

SPURIOUS CONDUCTED EMISSIONS

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 for each channel bandwidth using a QPSK Modulation type from 9 kHz to 27 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 Airscale Base Transceiver Station Radio Unit Model AVHA 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) for 5G NR. 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 27 GHz (2685 MHz * 10) for the n41 frequency Band.

Per section 27.53(m)(2), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The AVHA AirScale MAA operates as a 64 port MIMO transmitter. The 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 limit for the 9kHz to 150kHz frequency range was adjusted to -61.1dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 1MHz [i.e.: -61.1dBm = -31.1dBm -10log(1MHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to -51.1dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 1MHz [i.e.: -51.1dBm = -31.1dBm -10log(1MHz/10kHz)]. The required limit of -31.1dBm with a RBW of > 1MHz was used for all other frequency ranges.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3379	AMM	2024-08-15	2025-08-15
Block - DC	Fairview Microwave	SD3235	ANI	2024-02-14	2025-02-14

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EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-08
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrold Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

SPURIOUS CONDUCTED EMISSIONS

TEST RESULTS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
10 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-74.82	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.343	-51.1	Pass
	20 MHz to 4 GHz	3990.5	-38.718	-31.1	Pass
	4 GHz to 18 GHz	4026.1	-52.418	-31.1	Pass
	18 GHz to 27 GHz	26107.65	-52.376	-31.1	Pass
15 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.009	-75.461	-61.1	Pass
	150 kHz to 20 MHz	0.15	-76.969	-51.1	Pass
	20 MHz to 4 GHz	3987.1	-38.689	-31.1	Pass
	4 GHz to 18 GHz	4063.5	-52.284	-31.1	Pass
	18 GHz to 27 GHz	26154.9	-52.671	-31.1	Pass
20 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-74.866	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.654	-51.1	Pass
	20 MHz to 4 GHz	3991.5	-38.717	-31.1	Pass
	4 GHz to 18 GHz	4033.6	-52.061	-31.1	Pass
	18 GHz to 27 GHz	26130.15	-52.448	-31.1	Pass
30 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.009	-77.005	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.849	-51.1	Pass
	20 MHz to 4 GHz	3989.1	-38.725	-31.1	Pass
	4 GHz to 18 GHz	4035	-52.22	-31.1	Pass
	18 GHz to 27 GHz	26047.35	-52.453	-31.1	Pass
40 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-75.025	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.042	-51.1	Pass
	20 MHz to 4 GHz	3989.6	-38.751	-31.1	Pass
	4 GHz to 18 GHz	4021.9	-52.255	-31.1	Pass
	18 GHz to 27 GHz	26098.65	-52.426	-31.1	Pass
50 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-74.969	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.828	-51.1	Pass
	20 MHz to 4 GHz	3987.1	-38.674	-31.1	Pass
	4 GHz to 18 GHz	4038.7	-51.951	-31.1	Pass
	18 GHz to 27 GHz	26145	-52.462	-31.1	Pass
60 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.009	-76.481	-61.1	Pass
	150 kHz to 20 MHz	0.15	-78.043	-51.1	Pass
	20 MHz to 4 GHz	3994	-38.692	-31.1	Pass
	4 GHz to 18 GHz	4011.7	-51.942	-31.1	Pass
	18 GHz to 27 GHz	26100.45	-52.558	-31.1	Pass

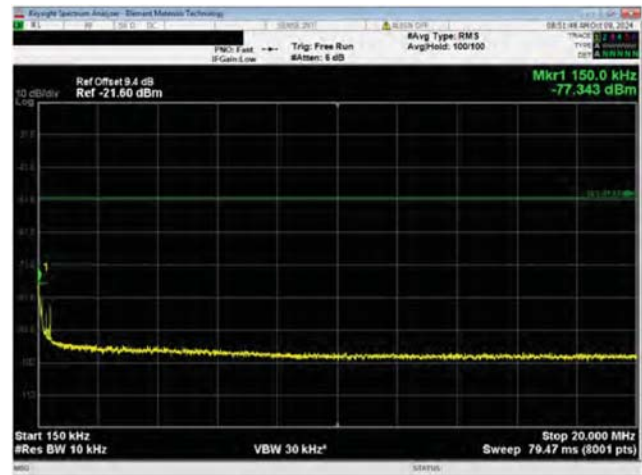
SPURIOUS CONDUCTED EMISSIONS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
70 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.009	-76.223	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.032	-51.1	Pass
	20 MHz to 4 GHz	3991.5	-38.688	-31.1	Pass
	4 GHz to 18 GHz	4015.4	-52.388	-31.1	Pass
	18 GHz to 27 GHz	26100.9	-52.514	-31.1	Pass
80 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-75.038	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.15	-51.1	Pass
	20 MHz to 4 GHz	3988.1	-38.91	-31.1	Pass
	4 GHz to 18 GHz	4009.8	-52.246	-31.1	Pass
	18 GHz to 27 GHz	26137.8	-52.657	-31.1	Pass
90 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-74.947	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.342	-51.1	Pass
	20 MHz to 4 GHz	3985.6	-38.895	-31.1	Pass
	4 GHz to 18 GHz	4012.6	-51.866	-31.1	Pass
	18 GHz to 27 GHz	26104.5	-52.587	-31.1	Pass
100 MHz Channel Bandwidth					
QPSK Modulation					
Mid Channel, 2592.99 MHz	9 kHz to 150 kHz	0.139	-74.203	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.637	-51.1	Pass
	20 MHz to 4 GHz	3987.1	-38.829	-31.1	Pass
	4 GHz to 18 GHz	4010.7	-52.105	-31.1	Pass
	18 GHz to 27 GHz	26092.35	-52.644	-31.1	Pass

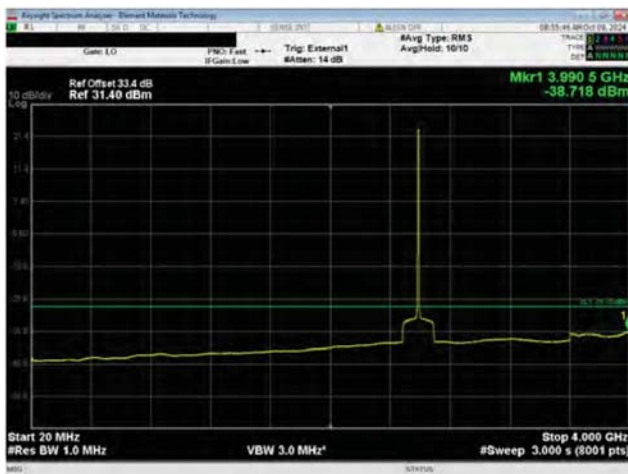
SPURIOUS CONDUCTED EMISSIONS



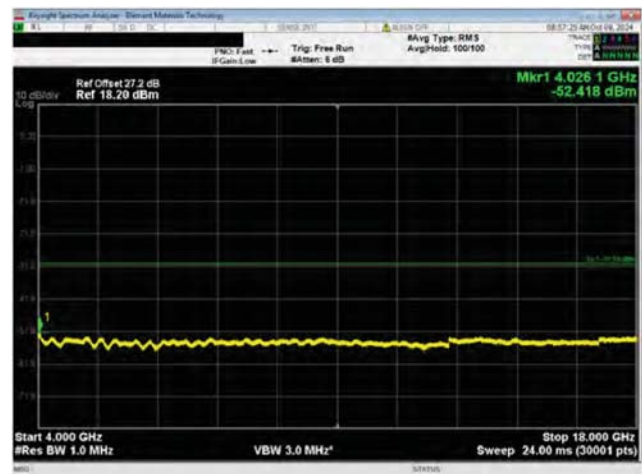
Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz



Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz



Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

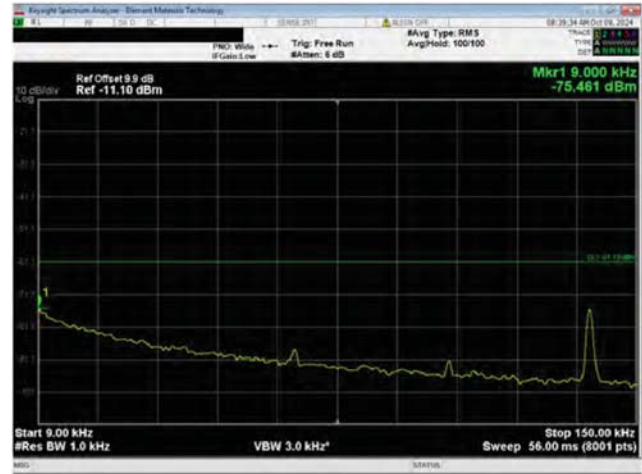


Port 1
10 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

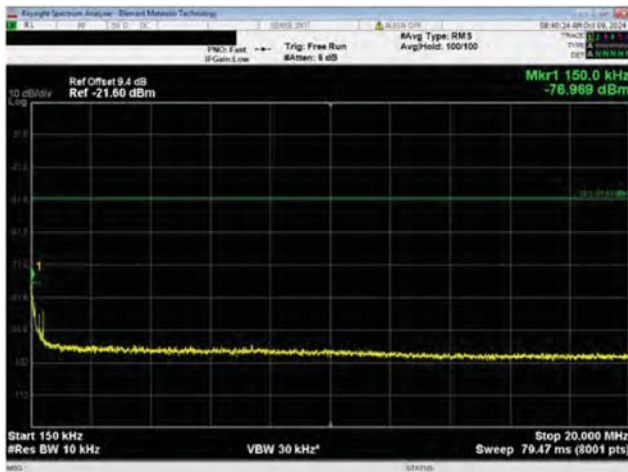
SPURIOUS CONDUCTED EMISSIONS



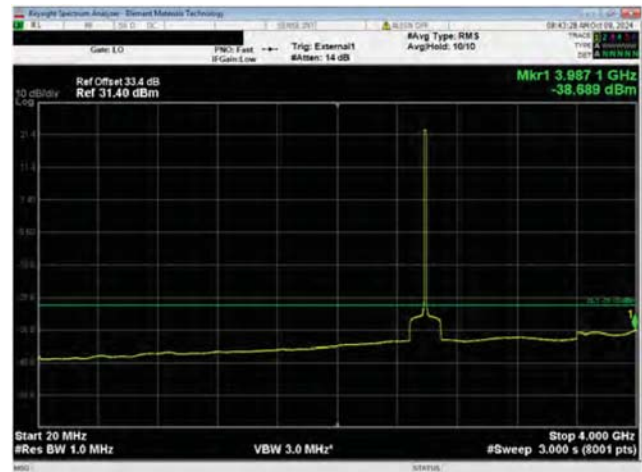
Port 1
 10 MHz Channel Bandwidth
 QPSK Modulation
 Mid Channel, 2592.99 MHz
 18 GHz to 27 GHz



Port 1
 15 MHz Channel Bandwidth
 QPSK Modulation
 Mid Channel, 2592.99 MHz
 9 kHz to 150 kHz

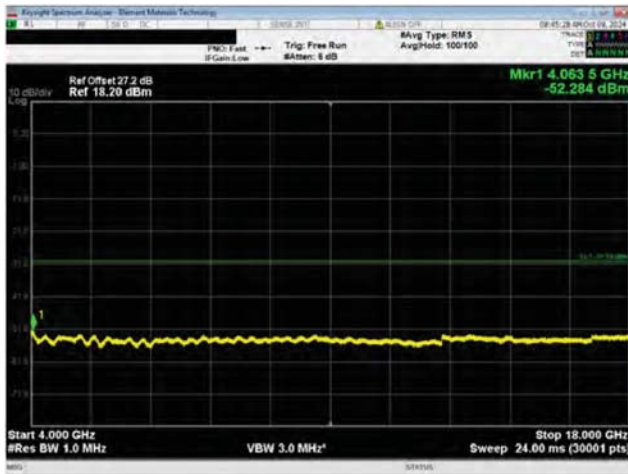


Port 1
 15 MHz Channel Bandwidth
 QPSK Modulation
 Mid Channel, 2592.99 MHz
 150 kHz to 20 MHz

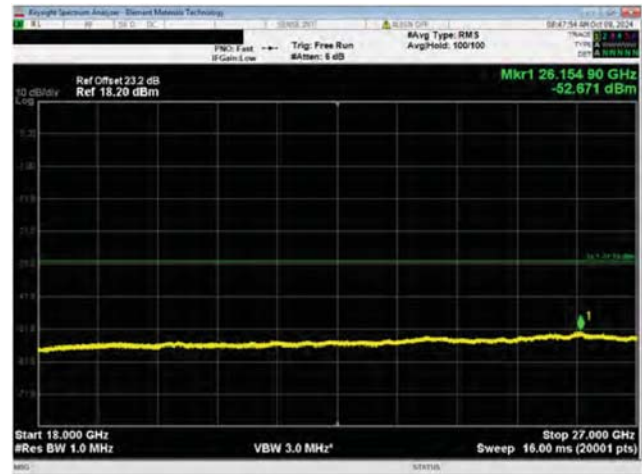


Port 1
 15 MHz Channel Bandwidth
 QPSK Modulation
 Mid Channel, 2592.99 MHz
 20 MHz to 4 GHz

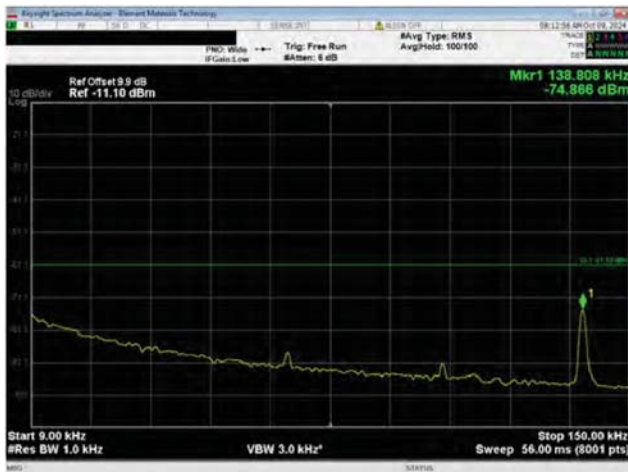
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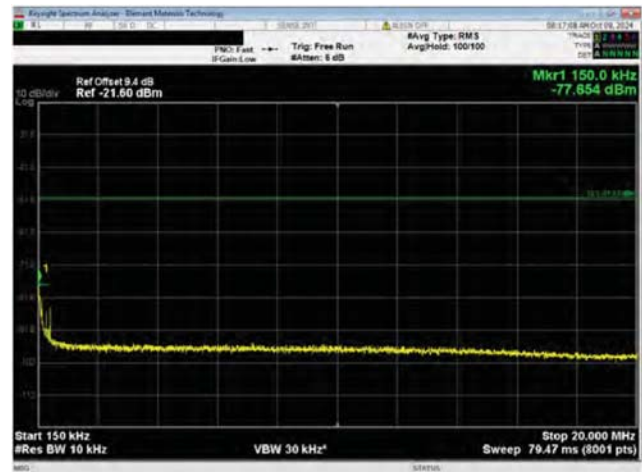
Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz



Port 1
15 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

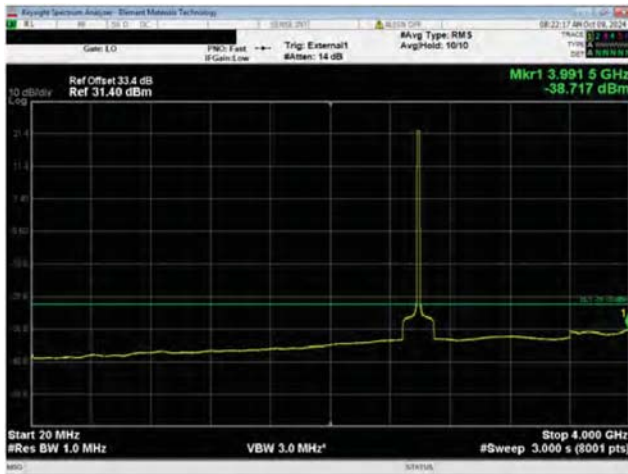


Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

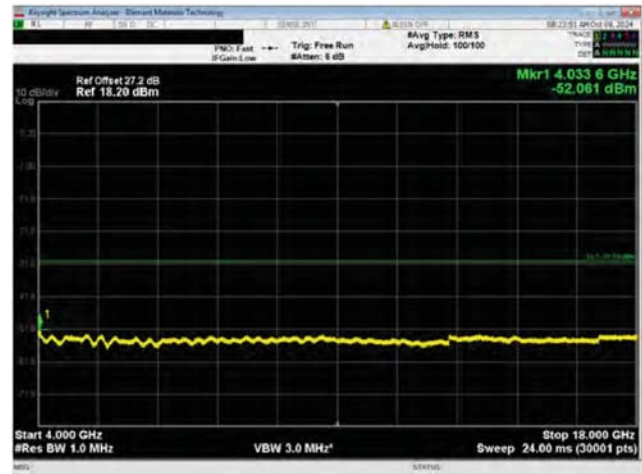


Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz

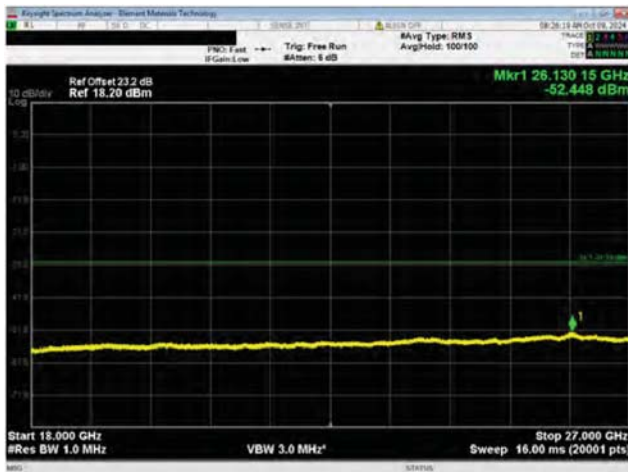
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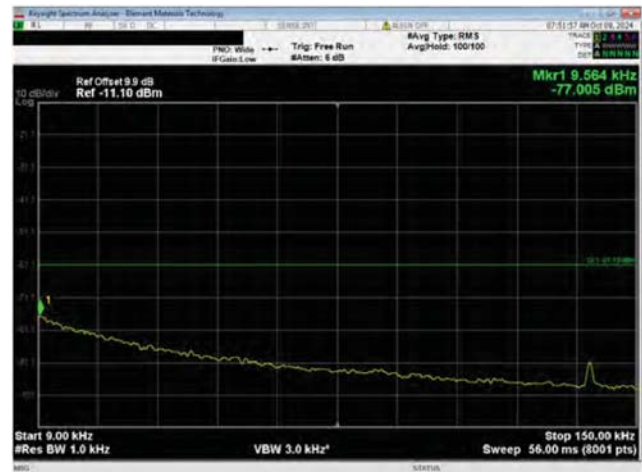
Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz



Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

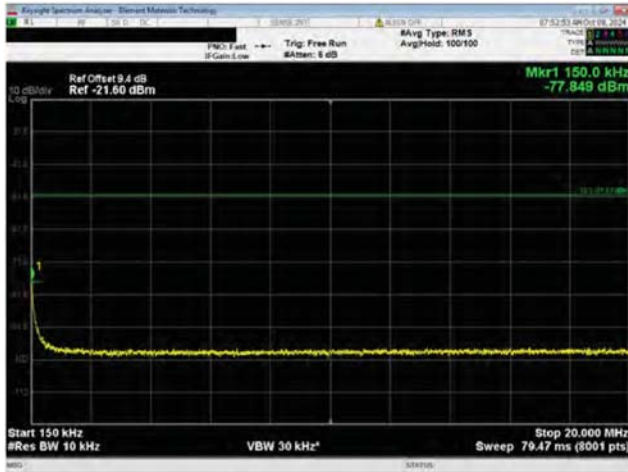


Port 1
20 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

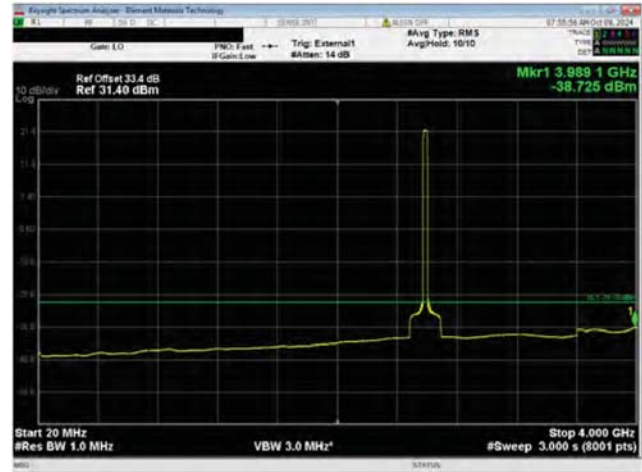


Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

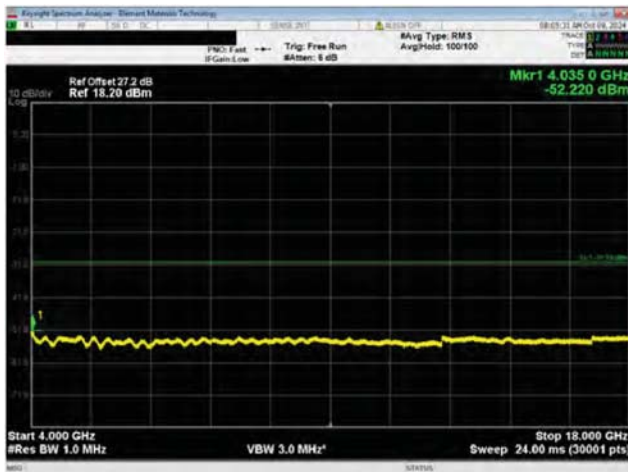
SPURIOUS CONDUCTED EMISSIONS



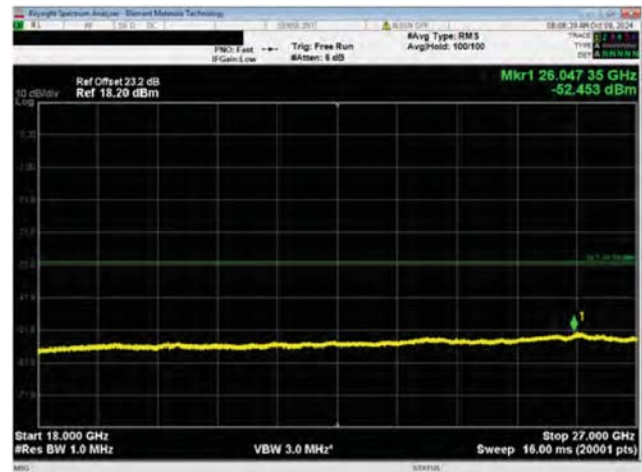
Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz



Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

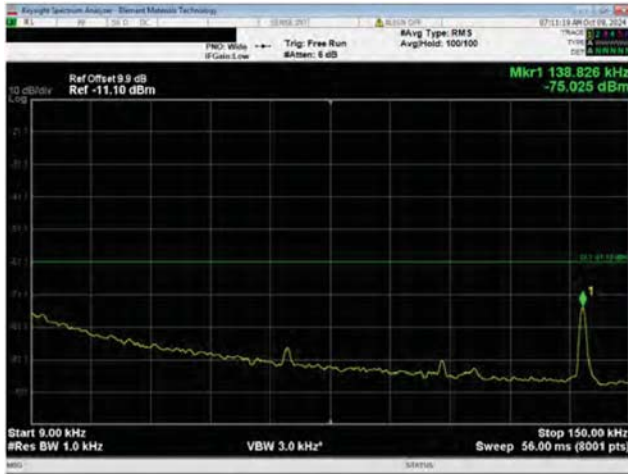


Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

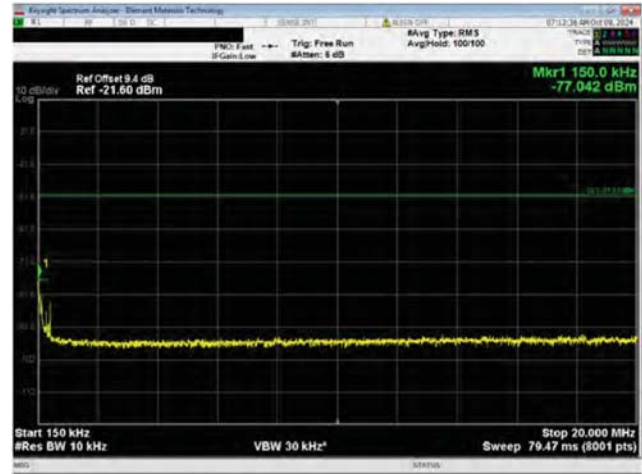


Port 1
30 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

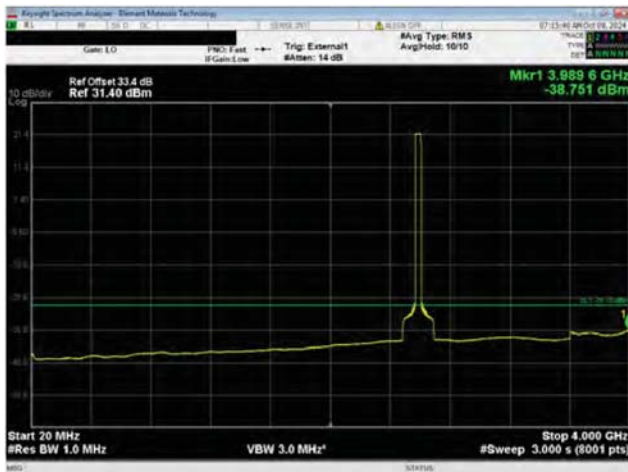
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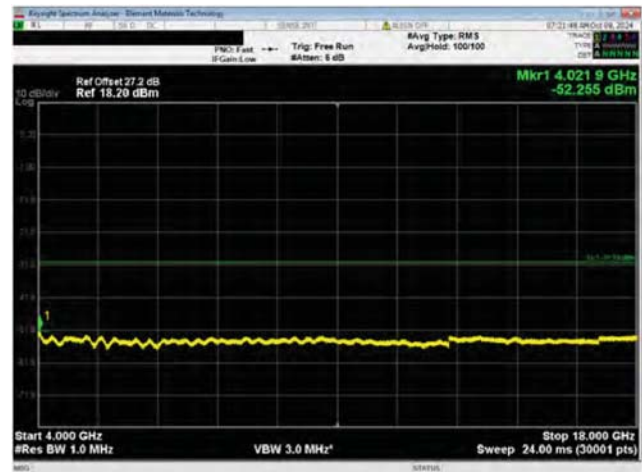
Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz



Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz

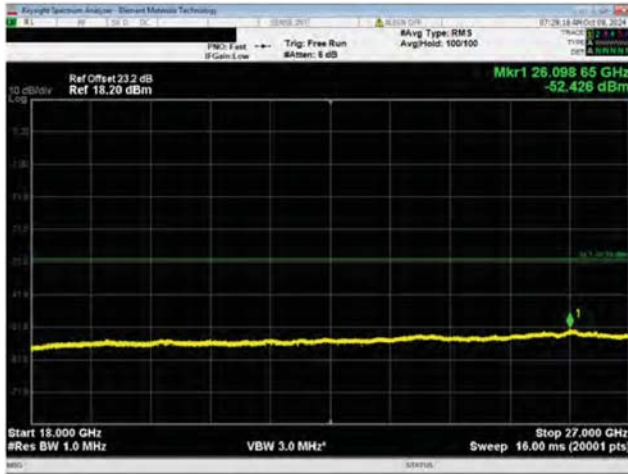


Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz



Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

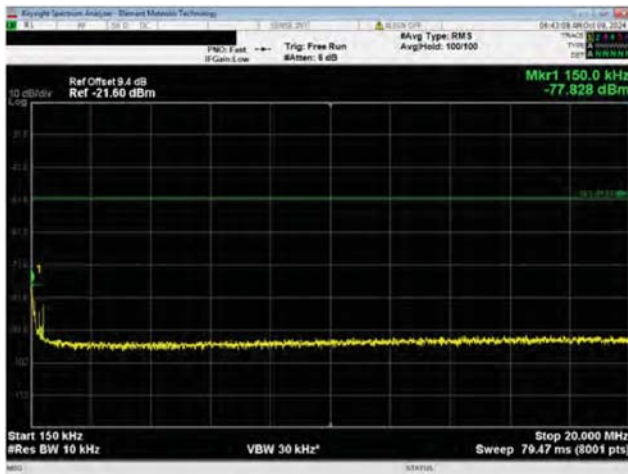
SPURIOUS CONDUCTED EMISSIONS



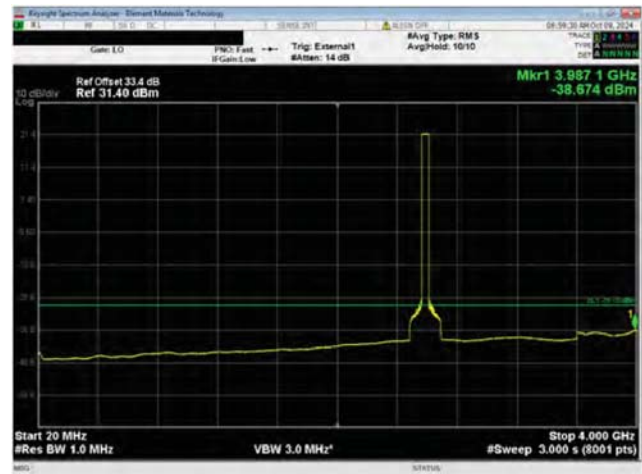
Port 1
40 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz



Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

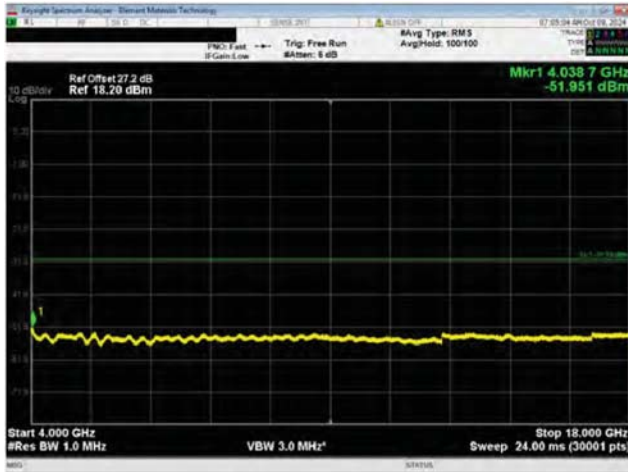


Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz



Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

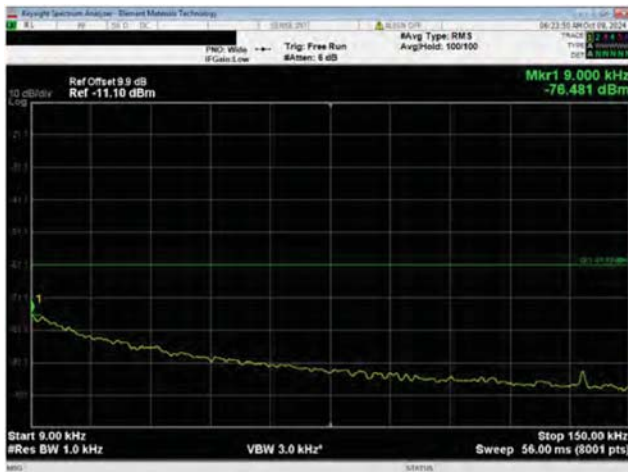
SPURIOUS CONDUCTED EMISSIONS



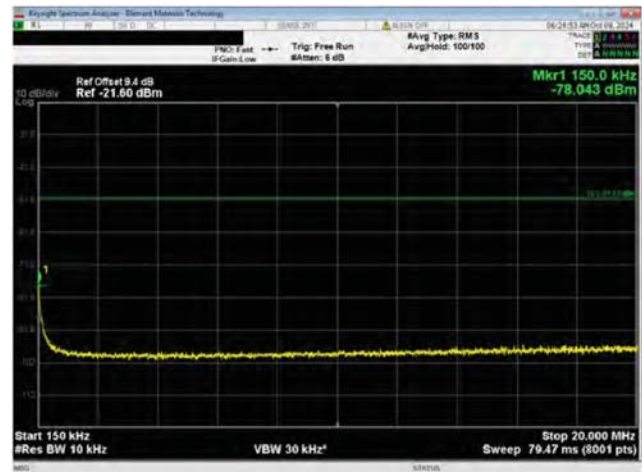
Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz



Port 1
50 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

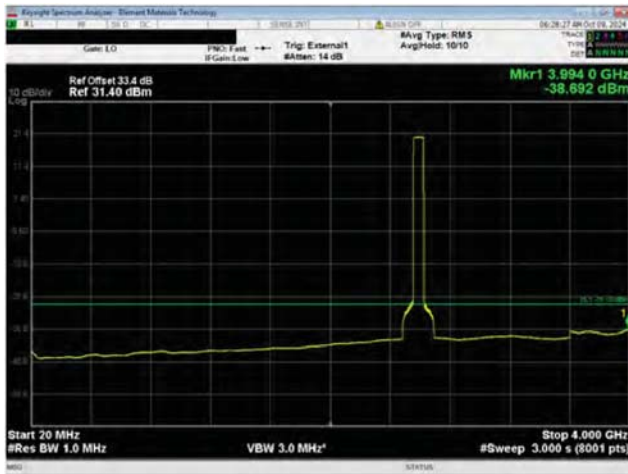


Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

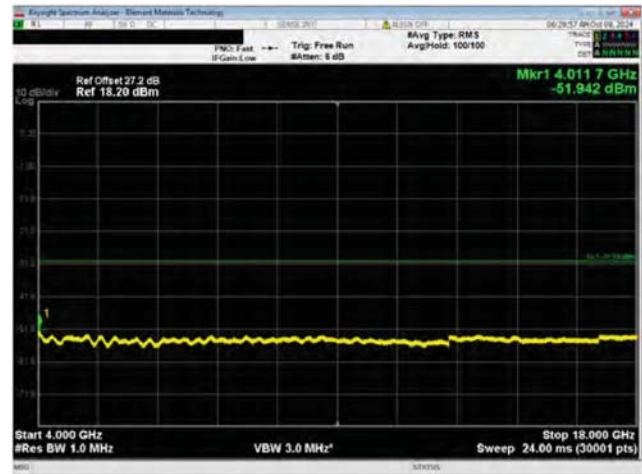


Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz

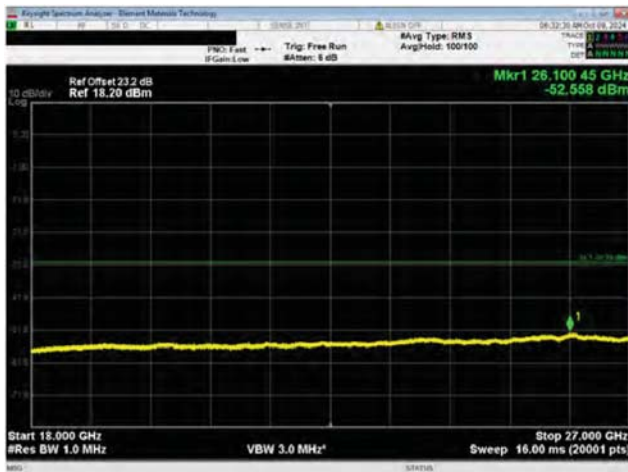
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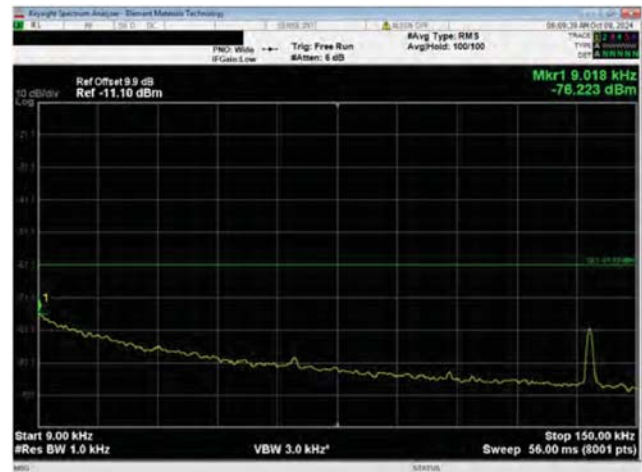
Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz



Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

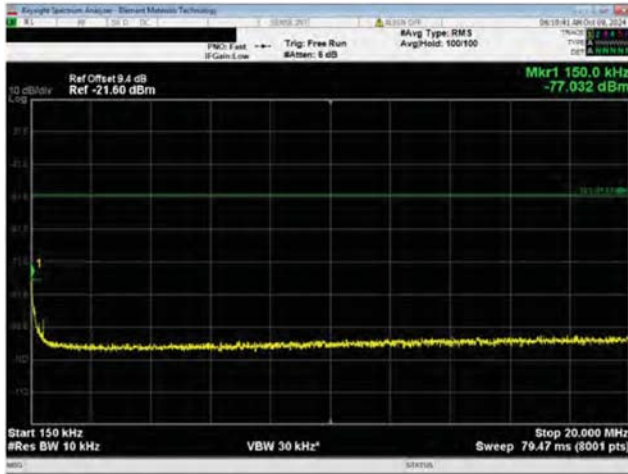


Port 1
60 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

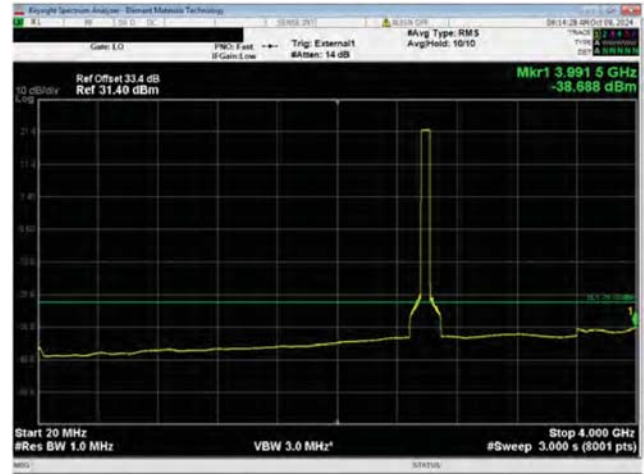


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

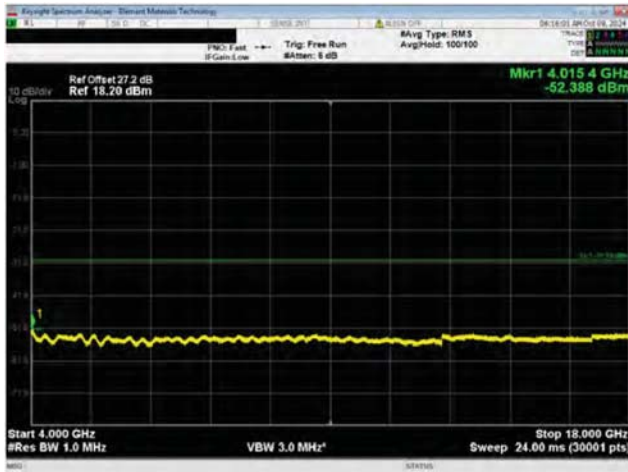
SPURIOUS CONDUCTED EMISSIONS



Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz



Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

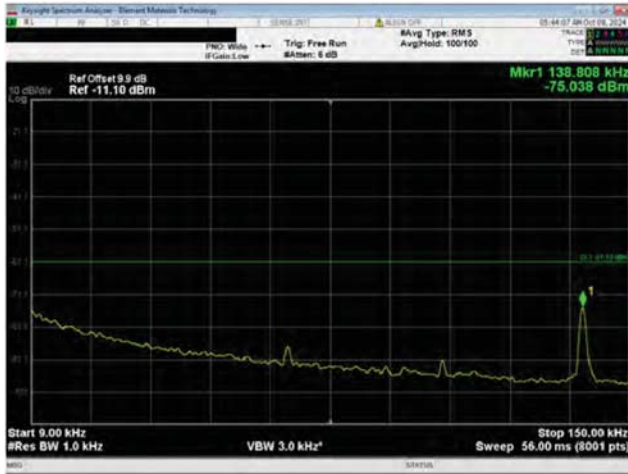


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

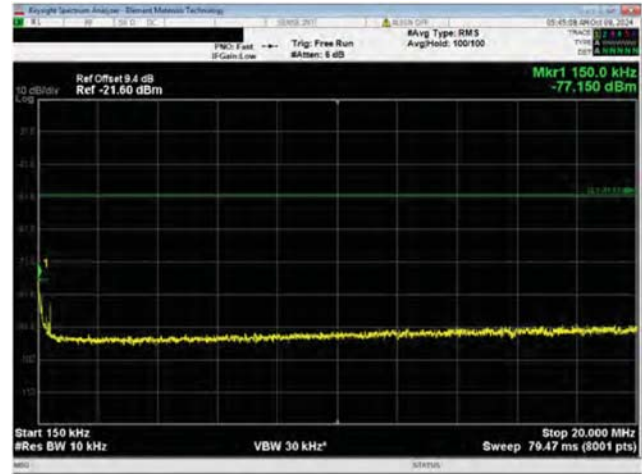


Port 1
70 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

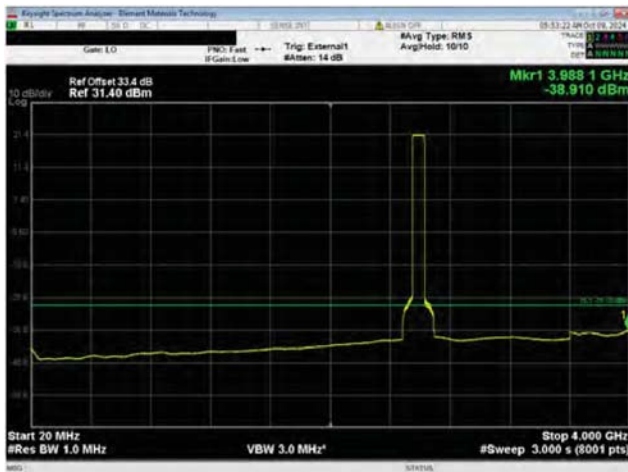
SPURIOUS CONDUCTED EMISSIONS



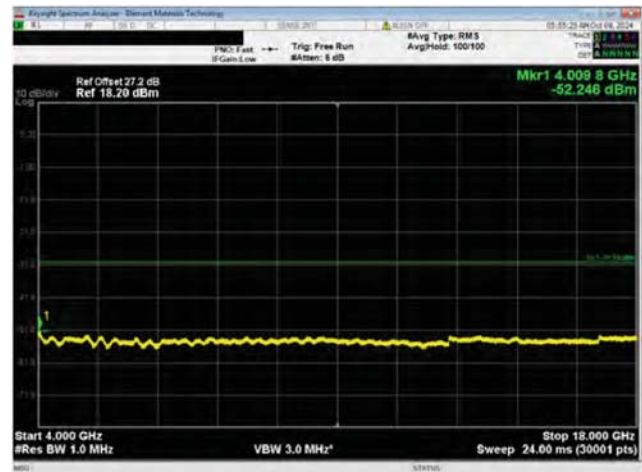
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz



Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz



Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

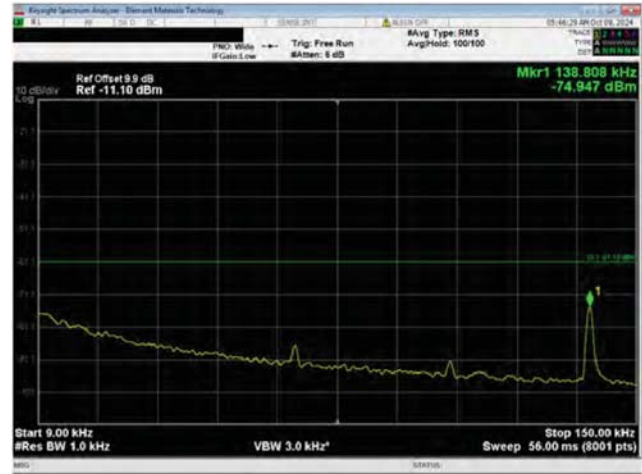


Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz

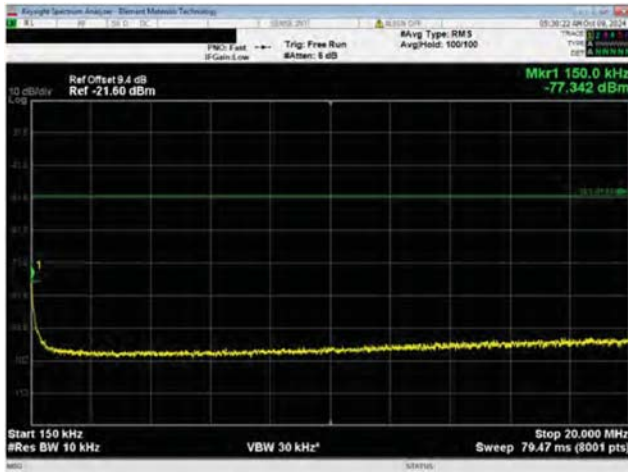
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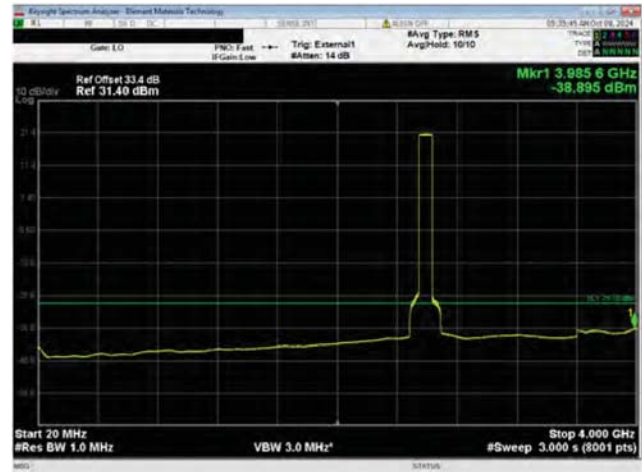
Port 1
80 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

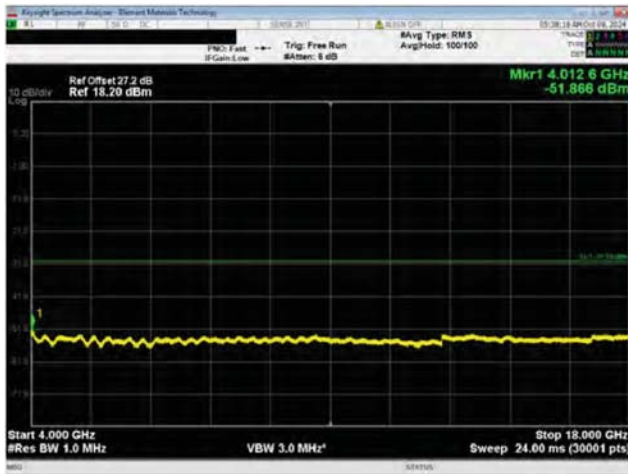


Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz

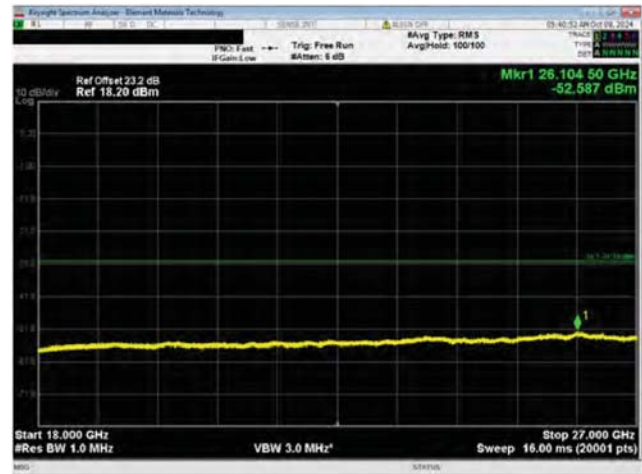


Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz

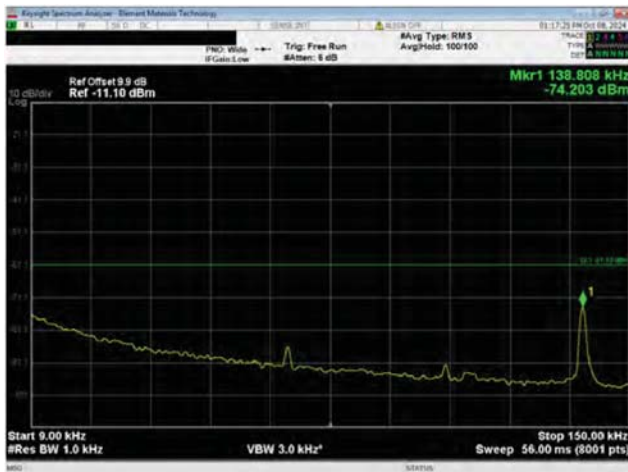
SPURIOUS CONDUCTED EMISSIONS



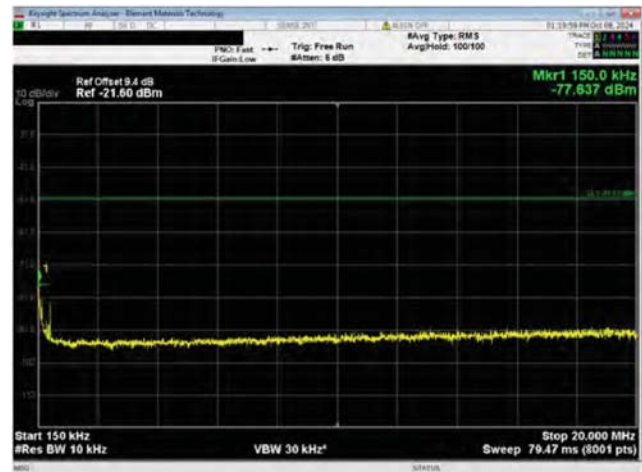
Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz



Port 1
90 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

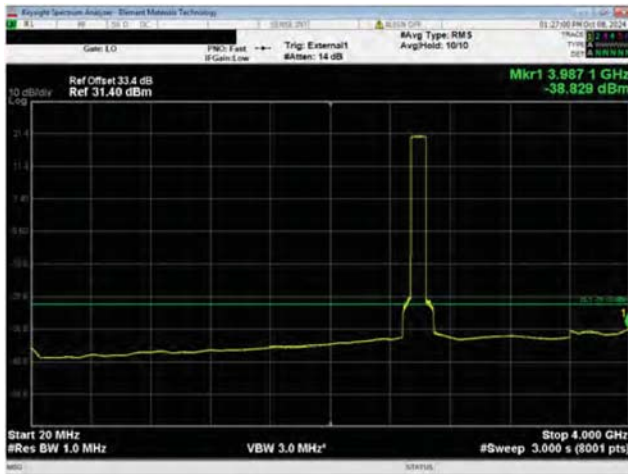


Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
9 kHz to 150 kHz

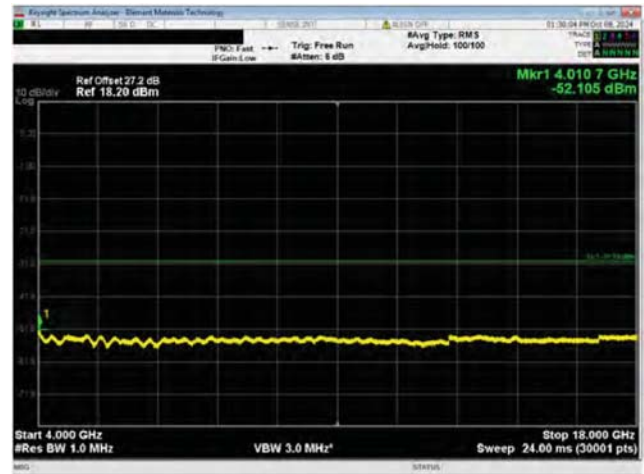


Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
150 kHz to 20 MHz

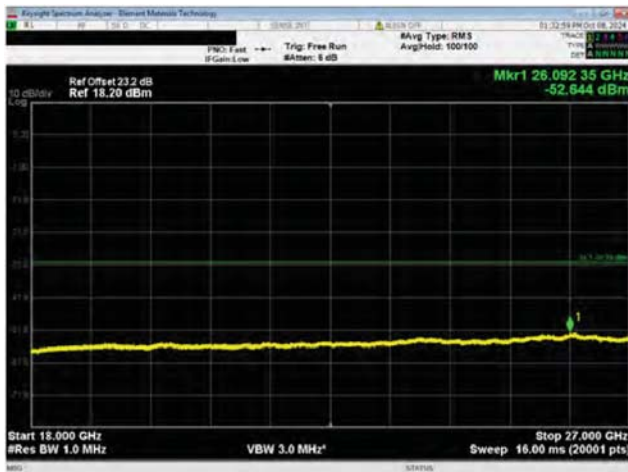
SPURIOUS CONDUCTED EMISSIONS



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
20 MHz to 4 GHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
4 GHz to 18 GHz



Port 1
100 MHz Channel Bandwidth
QPSK Modulation
Mid Channel, 2592.99 MHz
18 GHz to 27 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



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 for each Multicarrier test case from 9 kHz to 27 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 Airscale Base Transceiver Station Radio Unit Model AVHA 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) for 5G NR. 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 27 GHz ($2685 \text{ MHz} \times 10$) for the n41 frequency Band.

Per section 27.53(m)(2), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The AVHA AirScale MAA operates as a 64 port MIMO transmitter. The limit is adjusted to -31.1 dBm $[-13 \text{ dBm} - 10 \log(64)]$ 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 limit for the 9kHz to 150kHz frequency range was adjusted to -61.1dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 1MHz [i.e.: $-61.1 \text{ dBm} = -31.1 \text{ dBm} - 10 \log(1 \text{ MHz} / 1 \text{ kHz})$]. The limit for the 150kHz to 20MHz frequency range was adjusted to -51.1dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 1MHz [i.e.: $-51.1 \text{ dBm} = -31.1 \text{ dBm} - 10 \log(1 \text{ MHz} / 10 \text{ kHz})$]. The required limit of -31.1dBm with a RBW of > 1MHz was used for all other frequency ranges.

Multicarrier test cases have been developed as shown below:

- a) *Multicarrier Test Case 1:* Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the lower band edge (2501.01MHz, 2511.0MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power [31dBm] (80W/carrier) with a total radio power of 160 watts.
- b) *Multicarrier Test Case 2:* Two contiguous NR10 carriers with minimum spacing between carrier frequencies at the upper band edge (2674.98MHz, 2685.00MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power [31dBm] (80W/carrier) with a total radio power of 160 watts.
- c) *Multicarrier Test Case 3:* Two non-contiguous NR10 Carriers at maximum power with one carrier (2501.01MHz) at the bottom channel and one carrier (2685.00MHz) at the top channel. The carrier power for both NR10 is set to [31dBm] (80W/carrier). The total radio power is 160 watts.

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

- d) *Multicarrier Test Case 4:* Two Non-contiguous carriers with one NR100 Carrier (2546.01MHz) at the bottom channel and one NR90 Carrier (2644.98MHz) at the top channel (maximum spacing between carriers). All carriers at the same power level (200W/carrier), (34.8dBm/port). The total radio power is 400 watts.
- e) *Multicarrier Test Case 5:* Two Non-contiguous carriers with one NR90 Carrier (2541MHz) at the bottom channel and one NR100 Carrier (2640MHz) at the top channel (maximum spacing between carriers). All carriers at the same power level (200W/carrier). The total radio power is 400 watts.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3379	AMM	2024-08-15	2025-08-15
Block - DC	Fairview Microwave	SD3235	ANI	2024-02-14	2025-02-14

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-08
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	41.9%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrold Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

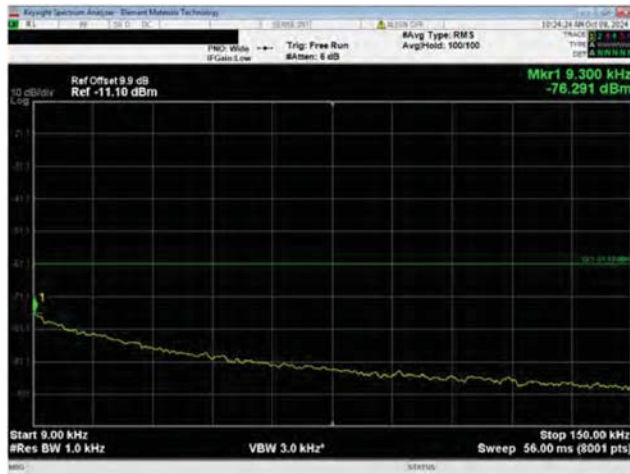
TEST RESULTS

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
QPSK Modulation					
Multicarrier Test Case 1					
NR10, Low Channel, 2501.01 MHz and NR10, Low Channel, 2511.00 MHz	9 kHz to 150 kHz	0.009	-76.291	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.266	-51.1	Pass
	20 MHz to 4 GHz	3991.5	-38.704	-31.1	Pass
	4 GHz to 18 GHz	4010.3	-52.366	-31.1	Pass
	18 GHz to 27 GHz	26104.05	-52.508	-31.1	Pass
Multicarrier Test Case 2					
NR10, High Channel, 2674.98 MHz and NR10, High Channel, 2685.00 MHz	9 kHz to 150 kHz	0.01	-76.673	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.997	-51.1	Pass
	20 MHz to 4 GHz	4000	-38.735	-31.1	Pass
	4 GHz to 18 GHz	4021	-52.261	-31.1	Pass
	18 GHz to 27 GHz	26125.2	-52.501	-31.1	Pass
Multicarrier Test Case 3					
NR10, Low Channel, 2501.01 MHz and NR10, High Channel, 2685.00 MHz	9 kHz to 150 kHz	0.139	-74.57	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.274	-51.1	Pass
	20 MHz to 4 GHz	3990.5	-38.756	-31.1	Pass
	4 GHz to 18 GHz	4010.7	-52.348	-31.1	Pass
	18 GHz to 27 GHz	26079.75	-52.656	-31.1	Pass
Multicarrier Test Case 4					
NR100, Low Channel, 2546.01 MHz and NR90, High Channel, 2644.98 MHz	9 kHz to 150 kHz	0.009	-76.801	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.537	-51.1	Pass
	20 MHz to 4 GHz	3995.5	-38.584	-31.1	Pass
	4 GHz to 18 GHz	4000	-52.232	-31.1	Pass

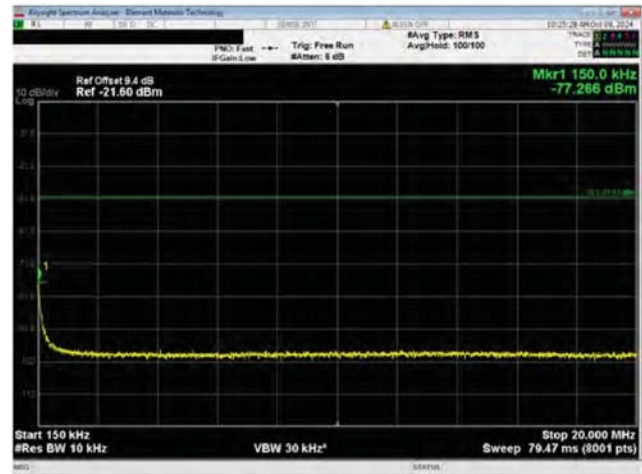
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
	18 GHz to 27 GHz	26122.95	-52.62	-31.1	Pass
Multicarrier Test Case 5					
NR90, Low Channel, 2541.00 MHz and NR100, High Channel, 2640.00 MHz	9 kHz to 150 kHz	0.139	-73.829	-61.1	Pass
	150 kHz to 20 MHz	0.15	-77.567	-51.1	Pass
	20 MHz to 4 GHz	3999.5	-38.649	-31.1	Pass
	4 GHz to 18 GHz	4007.9	-52.186	-31.1	Pass
	18 GHz to 27 GHz	26092.35	-52.347	-31.1	Pass

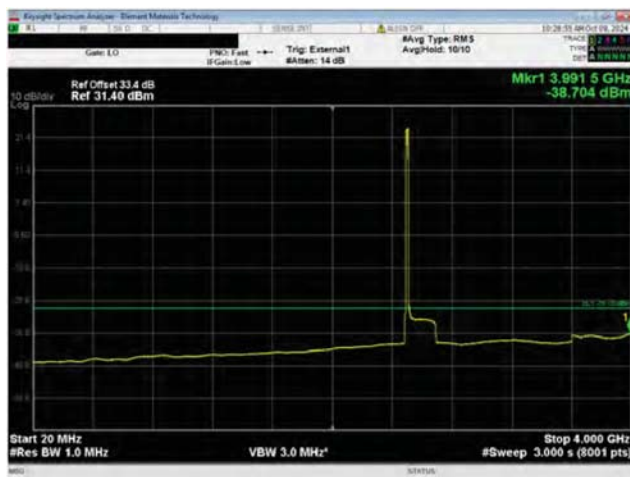
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



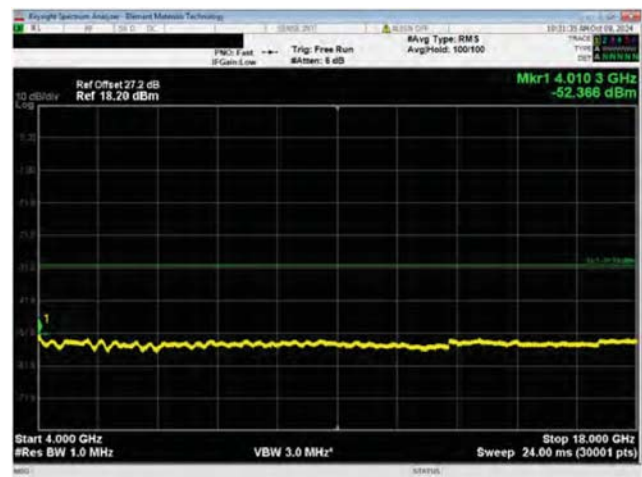
Port 1
QPSK Modulation
Multicarrier Test Case 1
9 kHz to 150 kHz



Port 1
QPSK Modulation
Multicarrier Test Case 1
150 kHz to 20 MHz

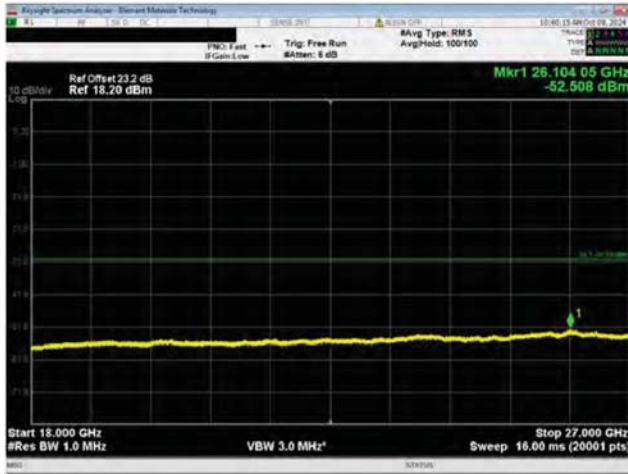


Port 1
QPSK Modulation
Multicarrier Test Case 1
20 MHz to 4 GHz

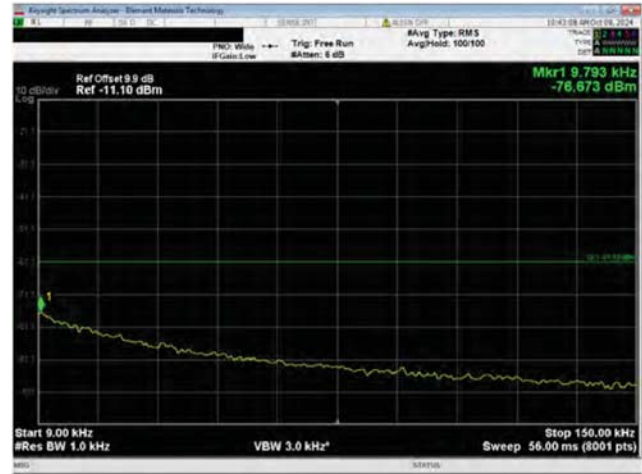


Port 1
QPSK Modulation
Multicarrier Test Case 1
4 GHz to 18 GHz

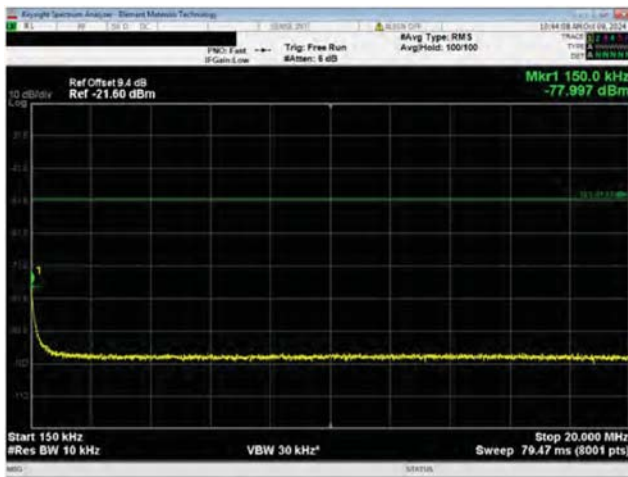
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



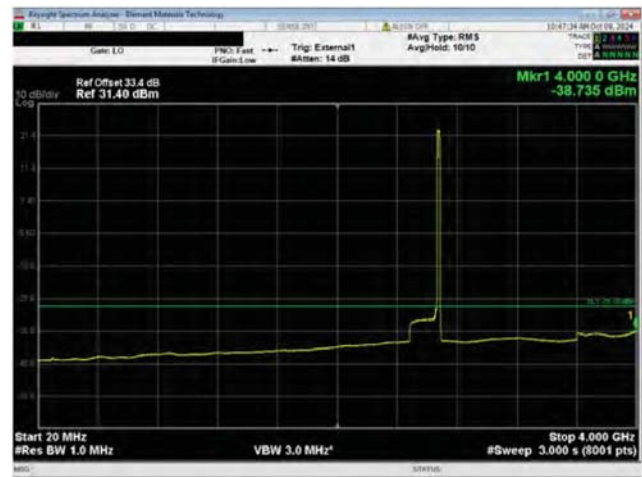
Port 1
QPSK Modulation
Multicarrier Test Case 1
18 GHz to 27 GHz



Port 1
QPSK Modulation
Multicarrier Test Case 2
9 kHz to 150 kHz

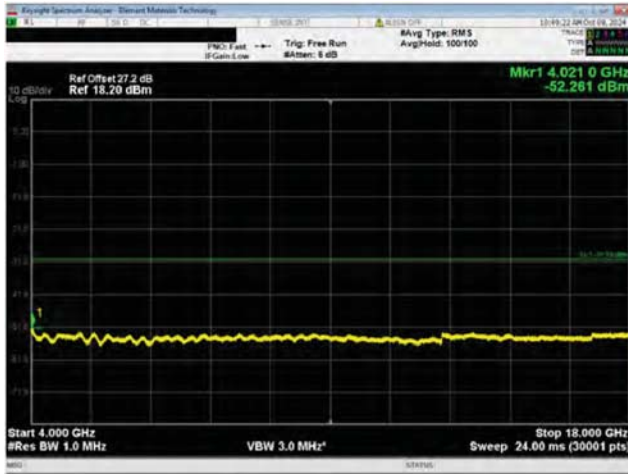


Port 1
QPSK Modulation
Multicarrier Test Case 2
150 kHz to 20 MHz

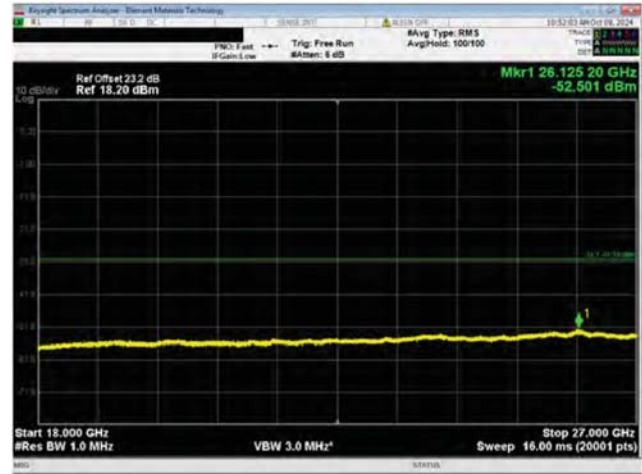


Port 1
QPSK Modulation
Multicarrier Test Case 2
20 MHz to 4 GHz

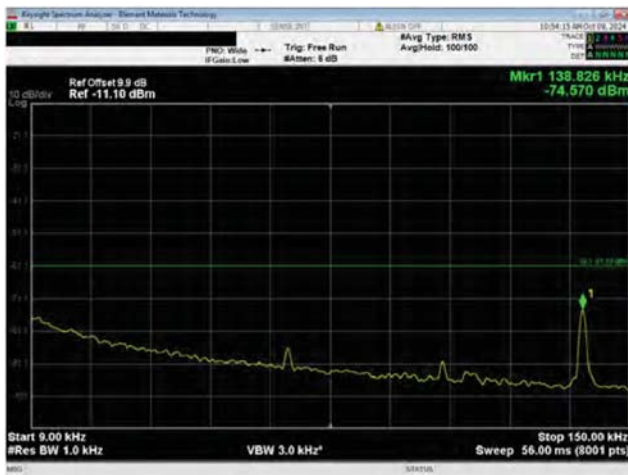
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



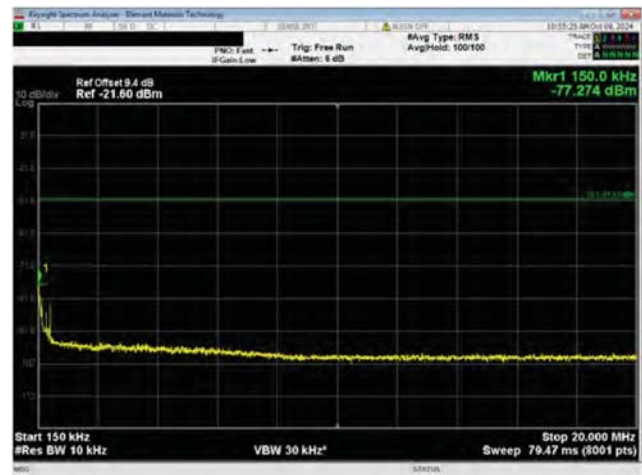
Port 1
QPSK Modulation
Multicarrier Test Case 2
4 GHz to 18 GHz



Port 1
QPSK Modulation
Multicarrier Test Case 2
18 GHz to 27 GHz

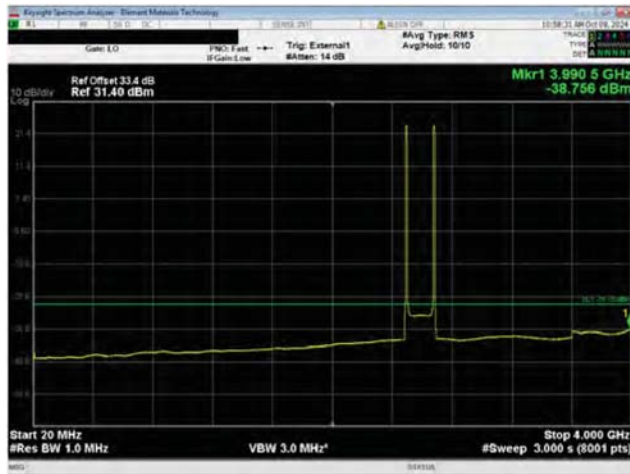


Port 1
QPSK Modulation
Multicarrier Test Case 3
9 kHz to 150 kHz

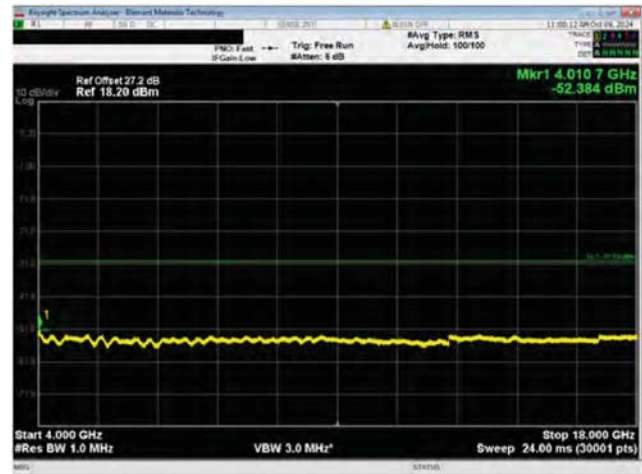


Port 1
QPSK Modulation
Multicarrier Test Case 3
150 kHz to 20 MHz

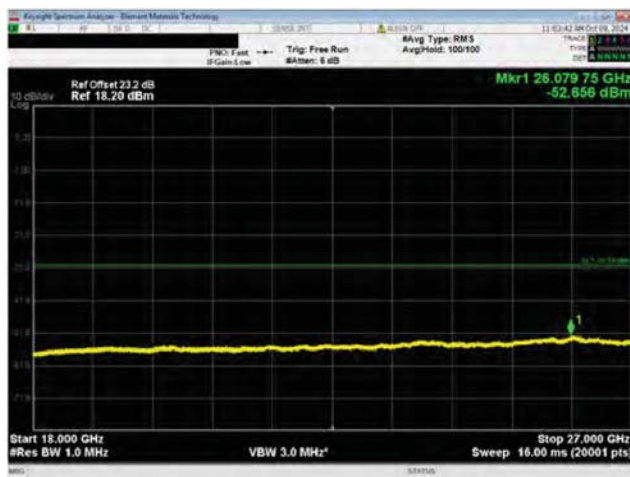
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



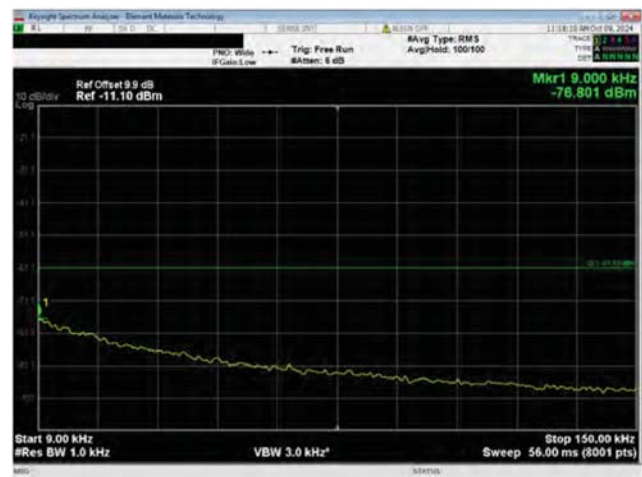
Port 1
QPSK Modulation
Multicarrier Test Case 3
20 MHz to 4 GHz



Port 1
QPSK Modulation
Multicarrier Test Case 3
4 GHz to 18 GHz

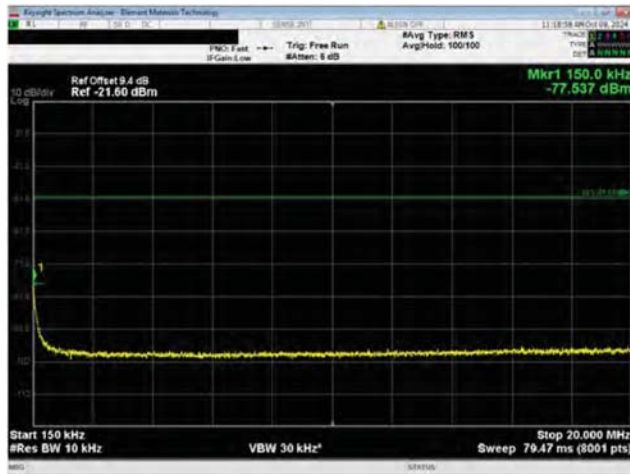


Port 1
QPSK Modulation
Multicarrier Test Case 3
18 GHz to 27 GHz

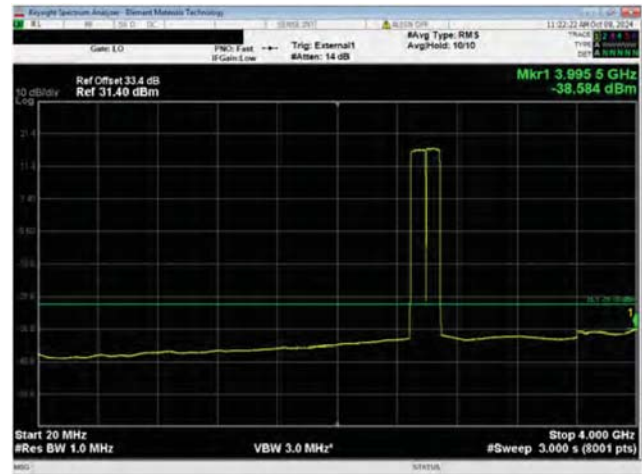


Port 1
QPSK Modulation
Multicarrier Test Case 4
9 kHz to 150 kHz

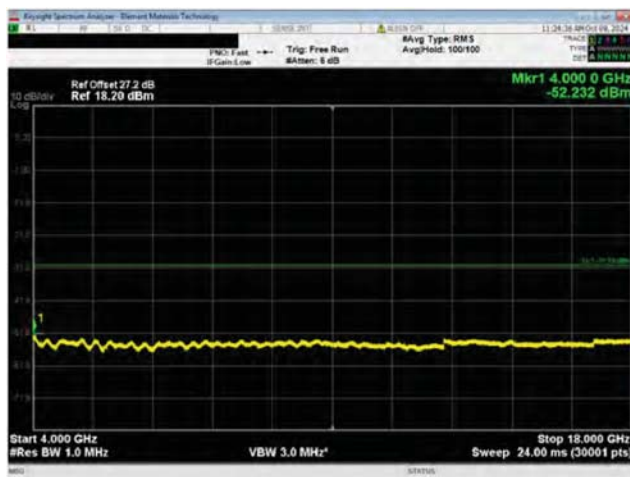
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



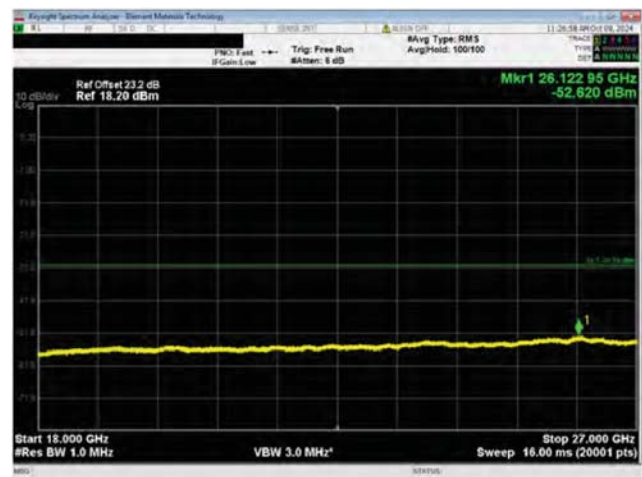
Port 1
QPSK Modulation
Multicarrier Test Case 4
150 kHz to 20 MHz



Port 1
QPSK Modulation
Multicarrier Test Case 4
20 MHz to 4 GHz

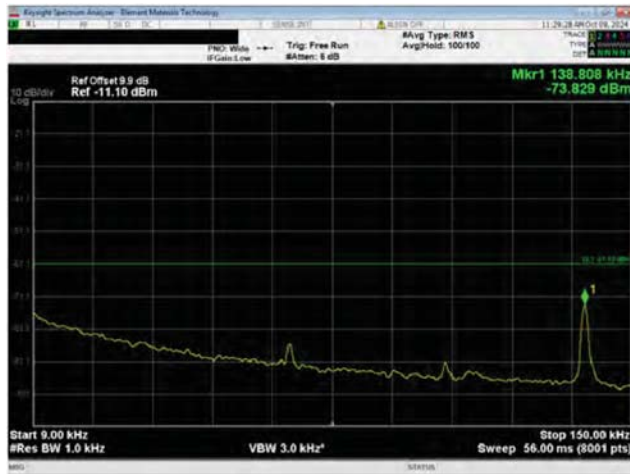


Port 1
QPSK Modulation
Multicarrier Test Case 4
4 GHz to 18 GHz

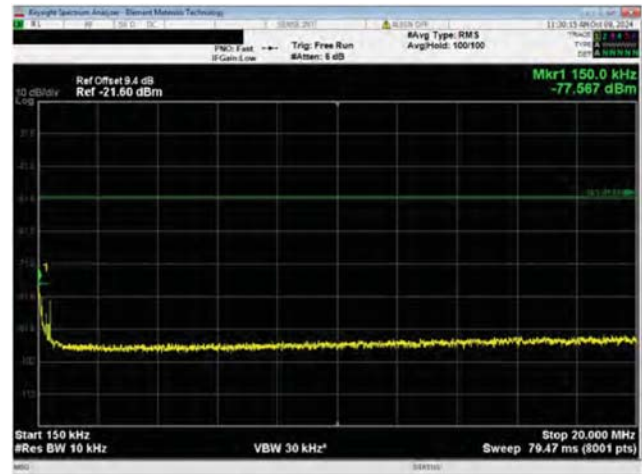


Port 1
QPSK Modulation
Multicarrier Test Case 4
18 GHz to 27 GHz

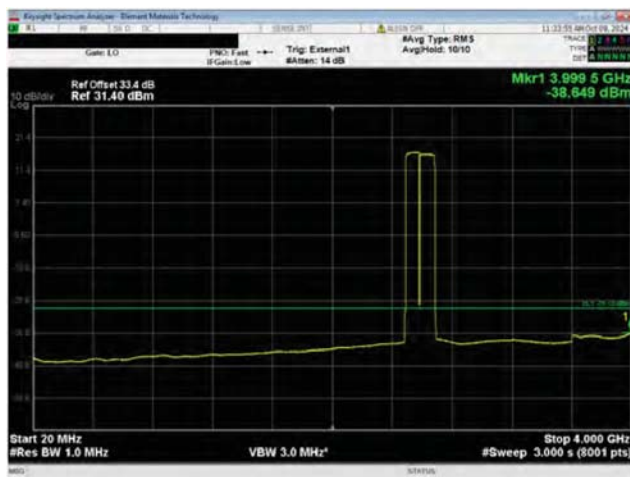
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



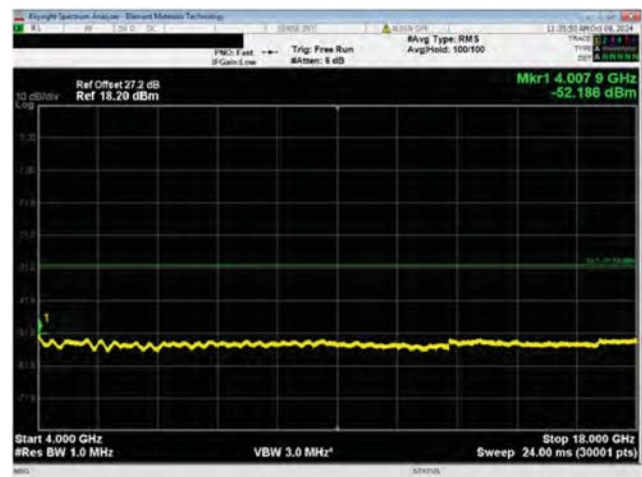
Port 1
QPSK Modulation
Multicarrier Test Case 5
9 kHz to 150 kHz



Port 1
QPSK Modulation
Multicarrier Test Case 5
150 kHz to 20 MHz

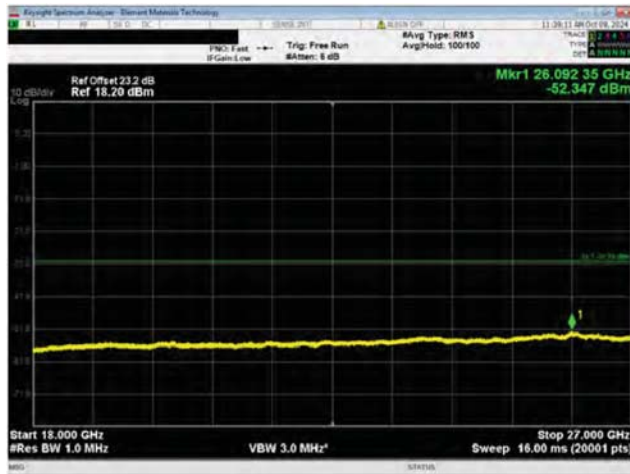


Port 1
QPSK Modulation
Multicarrier Test Case 5
20 MHz to 4 GHz



Port 1
QPSK Modulation
Multicarrier Test Case 5
4 GHz to 18 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER



Port 1
QPSK Modulation
Multicarrier Test Case 5
18 GHz to 27 GHz

SPURIOUS RADIATED EMISSIONS

TEST DESCRIPTION

The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. A reference preview scan (pre-scan) is included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

The test setups and measurement methods are detailed in KDB971168 D01v03 sections 6 & 7 and ANSI C63.26-2015. 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 27 GHz (2685 MHz * 10) for the AVHA n41 Band. The radiated emissions limits are defined in FCC 27.53(m)(2).

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2024-04-12	2025-04-12
Antenna - Double Ridge	ETS Lindgren	3115	AJN	2024-09-27	2026-09-27
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	2024-03-19	2025-03-19
Cable	Element	None	TXM	2024-07-09	2025-07-09
Antenna - Standard Gain	ETS Lindgren	3160-07	AJF	NCR	NCR
Antenna - Standard Gain	ETS Lindgren	3160-08	AJG	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	2024-08-29	2025-08-29
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	2024-08-29	2025-08-29
Cable	Element	None	TXO	2024-07-09	2025-07-09
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	2024-09-17	2026-09-17
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	2024-08-30	2025-08-30
Cable	Northwest EMC	18-40GHz	TXE	2024-08-30	2025-08-30
Antenna - Biconilog	ETS Lindgren	3143B	AYF	2023-05-03	2025-05-03
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	2024-03-19	2025-03-19
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	2024-07-23	2025-07-23
Attenuator	Weinschel Corp	4H-20	AWB	2024-02-10	2025-02-10
Filter - High Pass	Micro-Tronics	HPM50111	HGC	2024-02-10	2025-02-10

FREQUENCY RANGE INVESTIGATED

30 MHz TO 27 GHz

POWER INVESTIGATED

54VDC

CONFIGURATIONS INVESTIGATED

NOKI0079-5

SPURIOUS RADIATED EMISSIONS

MODES INVESTIGATED

Test Configuration 1 - Multimode SFP - Low Channel (2501.01 MHz, NR10, QPSK) and Mid Channel (2511.00 MHz, NR10, QPSK)

Test Configuration 2 - Multimode SFP - Mid Channel (2674.98 MHz, NR10, QPSK) and High Channel (2685.00 MHz, NR10, QPSK)

Test Configuration 3 - Multimode SFP - Low Channel (2501.01 MHz, NR10, QPSK) and High Channel (2685.00 MHz, NR10, QPSK)

Test Configuration 4 - Multimode SFP - Low Channel (2546.01 MHz, NR100, QPSK)

Test Configuration 5 - Single Mode SFP - High Channel (2640.00 MHz, NR100, QPSK)

SPURIOUS RADIATED EMISSIONS

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242100608	Date:	2024-10-16
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattavong, David Le	Relative Humidity:	41.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Jarrold Brenden	Job Site:	PT01
Power:	54VDC	Configuration:	NOKI0079-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 27.53:2024	ANSI C63.26:2015

TEST PARAMETERS

Run #:	1	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

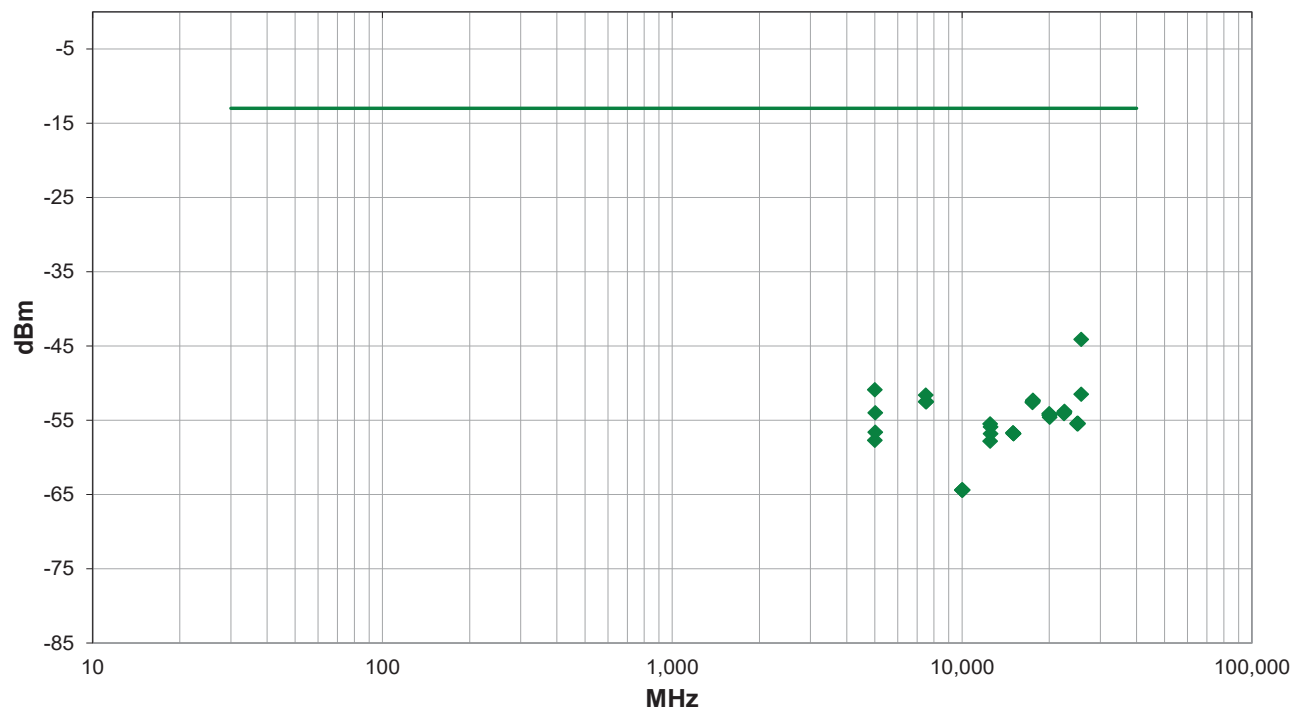
Pole mounted radio. TAB ports routed to 50 ohm terminators. The average emissions were duty cycle corrected up to 100% per the guidance provided in ANSI C63.26:2015 section 5.7.3 (d)(3): $10 \cdot \log(1/\text{Duty Cycle(in dec)})$. The measured duty cycle was seen to be 74% and applied as $10 \cdot \log(1/0.74) = 1.3$ dB upward correction.

EUT OPERATING MODES

Test Configuration 1 - Multimode SFP - Low Channel (2501.01 MHz, NR10, QPSK) and Mid Channel (2511.00 MHz, NR10, QPSK)

DEVIATIONS FROM TEST STANDARD

None



Run #: 1

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #1

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)
25782.000	1.5	344.0	Vert	AV	38.6E-9	-44.1	-13.0	-31.1
5002.020	1.7	0.0	Vert	AV	8.1E-9	-50.9	-13.0	-37.9
25781.000	1.5	311.0	Horz	AV	7.0E-9	-51.5	-13.0	-38.5
7503.030	1.5	346.0	Vert	AV	6.9E-9	-51.6	-13.0	-38.6
17577.000	2.1	230.0	Horz	AV	5.8E-9	-52.3	-13.0	-39.3
17577.000	1.5	137.0	Vert	AV	5.7E-9	-52.4	-13.0	-39.4
7503.030	1.5	132.0	Horz	AV	5.6E-9	-52.5	-13.0	-39.5
7533.000	1.5	46.0	Horz	AV	5.6E-9	-52.5	-13.0	-39.5
7533.000	1.5	223.0	Vert	AV	5.6E-9	-52.5	-13.0	-39.5
17507.070	1.5	42.0	Vert	AV	5.6E-9	-52.5	-13.0	-39.5
17507.070	1.5	235.0	Horz	AV	5.5E-9	-52.6	-13.0	-39.6
22599.000	1.5	136.0	Horz	AV	4.1E-9	-53.8	-13.0	-40.8
22599.000	1.5	3.0	Vert	AV	4.0E-9	-53.9	-13.0	-40.9
5022.000	1.5	36.0	Horz	AV	4.0E-9	-54.0	-13.0	-41.0
22509.090	1.5	241.0	Horz	AV	4.0E-9	-54.0	-13.0	-41.0
22509.090	1.5	334.0	Vert	AV	3.9E-9	-54.1	-13.0	-41.1
20008.080	1.5	96.0	Horz	AV	3.9E-9	-54.1	-13.0	-41.1
20008.080	1.5	269.0	Vert	AV	3.7E-9	-54.3	-13.0	-41.3
20088.000	1.5	120.0	Horz	AV	3.7E-9	-54.3	-13.0	-41.3
20088.000	1.5	325.0	Vert	AV	3.4E-9	-54.6	-13.0	-41.6
25010.100	1.5	163.0	Horz	AV	2.9E-9	-55.4	-13.0	-42.4
25110.000	1.5	121.0	Horz	AV	2.9E-9	-55.4	-13.0	-42.4
12505.050	1.9	30.0	Horz	AV	2.8E-9	-55.5	-13.0	-42.5
25010.100	1.5	323.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5
25110.000	1.5	56.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5
12555.000	1.5	17.0	Horz	AV	2.6E-9	-55.9	-13.0	-42.9
5022.000	1.5	303.0	Vert	AV	2.2E-9	-56.6	-13.0	-43.6
15006.060	1.5	46.0	Horz	AV	2.1E-9	-56.7	-13.0	-43.7
15006.060	1.5	296.0	Vert	AV	2.1E-9	-56.7	-13.0	-43.7
12555.000	1.5	322.0	Vert	AV	2.1E-9	-56.8	-13.0	-43.8
15066.000	1.5	225.0	Horz	AV	2.1E-9	-56.8	-13.0	-43.8
15066.000	1.5	140.0	Vert	AV	2.1E-9	-56.8	-13.0	-43.8
5002.020	1.5	26.0	Horz	AV	1.7E-9	-57.7	-13.0	-44.7
12505.050	1.8	35.0	Vert	AV	1.6E-9	-57.8	-13.0	-44.8
10004.040	1.5	112.0	Horz	AV	360.7E-12	-64.4	-13.0	-51.4
10004.040	1.5	173.0	Vert	AV	360.7E-12	-64.4	-13.0	-51.4
10044.000	1.5	45.0	Horz	AV	360.7E-12	-64.4	-13.0	-51.4
10044.000	1.5	119.0	Vert	AV	360.7E-12	-64.4	-13.0	-51.4

CONCLUSION

Pass



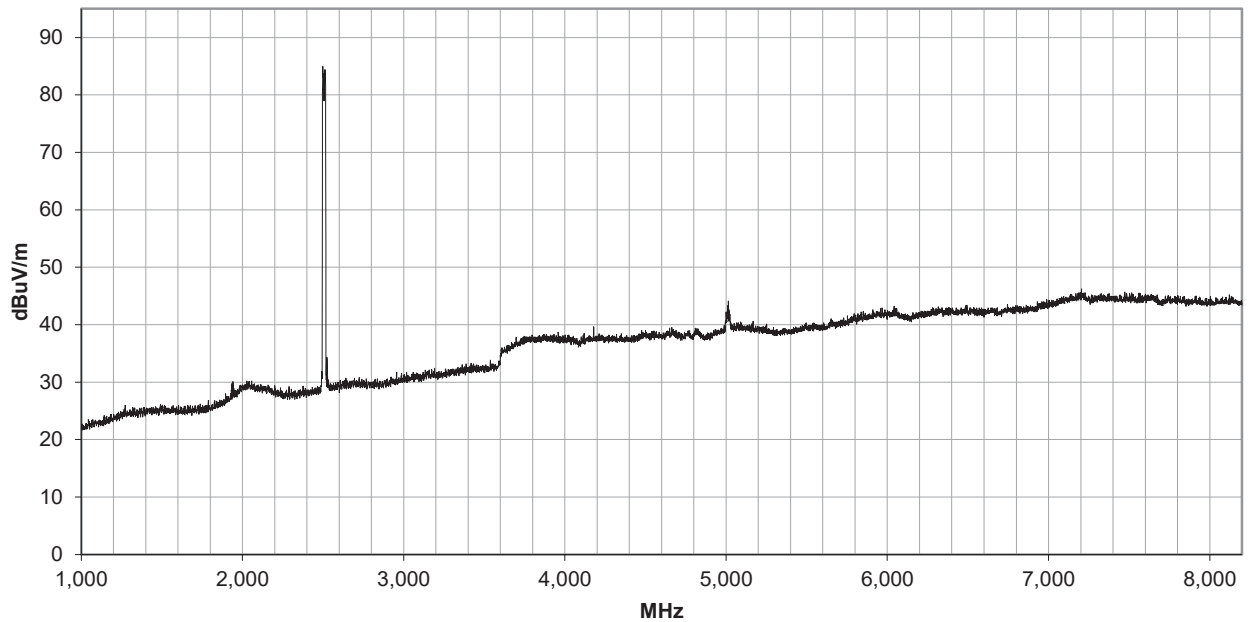
Tested By

SPURIOUS RADIATED EMISSIONS

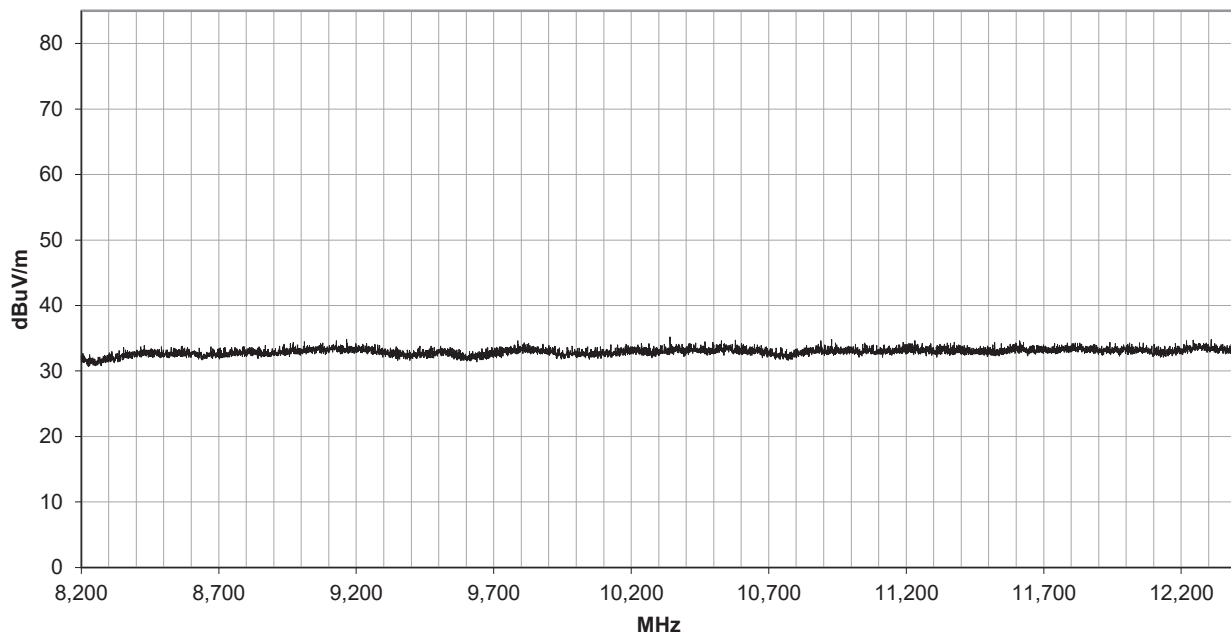
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

1000-8200 MHz, Run 1

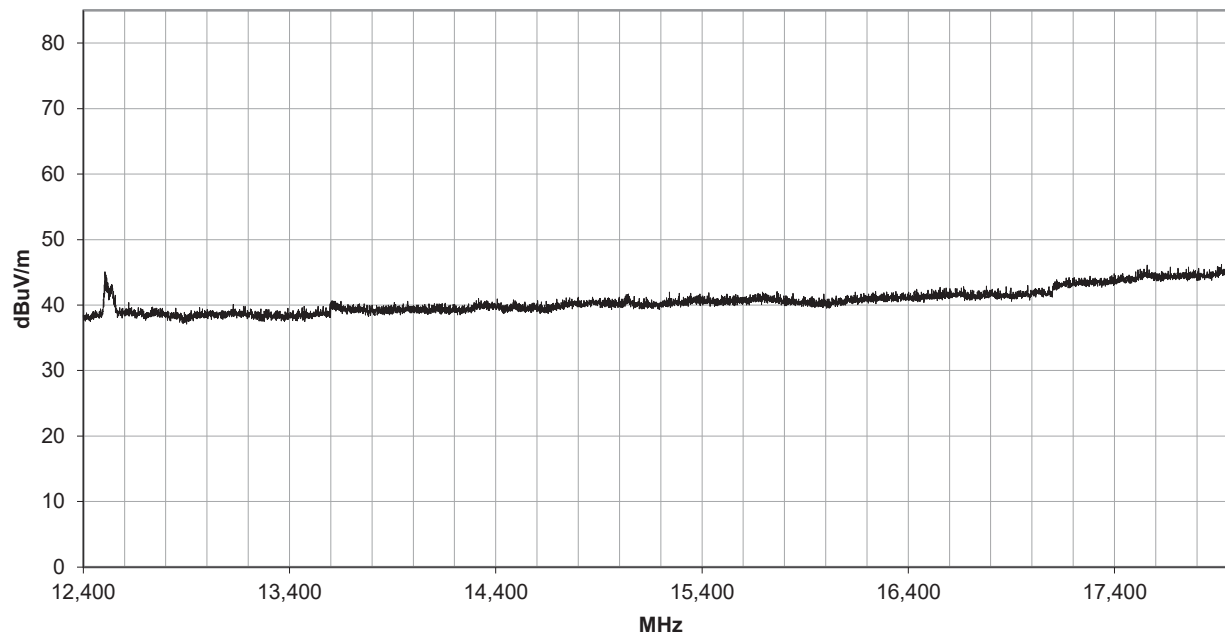


8200-12400 MHz, Run 3

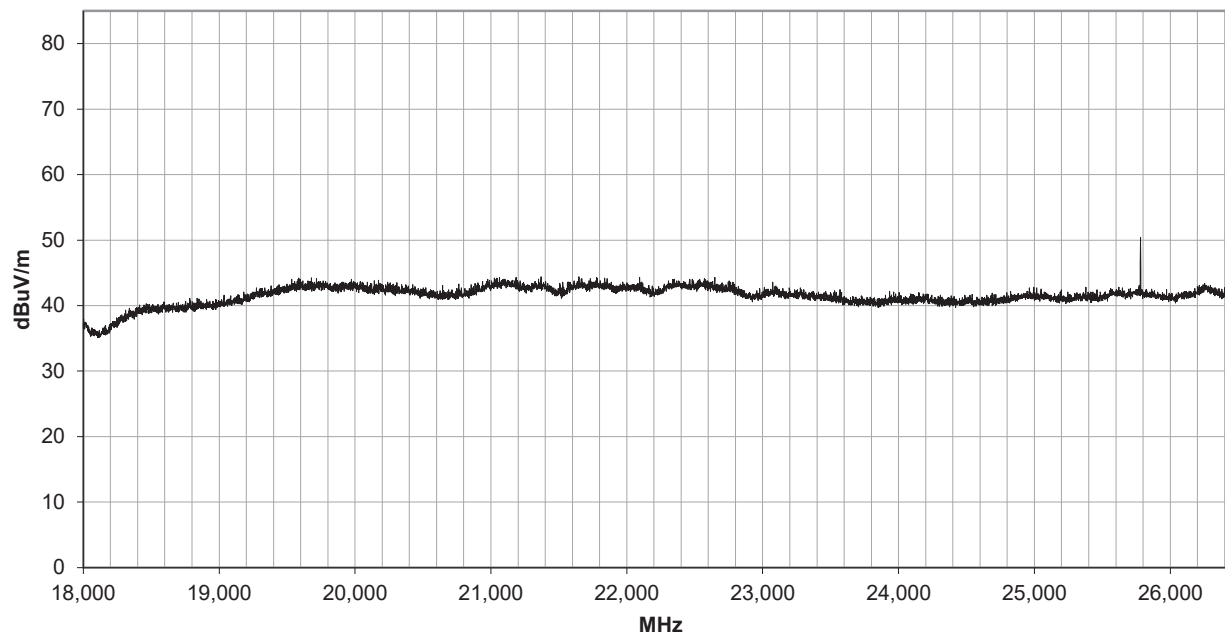


SPURIOUS RADIATED EMISSIONS

12400-18000 MHz, Run 4

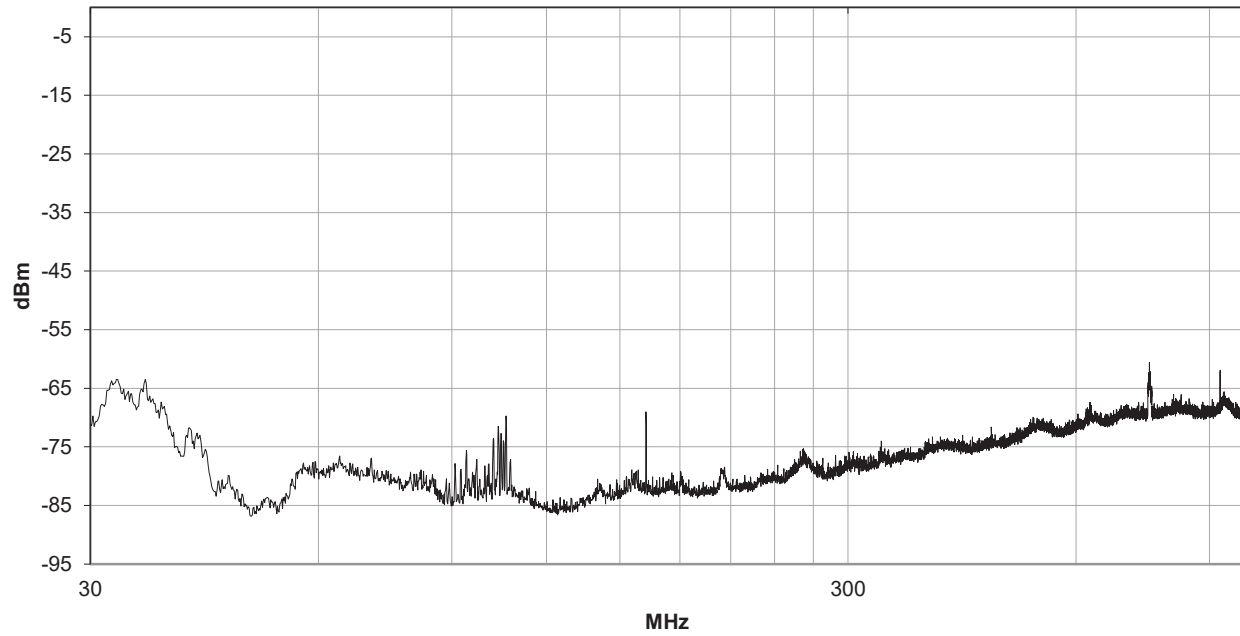


18000-26500 MHz, Run 31



SPURIOUS RADIATED EMISSIONS

30-1000 MHz, Run 33



SPURIOUS RADIATED EMISSIONS

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242100608	Date:	2024-10-16
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattavong, David Le	Relative Humidity:	41.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Jarrold Brenden	Job Site:	PT01
Power:	54VDC	Configuration:	NOKI0079-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 27.53:2024	ANSI C63.26:2015

TEST PARAMETERS

Run #:	6	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

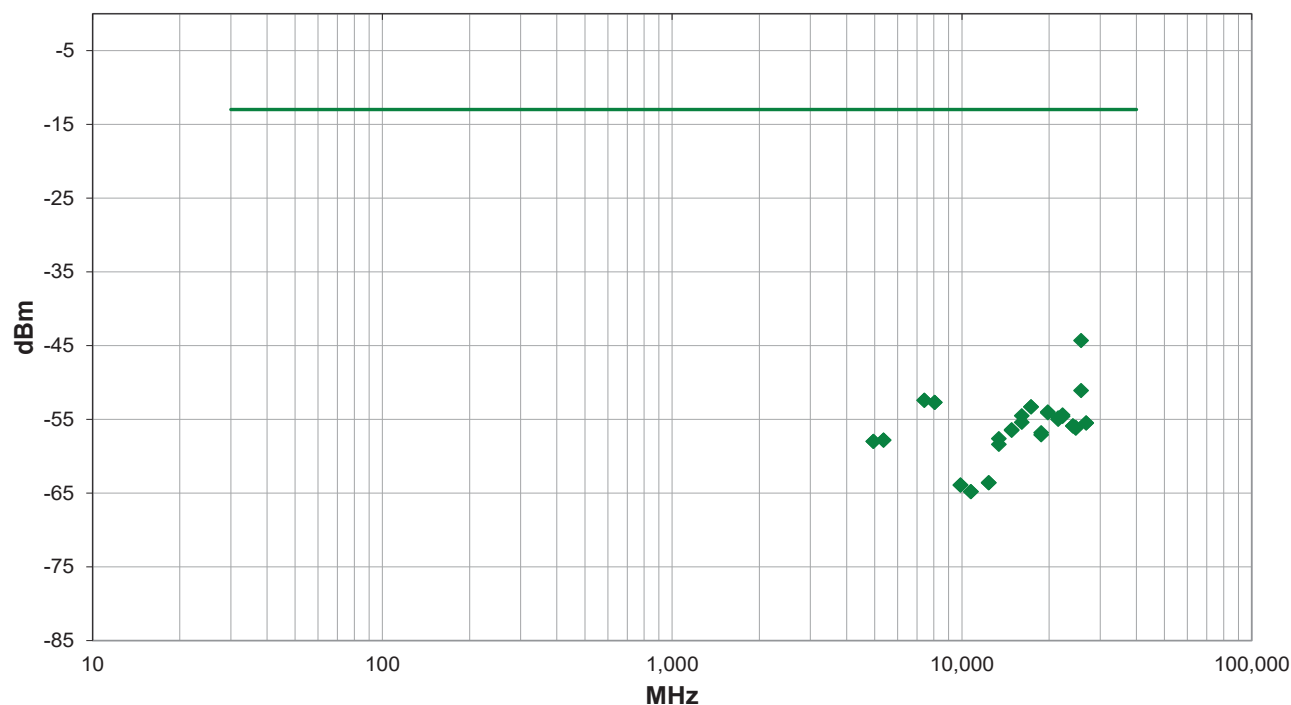
Pole Mounted Radio. TAB ports routed to 50 ohm terminators. The average emissions were duty cycle corrected up to 100% per the guidance provided in ANSI C63.26:2015 section 5.7.3 (d)(3): $10 \cdot \log(1/\text{Duty Cycle(in dec)})$. The measured duty cycle was seen to be 74% and applied as $10 \cdot \log(1/0.74) = 1.3 \text{ dB}$ upward correction.

EUT OPERATING MODES

Test Configuration 2 - Multimode SFP - Mid Channel (2674.98 MHz, NR10, QPSK) and High Channel (2685.00 MHz, NR10, QPSK)

DEVIATIONS FROM TEST STANDARD

None



Run #: 6

PK AV QP

SPURIOUS RADIATED EMISSIONS

RESULTS - Run #6

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
25782.000	1.5	344.0	Vert	AV	36.9E-9	-44.3	-13.0	-31.3
25782.000	1.5	309.0	Horz	AV	7.7E-9	-51.1	-13.0	-38.1
7424.940	1.5	312.0	Horz	AV	5.7E-9	-52.4	-13.0	-39.4
7424.940	1.5	100.0	Vert	AV	5.7E-9	-52.4	-13.0	-39.4
8055.000	1.5	76.0	Horz	AV	5.3E-9	-52.7	-13.0	-39.7
8055.000	3.1	328.0	Vert	AV	5.3E-9	-52.7	-13.0	-39.7
17324.860	1.5	340.0	Horz	AV	4.6E-9	-53.3	-13.0	-40.3
17324.860	1.5	57.0	Vert	AV	4.6E-9	-53.3	-13.0	-40.3
19799.840	1.5	316.0	Horz	AV	4.0E-9	-54.0	-13.0	-41.0
19799.840	1.5	253.0	Vert	AV	3.9E-9	-54.1	-13.0	-41.1
22274.820	1.5	301.0	Horz	AV	3.6E-9	-54.4	-13.0	-41.4
16110.000	1.3	323.0	Vert	AV	3.5E-9	-54.5	-13.0	-41.5
22274.820	1.5	58.0	Vert	AV	3.4E-9	-54.6	-13.0	-41.6
21480.000	1.5	261.0	Horz	AV	3.3E-9	-54.8	-13.0	-41.8
21480.000	1.5	144.0	Vert	AV	3.1E-9	-55.0	-13.0	-42.0
16110.000	1.5	45.0	Horz	AV	2.9E-9	-55.4	-13.0	-42.4
26850.000	1.5	263.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5
26850.000	1.5	184.0	Horz	AV	2.8E-9	-55.5	-13.0	-42.5
24165.000	1.5	24.0	Vert	AV	2.6E-9	-55.9	-13.0	-42.9
24165.000	1.5	287.0	Horz	AV	2.6E-9	-55.9	-13.0	-42.9
24749.800	1.5	151.0	Horz	AV	2.4E-9	-56.1	-13.0	-43.1
24749.800	1.5	215.0	Vert	AV	2.4E-9	-56.2	-13.0	-43.2
14849.880	1.5	27.0	Vert	AV	2.3E-9	-56.4	-13.0	-43.4
14849.880	1.5	217.0	Horz	AV	2.2E-9	-56.5	-13.0	-43.5
18795.000	1.5	326.0	Horz	AV	2.1E-9	-56.8	-13.0	-43.8
18795.000	1.5	74.0	Vert	AV	1.9E-9	-57.1	-13.0	-44.1
13425.000	1.5	8.0	Horz	AV	1.7E-9	-57.6	-13.0	-44.6
5370.000	1.2	45.0	Horz	AV	1.6E-9	-57.8	-13.0	-44.8
5370.000	1.5	12.0	Vert	AV	1.6E-9	-57.8	-13.0	-44.8
4949.960	1.5	0.0	Horz	AV	1.6E-9	-58.0	-13.0	-45.0
4949.960	1.5	252.0	Vert	AV	1.6E-9	-58.0	-13.0	-45.0
13425.000	2.8	316.0	Vert	AV	1.4E-9	-58.4	-13.0	-45.4
12374.900	1.5	302.0	Horz	AV	433.6E-12	-63.6	-13.0	-50.6
12374.900	1.6	201.0	Vert	AV	433.6E-12	-63.6	-13.0	-50.6
9899.920	1.5	324.0	Horz	AV	404.7E-12	-63.9	-13.0	-50.9
9899.920	1.5	8.0	Vert	AV	404.7E-12	-63.9	-13.0	-50.9
10740.000	1.5	342.0	Horz	AV	328.9E-12	-64.8	-13.0	-51.8
10740.000	1.5	300.0	Vert	AV	328.9E-12	-64.8	-13.0	-51.8

CONCLUSION

Pass



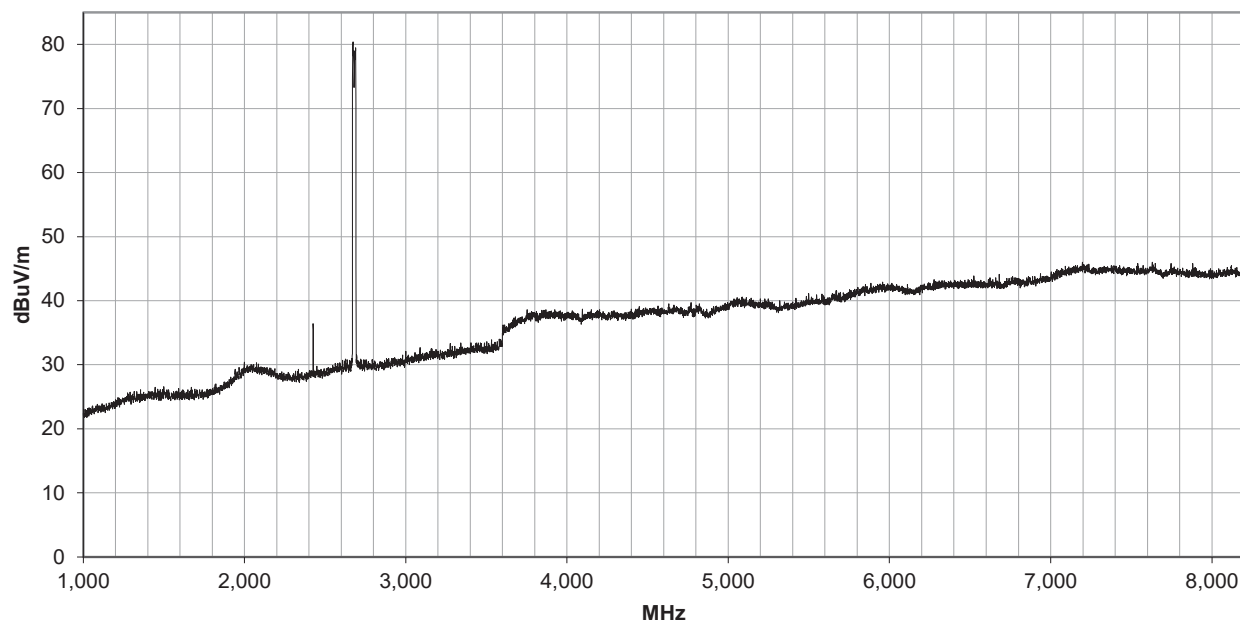
Tested By

SPURIOUS RADIATED EMISSIONS

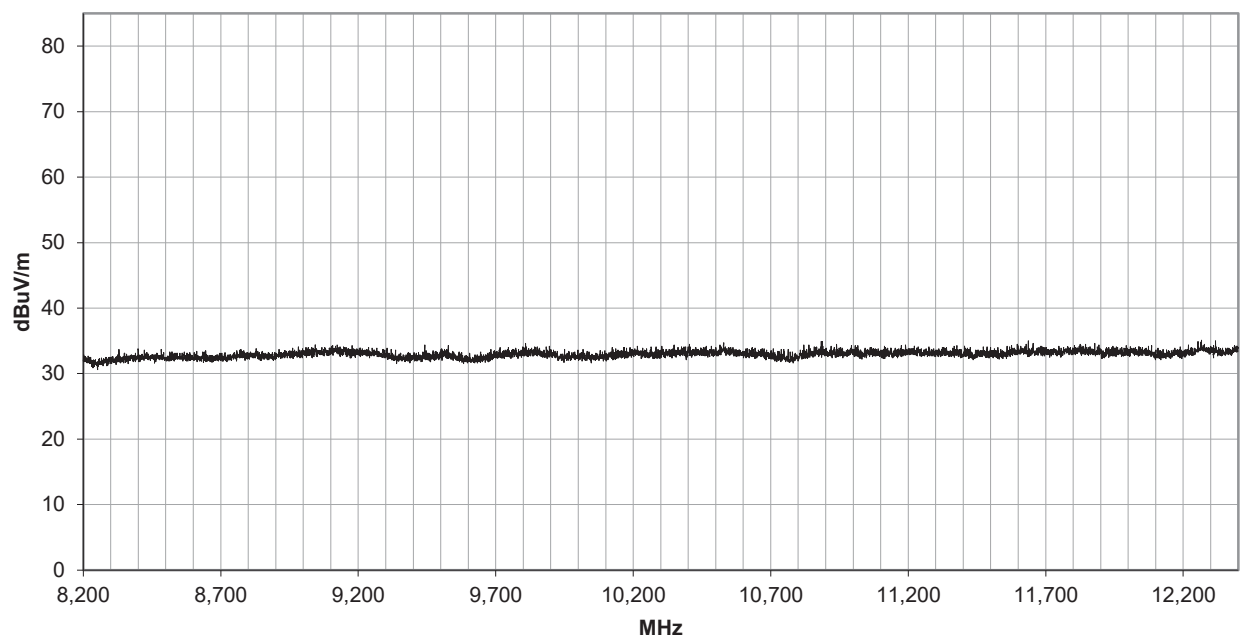
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

1000-8200 MHz, Run 6

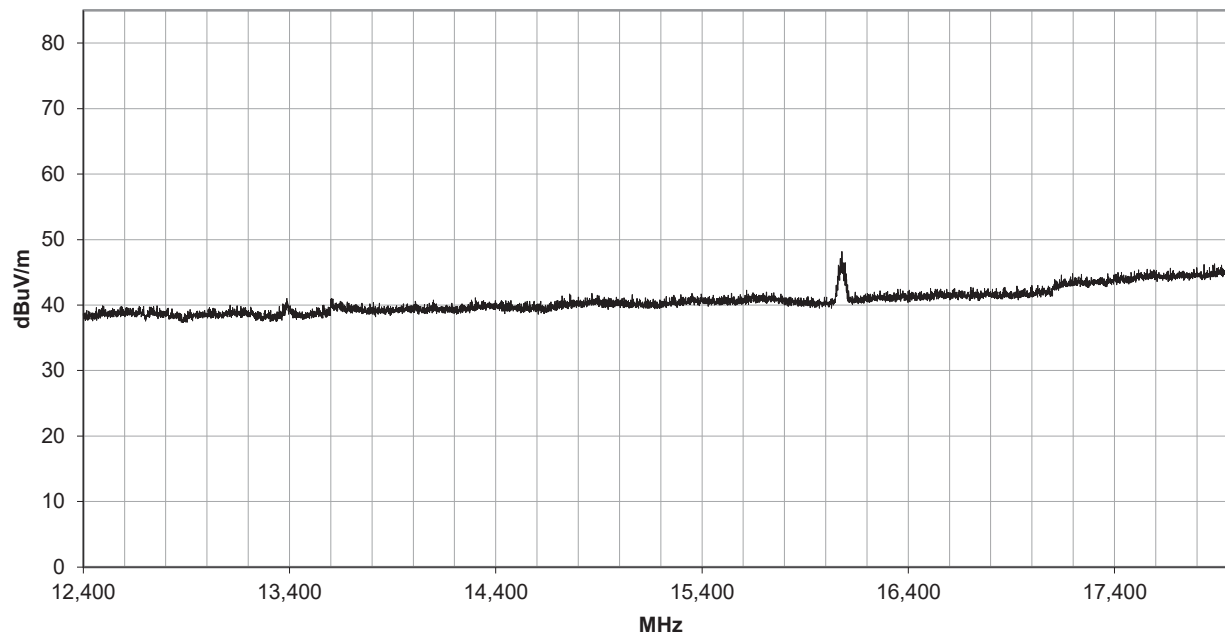


8200-12400 MHz, Run 7

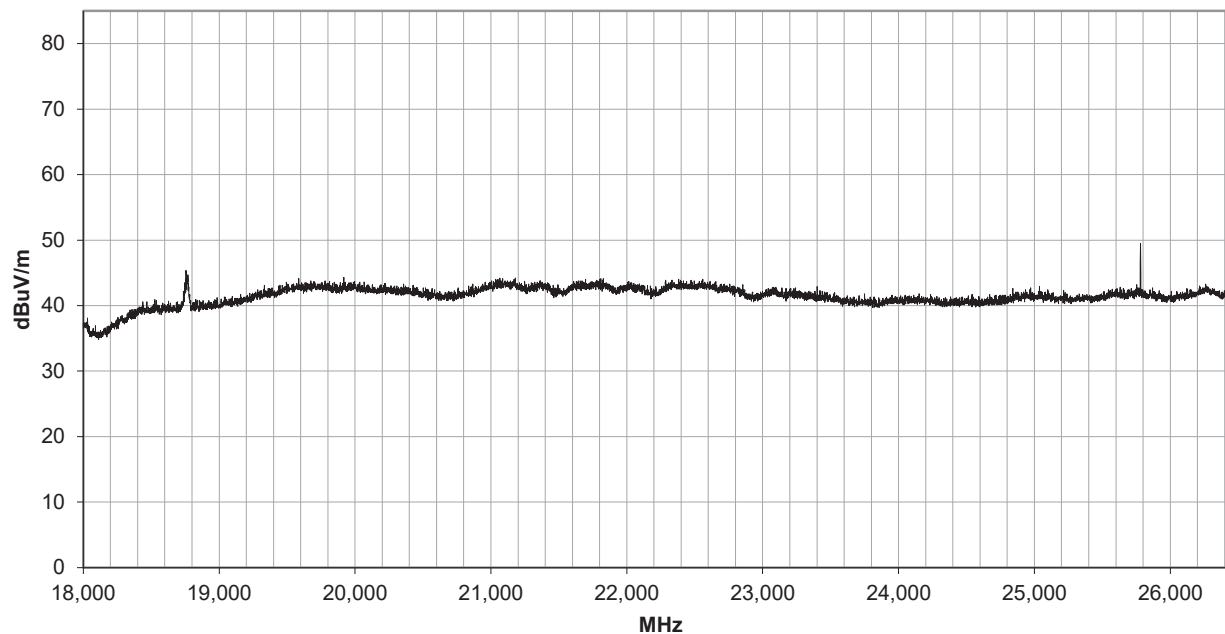


SPURIOUS RADIATED EMISSIONS

12400-18000 MHz, Run 8

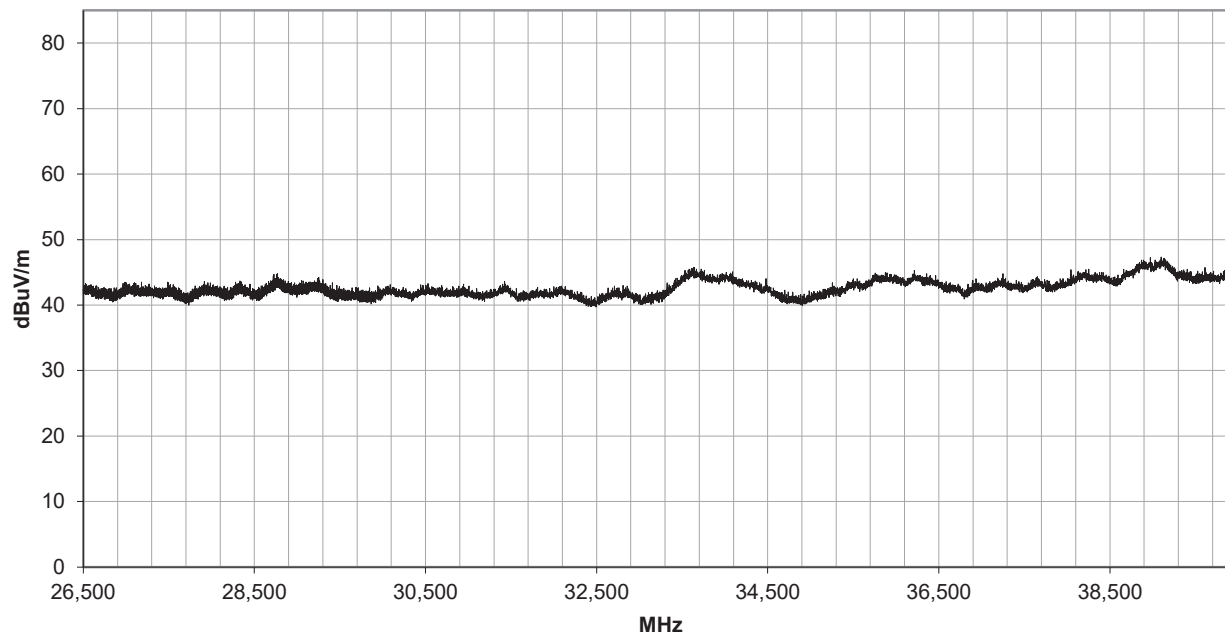


18000-26500 MHz, Run 29



SPURIOUS RADIATED EMISSIONS

26500-40000 MHz, Run 30



SPURIOUS RADIATED EMISSIONS

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242100608	Date:	2024-10-16
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattanaovong, David Le	Relative Humidity:	41.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Jarrold Brenden	Job Site:	PT01
Power:	54VDC	Configuration:	NOKI0079-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 27.53:2024	ANSI C63.26:2015

TEST PARAMETERS

Run #:	9	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

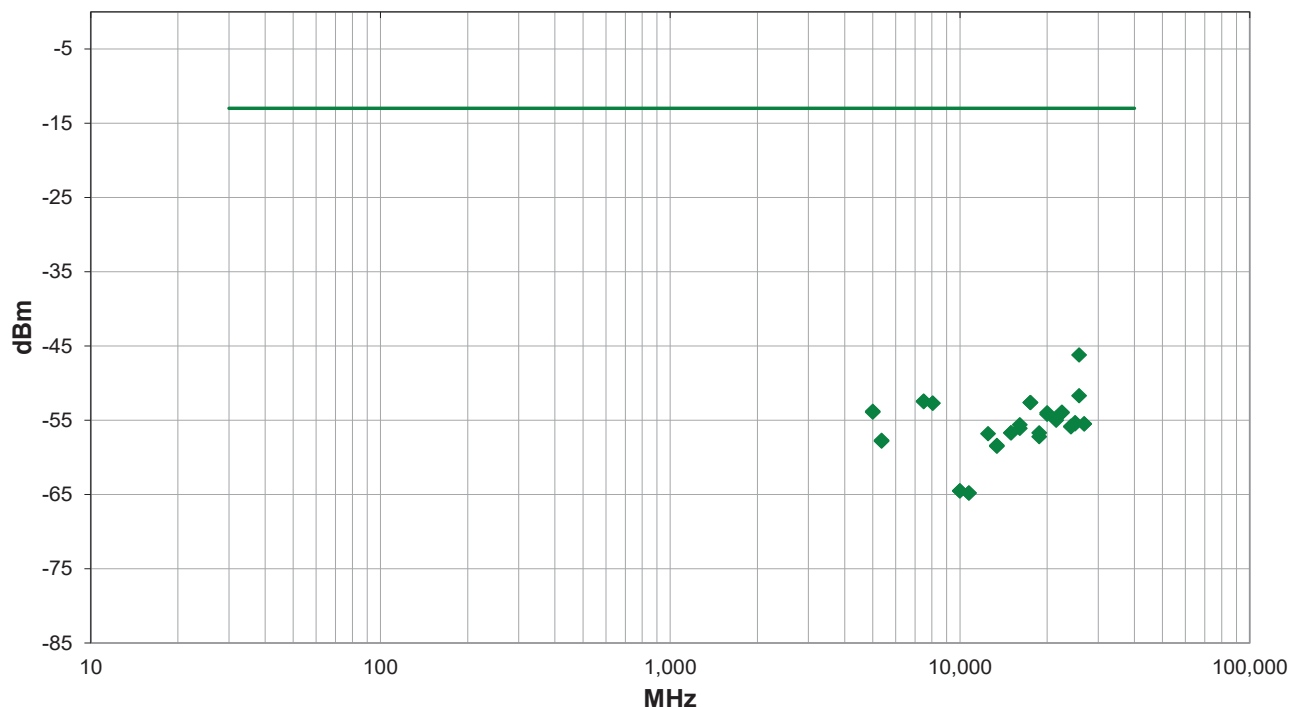
Pole Mounted Radio. TAB ports routed to 50 ohm terminators. The average emissions were duty cycle corrected up to 100% per the guidance provided in ANSI C63.26:2015 section 5.7.3 (d)(3): $10 \cdot \log(1/\text{Duty Cycle(in dec)})$. The measured duty cycle was seen to be 74% and applied as $10 \cdot \log(1/0.74) = 1.3$ dB upward correction.

EUT OPERATING MODES

Test Configuration 3 - Multimode SFP - Low Channel (2501.01 MHz, NR10, QPSK) and High Channel (2685.00 MHz, NR10, QPSK)

DEVIATIONS FROM TEST STANDARD

None



Run #: 9

PK AV QP

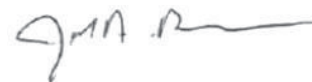
SPURIOUS RADIATED EMISSIONS

RESULTS - Run #9

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)
25781.000	1.5	341.0	Vert	AV	23.8E-9	-46.2	-13.0	-33.2
25781.000	1.5	304.0	Horz	AV	6.7E-9	-51.7	-13.0	-38.7
7503.030	1.5	148.0	Horz	AV	5.7E-9	-52.4	-13.0	-39.4
7503.030	1.5	324.0	Vert	AV	5.6E-9	-52.5	-13.0	-39.5
17507.070	1.5	30.0	Horz	AV	5.5E-9	-52.6	-13.0	-39.6
17507.070	1.5	161.0	Vert	AV	5.5E-9	-52.6	-13.0	-39.6
8055.000	1.5	298.0	Horz	AV	5.3E-9	-52.7	-13.0	-39.7
8055.000	1.5	202.0	Vert	AV	5.3E-9	-52.7	-13.0	-39.7
5002.020	1.5	39.0	Horz	AV	4.1E-9	-53.8	-13.0	-40.8
5002.020	1.5	350.0	Vert	AV	4.0E-9	-53.9	-13.0	-40.9
22509.090	1.5	190.0	Horz	AV	4.0E-9	-53.9	-13.0	-40.9
22509.090	1.5	205.0	Vert	AV	4.0E-9	-54.0	-13.0	-41.0
20008.080	1.5	257.0	Horz	AV	4.0E-9	-54.0	-13.0	-41.0
20008.080	1.5	12.0	Vert	AV	3.8E-9	-54.2	-13.0	-41.2
21480.000	1.5	0.0	Horz	AV	3.4E-9	-54.7	-13.0	-41.7
21480.000	1.5	287.0	Vert	AV	3.1E-9	-55.0	-13.0	-42.0
25010.100	1.5	278.0	Horz	AV	2.9E-9	-55.3	-13.0	-42.3
25010.100	1.5	103.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5
26850.000	1.5	259.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5
26850.000	1.5	76.0	Horz	AV	2.8E-9	-55.5	-13.0	-42.5
16110.000	1.5	343.0	Vert	AV	2.7E-9	-55.6	-13.0	-42.6
24165.000	1.5	14.0	Horz	AV	2.6E-9	-55.8	-13.0	-42.8
24165.000	1.5	94.0	Vert	AV	2.6E-9	-55.9	-13.0	-42.9
16110.000	1.5	185.0	Horz	AV	2.4E-9	-56.1	-13.0	-43.1
15006.060	1.5	294.0	Horz	AV	2.1E-9	-56.7	-13.0	-43.7
15006.060	1.7	149.0	Vert	AV	2.1E-9	-56.7	-13.0	-43.7
18795.000	1.5	16.0	Horz	AV	2.1E-9	-56.7	-13.0	-43.7
12505.050	1.5	349.0	Vert	AV	2.1E-9	-56.8	-13.0	-43.8
18795.000	1.5	340.0	Vert	AV	1.9E-9	-57.2	-13.0	-44.2
5370.000	1.5	51.0	Vert	AV	1.7E-9	-57.7	-13.0	-44.7
5370.000	2.8	54.0	Horz	AV	1.6E-9	-57.8	-13.0	-44.8
13425.000	2.3	307.0	Horz	AV	1.4E-9	-58.4	-13.0	-45.4
13425.000	1.3	327.0	Vert	AV	1.4E-9	-58.5	-13.0	-45.5
10004.040	1.5	257.0	Horz	AV	352.5E-12	-64.5	-13.0	-51.5
10004.040	1.5	255.0	Vert	AV	352.5E-12	-64.5	-13.0	-51.5
10740.000	1.5	16.0	Horz	AV	328.9E-12	-64.8	-13.0	-51.8
10740.000	2.0	3.0	Vert	AV	328.9E-12	-64.8	-13.0	-51.8

CONCLUSION

Pass



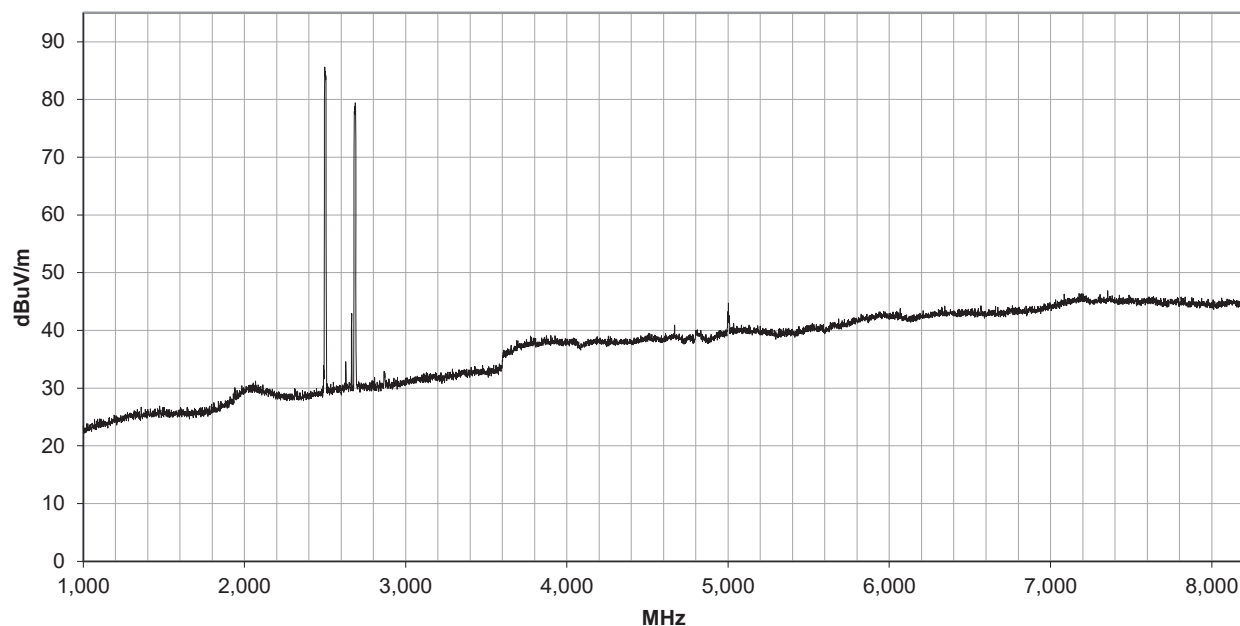
Tested By

SPURIOUS RADIATED EMISSIONS

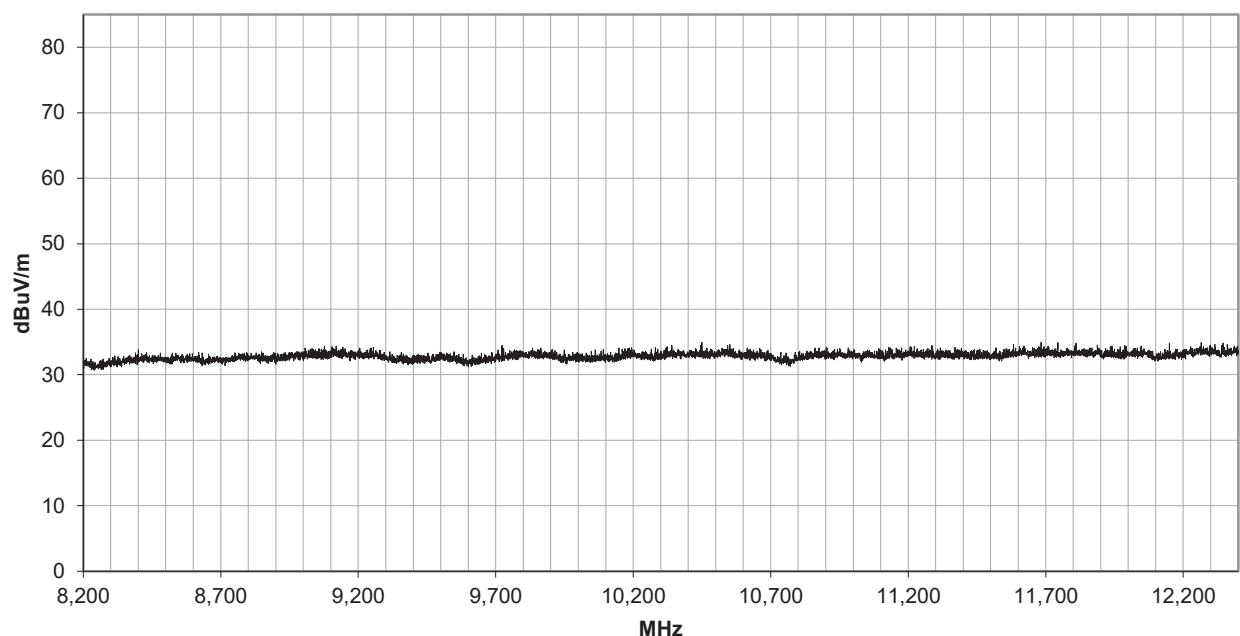
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

1000-8200 MHz, Run 9

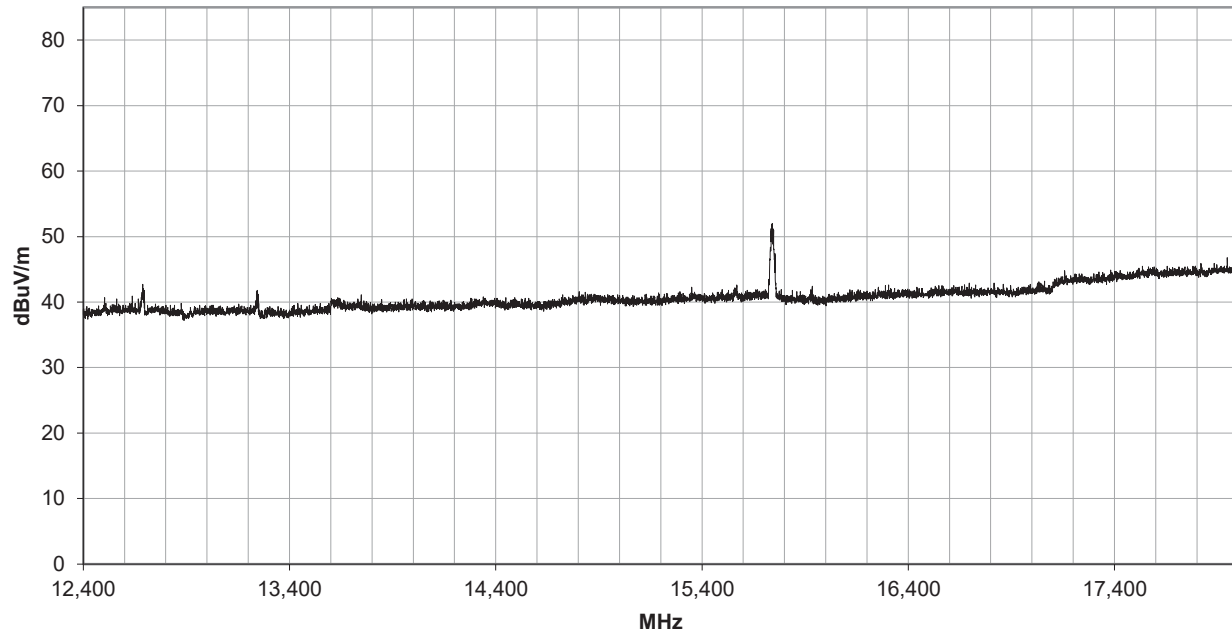


8200-12400 MHz, Run 10

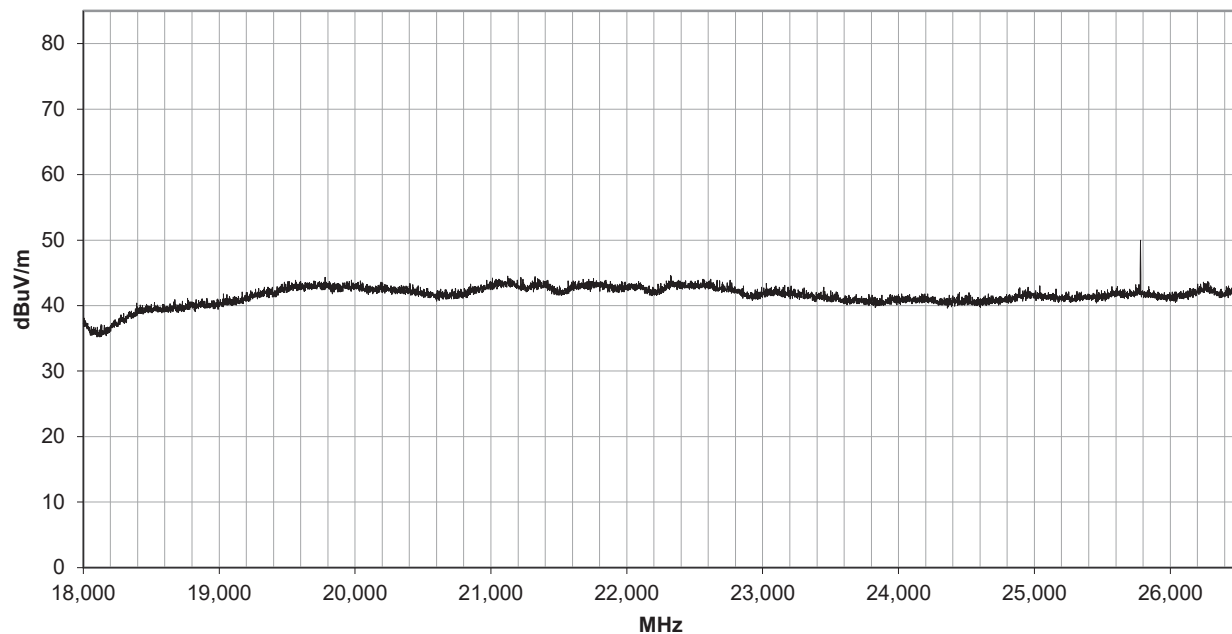


SPURIOUS RADIATED EMISSIONS

12400-18000 MHz, Run 11

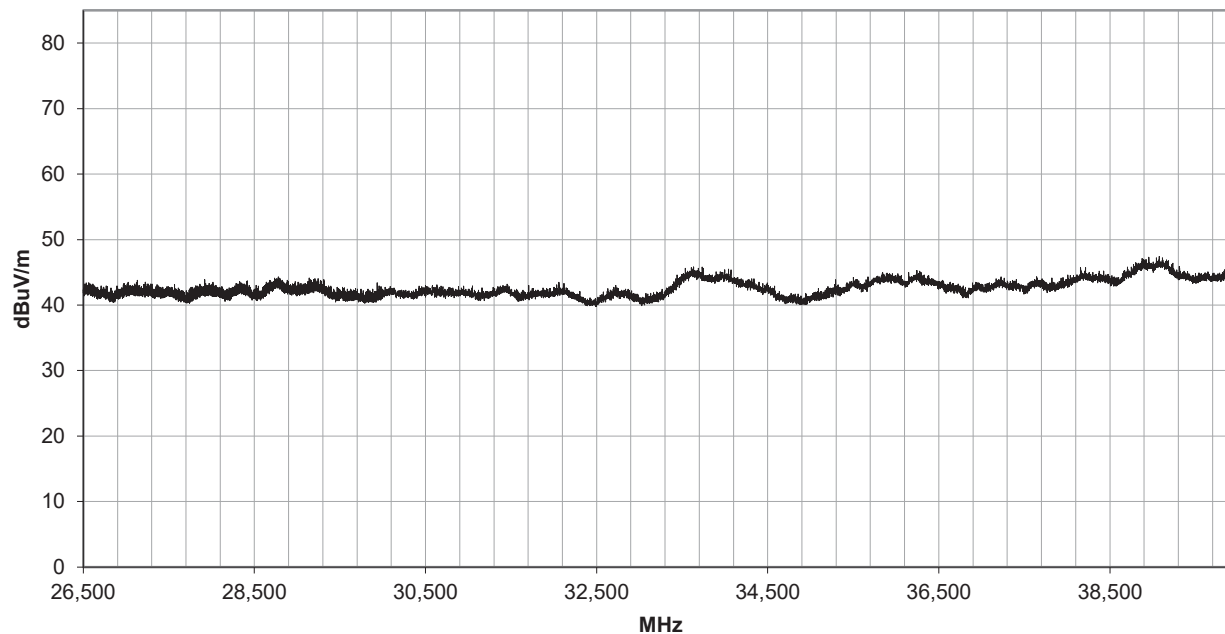


18000-26500 MHz, Run 27

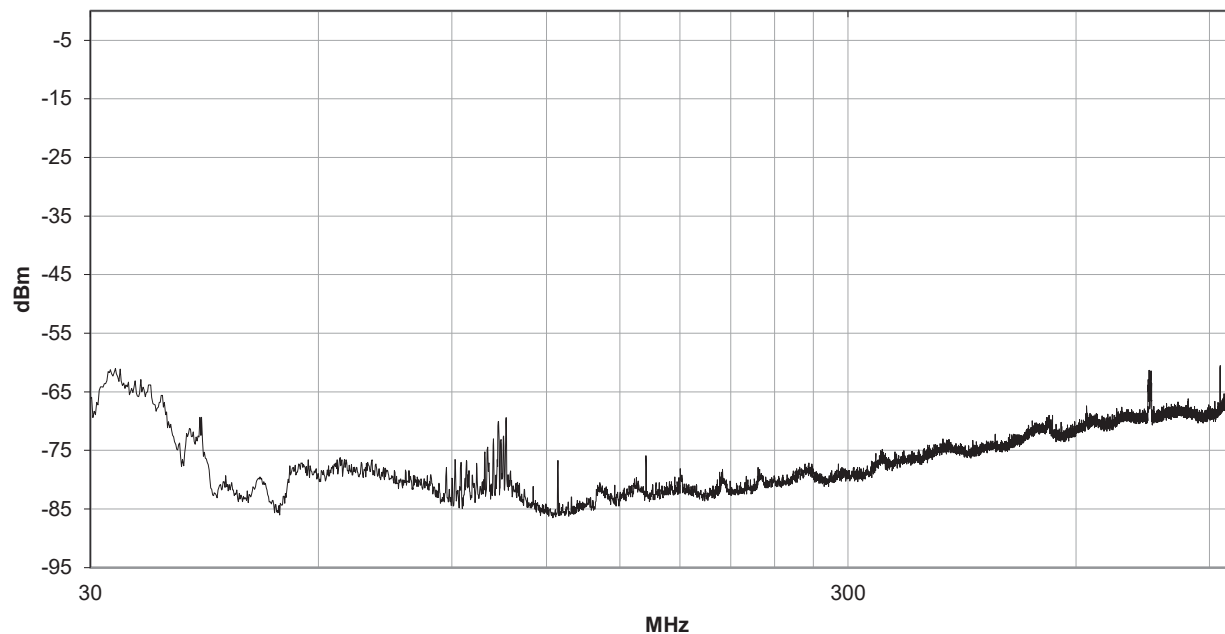


SPURIOUS RADIATED EMISSIONS

26500-40000 MHz, Run 28



30-1000 MHz, Run 36



SPURIOUS RADIATED EMISSIONS

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242100608	Date:	2024-10-16
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattanaovong, David Le	Relative Humidity:	41.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Jarrold Brenden	Job Site:	PT01
Power:	54VDC	Configuration:	NOKI0079-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 27.53:2024	ANSI C63.26:2015

TEST PARAMETERS

Run #:	14	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

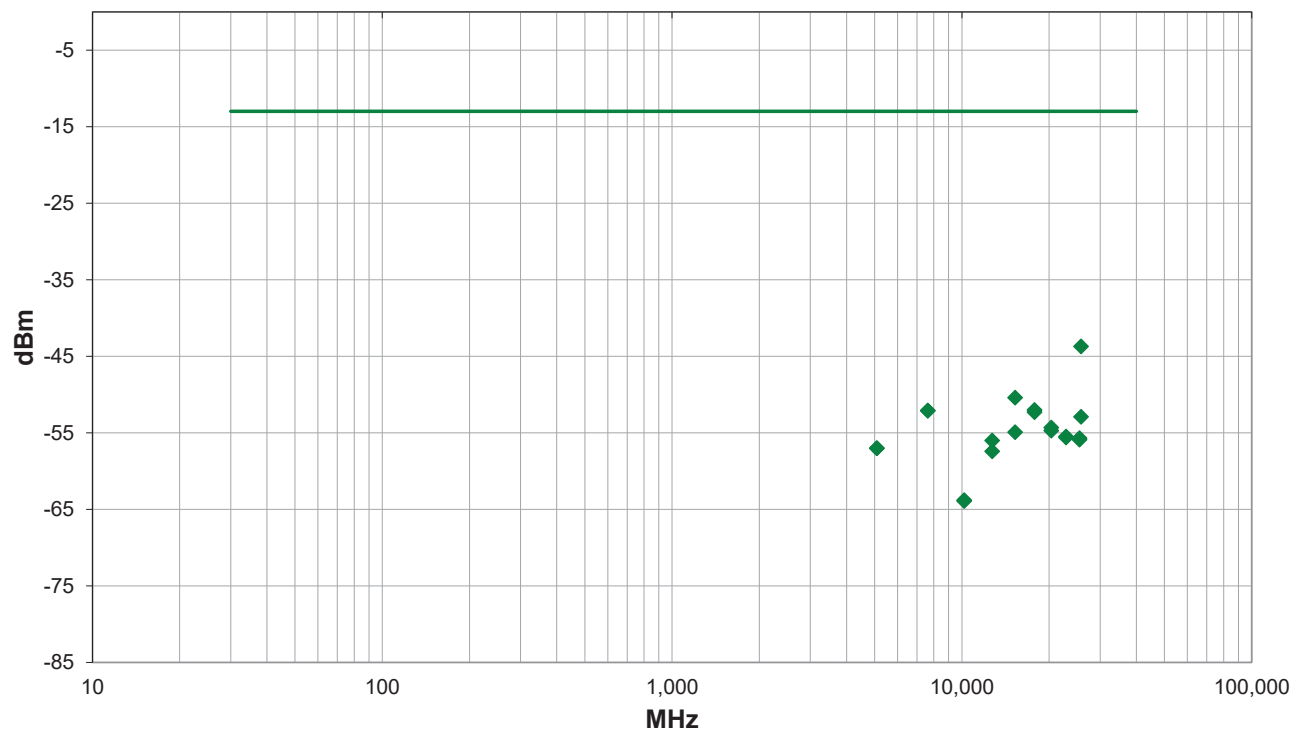
Pole Mounted Radio. TAB ports routed to 50 ohm terminators. The average emissions were duty cycle corrected up to 100% per the guidance provided in ANSI C63.26:2015 section 5.7.3 (d)(3): $10 \cdot \log(1/\text{Duty Cycle(in dec)})$. The measured duty cycle was seen to be 74% and applied as $10 \cdot \log(1/0.74) = 1.3 \text{ dB}$ upward correction.

EUT OPERATING MODES

Test Configuration 4 - Multimode SFP - Low Channel (2546.01 MHz, NR100, QPSK)

DEVIATIONS FROM TEST STANDARD

None



Run #: 14

PK AV QP

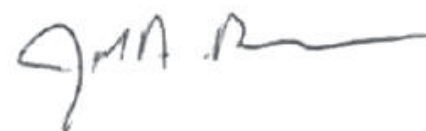
SPURIOUS RADIATED EMISSIONS

RESULTS - Run #14

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)
25782.000	1.5	342.0	Vert	AV	42.4E-9	-43.7	-13.0	-30.7
15276.060	1.5	352.0	Horz	AV	9.1E-9	-50.4	-13.0	-37.4
17822.070	1.5	318.0	Horz	AV	6.3E-9	-52.0	-13.0	-39.0
7638.030	1.5	10.0	Horz	AV	6.1E-9	-52.1	-13.0	-39.1
7638.030	1.5	166.0	Vert	AV	6.1E-9	-52.1	-13.0	-39.1
17822.070	1.5	230.0	Vert	AV	5.8E-9	-52.3	-13.0	-39.3
25781.000	1.5	297.0	Horz	AV	5.1E-9	-52.9	-13.0	-39.9
20368.080	1.5	286.0	Horz	AV	3.7E-9	-54.3	-13.0	-41.3
20368.080	1.5	271.0	Vert	AV	3.4E-9	-54.7	-13.0	-41.7
15276.060	1.5	304.0	Vert	AV	3.2E-9	-54.9	-13.0	-41.9
22914.090	1.5	78.0	Horz	AV	2.8E-9	-55.5	-13.0	-42.5
22914.090	1.5	219.0	Vert	AV	2.7E-9	-55.6	-13.0	-42.6
25460.100	1.5	90.0	Horz	AV	2.7E-9	-55.7	-13.0	-42.7
25460.100	1.5	142.0	Vert	AV	2.6E-9	-55.9	-13.0	-42.9
12730.050	1.5	31.0	Horz	AV	2.5E-9	-56.0	-13.0	-43.0
5092.020	1.9	62.0	Horz	AV	2.0E-9	-57.0	-13.0	-44.0
5092.020	1.5	61.0	Vert	AV	2.0E-9	-57.0	-13.0	-44.0
12730.050	1.5	276.0	Vert	AV	1.8E-9	-57.4	-13.0	-44.4
10184.000	1.5	222.0	Horz	AV	414.1E-12	-63.8	-13.0	-50.8
10184.000	1.5	177.0	Vert	AV	404.7E-12	-63.9	-13.0	-50.9

CONCLUSION

Pass



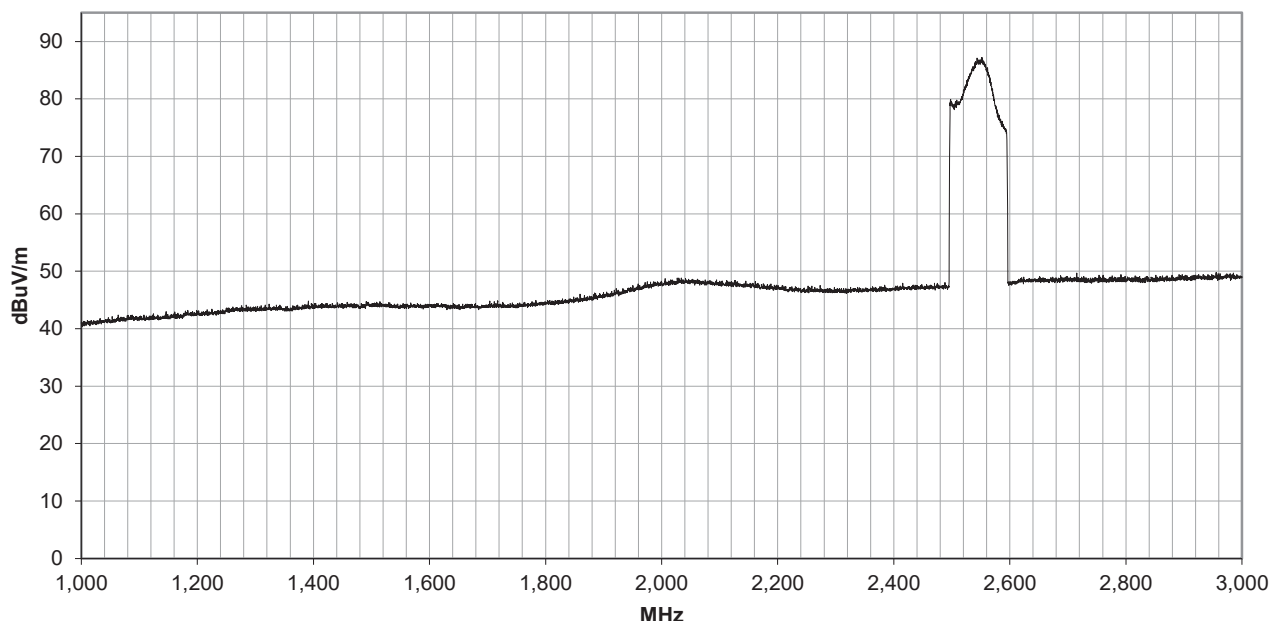
Tested By

SPURIOUS RADIATED EMISSIONS

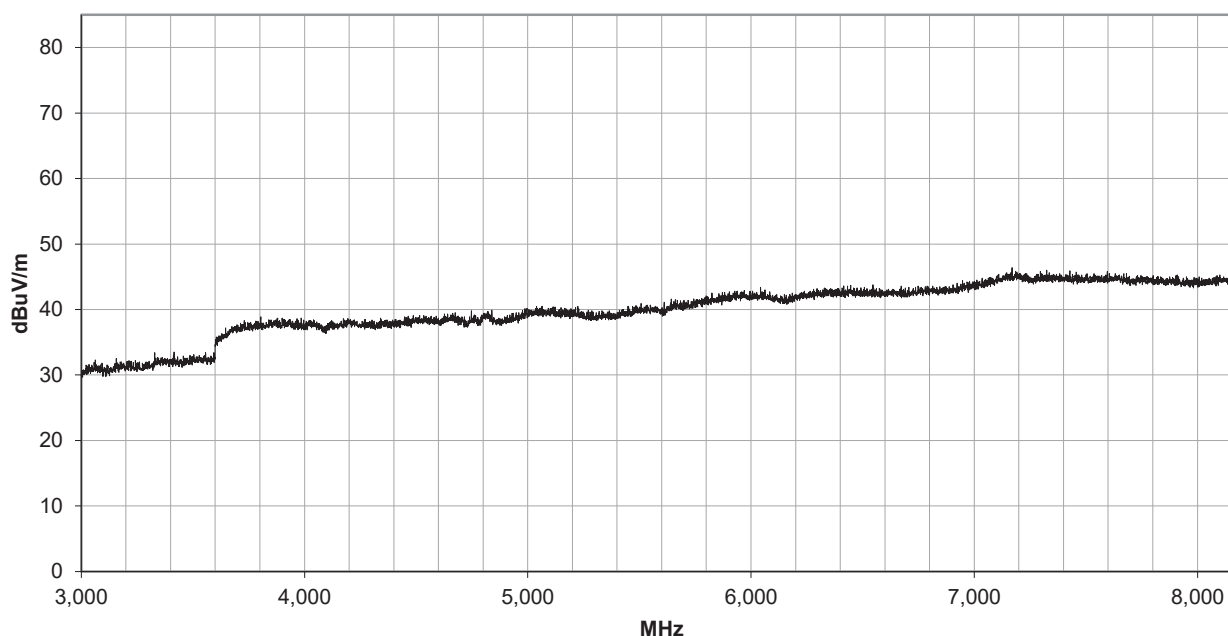
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

1000-3000 MHz, Run 13

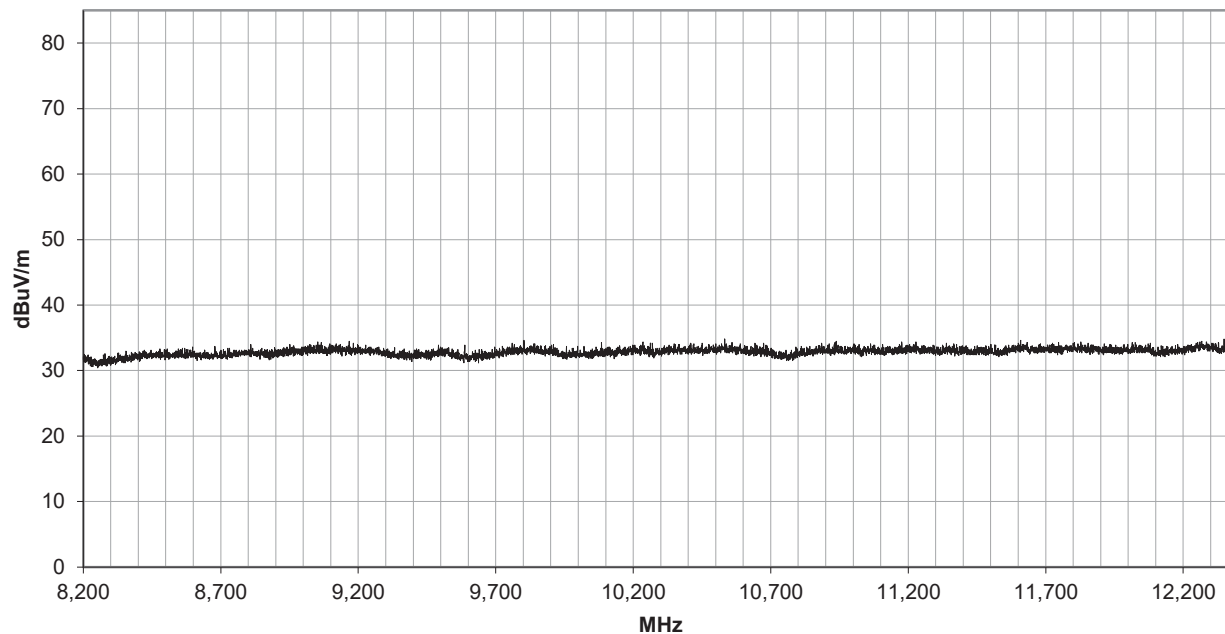


3000-8200 MHz, Run 14

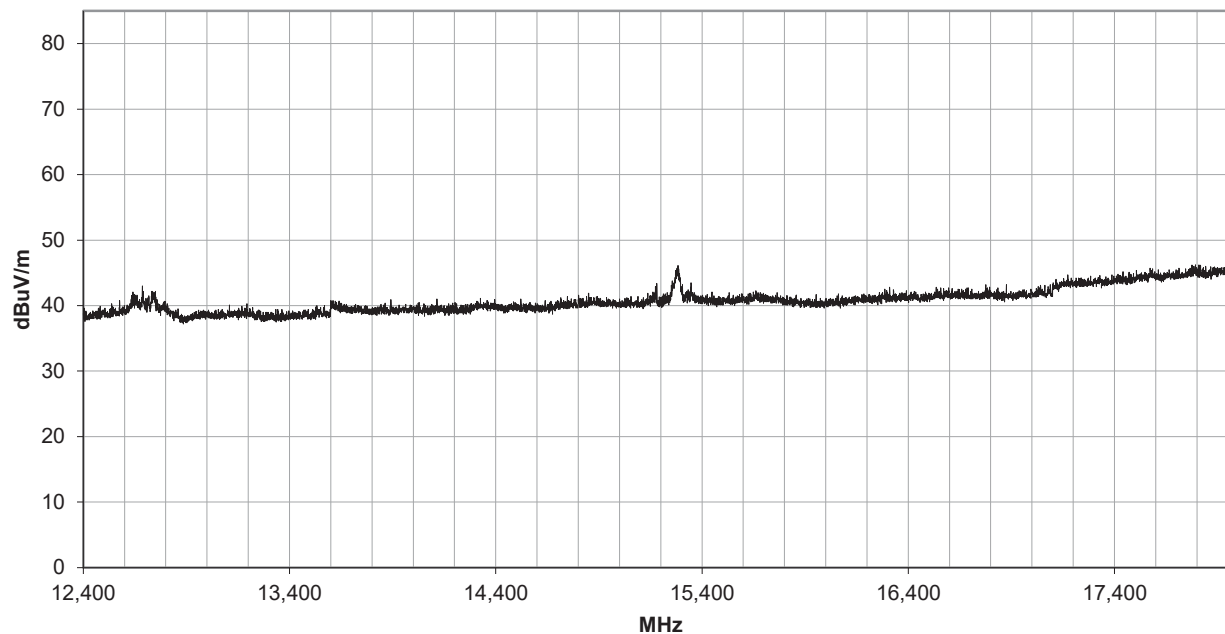


SPURIOUS RADIATED EMISSIONS

8200-12400 MHz, Run 15

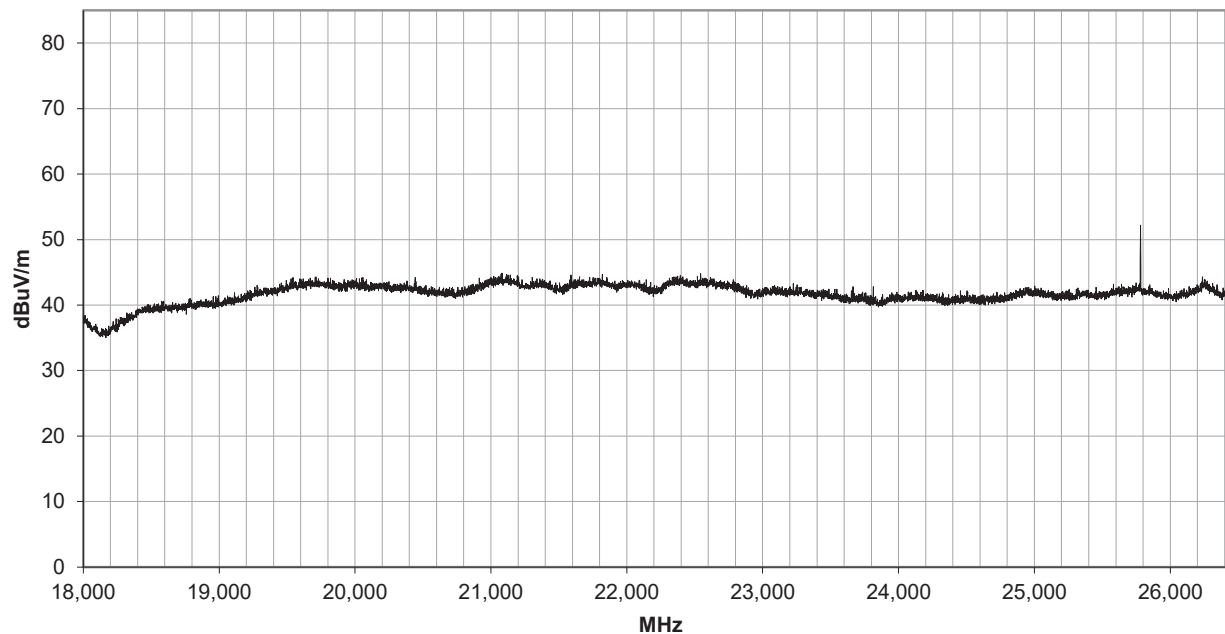


12400-18000 MHz, Run 16

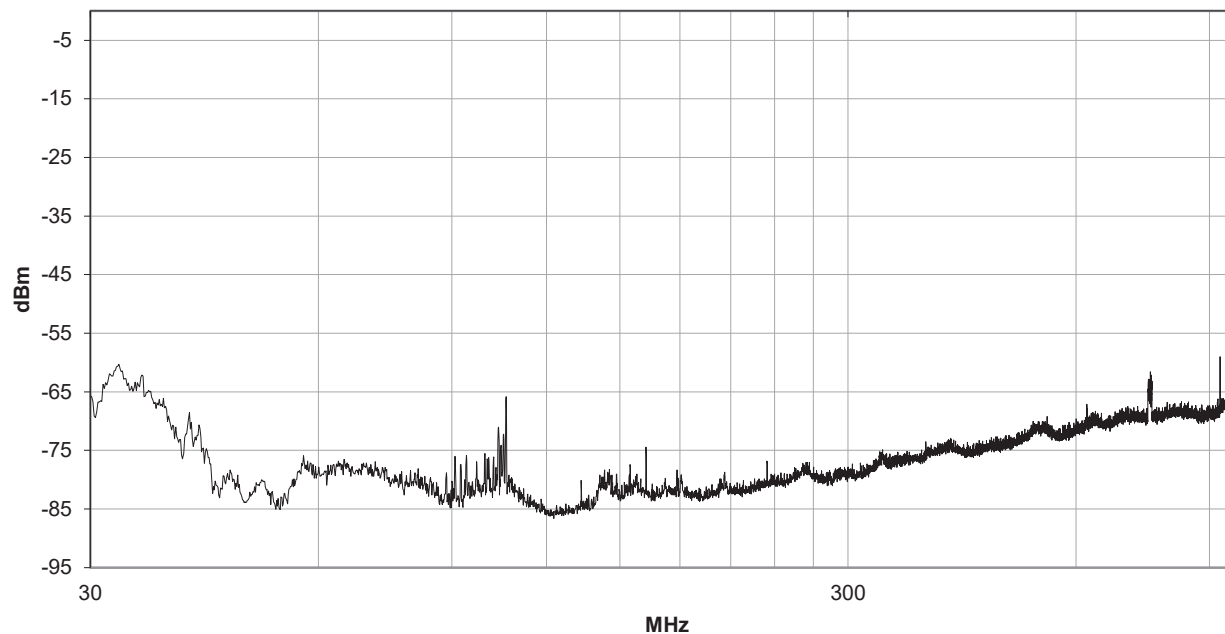


SPURIOUS RADIATED EMISSIONS

18000-26500 MHz, Run 25



30-1000 MHz, Run 37



SPURIOUS RADIATED EMISSIONS

EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242100608	Date:	2024-10-17
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	John Rattanaovong, David Le	Relative Humidity:	41.5%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Jarrold Brenden	Job Site:	PT01
Power:	54VDC	Configuration:	NOKI0079-5

TEST SPECIFICATIONS

Specification:	Method:
FCC 27.53:2024	ANSI C63.26:2015

TEST PARAMETERS

Run #:	18	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

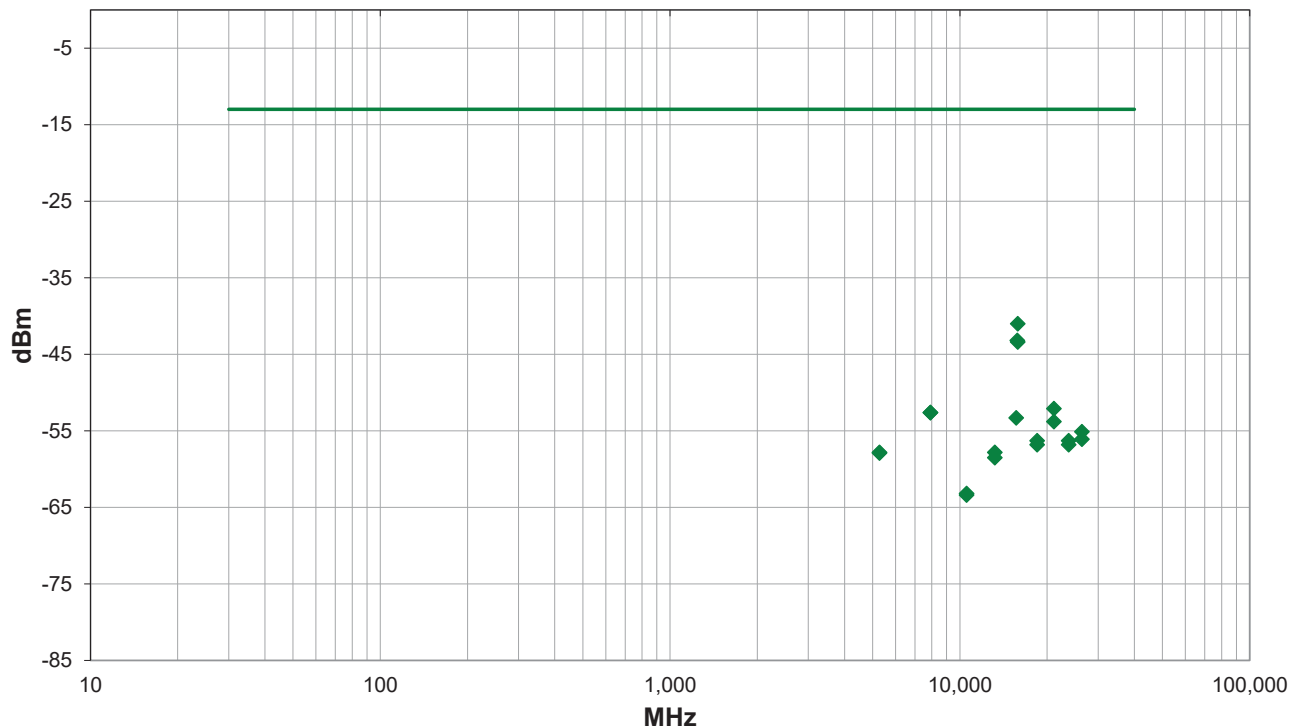
Pole Mounted Radio. TAB ports routed to 50 ohm terminators. The average emissions were duty cycle corrected up to 100% per the guidance provided in ANSI C63.26:2015 section 5.7.3 (d)(3): $10 \cdot \log(1/\text{Duty Cycle (in dec)})$. The measured duty cycle was seen to be 74% and applied as $10 \cdot \log(1/0.74) = 1.3 \text{ dB}$ upward correction.

EUT OPERATING MODES

Test Configuration 5 - Single Mode SFP - High Channel (2640.00 MHz, NR100, QPSK)

DEVIATIONS FROM TEST STANDARD

None



Run #: 18

■ PK ◆ AV ● QP

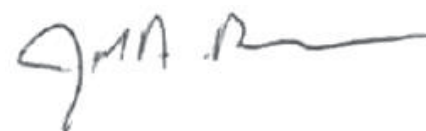
SPURIOUS RADIATED EMISSIONS

RESULTS - Run #18

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts/MHz)	EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)
15840.000	1.5	360.0	Vert	AV	78.9E-9	-41.0	-13.0	-28.0
15788.000	1.5	294.0	Vert	AV	47.5E-9	-43.2	-13.0	-30.2
15840.000	1.5	284.0	Horz	AV	45.4E-9	-43.4	-13.0	-30.4
21120.000	1.5	337.0	Horz	AV	6.1E-9	-52.1	-13.0	-39.1
7920.000	1.5	231.0	Horz	AV	5.5E-9	-52.6	-13.0	-39.6
7920.000	1.1	11.0	Vert	AV	5.5E-9	-52.6	-13.0	-39.6
15663.000	1.5	333.0	Horz	AV	4.6E-9	-53.3	-13.0	-40.3
21120.000	1.5	59.0	Vert	AV	4.1E-9	-53.8	-13.0	-40.8
26400.000	1.5	63.0	Horz	AV	3.1E-9	-55.1	-13.0	-42.1
26400.000	1.5	358.0	Vert	AV	2.4E-9	-56.1	-13.0	-43.1
18480.000	1.5	279.0	Horz	AV	2.3E-9	-56.3	-13.0	-43.3
23760.000	1.5	113.0	Horz	AV	2.3E-9	-56.3	-13.0	-43.3
18480.000	1.5	21.0	Vert	AV	2.1E-9	-56.8	-13.0	-43.8
23760.000	1.5	179.0	Vert	AV	2.1E-9	-56.8	-13.0	-43.8
5280.000	1.5	181.0	Horz	AV	1.6E-9	-57.8	-13.0	-44.8
13200.000	1.5	338.0	Horz	AV	1.6E-9	-57.8	-13.0	-44.8
5280.000	1.5	42.0	Vert	AV	1.6E-9	-57.9	-13.0	-44.9
13200.000	1.5	244.0	Vert	AV	1.4E-9	-58.5	-13.0	-45.5
10560.000	1.5	293.0	Horz	AV	475.5E-12	-63.2	-13.0	-50.2
10560.000	1.5	24.0	Vert	AV	454.1E-12	-63.4	-13.0	-50.4

CONCLUSION

Pass



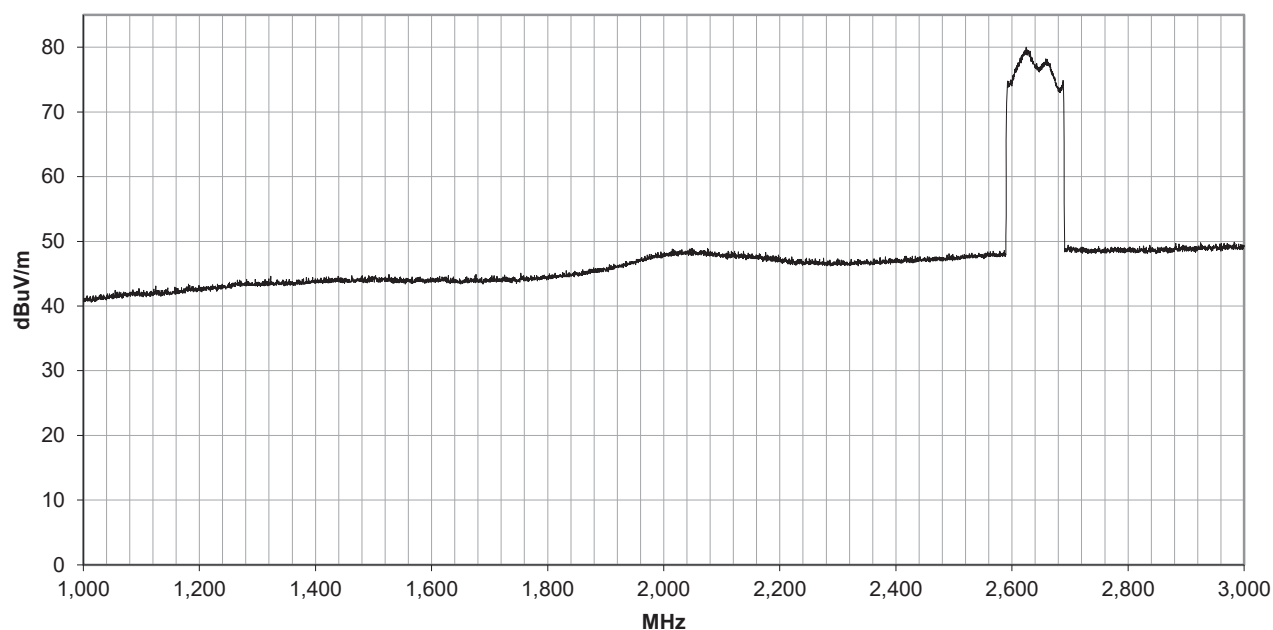
Tested By

SPURIOUS RADIATED EMISSIONS

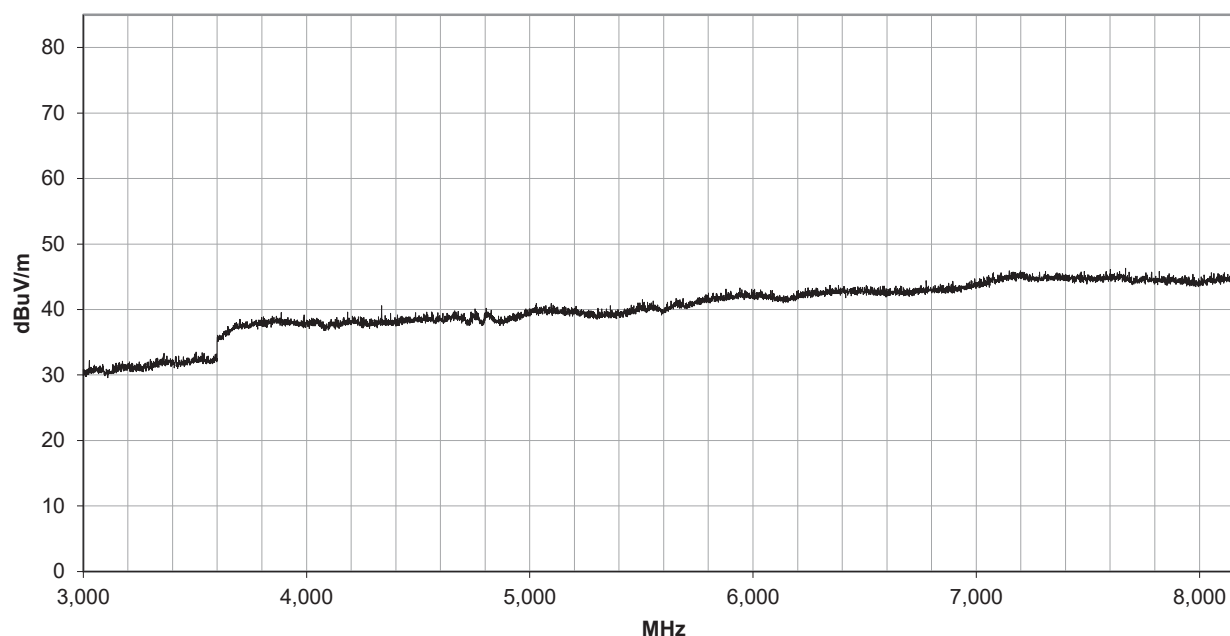
PRESCAN DATA

Radiated spurious emissions from the EUT are initially reviewed with Pre-scans (Preview scans). Pre-scans are performed, with the EUT transmitting on the lowest applicable data rate, for both vertical and horizontal polarizations. The Pre-scan plots below are shown with a peak detector and RBW for the following frequency ranges: 9 kHz RBW (< 30 MHz); 120 kHz RBW (30 - 1000 MHz); 1 MHz RBW (> 1 GHz). In the case where unintentional emissions are observed, an ambient or idle pre-scan with the radio off, will be shown for comparison.

1000-3000 MHz, Run 17

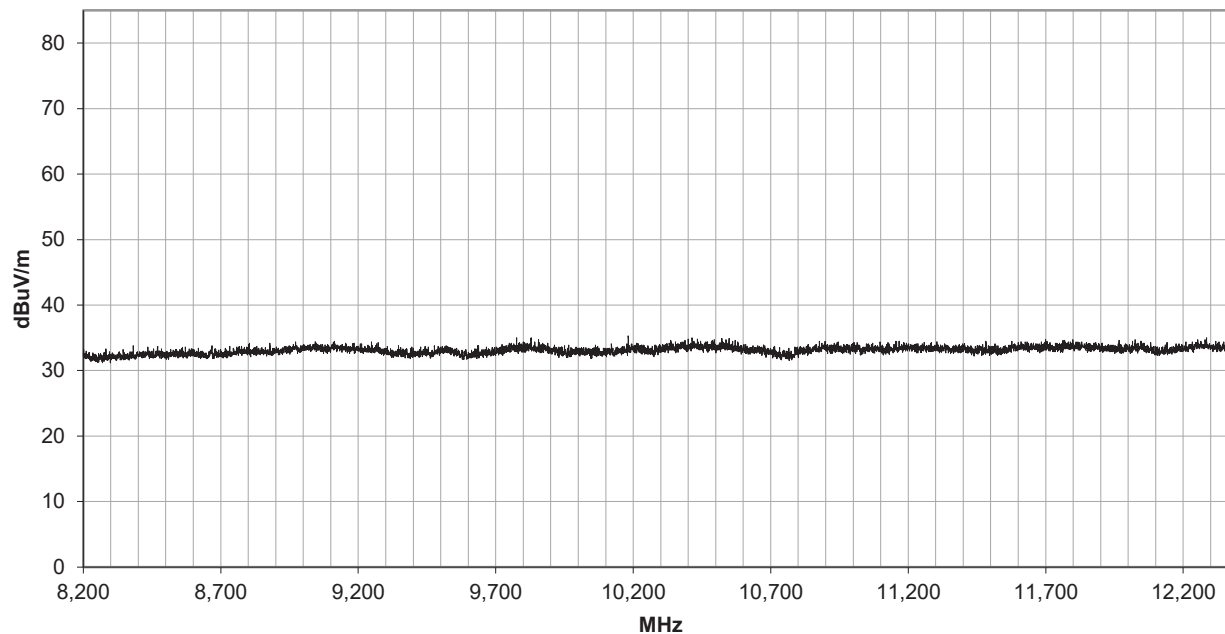


3000-8200 MHz, Run 18

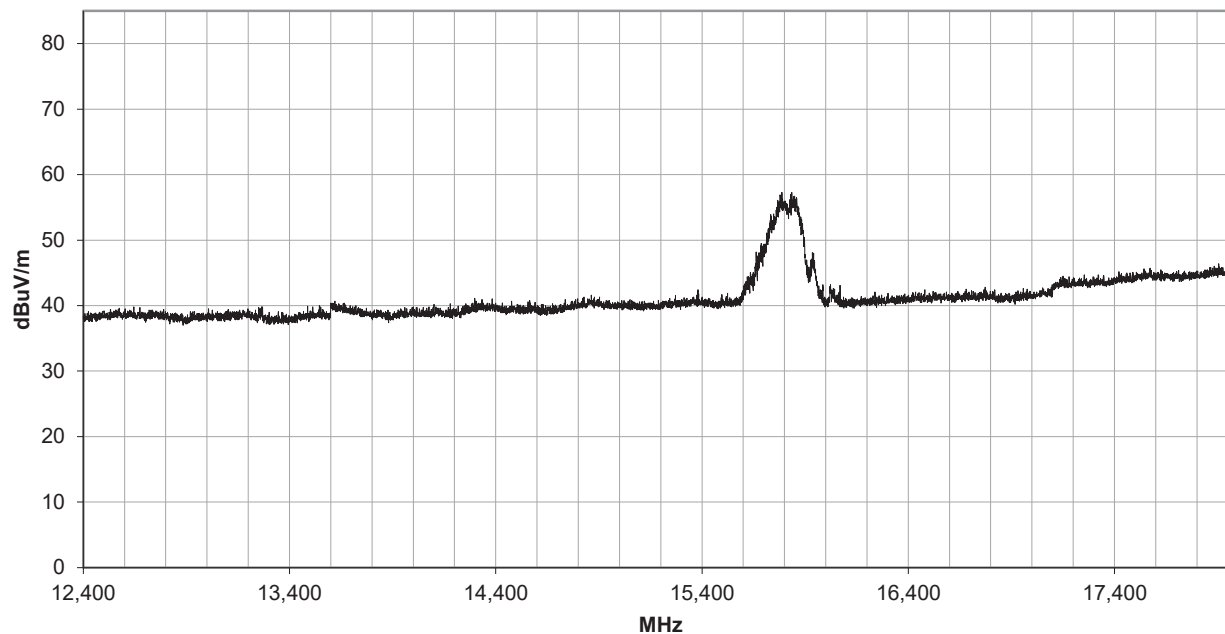


SPURIOUS RADIATED EMISSIONS

8200-12400 MHz, Run 19

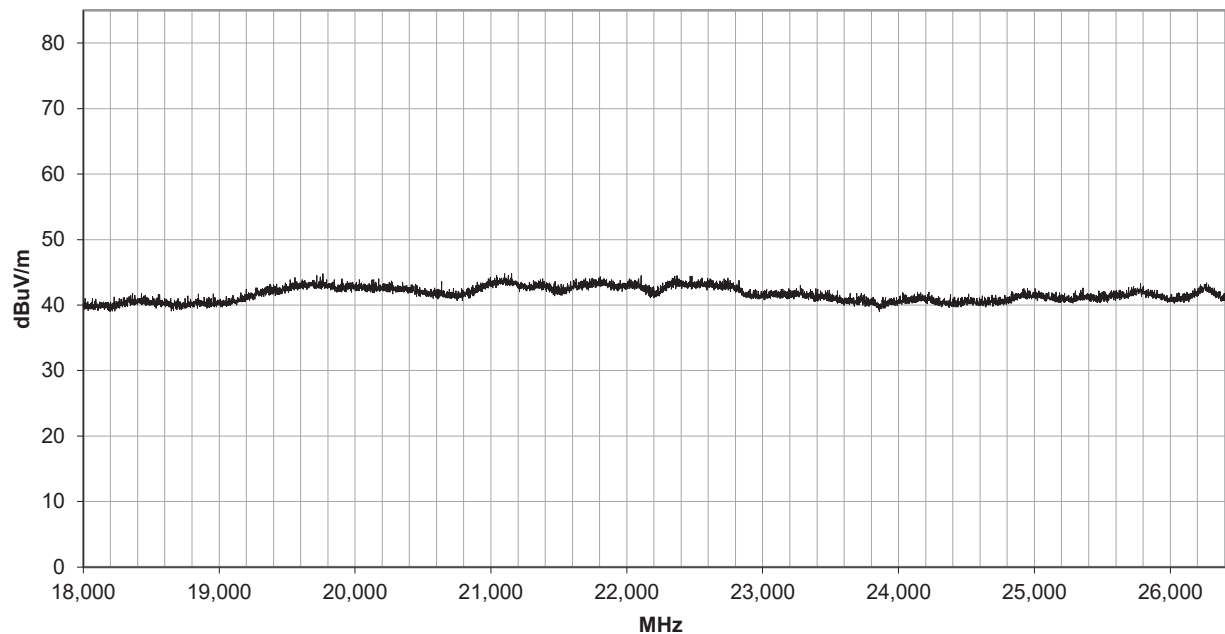


12400-18000 MHz, Run 24

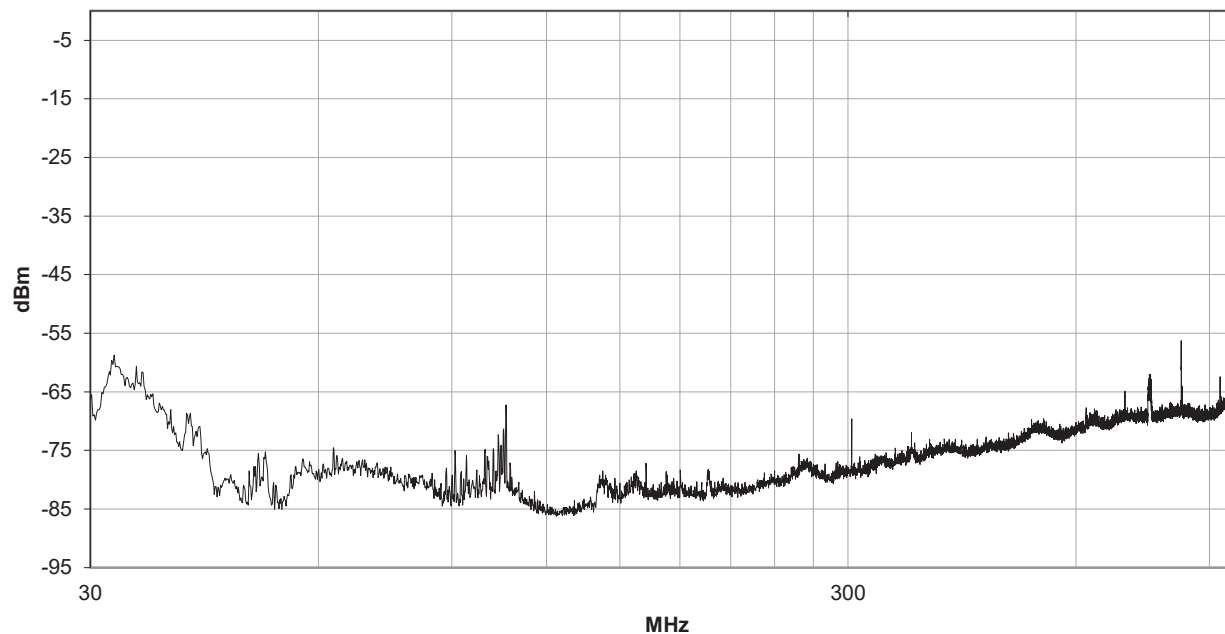


SPURIOUS RADIATED EMISSIONS

18000-26500 MHz, Run 21



30-1000 MHz, Run 38



FREQUENCY STABILITY

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 spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made on the single transmit frequency as called out on the data sheets. Testing was done while the EUT was continuously operating.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage while at ambient temperature. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range of -30 ° to +50° C and at 10°C intervals. At each temperature the transmitter under test shall be allowed to soak for a sufficient period of time to stabilize the temperature in the test chamber. This is typically a minimum of 30 minutes at each temperature step.

The measurement methods for FCC measurements are detailed in KDB971168 D01v03 section 9 and ANSI C63.26-2015. The BTS will be operated on the middle channel using NR10 channel bandwidth with QPSK modulation.

Results with a frequency error of less than 1000 Hz will show the carrier to be operating within the band. The frequency stability/accuracy radio design is the same for all radio technologies and modulation types.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Spectrum Analyzer	Keysight Technologies, Inc.	N9030B	R336	10/3/2024	10/3/2025
Meter - Multimeter	Fluke	115	MBH	2/22/2024	2/22/2025
Temperature/Relative Humidity Chamber	Thermotron	WP802	WC020944	N/A	N/A
Over/Temp Protection	Watlow	Limit SD	WC021180	N/A	N/A
Temp/Humidity Controller	Watlow	F-4	WC021008	2/22/2024	2/22/2025

FREQUENCY STABILITY



EUT:	Airscale Base Transceiver Station Radio Unit Model AVHA	Work Order:	NOKI0079
Serial Number:	L1242005329	Date:	2024-10-10
Customer:	Nokia Solutions and Networks	Temperature:	21.3°C
Attendees:	Mitch Hill, David Le	Relative Humidity:	43.9%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrold Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0079-7

TEST SPECIFICATIONS

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. BRS Band n41 carriers were enabled at maximum power levels.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

FREQUENCY STABILITY

TEST RESULTS

		Value Δ (Hz)	Limit Abs Δ (Hz)	Result
Port 1	BRS/EBS Band n41, 2496 MHz to 2690 MHz			
	10 MHz Bandwidth, QPSK			
	Nominal Temperature, 20°C			
	Low Voltage, 40.8 VDC, Mid Channel 2592.99 MHz	16.62	1000	Pass
	High Voltage, 55.2 VDC, Mid Channel, 2592.99 MHz	5.7	1000	Pass
	Nominal Voltage, 48 VDC			
	Extreme Temperature, -30°C, Mid Channel, 2592.99 MHz	-13.4	1000	Pass
	Extreme Temperature, -20°C, Mid Channel, 2592.99 MHz	18.45	1000	Pass
	Extreme Temperature, -10°C, Mid Channel, 2592.99 MHz	1.91	1000	Pass
	Extreme Temperature, 0°C, Mid Channel, 2592.99 MHz	24.76	1000	Pass
	Extreme Temperature, 10°C, Mid Channel, 2592.99 MHz	-1.48	1000	Pass
	Extreme Temperature, 20°C, Mid Channel, 2592.99 MHz	22.92	1000	Pass
	Extreme Temperature, 30°C, Mid Channel, 2592.99 MHz	76.84	1000	Pass
	Extreme Temperature, 40°C, Mid Channel, 2592.99 MHz	1.76	1000	Pass
	Extreme Temperature, 50°C, Mid Channel, 2592.99 MHz	13.83	1000	Pass

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz
10 MHz Bandwidth, QPSK
Nominal Temperature, 20°C
Low Voltage, 40.8 VDC, Mid Channel 2592.99 MHz



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz
10 MHz Bandwidth, QPSK
Nominal Temperature, 20°C
High Voltage, 55.2 VDC, Mid Channel, 2592.99 MHz

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, -30°C, Mid Channel, 2592.99 MHz



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, -20°C, Mid Channel, 2592.99 MHz

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, -10°C, Mid Channel, 2592.99 MHz



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 0°C, Mid Channel, 2592.99 MHz

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 10°C, Mid Channel, 2592.99 MHz



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 20°C, Mid Channel, 2592.99 MHz

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 30°C, Mid Channel, 2592.99 MHz



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 40°C, Mid Channel, 2592.99 MHz

FREQUENCY STABILITY



Port 1

BRS/EBS Band n41, 2496 MHz to 2690 MHz

10 MHz Bandwidth, QPSK

Nominal Voltage, 48 VDC

Extreme Temperature, 50°C, Mid Channel, 2592.99 MHz

CONFIGURATIONS



Test Configuration 1 (RF Conducted Testing)

Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

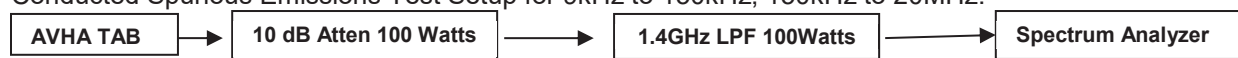
Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model)(with RF adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
10dB Attenuator 100 Watt	Weinschel Corp.	48-10-34-LIM	BJ1771
1.4GHz LPF 100Watts	Microwave Circuits	L13502G1	SN2454-01
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	5624428/4
2 Meter RF cable	Huber & Suhner Inc.	HS-SUCOFLEX_104	184424/4
(63) 25W -50ohm -Terminating Load	API Weinschel, Inc	1427-2	CN1829
(63) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 15m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48
GPS sync cable	Nokia	995426	CA2029
FYGB GPS receiver	Nokia	472748A	71231431
CAT5e data cable (EM-PC)	ETL	E316395	6066M

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic Cable	N	15 meters	N	ABIO	AVHB
GPS Receiver Cable	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	N	ASIB	WebEM- PC
Reference cables (Frame Clock & Trigger)	Y	1 meter	N	ASIB	Analyzer
CBL RF-Cable – RF Load Cables (63)	Y	4 meters	N	EUT [AVHA] Ant ports 2-64	25W -50ohm-Load

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF cable HS-SUCOFLEX_104	Y	2 meters	N	EUT [AVHA] TAB port #1	Attenuator 100W/10dB
Attenuator 100W/10dB	Y	NA	N	2-meter RF cable HS-SUCOFLEX_104	10MHz-1.4GHz LPF Filter
10MHz-1.4GHz LPF Filter	N	NA	N	Attenuator 100W/10dB	1-meter HS-SUCOFLEX_104
HS-SUCOFLEX_104	Y	1 meter	N	10MHz-1.4GHz LPF Filter	Analyzer

RF Test Setup Diagram:

Conducted Spurious Emissions Test Setup for 9kHz to 150kHz, 150kHz to 20MHz.



CONFIGURATIONS



Test Configuration 2 (RF Conducted Testing)

Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

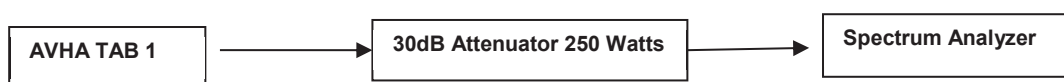
Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model)(with RF adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
Attenuator 250W/30dB	API Weinschel	58-30-34	LL627
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	5624428/4
2 Meter RF cable	Huber & Suhner Inc.	HS-SUCOFLEX_104	184424/4
(63) 25W -50ohm -Terminating Load	API Weinschel, Inc	1427-2	CN1829
(63) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 2m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48
GPS sync cable	Nokia	995426	CA2029
FYGB GPS receiver	Nokia	472748A	71231431
CAT5e data cable (EM-PC)	ETL	E316395	6066M

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic Cable	N	15 meters	N	ABIO	AVHA
GPS Receiver Cable	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	N	ASIB	WebEM- PC
CBL RF-Cable – RF Load Cables (63)	Y	4 meters	N	EUT [AVHA] Ant ports 2-64	25W -50ohm-Load
Reference cables (Frame Clock & Trigger)	Y	1 meter	N	ASIB	Analyzer

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF cable HS-SUCOFLEX_104	Y	2 meters	N	EUT [AVHB] TAB port #1	Attenuator 250W/30dB
Attenuator 250W/30dB	N	NA	N	RF cable HS-SUCOFLEX_104 2 Meters	RF cable HS-SUCOFLEX_104 1 meter
RF cable HS-SUCOFLEX_104	Y	1 meter	N	Attenuator 250W/30dB	Analyzer

RF Test Setup Diagram:

Conducted Spurious Emissions Test Setup for 20MHz to 4GHz



CONFIGURATIONS



Test Configuration 3 (RF Conducted Testing)

Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

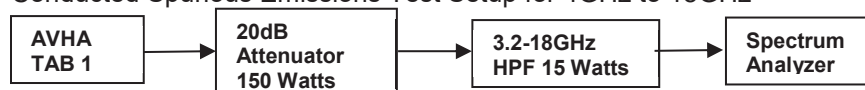
Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model)(with RF adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
Attenuator 150W/20dB	AeroflexWeinschel	66-20-33	BZ1163
High Pass Filter 3.2-18GHz/15W	Microwave Circuits, Inc.	RHPF23G03G18	20121400043
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
1 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN551426/4
2 Meter RF cable	Huber + Suhner, Inc.	HS-SUCOFLEX_104	SN185855/4
(63) 25W -50ohm -Terminating Load	API Weinschel, Inc	1427-2	CN1829
(63) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 2m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48
GPS sync cable	Nokia	995426	CA2029
FYGB GPS receiver	Nokia	472748A	71231431
CAT5e data cable (EM-PC)	ETL	E316395	6066M

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic Cable	N	15 meters	N	ABIO	AVHA
GPS Receiver Cable	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	N	ASIB	WebEM- PC
CBL RF-Cable – RF Load Cables (63)	Y	4 meters	N	EUT [AVHA] Ant ports 2-64	25W -50ohm-Load
Reference cables (Frame Clock & Trigger)	Y	1 meter	N	ASIB	Analyzer

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF cable HS-SUCOFLEX_104	Y	2 meters	N	EUT [AVHA] TAB port #1	Attenuator 150W/20dB
Attenuator 150W/20dB	N	NA	N	RF cable HS-SUCOFLEX_104-2 Meters	3.2 – 18GHz HPF 15 Watts
3.2 – 18GHz HPF 15 Watts	N	NA	N	Attenuator 150W/20dB	RF cable HS-SUCOFLEX_104-1 Meter
RF cable HS-SUCOFLEX_104	Y	1 meter	N	3.2 – 18GHz HPF 15 Watts	Analyzer

RF Test Setup Diagram:

Conducted Spurious Emissions Test Setup for 4GHz to 18GHz



CONFIGURATIONS



Test Configuration 4 (RF Conducted Testing)

Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

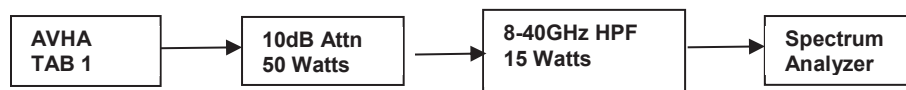
Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model)(with RF adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
Attenuator 50W/10dB	AeroflexWeinschel	RFS50G26S10FF	20031701
High Pass Filter 8-40GHz/15W	RF-Lambda	RHPF23G08G40	17102700016
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
1 Meter RF cable	RF-Lambda	RFC6767A-B7RU1219	AC20040004
3 Meter RF cable	Junsho	MWX241-03000KMSKMS/B	J12J105861-00
(63) 25W -50ohm -Terminating Load	API Weinschel, Inc	1427-2	CN1829
(63) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 2m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48
GPS sync cable	Nokia	995426	CA2029
FYGB GPS receiver	Nokia	472748A	71231431
CAT5e data cable (EM-PC)	ETL	E316395	6066M

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic Cable	N	15 meters	N	ABIO	AVHA
GPS Receiver Cable	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e Cable	Y	5 meters	N	ASIB	WebEM- PC
CBL RF-Cable – RF Load Cables (63)	Y	4 meters	N	EUT [AVHA] Ant ports 2-64	25W -50ohm-Load
Reference cables (Frame Clock & Trigger)	Y	1 meter	N	ASIB	Analyzer

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF cable Junsho	Y	3 meters	N	EUT [AVHA] TAB port #1	Attenuator 50W/10dB
Attenuator 50W/10dB	N	NA	N	RF cable Junsho	High Pass Filter 8-40GHz/15W
High Pass Filter 8-40GHz/15W	N	NA	N	Attenuator 50W/10dB	RF-Lambda cable - AC20040004
RF-Lambda cable - AC20040004	Y	1 meter	N	High Pass Filter 8-40GHz/15W	Analyzer

RF Test Setup Diagram:

Conducted Spurious Emissions Test Setup for 18GHz to 27GHz



CONFIGURATIONS



Test Configuration 5 (Radiated Emissions – AVHA)

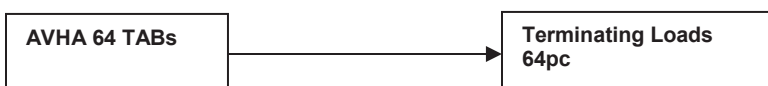
Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model) (with Integration adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
DC Line filter	ASTRODYNE TDI	RP600-125-1000-S-F	120623HT
Terminating Load -50ohms. 25w. Dc to 10GHz (64 pieces)	API Weinschel. Inc	Model 1427-2	CN1869
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
(64) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 2m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic cable	N	25 meters	N	ASIB	AVHA
Cat-5e cable (CSA)	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e cable	Y	25 meters	N	ASIB	WebEM- PC

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF-Cable	Y	4 meters	N	EUT [AVHA] TAB port #1-64	25w -50ohm Terminating Loads
AISG/RET	N	2.4m	N	Remote Radio Head Module	Unterminated
Grounding	N	3m	N	Remote Radio Head Module	Turntable Ground

RF Test Setup Diagram



CONFIGURATIONS

Test Configuration 6 (Frequency Stability)

Software/Firmware Running during test	
Description	Version
Radio Module Software	RF.SRM7.trunk.20240823.002
BTS Software Version (25R1)	SBTS25R1_ENB_9999_240823_000015

Equipment being tested (include Peripherals)			
Description	Manufacturer	Model/Part Number	Serial Number
AMIA (BTS System Module)	Nokia Solutions and Networks	473098.102	J8173107703
ASIB (BTS System Module)	Nokia Solutions and Networks	473764A.102	K9214331950
ABIO (BTS System Module)	Nokia Solutions and Networks	475266A.102	DH223246457
AVHA (Radio Module Model) (with RF adaptor plate)	Nokia Solutions and Networks	476542A.X21	L1242005329
DC Line filter	ASTRODYNE TDI	RP600-125-1000-S-F	120623HT
Terminating Load -50ohms. 25w. Dc to 10GHz (64 pieces)	API Weinschel. Inc	Model 1427-2	CN1869
SFP28 70M MM-ENB	Nokia	P462265	FR214716965
SFP28 70M MM-RADIO	Nokia	P462265	FR214716952
Lenovo PC T490	Lenovo	T490	PF26RVZ0
Keysight- DC System power supply	Keysight	N8757A	US21D4054S
FPAC (DC-pwr supply)	Nokia	472438A.101	G7111007146
(64) 4 Meter- RF cable	CBL	CBL-10F-SMSF-402J-N	402J-N
Fiber Optic cable 2m	Amphenol Fiber Optic	995741A	VZ1701
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-72
Reference cable (Frame Clock & Trigger)	Pomona	2249	C-48

Cables (Peripheral)					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
Fiber Optic cable	N	25 meters	N	ASIB	AVHA
Cat-5e cable (CSA)	Y	100 meters	N	ASIB	FYGB GPS receiver
Cat-5e cable	Y	25 meters	N	ASIB	WebEM- PC

Cables					
Description	Shield (Y/N)	Length (m)	Ferrite (Y/N)	Connection 1	Connection 2
RF-Cable	Y	4 meters	N	EUT [AVHA] TAB port #1-64	25w -50ohm Terminating Loads
AISG/RET	N	2.4m	N	Remote Radio Head Module	Unterminated
Grounding	N	3m	N	Remote Radio Head Module	Turntable Ground

RF Test Setup Diagram



End of Test Report