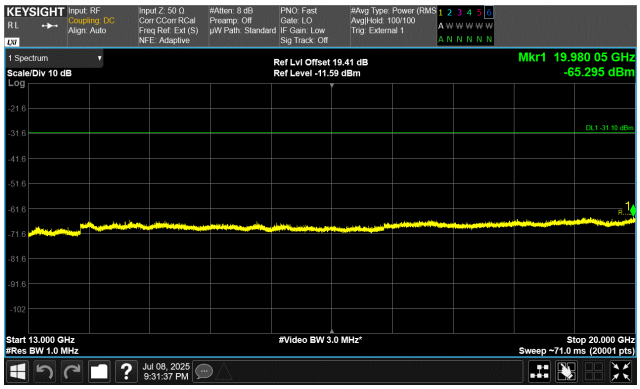
Test Case A
30 MHz to 3400 MHz



Test Case A
3400 MHz to 6000 MHz



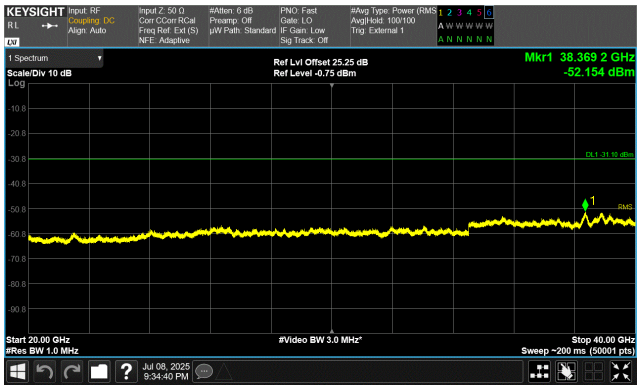
Test Case A
6 GHz to 13 GHz



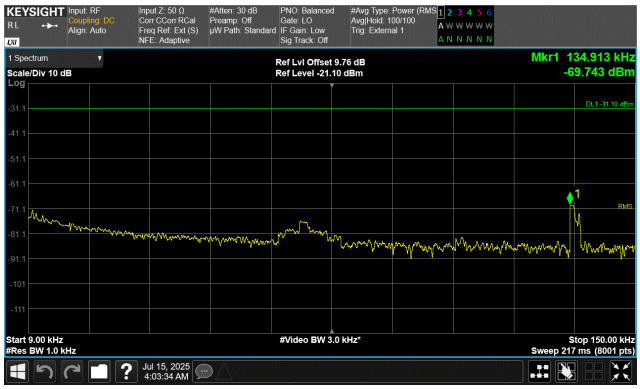
Test Case A
13 GHz to 20 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

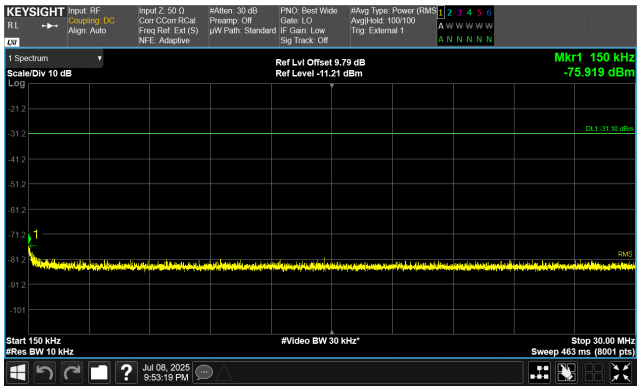
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



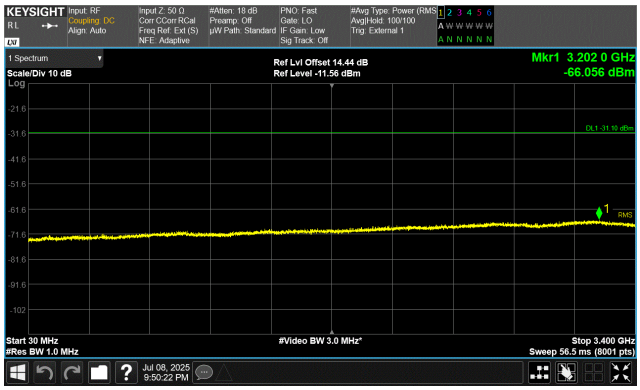
Test Case A
20 GHz to 40 GHz



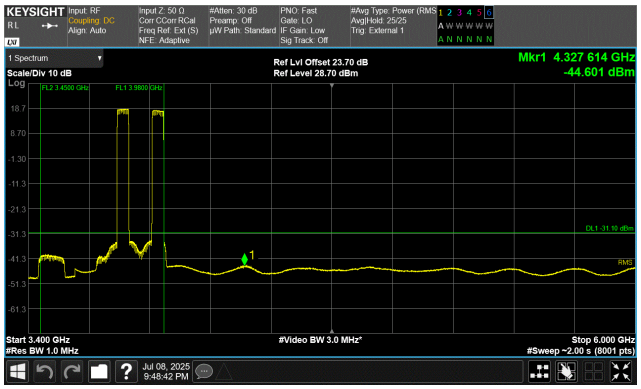
Test Case B
9 kHz to 150 kHz



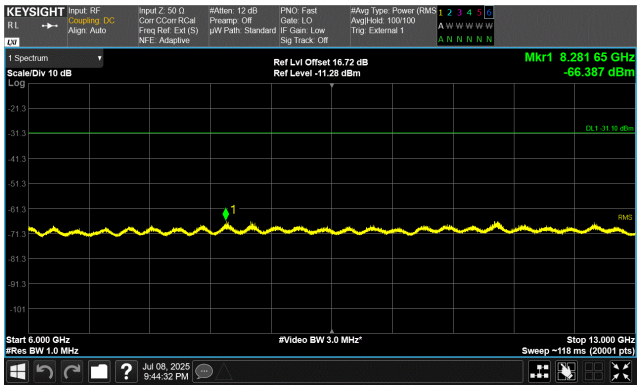
Test Case B
150 kHz to 30 MHz



Test Case B
30 MHz to 3400 MHz



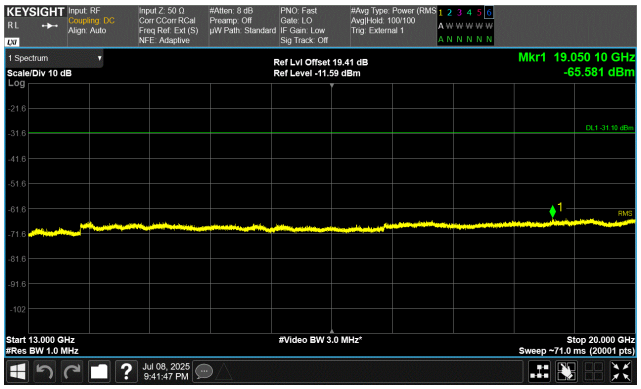
Test Case B
3400 MHz to 6000 MHz



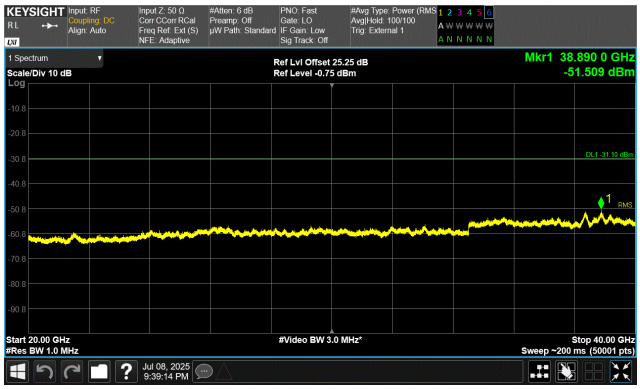
Test Case B
6 GHz to 13 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

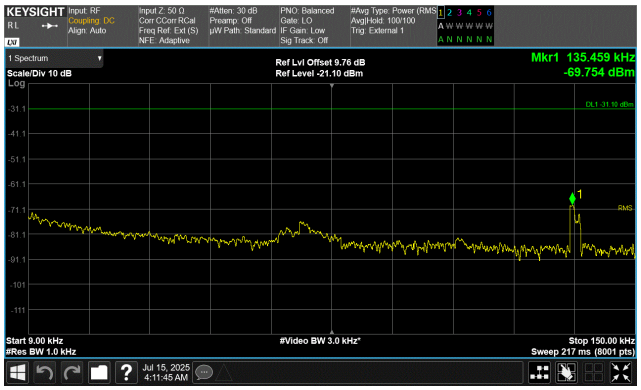
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



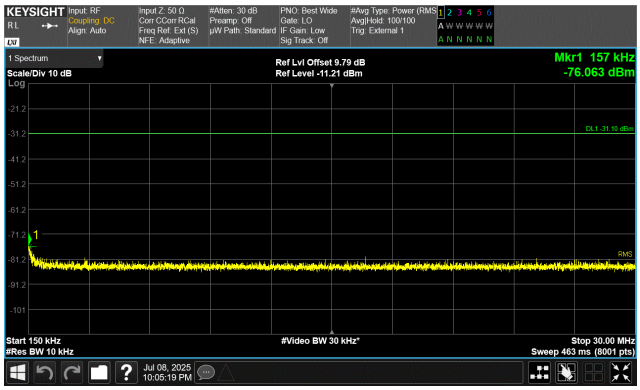
Test Case B
13 GHz to 20 GHz



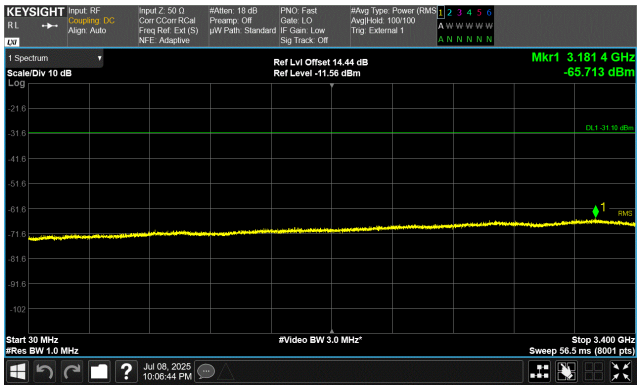
Test Case B
20 GHz to 40 GHz



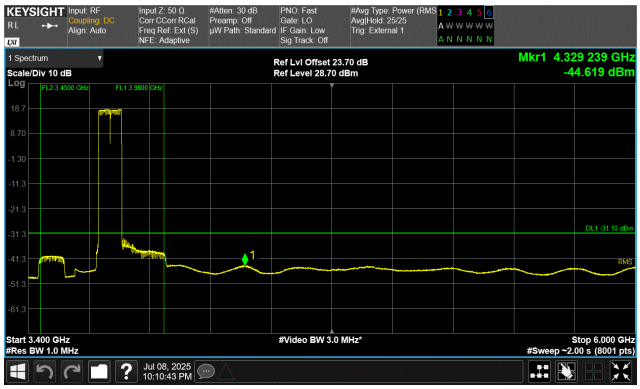
Test Case C
9 kHz to 150 kHz



Test Case C
150 kHz to 30 MHz



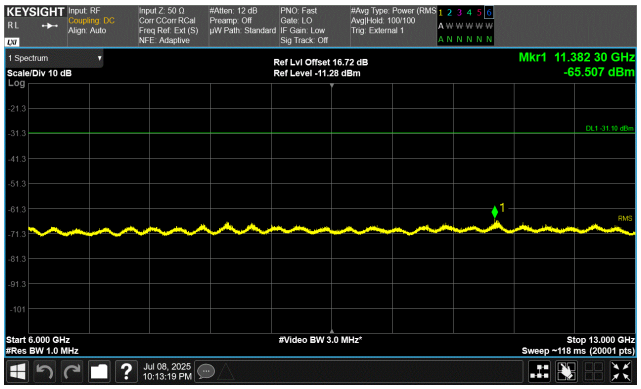
Test Case C
30 MHz to 3400 MHz



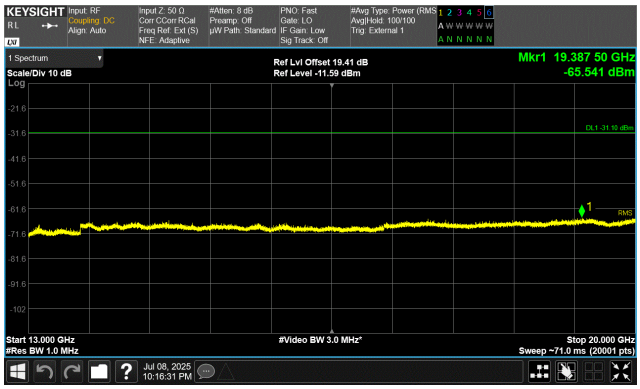
Test Case C
3400 MHz to 6000 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

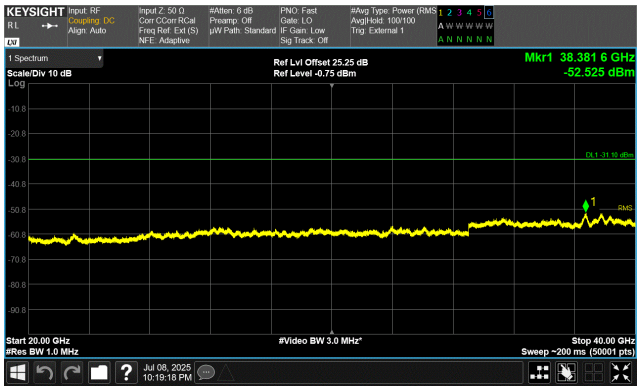
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



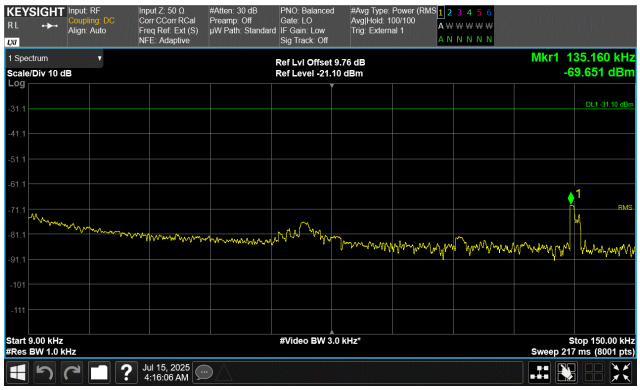
Test Case C
6 GHz to 13 GHz



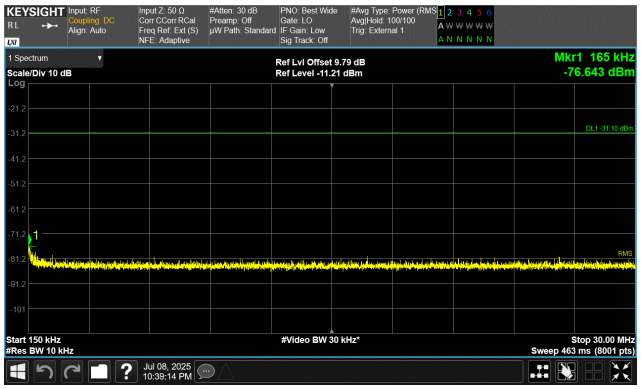
Test Case C
13 GHz to 20 GHz



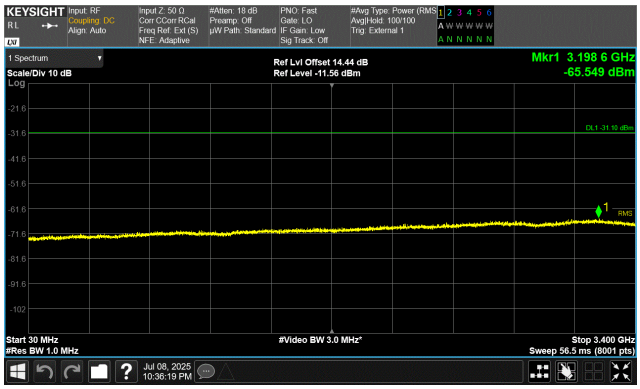
Test Case C
20 GHz to 40 GHz



Test Case D
9 kHz to 150 kHz



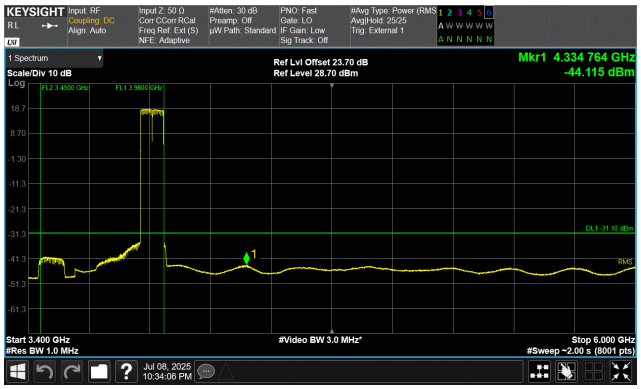
Test Case D
150 kHz to 30 MHz



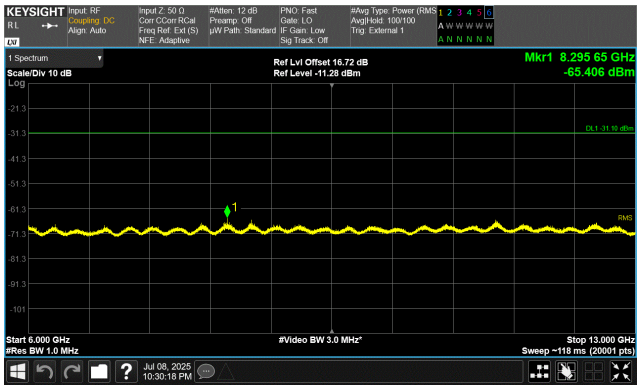
Test Case D
30 MHz to 3400 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

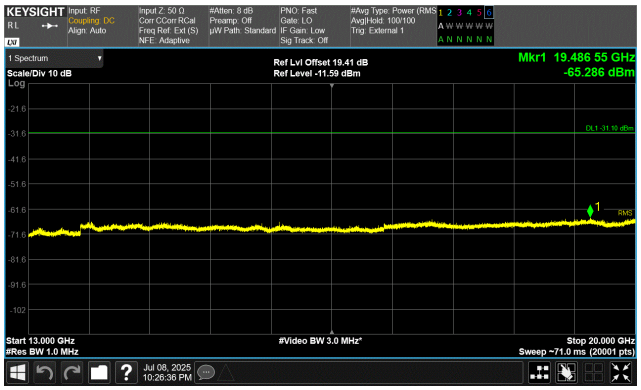
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



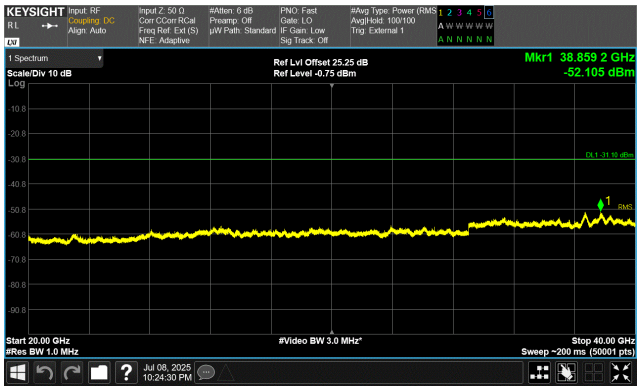
Test Case D
3400 MHz to 6000 MHz



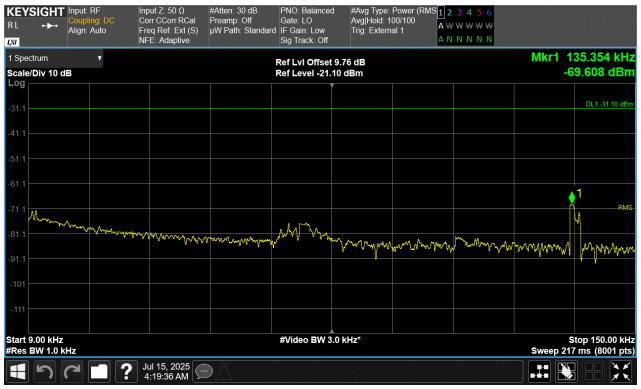
Test Case D
6 GHz to 13 GHz



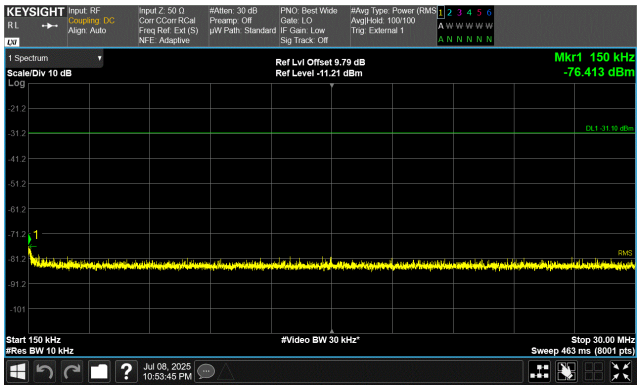
Test Case D
13 GHz to 20 GHz



Test Case D
20 GHz to 40 GHz



Test Case E
9 kHz to 150 kHz



Test Case E
150 kHz to 30 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

element
TbtTx 2024.05.24.1
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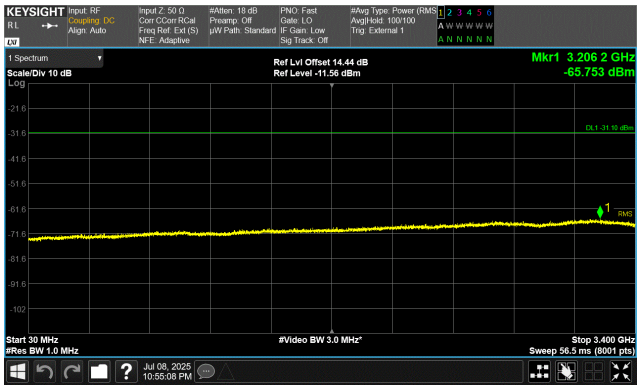
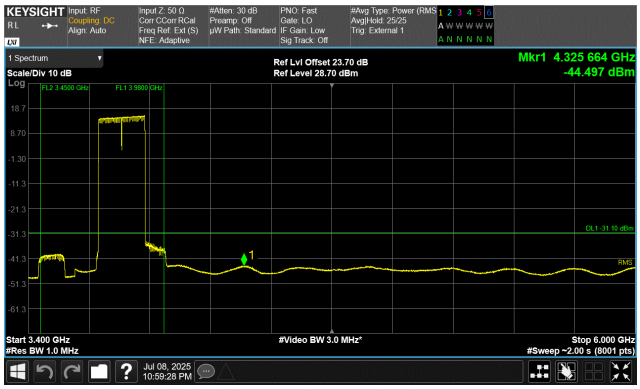
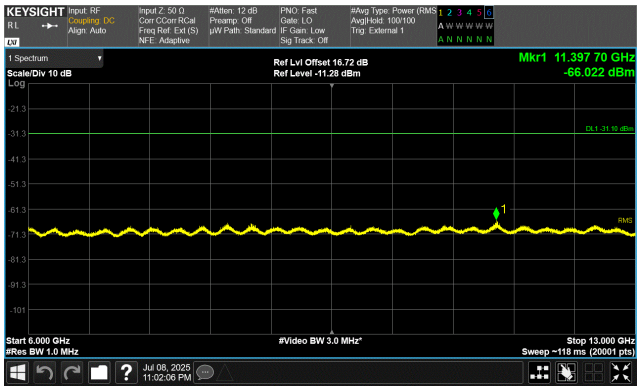


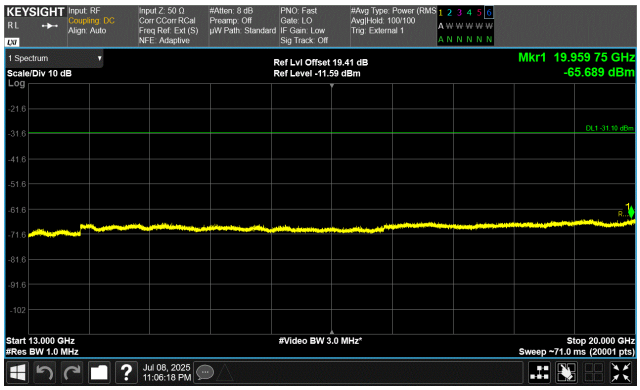
Test Case E
30 MHz to 3400 MHz



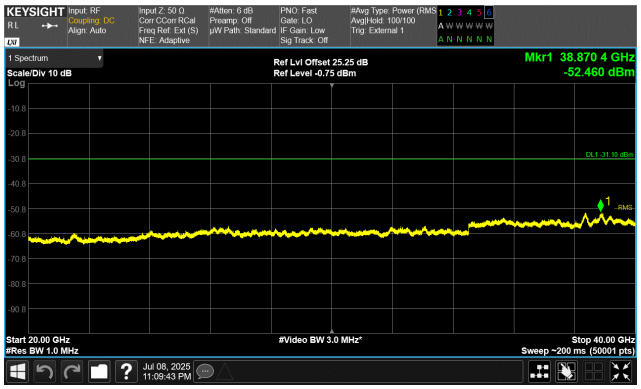
Test Case E
3400 MHz to 6000 MHz



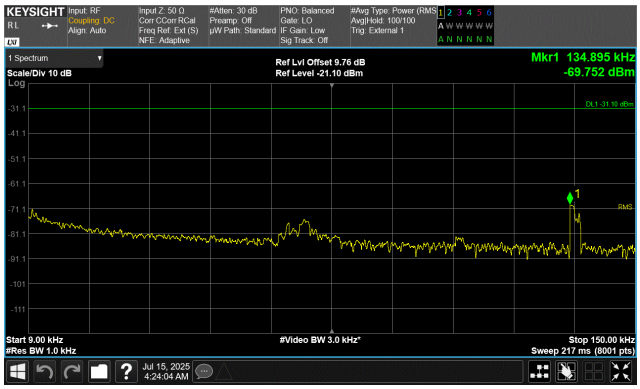
Test Case E
6 GHz to 13 GHz



Test Case E
13 GHz to 20 GHz



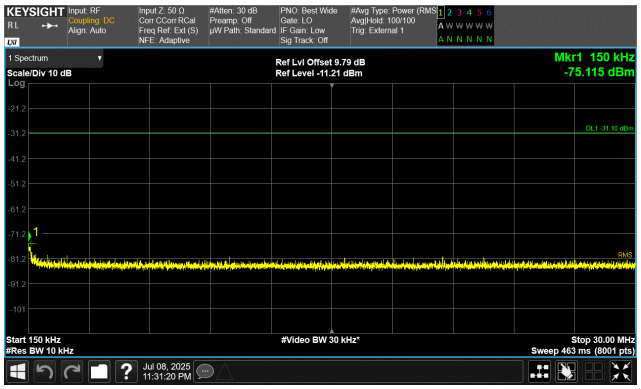
Test Case E
20 GHz to 40 GHz



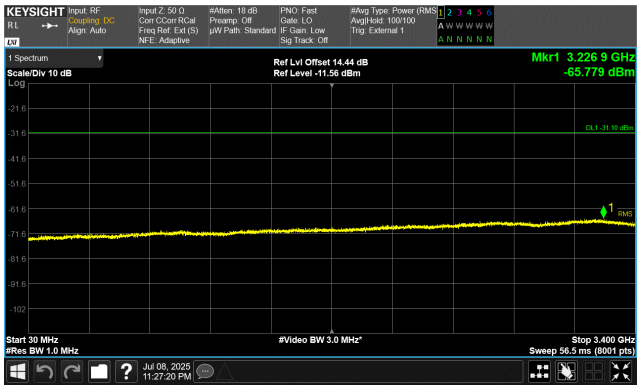
Test Case F
9 kHz to 150 kHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER, 3700 BAND

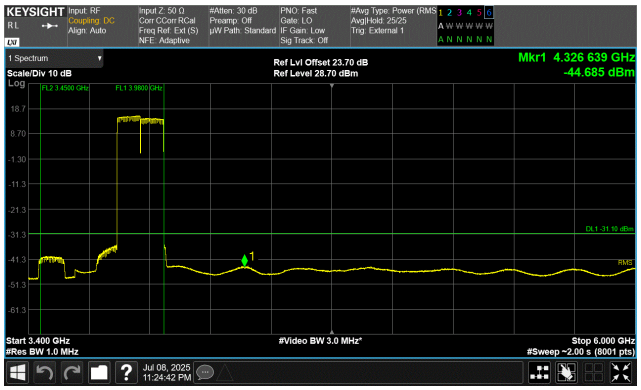
element
TbtTx 2024.05.24.1
WTD.2025.03.25.0



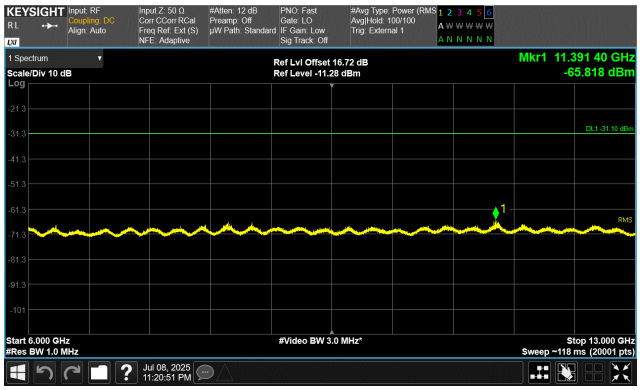
Test Case F
150 kHz to 30 MHz



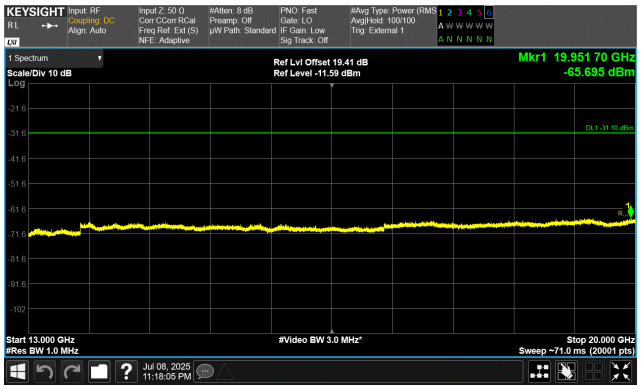
Test Case F
30 MHz to 3400 MHz



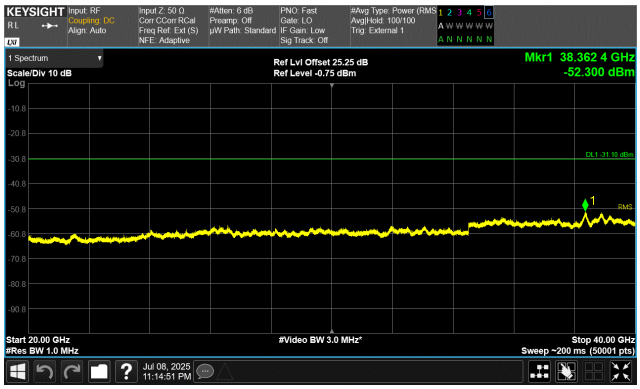
Test Case F
3400 MHz to 6000 MHz



Test Case F
6 GHz to 13 GHz



Test Case F
13 GHz to 20 GHz



Test Case F
20 GHz to 40 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTIBAND

element
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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 antenna port spurious emissions were measured at the RF output terminal of the EUT through five different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth defined by ANSI C63.2 were made from 9 kHz to 40 GHz. The conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in output power testing) and antenna port 1 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 measurement methods for FCC measurements are detailed in KDB971168 D01v03 section 6 and ANSI C63.26-2015. Measurements shall be performed at full power on the channel(s) and bandwidth(s) specified by the compliance lab. These measurements are for frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

Per FCC 2.1057(a)(1), the upper level of measurement is the 10th harmonic of the highest fundamental frequency. As such, the upper level of the measurement is approximately 40 GHz (3550 MHz * 10) for the AVQQA 3.45GHz Band and approximately 40 GHz for (3980 MHz * 10) for the AVQQA 3.7GHz Band.

Per section 27.53(l)(1), For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. This limit is adjusted to -31.1 dBm [-13 dBm - 10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be > 1MHz per FCC 27.53(l)(1)

Per section FCC 27.53(n)(1) and FCC 27.53 (l)(1), power of any emission outside of the authorized operating frequency range cannot exceed, of the two rule parts, the more restrictive limits. Per section 27.53(n)(1), the power of any emission outside band edge region (frequency ranges below 3430MHz and above 3570MHz) cannot exceed -40 dBm/MHz. The limit is adjusted to -58.1 dBm [-40 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be 1MHz per FCC 27.53(n)(1).

Per ITU-R SM.329-10 section 4.1, measurement resolution bandwidth (RBW) 1KHz and 10KHz “Reference bandwidth” limit scaling/adjustment is not required.

The spurious emission testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

All Measurements were synchronized with the measurement receiver - gated with external trigger input (frame clock (100Hz) provided by the system module.

Multi band/Multi carrier operating mode - carriers were enabled at maximum power levels.

SPURIOUS CONDUCTED EMISSIONS - MULTIBAND

element
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Multicarrier/Multiband test cases have been developed as shown below:

a) Multiband Multicarrier: In 3.7GHz Band, Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the lower band edge (3705.00 & 3715.02MHz). In 3.45GMHz band. Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the upper band edge (3534.99 & 3544.98MHz). The smallest channel bandwidth is selected to maximized available power spectral density. The carriers are operated at maximum power (~0.78W/carrier) with a total radio power of 200 watts.

b) Multiband Multicarrier: In 3.7GHz Band, Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the upper band edge (3964.98 & 3975.00MHz). In 3.45GHz band. Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the lower band edge (3455.01 & 3465.00MHz). The smallest channel bandwidth is selected to maximized available power spectral density. The carriers are operated at maximum power (~0.78W/carrier) with a total radio power of 200 watts.

c) Multiband Multicarrier: In 3.7GHz Band, Two non-contiguous NR10 carriers with maximum spacing between carrier frequencies at the lower band edge (3705.00 & 3894.99MHz). In 3.45GHz band. Two non-contiguous NR10 carriers with maximum spacing between carrier frequencies at the lower/upper band edge (3455.01 & 3544.98MHz). The smallest channel bandwidth is selected to maximized available power spectral density and occupied bandwidth. The carriers are operated at maximum power (~0.78W/carrier) with a total radio power of 200 watts.

d) Multiband Multicarrier: In 3.7GHz Band, Two non-contiguous NR10 carriers with maximum spacing between carrier frequencies at the Upper band edge (3784.98 & 3975.00MHz). In 3.45GHz band. Two non-contiguous NR10 carriers with maximum spacing between carrier frequencies at the lower/upper band edge (3455.01 & 3544.98MHz). The smallest channel bandwidth is selected to maximized available power spectral density and occupied bandwidth. The carriers are operated at maximum power (~0.78W/carrier) with a total radio power of 200 watts.

e) Multiband Multicarrier: In 3.7GHz Band, Two non-contiguous NR50 carriers with maximum spacing between carrier frequencies at the lower band edge (3725.01 & 3874.98MHz). In 3450 3.45GHz band. Two contiguous NR50 carriers at the lower/upper band edges (3475.02 & 3525.00MHz). The channel bandwidth is selected to maximized available power spectral density and occupied bandwidth. The carriers are operated at maximum power (~1.32W/NR50 carrier) with a total radio power of ~340 watts.

f) Multiband Multicarrier: In 3.7GHz Band, Two non-contiguous NR50 carriers with maximum spacing between carrier frequencies at the Upper band edge (3805.02 & 3954.99MHz). In 3.45GMHz band. Two contiguous NR50 carriers at the lower/upper band edges (3475.02 & 3525.00MHz). The channel bandwidth is selected to maximized available power spectral density and occupied bandwidth. The carriers are operated at maximum power (~1.32W/NR50 carrier) with a total radio power of ~340 watts.

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.

SPURIOUS CONDUCTED EMISSIONS - MULTIBAND

element
TbtTx 2024.05.24.1
WTD.2025.03.25.0

EUT:	Airscale Base Transceiver Station Radio Unit Model AVQQA	Work Order:	NOKI0086
Serial Number:	L1242501908	Date:	2025-07-14
Customer:	Nokia Solutions and Networks	Temperature:	26.2°C
Attendees:	John Rattanavong, Mitch Hill	Relative Humidity:	44.4%
Customer Project:	None	Bar. Pressure (PMSL):	1014 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54 VDC	Configuration:	NOKI0086-3

COMMENTS

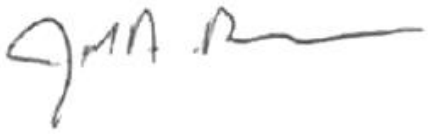
All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass



Tested By

TEST RESULTS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
QPSK Modulation					
Test Case A					
	9 kHz to 150 kHz	0.135	-70.392	-58.1	Pass
	150 kHz to 30 MHz	0.213	-75.698	-58.1	Pass
	30 MHz to 3400 MHz	3181.4	-65.309	-58.1	Pass
	4030 MHz to 6000 MHz	4045.02	-65.397	-58.1	Pass
	3100 MHz to 3430 MHz	3151.15	-70.205	-58.1	Pass
	3570 MHz to 3680 MHz	3573.85	-64.696	-58.1	Pass
	4000 MHz to 4200 MHz	4013.8	-66.071	-58.1	Pass
	3400 MHz to 4030 MHz	3983.77	-43.001	-31.1	Pass
	6 GHz to 13 GHz	11419.05	-66.062	-58.1	Pass
	13 GHz to 20 GHz	19955.2	-65.35	-58.1	Pass
	20 GHz to 40 GHz	38333.2	-67.541	-58.1	Pass
Test Case B					
	9 kHz to 150 kHz	0.135	-70.2	-58.1	Pass
	150 kHz to 30 MHz	0.15	-76.409	-58.1	Pass
	30 MHz to 3400 MHz	3178.4	-65.298	-58.1	Pass
	4030 MHz to 6000 MHz	4042.07	-65.827	-58.1	Pass
	3100 MHz to 3430 MHz	3179.53	-70.135	-58.1	Pass
	3570 MHz to 3680 MHz	3604.65	-65.082	-58.1	Pass
	4000 MHz to 4200 MHz	4013.8	-66.149	-58.1	Pass
	3400 MHz to 4030 MHz	3984.09	-39.191	-31.1	Pass
	6 GHz to 13 GHz	11381.6	-65.962	-58.1	Pass
	13 GHz to 20 GHz	19505.45	-65.237	-58.1	Pass
	20 GHz to 40 GHz	38311.2	-67.153	-58.1	Pass

SPURIOUS CONDUCTED EMISSIONS - MULTIBAND

element
TbtTx 2024.05.24.1
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	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Test Case C					
	9 kHz to 150 kHz	0.135	-70.367	-58.1	Pass
	150 kHz to 30 MHz	0.217	-75.925	-58.1	Pass
	30 MHz to 3400 MHz	3218.4	-65.474	-58.1	Pass
	4030 MHz to 6000 MHz	4036.9	-65.324	-58.1	Pass
	3100 MHz to 3430 MHz	3158.74	-69.368	-58.1	Pass
	3570 MHz to 3680 MHz	3641.06	-64.406	-58.1	Pass
	4000 MHz to 4200 MHz	4005.2	-63.947	-58.1	Pass
	3400 MHz to 4030 MHz	3984.09	-36.403	-31.1	Pass
	6 GHz to 13 GHz	11401.55	-66.519	-58.1	Pass
	13 GHz to 20 GHz	19913.55	-65.704	-58.1	Pass
	20 GHz to 40 GHz	38349.2	-66.896	-58.1	Pass
Test Case D					
	9 kHz to 150 kHz	0.135	-70.202	-58.1	Pass
	150 kHz to 30 MHz	0.213	-76.227	-58.1	Pass
	30 MHz to 3400 MHz	3058.4	-65.169	-58.1	Pass
	4030 MHz to 6000 MHz	4031.48	-65.374	-58.1	Pass
	3100 MHz to 3430 MHz	3140.26	-69.339	-58.1	Pass
	3570 MHz to 3680 MHz	3571.65	-68.008	-58.1	Pass
	4000 MHz to 4200 MHz	4008.6	-66.101	-58.1	Pass
	3400 MHz to 4030 MHz	3984.09	-36.11	-31.1	Pass
	6 GHz to 13 GHz	11388.25	-66.188	-58.1	Pass
	13 GHz to 20 GHz	19498.8	-65.361	-58.1	Pass
	20 GHz to 40 GHz	38307.6	-66.629	-58.1	Pass
Test Case E					
	9 kHz to 150 kHz	0.135	-69.756	-58.1	Pass
	150 kHz to 30 MHz	0.161	-75.567	-58.1	Pass
	30 MHz to 3400 MHz	3170	-65.702	-58.1	Pass
	4030 MHz to 6000 MHz	4343.97	-64.83	-58.1	Pass
	3100 MHz to 3430 MHz	3178.21	-69.744	-58.1	Pass
	3570 MHz to 3680 MHz	3665.48	-65.213	-58.1	Pass
	4000 MHz to 4200 MHz	4007.4	-62.607	-58.1	Pass
	3400 MHz to 4030 MHz	3983.22	-32.696	-31.1	Pass
	6 GHz to 13 GHz	11397	-65.371	-58.1	Pass
	13 GHz to 20 GHz	19403.25	-64.891	-58.1	Pass
	20 GHz to 40 GHz	38853.6	-66.874	-58.1	Pass
Test Case F					
	9 kHz to 150 kHz	0.135	-69.876	-58.1	Pass
	150 kHz to 30 MHz	0.213	-75.322	-58.1	Pass
	30 MHz to 3400 MHz	3156.1	-65.794	-58.1	Pass
	4030 MHz to 6000 MHz	4335.35	-60.048	-58.1	Pass
	3100 MHz to 3430 MHz	3310.54	-70.022	-58.1	Pass
	3570 MHz to 3680 MHz	3668.12	-66.726	-58.1	Pass
	4000 MHz to 4200 MHz	4007.8	-64.058	-58.1	Pass
	3400 MHz to 4030 MHz	3984.09	-32.727	-31.1	Pass
	6 GHz to 13 GHz	8279.2	-65.503	-58.1	Pass
	13 GHz to 20 GHz	19983.55	-64.651	-58.1	Pass
	20 GHz to 40 GHz	38318	-68.113	-58.1	Pass