



Test report

REP032370-1TRFWL

Date of issue: May 13, 2024

Applicant:

Maven Wireless Inc.

Product description:

20W Exo Repeater

Model:

RAH00030

FCC ID:

2BE5B-RAH00030


Product marketing name(s):

None

Specifications:

- ◆ FCC 47 CFR Part 24 – Personal Communication Services
- ◆ FCC 47 CFR Part 27 – Miscellaneous Wireless Communication Services

Lab and test locations

Company name	Nemko USA Inc.
Address	2210 Faraday Ave, Suite 150
City	Carlsbad
State	California
Postal code	92008
Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943; Designation Number: US3165
ISED Test Site	2040B
Tested by	Lan Sayasane, EMC Test Engineer
Reviewed by	James Cunningham, EMC/WL Manager
Review date	May 13, 2024
Reviewer signature	

Limits of responsibility

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

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

This report must not be used by the client to claim product certification, approval, or endorsement by ANAB, NIST, or any agency of the U.S. Government.

Copyright notification

Nemko USA Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

Nemko USA Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

© Nemko USA Inc.

Table of Contents

Table of Contents	3
Section 1 Report summary	4
1.1 Test specifications	4
1.2 Test methods	4
1.3 Exclusions	4
1.4 Statement of compliance.....	4
1.5 Test report revision history.....	4
Section 2 Summary of test results	5
2.1 Sample information	5
2.2 Testing period.....	5
2.3 Test results	5
Section 3 Equipment under test (EUT) details	6
3.1 Disclaimer	6
3.2 Applicant.....	6
3.3 Manufacturer.....	6
3.4 EUT information	6
3.5 Transmitter Information	7
3.6 EUT setup details	7
Section 4 Engineering considerations	9
4.1 Modifications incorporated in the EUT.....	9
4.2 Technical judgement	9
4.3 Deviations from laboratory test procedures.....	9
Section 5 Test conditions	10
5.1 Atmospheric conditions	10
5.2 Power supply range	10
Section 6 Measurement uncertainty	11
6.1 Uncertainty of measurement	11
Section 7 Test equipment.....	12
7.1 Test equipment list	12
7.2 Test software list	12
Section 8 Testing data	13
8.1 AGC Threshold	13
8.2 Out of band rejection	14
8.3 Occupied bandwidth / Input Versus Output Comparison	18
8.4 Output power / Mean output power and amplifier gain	23
8.5 Spurious emissions at RF connector	28
8.6 Radiated spurious emissions.....	47

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 24	Personal Communication Services
FCC 47 CFR Part 27	Miscellaneous Wireless Communication Services

1.2 Test methods

ANSI C63.26 – 2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Services; Section 7 – RF Repeaters, amplifiers, and boosters testing
FCC KDB 935210 D05 v01r04	Measurements Guidance for Industrial, and Non-Consumer Signal Booster, Repeater, and Amplifier Devices

1.3 Exclusions

None.

1.4 Statement of compliance

Testing was performed against all relevant requirements of the test standard(s).

Results obtained indicate that the product under test complies in full with the tested requirements.

The test results relate only to the item(s) tested.

See “Section 2 Summary of test results” for full details.

1.5 Test report revision history

Table 1.5-1: Test report revision history

Revision #	Issue Date	Details of changes made to test report
REP032370-1TRFEMC	May 13, 2024	Original report issued

Section 2 Summary of test results

2.1 Sample information

Receipt date	18-Mar-24
Nemko sample ID number	REP032370

2.2 Testing period

Test start date	21-Mar-24
Test end date	27-Mar-24

2.3 Test results

Table 2.3-1: Summary of results

FCC Part	Test method	Test description	Verdict
	KDB 935210 D05V01r04 (3.2) ANSI C63.26 7.2.2.1	AGC threshold	Pass
	KDB 935210 D05v01r04 (3.3) ANSI C63.26 7.2.2.2	Out of band rejection	Pass
FCC Part 2.1049	KDB 935210 D05v01r05 (3.4) ANSI C63.26 7.2.2.3	Occupied bandwidth / Input-versus-output spectrum	Pass
FCC Part 24.232 (band 25 operation) FCC Part 27.50(d) (band 66 operation)	KDB 935210 D05v01r05 (3.5) ANSI C63.26 7.2.2.4	Input/output power and amplifier/booster gain	Pass
FCC Part 24.238 (band 25 operation) FCC Part 27.53(h) (band 66 operation)	KDB 935210 D05v01r05 (3.6) ANSI C63.26 7.2.2.5	Spurious emissions at RF antenna connector	Pass
FCC Part 24.235 (band 25 operation) FCC Part 27.54 (band 66 operation)	KDB 935210 D05v01r05 (3.7) ANSI C63.26 7.2.2.6	Frequency stability	Not applicable ¹
FCC Part 24.238 (band 25 operation) FCC Part 27.53(h) (band 66 operation)	KDB 935210 D05v01r05 (3.8) ANSI C63.26 7.2.2.7	Radiated spurious emissions	Pass

Notes: ¹ Per ANSI C63.26-2015 clause 7.2.2.6 and KDB 935210 Clause 3.7, frequency stability testing is not required if the EUT does not process the input signal in a manner that can influence the output signal frequency/frequencies.

Section 3 Equipment under test (EUT) details

3.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

3.2 Applicant

Company name	Maven Wireless Inc.
Address	222 Pacific Coast Highway
City	El Segundo
State	CA
Postal/Zip code	90245
Country	USA

3.3 Manufacturer

Company name	Maven Wireless Inc.
Address	222 Pacific Coast Highway
City	El Segundo
State	CA
Postal/Zip code	90245
Country	USA

3.4 EUT information

Product name	20W Exo Repeater
Model	RAH00030
Variant(s)	None
Serial number	017E0
Part number	RAH00030, Rev. B
Power requirements	115-230 VAC, 50/60 Hz, 5.2-206 A rms
Description/theory of operation	The Maven digital off-air repeater is a bidirectional frequency-selective amplifier: Downlink signals from the base (donor) antenna port are digitized, the signals which should be amplified are selected by digital filtering and are re-transmitted with the wanted gain on the mobile (server) antenna port. Uplink signals from the mobile (server) antenna port are similarly digitised, filtered and re-transmitted on the base (donor) port. In both directions, excessive signal levels are limited by fast-acting automatic level control (ALC). The isolation between antennas is monitored to prevent oscillation in case of inadequate isolation margin.
Operational frequencies	Band 25: 1930 – 1995 MHz DL / 1850 – 1915 MHz UL Band 66: 2110 – 2180 MHz DL / 1710 – 1760 MHz UL (*)
Software details	N/A
Type of signal booster	FCC: <ul style="list-style-type: none"> <input type="checkbox"/> Consumer Signal Booster <input type="checkbox"/> Provider-Specific Consumer Signal Booster <input checked="" type="checkbox"/> Industrial Signal Booster ISSED: <ul style="list-style-type: none"> <input type="checkbox"/> Consumer Zone Enhancer <input type="checkbox"/> Fixed Consumer Zone Enhancer <input checked="" type="checkbox"/> Industrial Zone Enhancer <input type="checkbox"/> Mobile Consumer Zone Enhancer <input type="checkbox"/> Provider-Specific Consumer Zone Enhancer

(*) Note this is a subset of the full band 66 (2110 – 2200 MHz DL / 1710 – 1780 MHz UL)

3.5 Transmitter Information

Frequency band(s)	Band 25: 1930 – 1995 MHz DL / 1850 – 1915 MHz UL Band 66: 2110 – 2180 MHz DL / 1710 – 1760 MHz UL
Antenna information	One output antenna port. None - antenna connectors only
Nominal gain (*)	15 to 45 dB in 0.1 dB steps
Gain-versus-frequency response (*)	Gain is nominally flat across the frequency bands. See out-of-band rejection data in section 8.2 for verification.
Rated mean output power P _{rated} (*)	43 dBm
Output signal coupling attenuation (*)	0 dB
Mobile Station Coupling Loss (*)	N/A (EUT is not a Wideband Consumer Zone Enhancer)
Base Station Coupling Loss (*)	N/A (EUT is not a Provider-Specific Consumer Zone Enhancer)
Input port impedance	50 ohms
Output port impedance	50 ohms

3.6 EUT setup details

Table 3.6-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number	Rev.
None	N/A	N/A	N/A	N/A

Table 3.6-2: EUT interface ports

Description	Qty.
AC Input	1
BASE Input	1
MOBILE Output	1
SIM Card Slot	1
External Alarm Connector	1
SFP+ Fiber Ports	4
Local Management Port	1
AUX/USB Port	1
QSFP+ Fiber Ports	3

Table 3.6-3: Support equipment

Description	Brand name	Model/Part number	Serial number	Rev.
Laptop	DELL	Latitude	N/A	N/A
Vector Signal Generator	Rohde & Schwarz	SMW200A	N/A	N/A

Table 3.6-4: Inter-connection cables

Cable description	From	To	Length (m)
AC power cable	Building	Exo Repeater	2
USB cable	Laptop	Exo Repeater	2
SMA cable	Vector Signal Generator	Exo Repeater	2

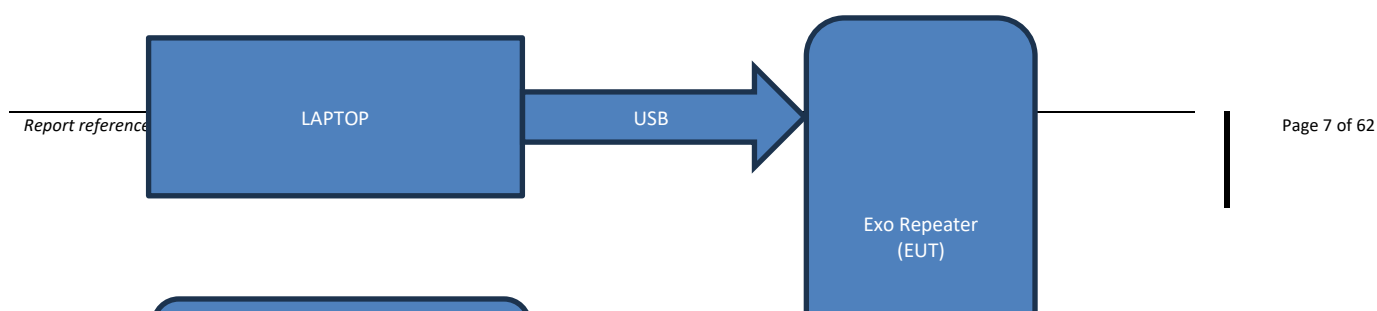


Figure 3.6-1: Test setup diagram

Section 4 Engineering considerations

4.1 Modifications incorporated in the EUT

None.

4.2 Technical judgement

None.

4.3 Deviations from laboratory test procedures

None.

Section 5 Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	86–106 kPa

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.

Section 6 Measurement uncertainty

6.1 Uncertainty of measurement

Nemko USA Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4-2 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics, and limit modelling – Measurement instrumentation uncertainty. The expression of Uncertainty in EMC testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Table 6.1-1: Measurement uncertainty calculations

Measurement		U_{cispr} dB	U_{lab} dB
Conducted disturbance at AC mains and other port power using a V-AMN	9 kHz to 150 kHz	3.8	2.9
	150 kHz to 30 MHz	3.4	2.3
Conducted disturbance at telecommunication port using AAN	150 kHz to 30 MHz	5.0	4.3
Conducted disturbance at telecommunication port using CVP	150 kHz to 30 MHz	3.9	2.9
Conducted disturbance at telecommunication port using CP	150 kHz to 30 MHz	2.9	1.4
Conducted disturbance at telecommunication port using CP and CVP	150 kHz to 30 MHz	4.0	3.1
Radiated disturbance (electric field strength in a SAC)	30 MHz to 1 GHz	6.3	5.5
Radiated disturbance (electric field strength in a FAR)	1 GHz to 6 GHz	5.2	4.7
Radiated disturbance (electric field strength in a FAR)	6 GHz to 18 GHz	5.5	5.0

- Notes: Compliance assessment:
- If U_{lab} is less than or equal to U_{cispr} then:
- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit.
 - non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit
- If U_{lab} is greater than U_{cispr} then:
- compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.
 - non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit

V-AMN: V type artificial mains network
 AAN: Asymmetric artificial network
 CP: Current probe
 CVP: Capacitive voltage probe
 SAC: Semi-anechoic chamber
 FAR: Fully anechoic room

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: Test Equipment List

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	E1120	2 years	14-Dec-2025
Vector Signal Generator	Rohde & Schwarz	SMW200A	E1156	3 years	10-May-2024
EMI Test Receiver	Rohde & Schwarz	ESU 40	E1121	1 year	23-Aug-2024
System Controller	Sunol Sciences	SC104V	E1191	NCR	NCR
Antenna, Bilog	Schaffner-Chase	CBL6111C	1480	1 year	21-Feb-2025
Antenna, DRG Horn	ETS-Lindgren	3117-PA	E1160	1 year	13-Feb-2025
Antenna, Horn (18-26.5 GHz)	Eravant	SAZ-2410-42-S1	EW107	1 year	05-Dec-2024
Termination, 50 ohms	Diamond Antenna	DC-500MHz	N/A	NCR	NCR
Attenuator, 30dB	Pasternack	PE7388-30	E1325	VBU	VBU
Power Splitter	Mini-Circuits	ZFRSC-123-S+	E1215	NCR	NCR

Notes: NCR: no calibration required
VBU: verify before use

7.2 Test software list

Table 7.2-1: Test Software

Manufacturer	Details
Rohde & Schwarz	EMC 32 V10.60.10 (AC conducted emissions)
Rohde & Schwarz	EMC 32 V10.60.15 (radiated emissions)

Section 8 Testing data

8.1 AGC Threshold

8.1.1 References and limits

- ANSI C63.26 Section 7.2.2.1
- KDB 935210 D05v01r04 Clause 3.2

8.1.2 Test summary

Verdict	Pass		
Test date	March 21, 2024	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1009 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input type="checkbox"/> 3m semi anechoic chamber <input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	52 %

8.1.3 Notes

Per KDB 935210 D05 v01r04, Clause 3.1 and ANSI C63.26 Clause 7.2.2.1, testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth).

8.1.4 Setup details

EUT power input during test	120 VAC / 60 Hz
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	<p>The automatic gain control (AGC) threshold is determined as follows:</p> <ol style="list-style-type: none"> a) Connect a signal generator to the input of the EUT. b) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation. c) The signal generator must be set to either of the required modulation signals. d) Set the frequency to the middle frequency of the EUT operating band. e) While monitoring the output of the EUT using the method of ANSI C63.26 7.2.2.4.2 or 7.2.2.4.3, increase the input level until a 1 dB increase in the input signal no longer causes a 1 dB increase in the output signal. f) This is the AGC threshold level of the EUT. g) Repeat for the other modulation signal.

8.1.5 Test data

Table 8.1-1: AGC Threshold results

Operating frequency band	Input signal type	AGC Threshold Level (dBm)
Band 25: 1930 – 1995 MHz	Narrowband	-7.0
	Broadband	-8.0
Band 66: 2110 – 2180 MHz	Narrowband	-8.0
	Broadband	-9.0

8.2 Out of band rejection

8.2.1 References and limits

- ANSI C63.26 Section 7.2.2.2
- KDB 935210 D05v01r04 Clause 3.3

8.2.2 Test summary

Verdict	Pass		
Test date	March 21, 2024	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1009 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input type="checkbox"/> 3m semi anechoic chamber <input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	52 %

8.2.3 Notes

The EUT can only be configured to operate in defined 20 MHz sub-bands of the supported operating bands. Therefore, out-of-band rejection tests were performed with the EUT configured to operate on the lowest, middle and highest 20 MHz sub-bands for band 25 and lowest and middle 20 MHz sub-bands for band 66.

8.2.4 Setup details

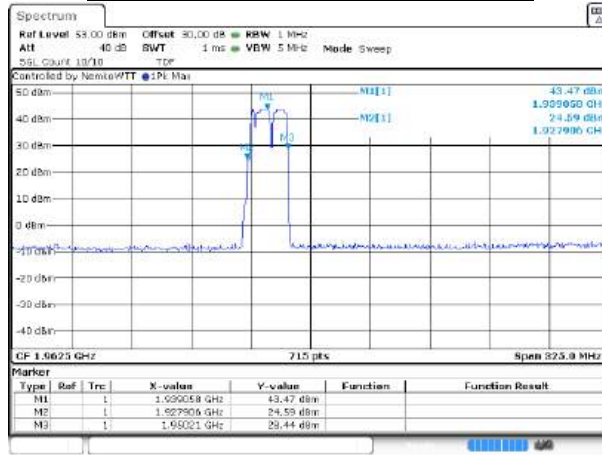
EUT power input during test	120 VAC / 60 Hz
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	<p>The out-of-band rejection is measured as follows:</p> <ol style="list-style-type: none"> a. Connect a signal generator to the input of the EUT. b. Configure a swept CW signal with the following parameters: <ol style="list-style-type: none"> 1) Frequency range = $\pm 250\%$ of the passband from the center of the passband, for each applicable operating frequency band. 2) Level = a sufficient level to affirm that the out-of-band rejection is > 20 dB above the noise floor and will not engage the AGC during the entire sweep. 3) Dwell time = approximately 10 ms. 4) Number of points = $SPAN/(RBW/2)$. c. Connect a spectrum analyzer to the output of the EUT using appropriate attenuation. d. Set the span of the spectrum analyzer to the same frequency range of the signal generator. e. Set the RBW of the spectrum analyzer to be 1% to 5% of the EUT passband and the VBW shall be set to $\geq 3 \times RBW$. f. Set the detector to Peak Max-Hold and wait for the spectrum analyzer's display to fill. g. Capture the frequency response of the EUT. h. Place a marker to the peak of the frequency response and record this frequency as f_0. i. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the -20 dB down amplitude to determine the 20 dB bandwidth. j. Repeat for all frequency bands applicable for use by the EUT.

8.2.5 Test data

8.2.5.1 Operating frequency band: Band 25: 1930 – 1995 MHz

Table 8.2-1: Out of band rejection results, low sub-band

Parameter	Value
f_0	1939.058
f_l	1927.906
f_h	1950.21
20 dB bandwidth	22.304

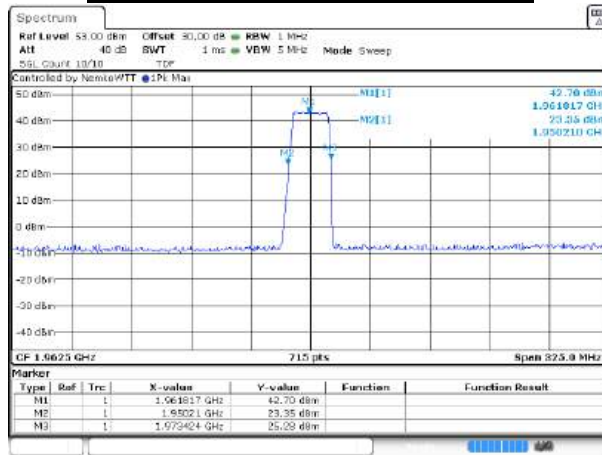


Out of band rejection: 1930-1986 MHz

Figure 8.2-1: Out of band rejection results, low sub-band

Table 8.2-2: Out of band rejection results, mid sub-band

Parameter	Value
f_0	1961.817
f_l	1950.21
f_h	1973.424
20 dB bandwidth	23.214



Out of band rejection: 1930-1986 MHz

Figure 8.2-2: Out of band rejection results, mid sub-band

Table 8.2-3: Out of band rejection results, high sub-band

Parameter	Value
f_0	1984.349
f_i	1972.969
f_h	1995.728
20 dB bandwidth	22.759

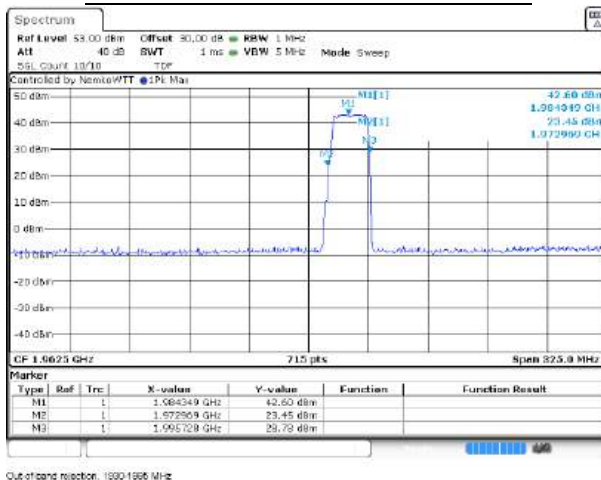


Figure 8.2-3: Out of band rejection results, high sub-band

8.2.5.2 Operating frequency band: Band 66: 2110 – 2200 MHz

Table 8.2-4: Out of band rejection results, low sub-band

Parameter	Value
f_0	2119.51
f_i	2108.362
f_h	2130.657
20 dB bandwidth	22.295

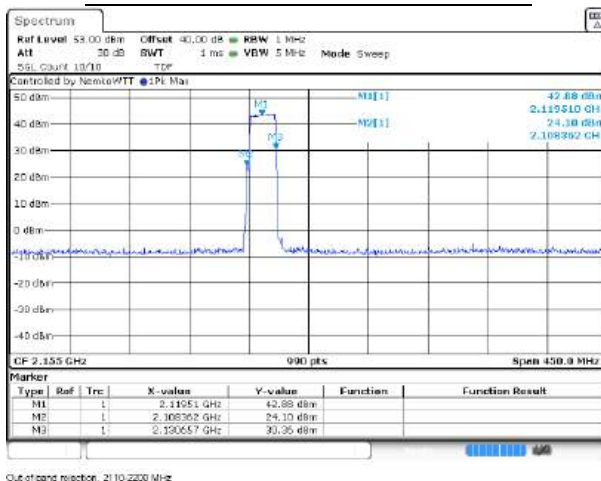


Figure 8.2-4: Out of band rejection results, low sub-band

Table 8.2-5: Out of band rejection results, mid sub-band

Parameter	Value
f_0	2154.317
f_i	2142.942
f_h	2165.693
20 dB bandwidth	22.751

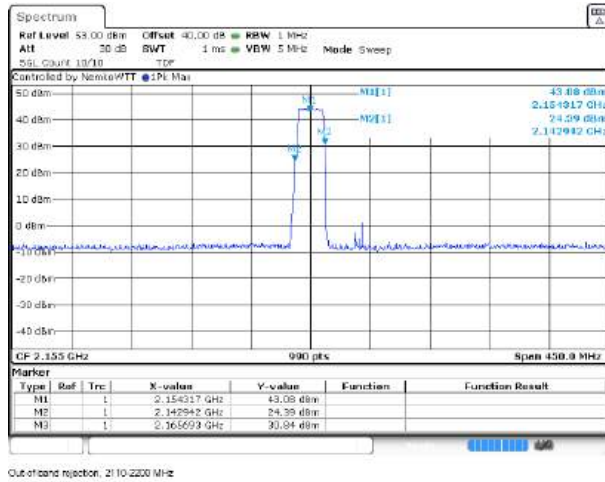


Figure 8.2-5: Out of band rejection results, mid sub-band

8.3 Occupied bandwidth / Input Versus Output Comparison

8.3.1 References and limits

- FCC 47 CFR Part 2.1049
- ANSI C63.26 Clause 7.2.2.4
- KDB 935210 D05v01r04 Clause 3.4

8.3.2 Test summary

Verdict	Pass		
Test date	March 21, 2024	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1009 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input type="checkbox"/> 3m semi anechoic chamber <input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	52 %

8.3.3 Notes

Per KDB 935210 D05 v01r04, Clause 3.3 and ANSI C63.26 Clause 7.2.2.3, testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth).

8.3.4 Setup details

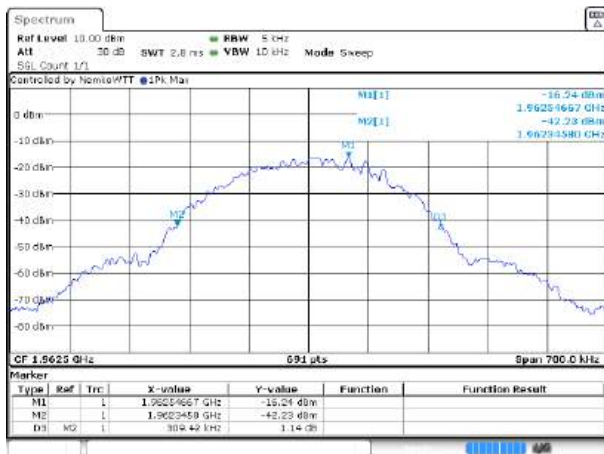
EUT power input during test	120 VAC / 60 Hz
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	<p>A 26 dB bandwidth measurement shall be performed on the input and the output signal.</p> <ol style="list-style-type: none"> a. Connect a signal generator to the EUT. b. Configure the signal generator to transmit the AWGN signal. c. Configure the signal level to be just below the AGC threshold, but not more than 015 dB below. d. Connect a spectrum analyzer to the output of the EUT using appropriate attenuation. e. Set the spectrum analyzer center frequency to the nominal EUT channel center frequency. The span range of the spectrum analyzer shall be between 2 x OBW and 5 x OBW. f. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW and the VBW shall be $\geq 3 \times$ RBW. g. Set the reference level of the instrument as required, to prevent the signal from exceeding the maximum spectrum analyzer input mixer level for linear operation. In general, the peak of the spectral envelope must be more than $[10 \log (OBW / RBW)]$ below the reference level. Step f) and step g) can require iteration to enable adjustments within the specified tolerances. h. The noise floor of the spectrum analyzer at the selected RBW shall be at least 36 dB below the reference level. i. Set spectrum analyzer detection mode to peak, and the trace mode to max hold. j. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference level). k. Determine the -26 dB down amplitude by placing two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the -26 dB down amplitude. If a marker is below the -26 dB down value, it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. l. Repeat step 3) to step k) to measure the input signal to the EUT (i.e., signal generator output). Compare the 26 dB bandwidths to affirm they are similar. m. Repeat step e) to step l) with the input signal to the EUT set to 3 dB above the AGC threshold. n. Repeat step e) to step m) with the signal generator set to the narrowband signal. o. Repeat step e) to step n) for all bands used by the EUT.

8.3.5 Test data

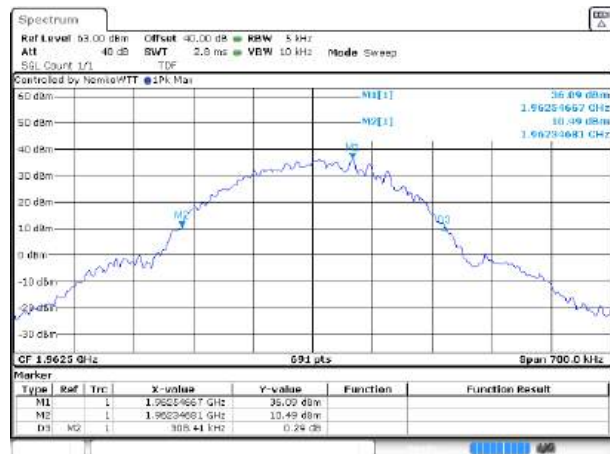
8.3.5.1 Operating frequency band: Band 25: 1930 – 1995 MHz

Table 8.3-1: Occupied bandwidth / Input Versus Output Comparison results

Condition	Test Frequency (MHz)	26 dB Bandwidth (Input Signal) (MHz)	26 dB Bandwidth (Output Signal) (MHz)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband	1962.5	0.30942	0.30841
Input Level = AGC Threshold + 3 dB Input signal = narrowband	1962.5	0.31246	0.30841
Input Level = AGC Threshold - 0.5 dB Input signal = broadband	1962.5	4.6667	4.6667
Input Level = AGC Threshold + 3 dB Input signal = broadband	1962.5	4.6667	4.692

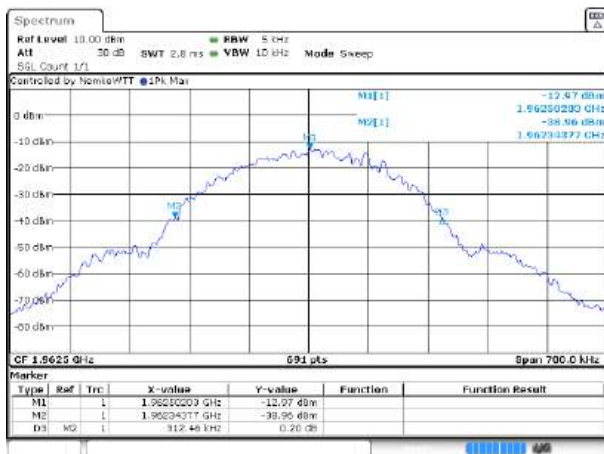


Occupied bandwidth (26 dB), TX: 1962.5 MHz, BW: 0.26 MHz, MOD: QPSK

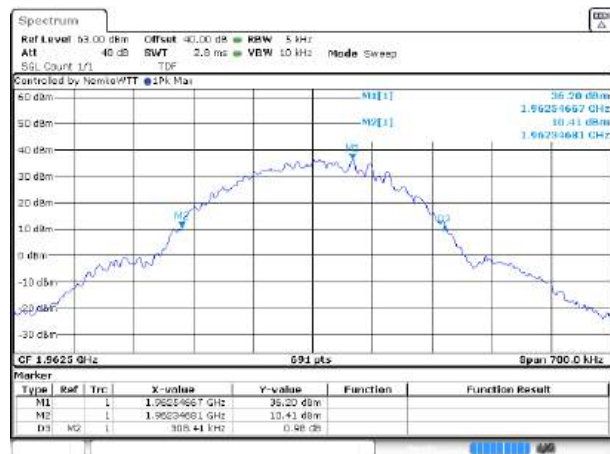


Occupied bandwidth (26 dB), TX: 1962.5 MHz, BW: 0.26 MHz, MOD: QPSK

Figure 8.3-1: Occupied bandwidth / Input Versus Output Comparison results, narrowband signal, 0.5 dB below AGC threshold, input and output signal respectively

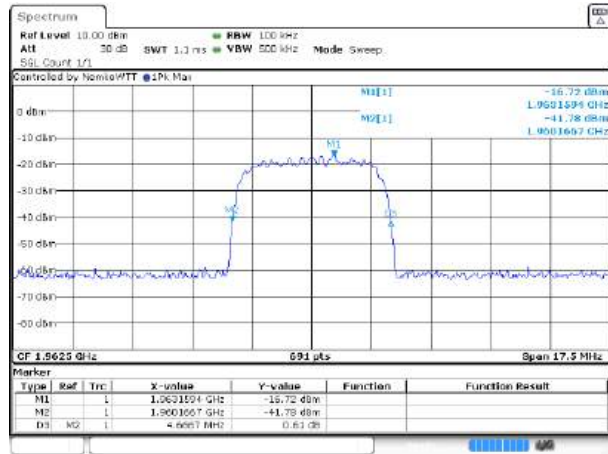


Occupied bandwidth (26 dB), TX: 1962.5 MHz, BW: 0.26 MHz, MOD: QPSK

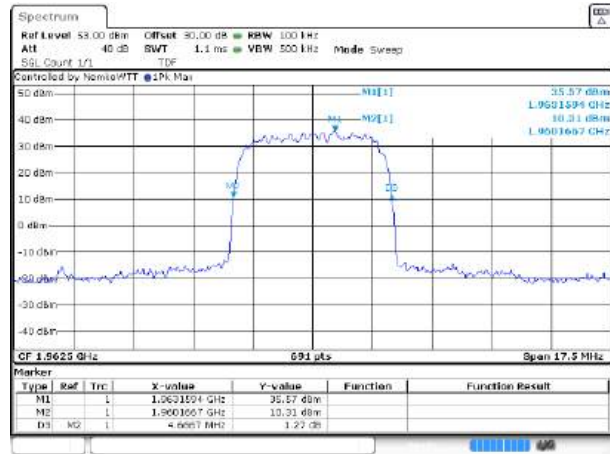


Occupied bandwidth (26 dB), TX: 1962.5 MHz, BW: 0.26 MHz, MOD: QPSK

Figure 8.3-2: Occupied bandwidth / Input Versus Output Comparison results, narrowband signal, 3.0 dB above AGC threshold, input and output signal respectively

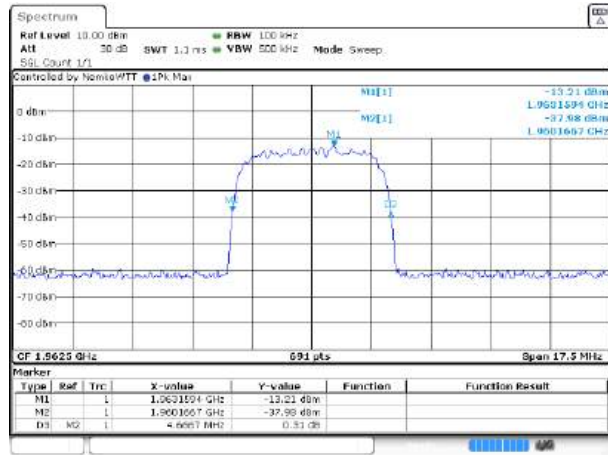


Occupied bandwidth (25 dB) TX 1962.5 MHz, BW 5MHz, MOD: WY
CDMA



Occupied bandwidth (25 dB) TX 1962.5 MHz, BW 5MHz, MOD: WY
CDMA

Figure 8.3-3: Occupied bandwidth / Input Versus Output Comparison results, broadband signal, 0.5 dB below AGC threshold, input and output signal respectively



Occupied bandwidth (25 dB) TX 1962.5 MHz, BW 5MHz, MOD: WY
CDMA



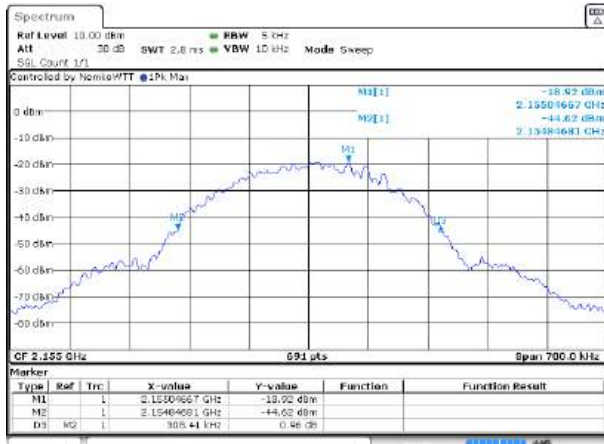
Occupied bandwidth (25 dB) TX 1962.5 MHz, BW 5MHz, MOD: WY
CDMA

Figure 8.3-4: Occupied bandwidth / Input Versus Output Comparison results, broadband signal, 3.0 dB above AGC threshold, input and output signal respectively

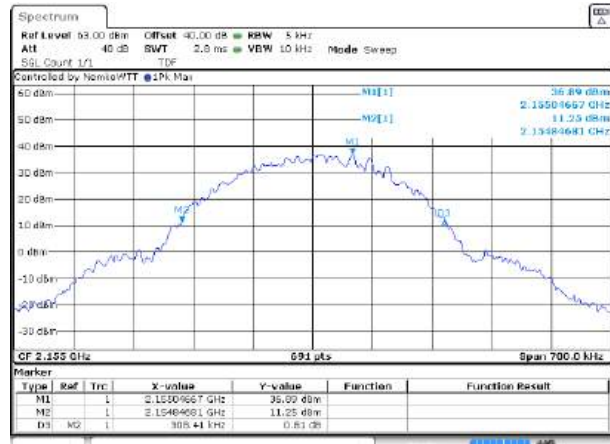
8.3.5.2 Operating frequency band: Band 66: 2110 – 2200 MHz

Table 8.3-2: Occupied bandwidth / Input Versus Output Comparison results

Condition	Test Frequency (MHz)	26 dB Bandwidth (Input Signal) (MHz)	26 dB Bandwidth (Output Signal) (MHz)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband	2155	0.30841	0.30841
Input Level = AGC Threshold + 3 dB Input signal = narrowband	2155	0.30841	0.30841
Input Level = AGC Threshold - 0.5 dB Input signal = broadband	2155	4.6667	4.6667
Input Level = AGC Threshold + 3 dB Input signal = broadband	2155	4.6667	4.692

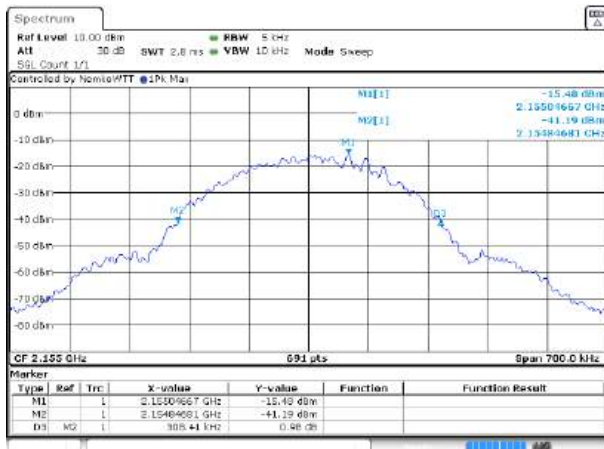


Occupied bandwidth (26 dB), TX 2155 MHz, BW: 0.2MHz, MOD: G SM

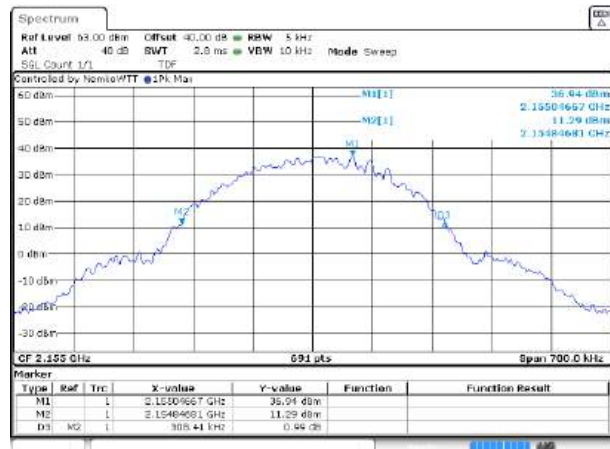


Occupied bandwidth (26 dB), TX 2155 MHz, BW: 0.2MHz, MOD: G SM

Figure 8.3-5: Occupied bandwidth / Input Versus Output Comparison results, narrowband signal, 0.5 dB below AGC threshold, input and output signal respectively

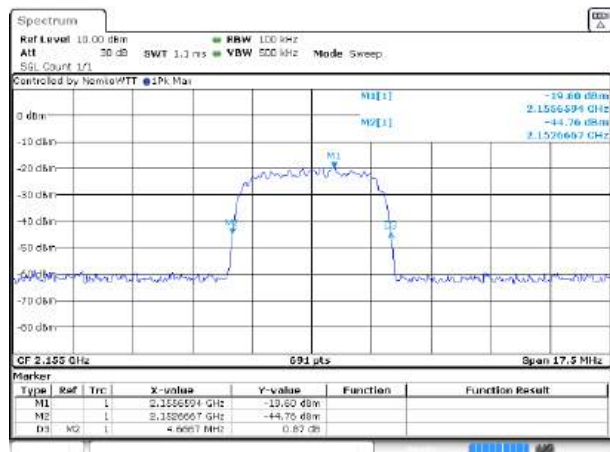


Occupied bandwidth (26 dB), TX 2155 MHz, BW: 0.2MHz, MOD: G SM

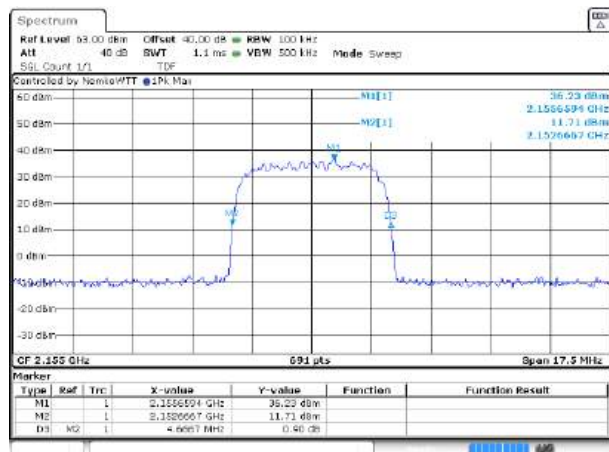


Occupied bandwidth (26 dB), TX 2155 MHz, BW: 0.2MHz, MOD: G SM

Figure 8.3-6: Occupied bandwidth / Input Versus Output Comparison results, narrowband signal, 3.0 dB above AGC threshold, input and output signal respectively

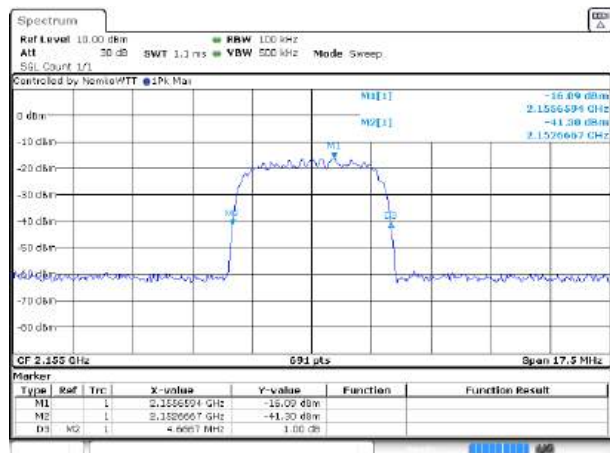


Occupied bandwidth (25 dB) TX 2165 MHz, BW 3MHz, MOD WCD MA

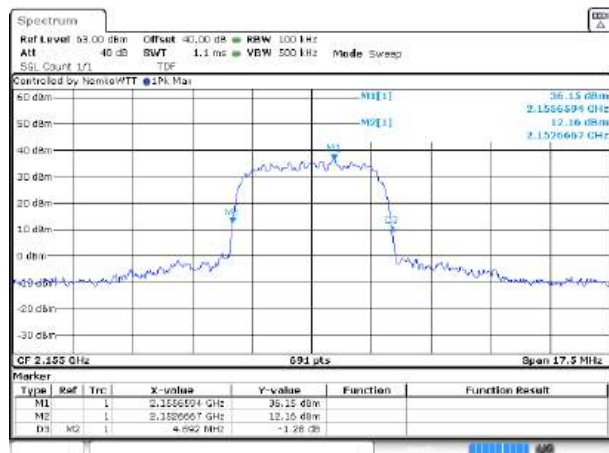


Occupied bandwidth (25 dB) TX 2165 MHz, BW 3MHz, MOD WCD MA

Figure 8.3-7: Occupied bandwidth / Input Versus Output Comparison results, broadband signal, 0.5 dB below AGC threshold, input and output signal respectively



Occupied bandwidth (25 dB) TX 2165 MHz, BW 3MHz, MOD WCD MA



Occupied bandwidth (25 dB) TX 2165 MHz, BW 3MHz, MOD WCD MA

Figure 8.3-8: Occupied bandwidth / Input Versus Output Comparison results, broadband signal, 3.0 dB above AGC threshold, input and output signal respectively

8.4 Output power / Mean output power and amplifier gain

8.4.1 References and limits

- FCC Part 24.232 (band 25 operation)
- FCC Part 27.50(d) (band 66 operation)
- ANSI C63.26 Clause 7.2.2.4
- KDB 935210 D05v01r05 Clause 3.5

8.4.2 Test summary

Verdict	Pass		
Test date	March 21, 2024	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1009 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input type="checkbox"/> 3m semi anechoic chamber <input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	52 %

8.4.3 Notes

Per KDB 935210 D05 v01r04, Clause 3.4 and ANSI C63.26 Clause 7.2.2.4, testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth).

8.4.4 Setup details

EUT power input during test	120 VAC / 60 Hz
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	<p>Adjust the internal gain control of the EUT to the maximum gain for which the equipment certification is sought. Any EUT attenuation settings shall be set to their minimum value.</p> <ol style="list-style-type: none"> a. Connect a signal generator to the input of the EUT. b. The modulation shall be set to the AWGN signal. c. The frequency of the signal generator shall be set to the frequency f_0 as determined during the out-of-band rejection measurement. d. Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation, e. Set the level of the signal generator to a level that produces an output just below the AGC threshold, but not more than 015 dB below. f. Measure the output power of the EUT. g. Remove the EUT from the measurement set-up. Using the same signal generator settings, repeat the power measurement on the input signal to the EUT (i.e., the signal generator output). Calculate the amplifier gain as follows: $\text{Gain (dB)} = \text{output (dBm)} - \text{input (dBm)}$ h. Repeat step f) and g) with the input level set to a level that is 3 dB above the AGC threshold. i. Repeat step e) to step h) with the input signal set to narrowband modulation. j. Repeat step e) to step i) for all bands used by the EUT.

8.4.5 Test data

8.4.5.1 Operating frequency band: Band 25: 1930 – 1995 MHz

Table 8.4-1: Output power / Mean output power and amplifier gain test data

Condition	Test frequency (MHz)	Input power (dBm / MHz)	Output power (dBm/MHz)	Amplifier gain (dB)	0.1 % PAPR (dB)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband	1961.817	-10.04	42.20	52.24	0.43
Input Level = AGC Threshold + 3 dB Input signal = narrowband	1961.817	-6.47	42.17	48.64	0.38
Input Level = AGC Threshold - 0.5 dB Input signal = broadband	1961.817	-9.95	42.24	52.19	4.43
Input Level = AGC Threshold + 3 dB Input signal = broadband	1961.817	-6.41	42.39	48.80	3.65

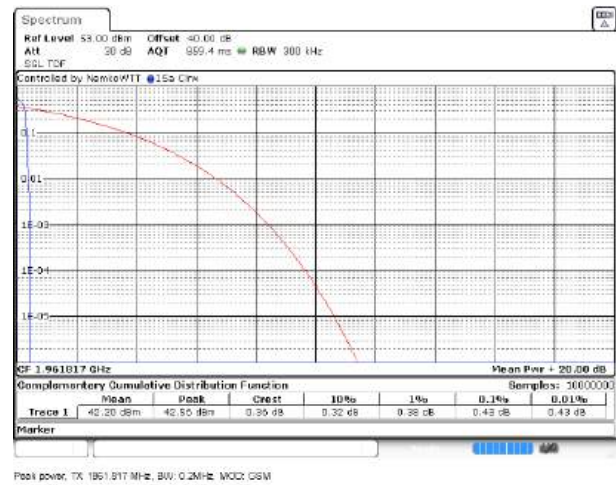
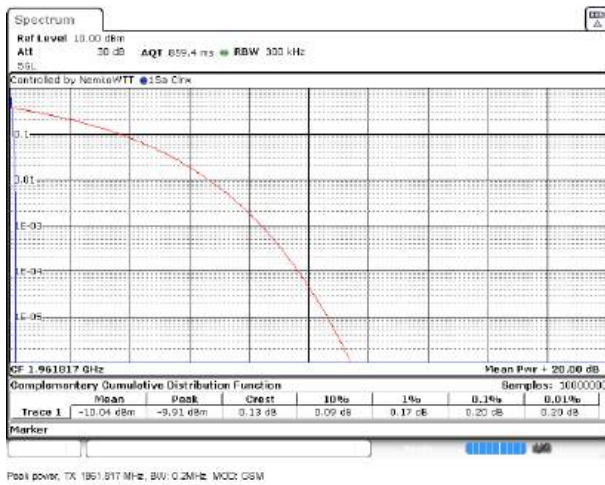


Figure 8.4-1: Output power / Mean output power and amplifier gain results, narrowband signal, 0.5 dB below AGC threshold, input and output signal respectively

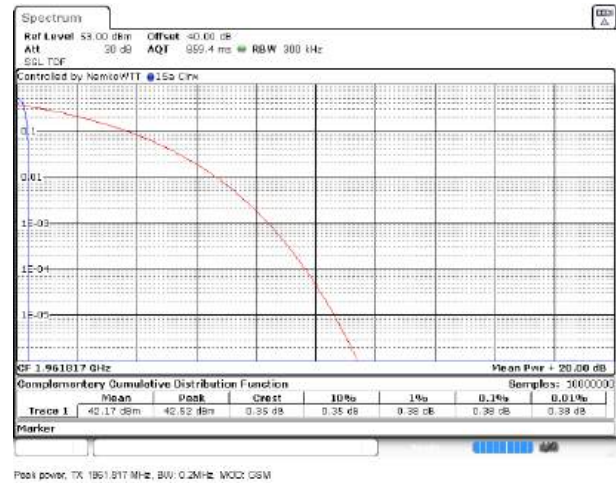
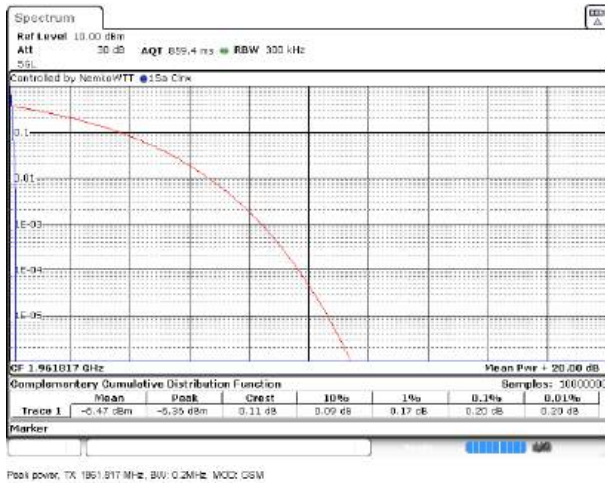
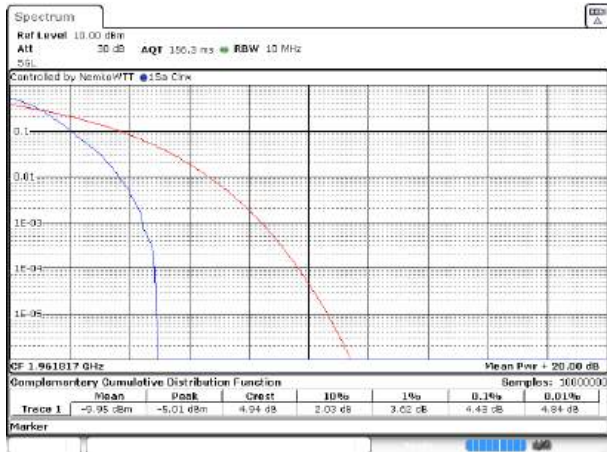
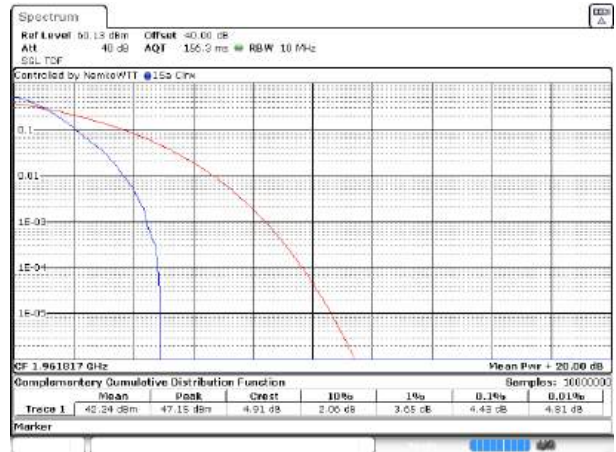


Figure 8.4-2: Output power / Mean output power and amplifier gain results, narrowband signal, 3 dB above AGC threshold, input and output signal respectively

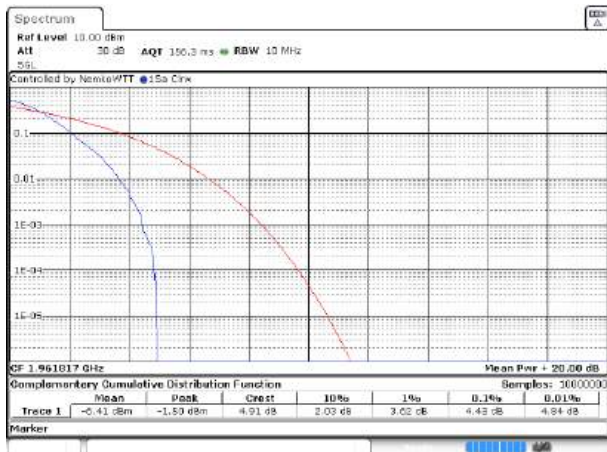


Peak power, TX: 1951.917 MHz, BW: 5 MHz, MCD: WCDMA

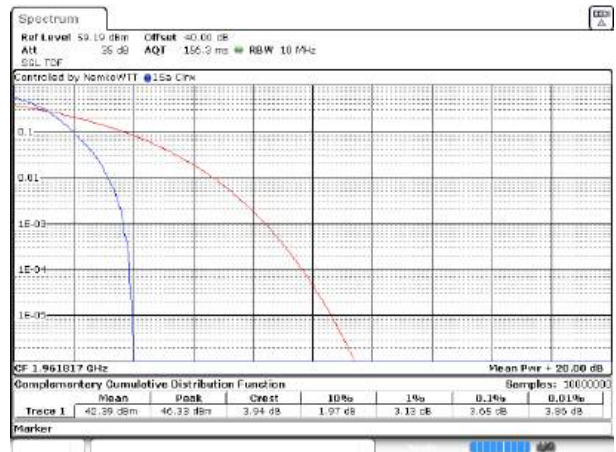


Peak power, TX: 1951.917 MHz, BW: 5 MHz, MCD: WCDMA

Figure 8.4-3: Output power / Mean output power and amplifier gain results, broadband signal, 0.5 dB below AGC threshold, input and output signal respectively



Peak power, TX: 1951.917 MHz, BW: 5 MHz, MCD: WCDMA



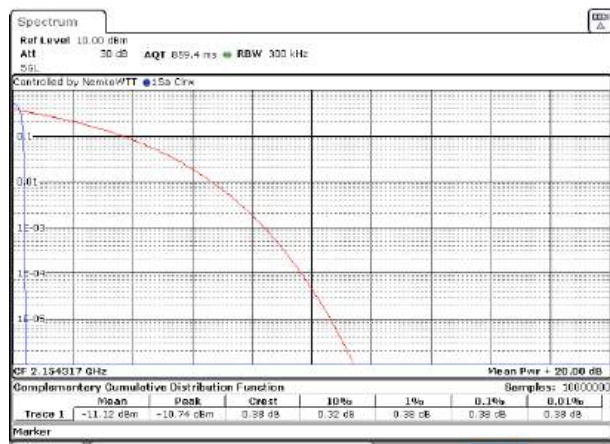
Peak power, TX: 1951.917 MHz, BW: 5 MHz, MCD: WCDMA

Figure 8.4-4: Output power / Mean output power and amplifier gain results, broadband signal, 3 dB above AGC threshold, input and output signal respectively

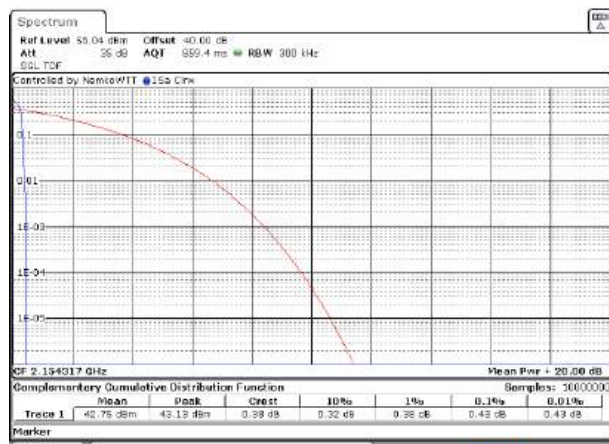
8.4.5.2 Operating frequency band: Band 66: 2110 – 2200 MHz

Table 8.4-2: Output power / Mean output power and amplifier gain test data

Condition	Test frequency (MHz)	Input power (dBm / MHz)	Output power (dBm/MHz)	Amplifier gain (dB)	0.1 % PAPR (dB)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband	2154.317	-11.12	42.75	53.87	0.43
Input Level = AGC Threshold + 3 dB Input signal = narrowband	2154.317	-9.59	42.82	52.41	0.38
Input Level = AGC Threshold - 0.5 dB Input signal = broadband	2154.317	-12.83	42.99	55.82	4.46
Input Level = AGC Threshold + 3 dB Input signal = broadband	2154.317	-9.32	43.03	52.35	3.83

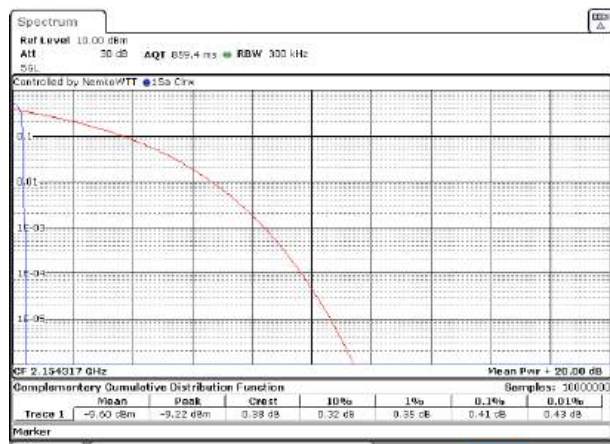


Peak power, TX 2104.317 MHz, BW: 0.2MHz, MOD: GSM

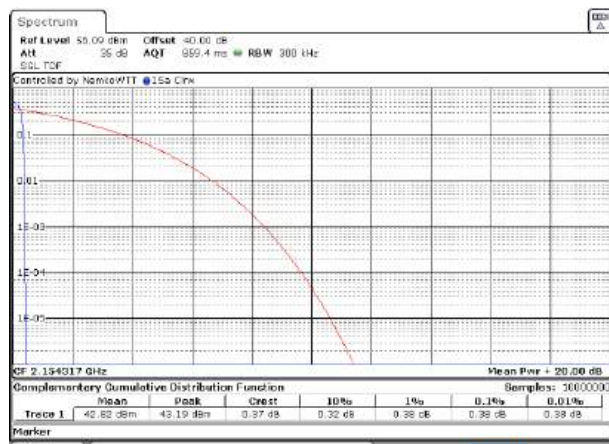


Peak power, TX 2104.317 MHz, BW: 0.2MHz, MOD: GSM

Figure 8.4-5: Output power / Mean output power and amplifier gain results, narrowband signal, 0.5 dB below AGC threshold, input and output signal respectively

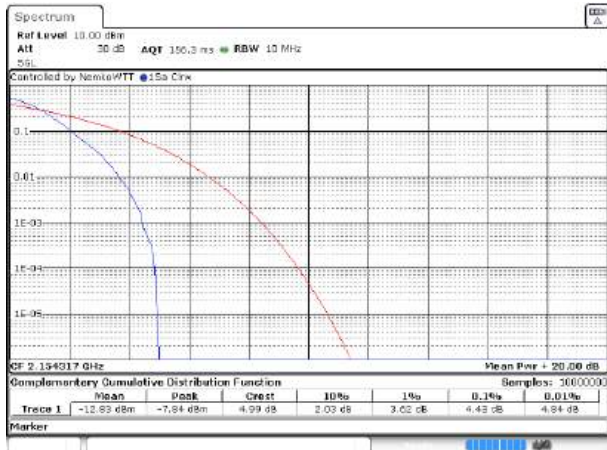


Peak power, TX 2104.317 MHz, BW: 0.2MHz, MOD: GSM

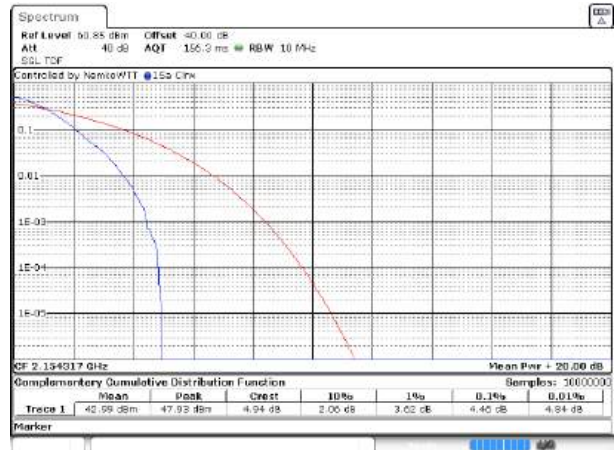


Peak power, TX 2104.317 MHz, BW: 0.2MHz, MOD: GSM

Figure 8.4-6: Output power / Mean output power and amplifier gain results, narrowband signal, 3 dB above AGC threshold, input and output signal respectively

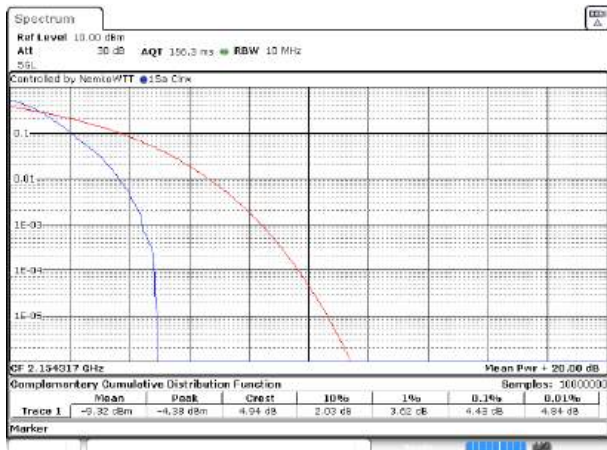


Peak power, TX 2104.917 MHz, BW: 5MHz, MCD: WCDMA

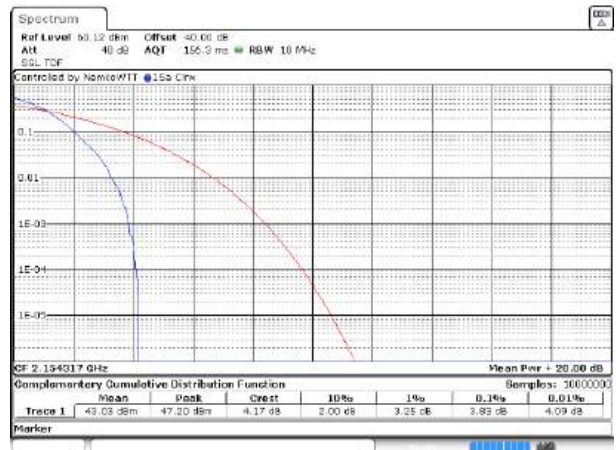


Peak power, TX 2104.917 MHz, BW: 5MHz, MCD: WCDMA

Figure 8.4-7: Output power / Mean output power and amplifier gain results, broadband signal, 0.5 dB below AGC threshold, input and output signal respectively



Peak power, TX 2104.917 MHz, BW: 5MHz, MCD: WCDMA



Peak power, TX 2104.917 MHz, BW: 5MHz, MCD: WCDMA

Figure 8.4-8: Output power / Mean output power and amplifier gain results, broadband signal, 3 dB above AGC threshold, input and output signal respectively

8.5 Spurious emissions at RF connector

8.5.1 References and limits

- FCC Part 24.232 (band 25 operation)
- FCC Part 27.50(a) & RSS-195 (band 30 operation)
- FCC Part 27.50(d) (band 66 operation)
- ANSI C63.26 Clause 7.2.2.5
- KDB 935210 D05v01r05 Clause 3.6

8.5.2 Test summary

Verdict	Pass		
Test date	March 21, 2024	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1009 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input type="checkbox"/> 3m semi anechoic chamber <input checked="" type="checkbox"/> Wireless bench <input type="checkbox"/> Other:	Relative humidity	52 %

8.5.3 Notes

Per KDB 935210 D05 v01r04, Clause 3.4 and ANSI C63.26 Clause 7.2.2.4, testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth).

For intermodulation products and out-of-channel block tests, testing is performed under the following two conditions (per ANSI C63.26 7.2.2.5.1 and KDB 935210 D05v01r04 Section 3.6):

- a) Two modulated signals set to the lower or upper block edge.
- b) A single modulated signal set to the low or high channel

Since the EUT does not support operation in the highest sub-band of band 66 (only operation from 2110 MHz to 2180 MHz out of entire band 2110 – 2200 MHz), out-of-channel block tests were only performed on the lowest operating sub-band.

8.5.4 Setup details

EUT power input during test	120 VAC / 60 Hz
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:
Measurement details	<p>Out-of-channel-block and out-of-band emissions:</p> <ol style="list-style-type: none"> a. Connect a signal generator to the input of the EUT. If the signal generator is not capable of generating two modulated carriers at one time, then it may be replaced by two signal generators connected with an appropriate combining network b. Set the signal generator to produce 2 AWGN signals. c. The frequencies shall be set so that the AWGN signals occupy adjacent channels, as defined by industry standards such as 3GPP or 3GPP2, at the upper block edge of the frequency band under test. d. The composite power levels shall be set so that the signal is just below the AGC threshold, but not more than 0.5 dB below. The composite power can be measured using the methods described in the output power methods, however, it will be necessary to measure the composite power by increasing the band power integration bandwidth to include both transmit channels, or alternatively, this measurement can be performed using an average power meter. e. Connect a spectrum analyzer to the output of the EUT using appropriate attenuation. f. Set the RBW= reference bandwidth in the applicable rule section for the supported frequency band (typically 1% of the EBW or 100 kHz or 1 MHz). g. Set the VBW = 3 x RBW. h. Set the detector to power averaging (rms) detector. i. Set the sweep time = auto couple. j. Set the spectrum analyzer start frequency to the upper block edge frequency and the stop frequency to the upper block edge frequency plus 300 kHz or 3 MHz for frequencies below and above 1 GHz, respectively. k. Trace average at least one hundred traces in power averaging (i.e., rms) mode.

- l. Use the marker function to find the maximum power level.
 - m. Capture the spectrum analyzer trace of the power level for inclusion in the test report.
 - n. Repeat step k) and step m) with the input level set to 3 dB above the AGC threshold.
 - o. Set the frequencies of the input signals to the lower block edge of the frequency band under test.
 - p. Reset the analyzer start frequency to the lower block edge frequency minus 300 kHz or 3 MHz for frequencies below and above 1 GHz, respectively, and the stop frequency to the lower block edge frequency.
 - q. Repeat step k) to step n).
 - r. Repeat step a) to step q) with the signal generator set to only a single signal closest to the block edges.
 - s. Repeat step a) to step r) with the narrowband signal.
 - t. Repeat step a) to step s) for all bands used by the EUT.
- Conducted spurious:
- a. Connect a signal generator to the input of the EUT.
 - b. Set the signal generator to produce the AWGN signal.
 - c. Set the frequency of the signal to the lowest channel within the frequency block.
 - d. The power levels shall be set so that the signal is just below the AGC threshold, but not more than 0.5 dB below.
 - e. Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.
 - f. Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band (typically 100 kHz or 1 MHz).
 - g. Set the VBW = 3 x RBW.
 - h. Set the sweep time = auto-couple.
 - i. Set the spectrum analyzer start frequency to the lowest RF signal generated in the equipment, without going below 9 kHz, and the stop frequency to the lower band/block edge frequency minus 100 kHz to 1 MHz, as specified in the applicable rule part. The number of measurement points in each sweep must be $\geq (2 \times \text{span}/\text{RBW})$, which may require that the measurement range defined by the start and stop frequencies be subdivided depending on the available number of measurement points provided by the spectrum analyzer.
 - j. Trace average at least ten traces in power averaging (i.e., rms) mode.
 - k. Use the peak marker function to identify the highest amplitude level over each of measured frequency range. Record the frequency and amplitude and capture a plot for inclusion in the test report.
 - l. Reset the spectrum analyzer start frequency to the upper band/block edge frequency plus 100 kHz or 1 MHz, as specified in the applicable rule part, and the spectrum analyzer stop frequency to ten times the highest frequency of the fundamental emission. The number of measurement points in each sweep must be $\geq (2 \times \text{span}/\text{RBW})$, which may require that the measurement range defined by the start and stop frequencies be subdivided, depending on the available number of measurement points provided by the spectrum analyzer.
 - m. Trace average at least ten traces in power averaging (i.e., rms) mode.
 - n. Use the peak marker function to identify the highest amplitude level over each of the measured frequency ranges. Record the frequency and amplitude and capture a plot for inclusion in the test report; also provide tabular data, if required.
 - o. Repeat step i) to step n) with the input signal firstly set to a middle channel frequency and then tuned to a high channel frequency.
 - p. Repeat step c) to step o) with the narrowband signal.
 - q. Repeat step b) to step p) for all bands used by the EUT

8.5.5 Test data – out-of-channel block and out-of-band emissions

8.5.5.1 Operating frequency band: Band 25: 1930 – 1995 MHz

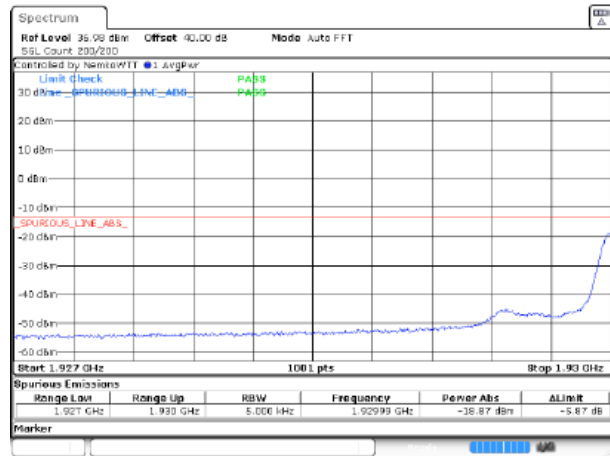
Table 8.5-1: Spurious emissions at RF connector test data, narrowband

Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 2 Low band edge	1929.981	-26.38	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 1 Low band edge	1929.990	-18.87	-13.00
Input Level = AGC Threshold +3 dB Input signal = narrowband Number of signals: 2 Low band edge	1929.990	-26.63	-13.00
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 Low band edge	1929.996	-18.87	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 2 High band edge	1995.088	-21.99	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 1 High band edge	1995.010	-18.61	-13.00
Input Level = AGC Threshold +3 dB Input signal = narrowband Number of signals: 2 High band edge	1995.010	-26.12	-13.00
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 High band edge	1995.004	-19.01	-13.00

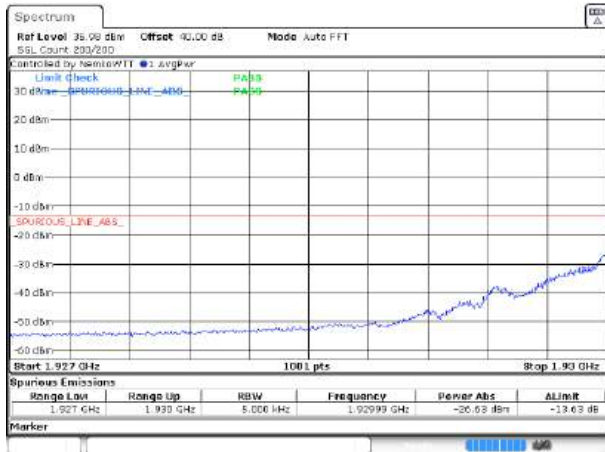
Narrowband signal(s):



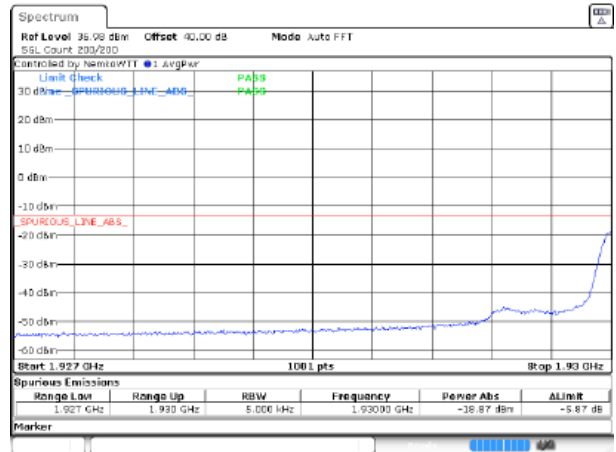
Low band edge, 2 signals, level = AGC Threshold - 0.5



Low band edge, 1 signal, level = AGC Threshold - 0.5



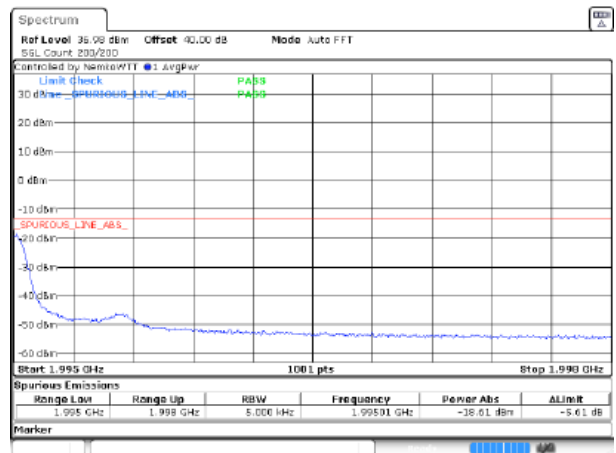
Low band edge, 2 signals, level = AGC Threshold + 3



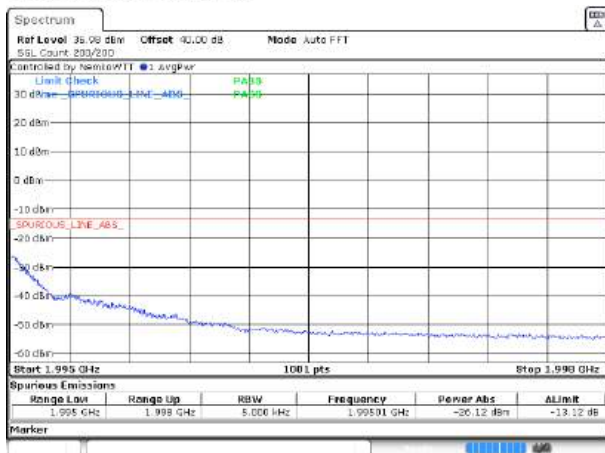
Low band edge, 1 signal, level = AGC Threshold + 3



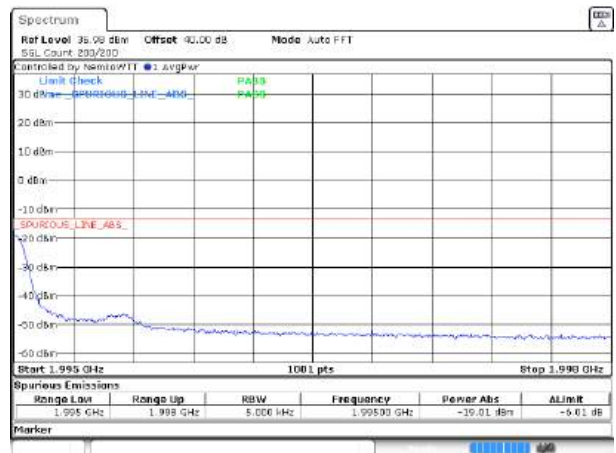
High band edge, 2 signals, level = AGC Threshold - 0.5



High band edge, 1 signal, level = AGC Threshold - 0.5



High band edge, 2 signals, level = AGC Threshold + 3

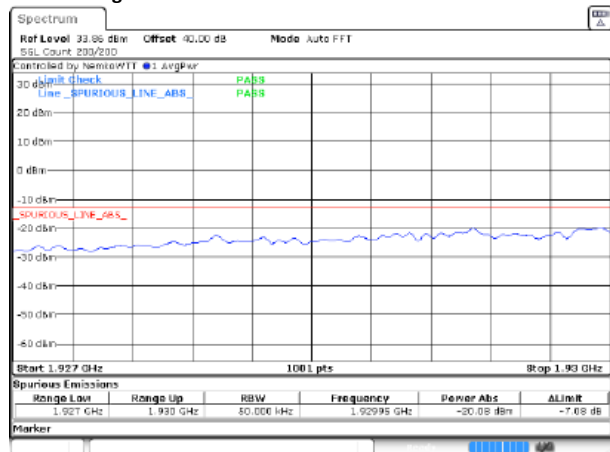


Low band edge, 1 signal, level = AGC Threshold + 3

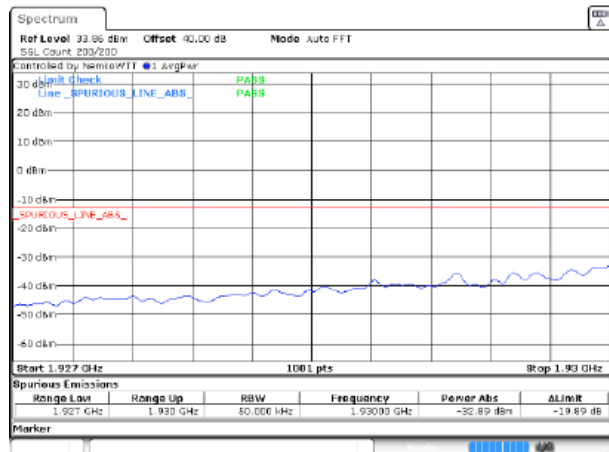
Table 8.5-2: Spurious emissions at RF connector test data, broadband

Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 2 Low band edge	1929.950	-20.08	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 1 Low band edge	1929.998	-32.89	-13.00
Input Level = AGC Threshold +3 dB Input signal = broadband Number of signals: 2 Low band edge	1929.998	-26.71	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 Low band edge	1929.998	-26.93	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 2 High band edge	1997.930	-51.37	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 1 High band edge	1995.001	-33.18	-13.00
Input Level = AGC Threshold +3 dB Input signal = broadband Number of signals: 2 High band edge	1995.001	-25.46	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 High band edge	1995.001	-24.70	-13.00

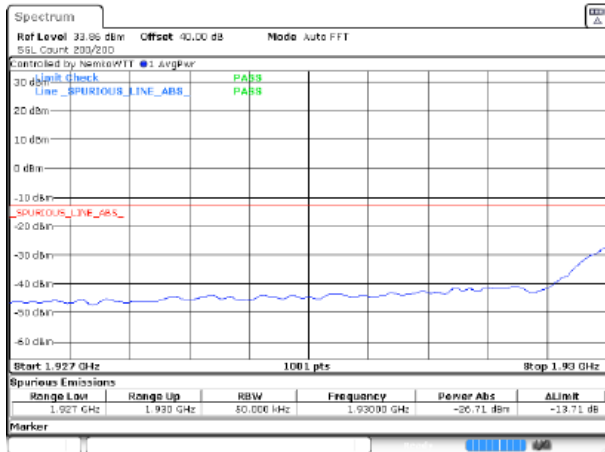
Broadband signals:



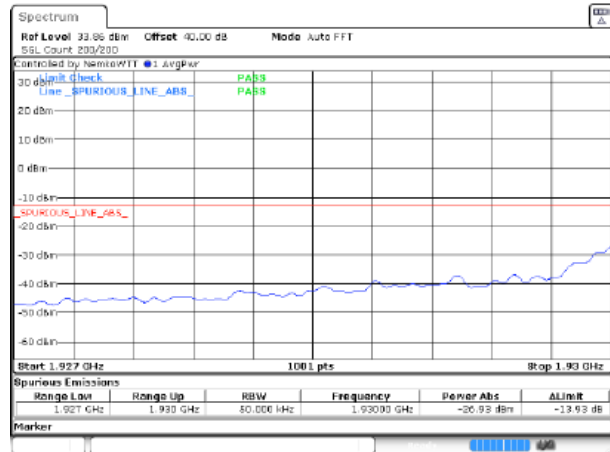
Low band edge, 2 signals, level = AGC Threshold - 0.5



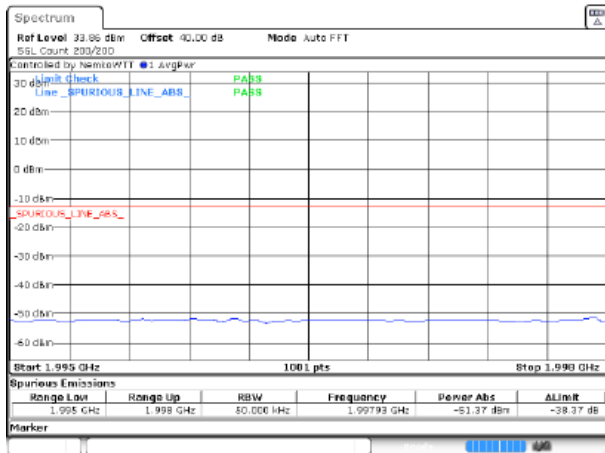
Low band edge, 1 signal, level = AGC Threshold - 0.5



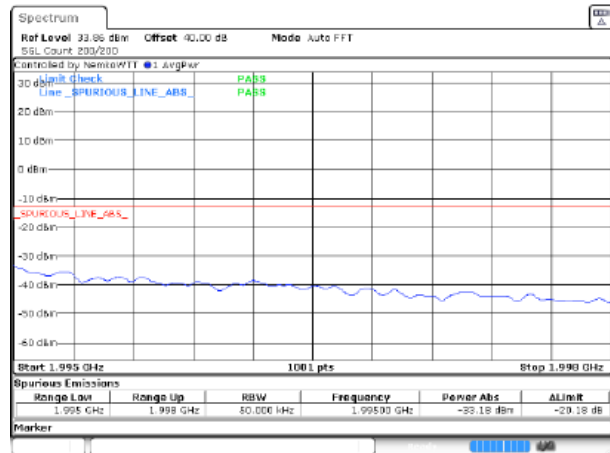
Low band edge, 2 signals, level = AGC Threshold + 3



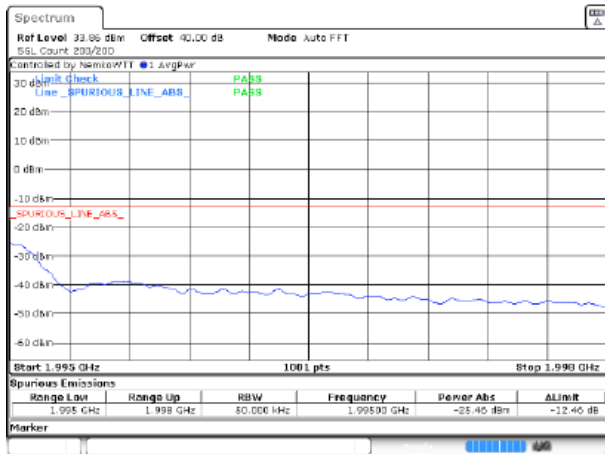
Low band edge, 1 signal, level = AGC Threshold + 3



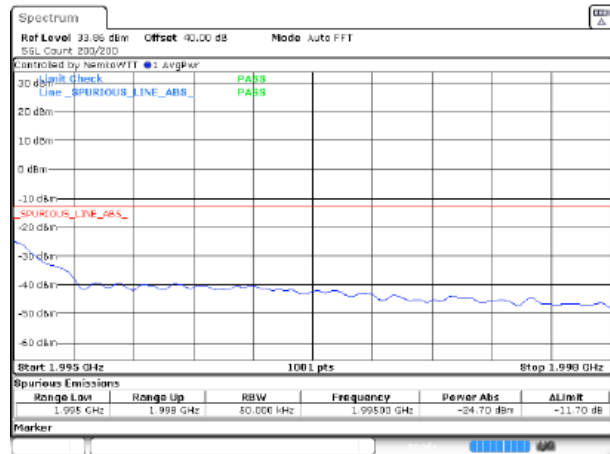
High band edge, 2 signals, level = AGC Threshold - 0.5



High band edge, 1 signal, level = AGC Threshold - 0.5



High band edge, 2 signals, level = AGC Threshold + 3

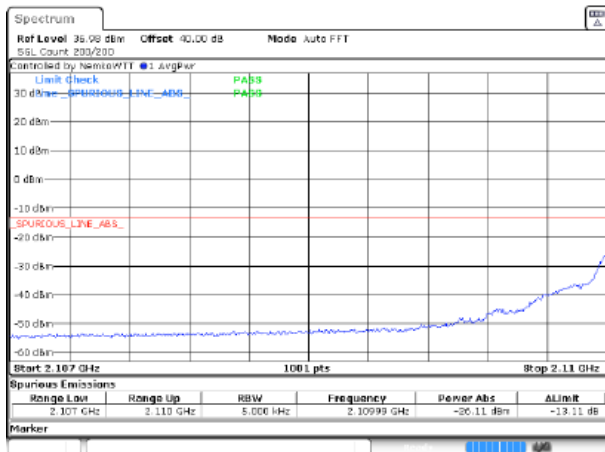


Low band edge, 1 signal, level = AGC Threshold + 3

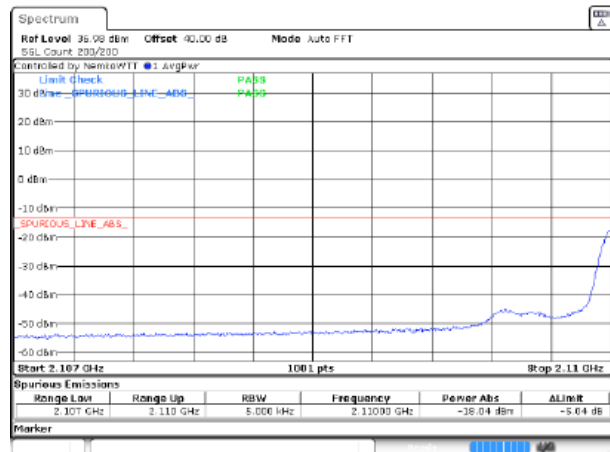
8.5.5.2 Operating frequency band: Band 66: 2110 – 2200 MHz

Table 8.5-3: Spurious emissions at RF connector test data, narrowband

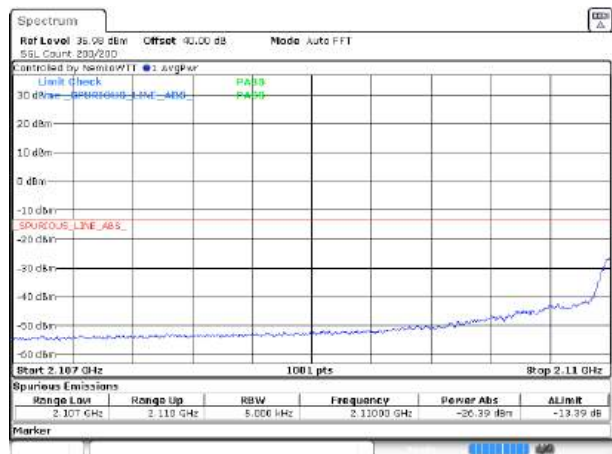
Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 2 Low band edge	2109.993	-26.11	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 1 Low band edge	2109.996	-18.04	-13.00
Input Level = AGC Threshold +3 dB Input signal = narrowband Number of signals: 2 Low band edge	2109.996	-26.39	-13.00
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 Low band edge	2109.996	-18.18	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 2 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold - 0.5 dB Input signal = narrowband Number of signals: 1 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold +3 dB Input signal = narrowband Number of signals: 2 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold + 3 dB Input signal = narrowband Number of signals: 1 High band edge	Not Applicable	Not Applicable	Not Applicable



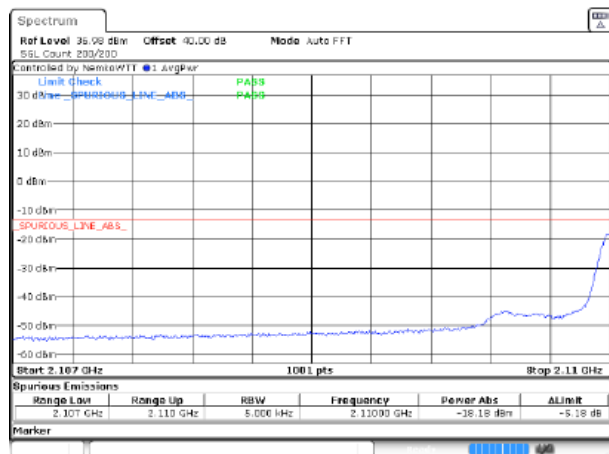
Low band edge, 2 signals, level = AGC Threshold - 0.5



Low band edge, 1 signal, level = AGC Threshold - 0.5



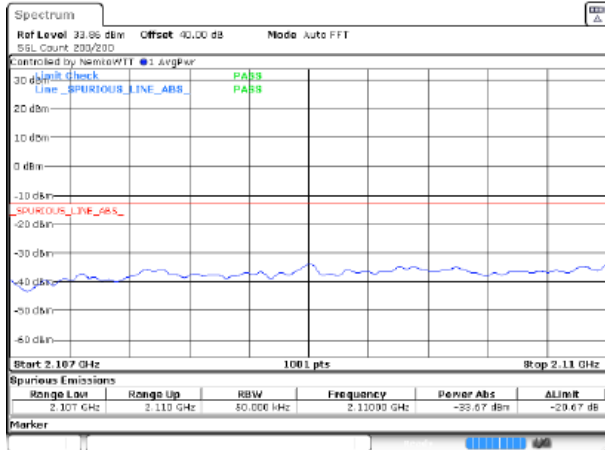
Low band edge, 2 signals, level = AGC Threshold + 3



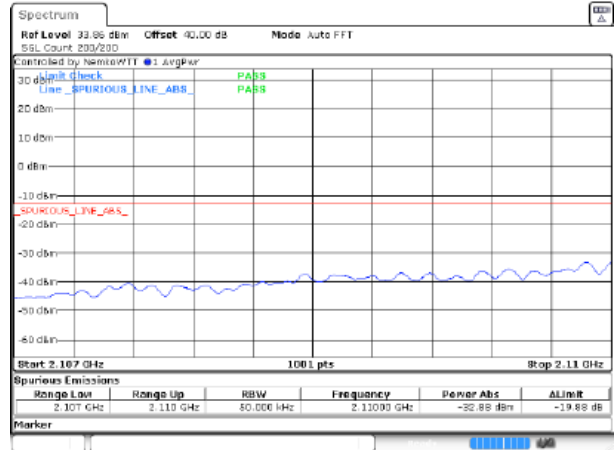
Low band edge, 1 signal, level = AGC Threshold + 3

Table 8.5-4: Spurious emissions at RF connector test data, broadband

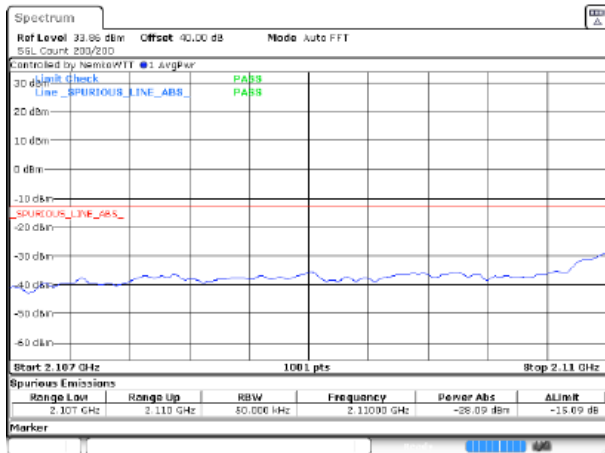
Condition	Frequency of highest emission (MHz)	Level (dBm)	Limit (dBm)
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 2 Low band edge	2109.998	-33.67	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 1 Low band edge	2109.998	-32.88	-13.00
Input Level = AGC Threshold +3 dB Input signal = broadband Number of signals: 2 Low band edge	2109.998	-28.09	-13.00
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 Low band edge	2109.998	-27.67	-13.00
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 2 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold - 0.5 dB Input signal = broadband Number of signals: 1 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold +3 dB Input signal = broadband Number of signals: 2 High band edge	Not Applicable	Not Applicable	Not Applicable
Input Level = AGC Threshold + 3 dB Input signal = broadband Number of signals: 1 High band edge	Not Applicable	Not Applicable	Not Applicable



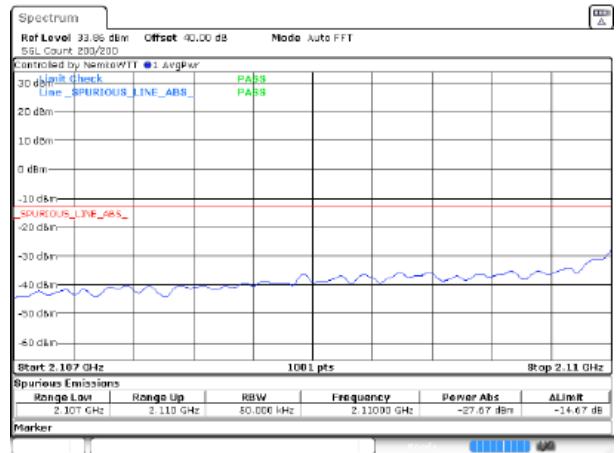
Low band edge, 2 signals, level = AGC Threshold - 0.5



Low band edge, 1 signal, level = AGC Threshold - 0.5



Low band edge, 2 signals, level = AGC Threshold + 0

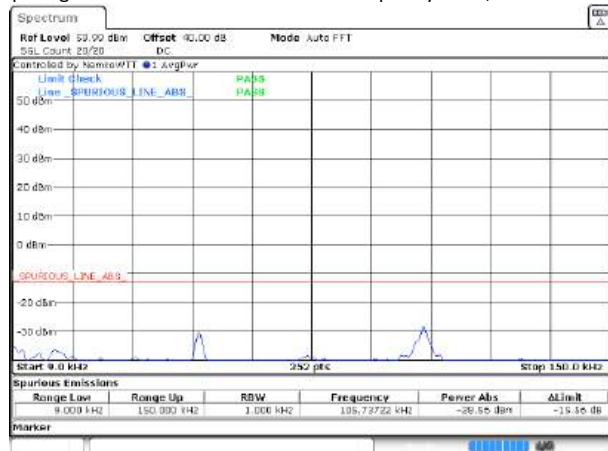


Low band edge, 1 signal, level = AGC Threshold + 0

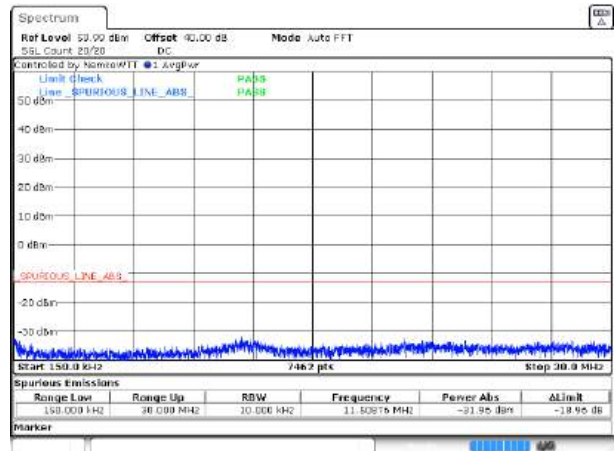
8.5.6 Test data - conducted spurious emissions:

8.5.6.1 Operating frequency band: Band 25: 1930 – 1995 MHz

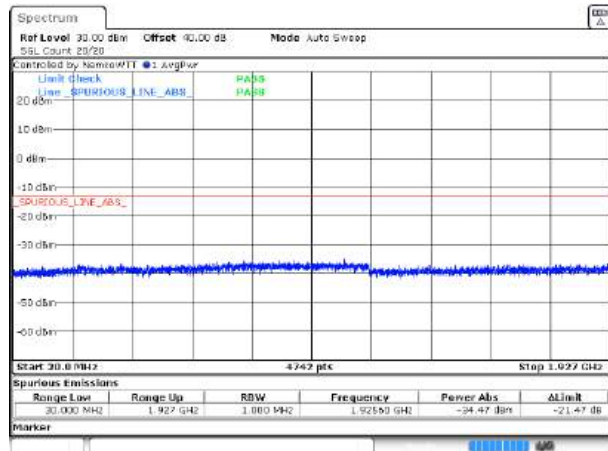
Input signal = lowest channel within the frequency block; narrowband:



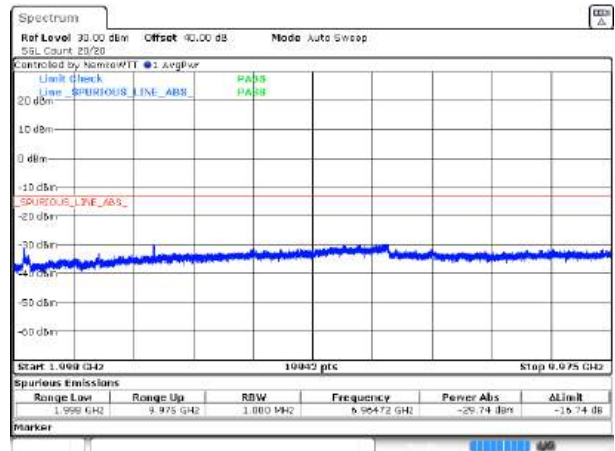
Conducted Spurious Emissions, Low channel, low frequency ran
go, NB



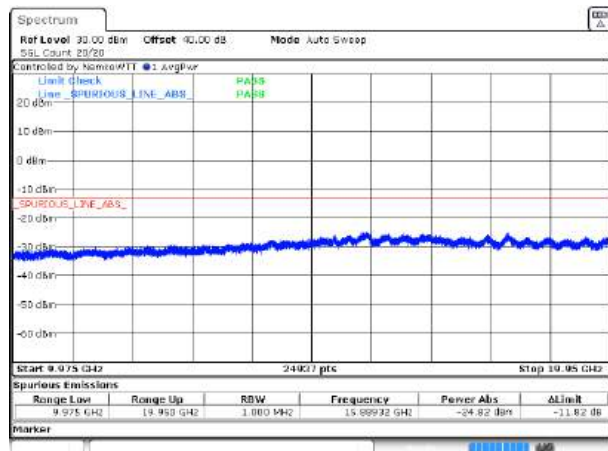
Conducted Spurious Emissions, Low channel, low frequency ran
go, NB



Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

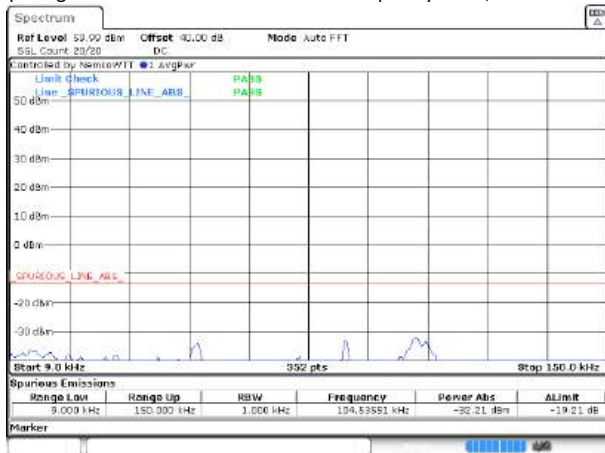


Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

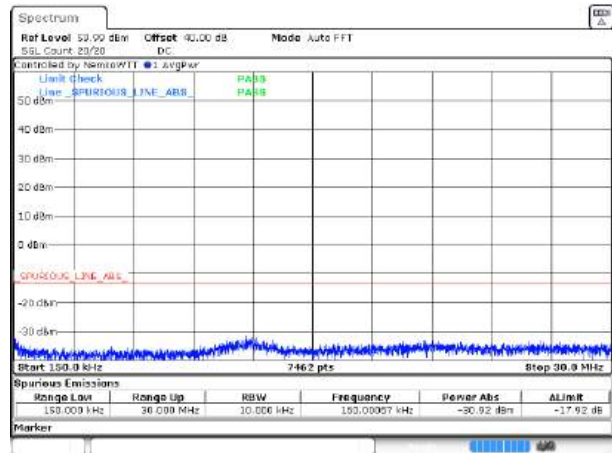


Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

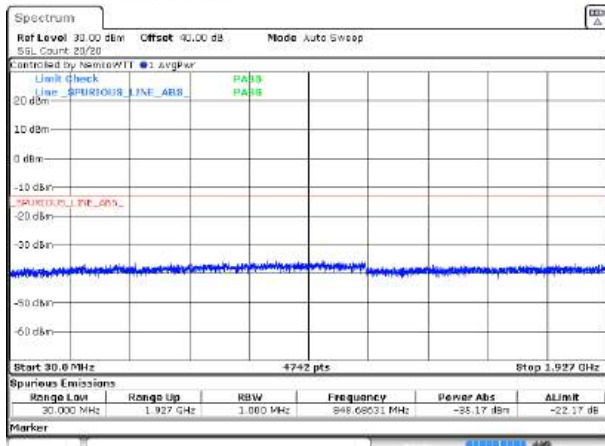
Input signal = middle channel within the frequency block; narrowband:



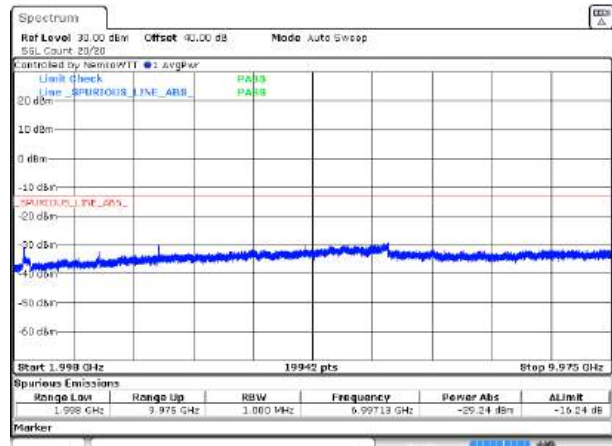
Conducted Spurious Emissions, Middle channel, NE



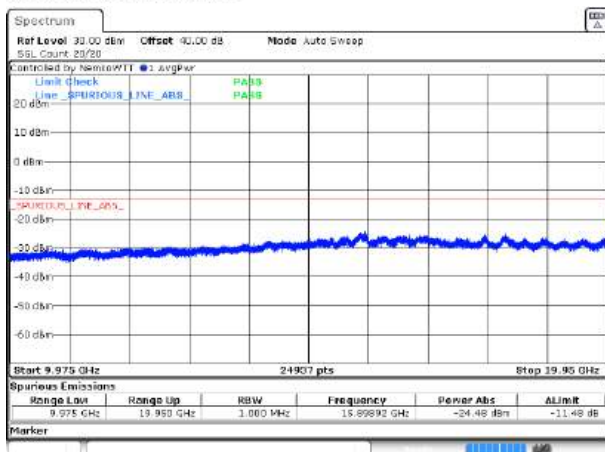
Conducted Spurious Emissions, Middle channel, NE



Conducted Spurious Emissions, Middle channel, NE

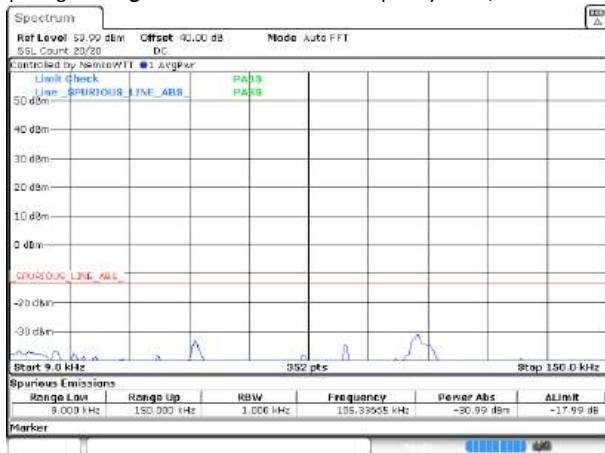


Conducted Spurious Emissions, Middle channel, NE

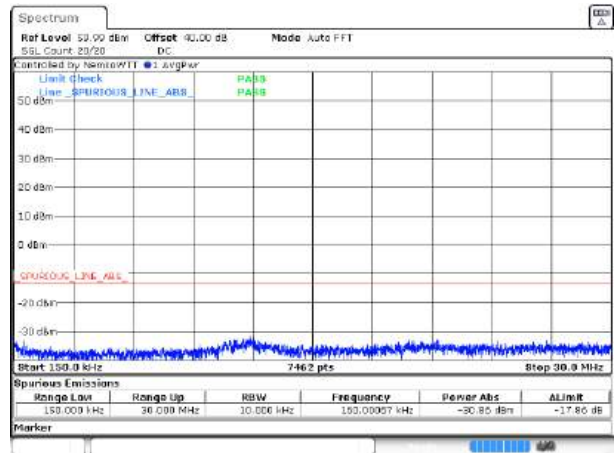


Conducted Spurious Emissions, Middle channel, NE

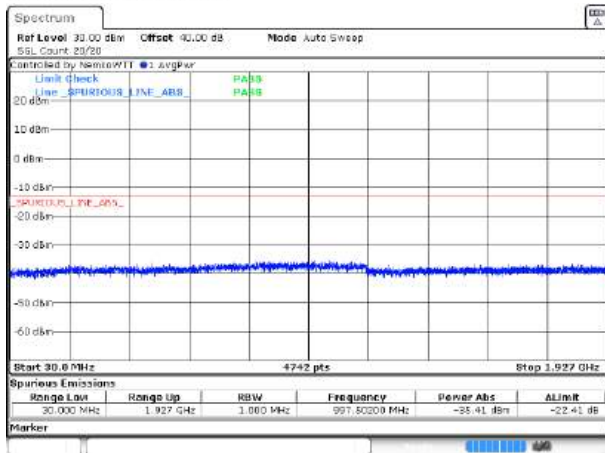
Input signal = highest channel within the frequency block; narrowband:



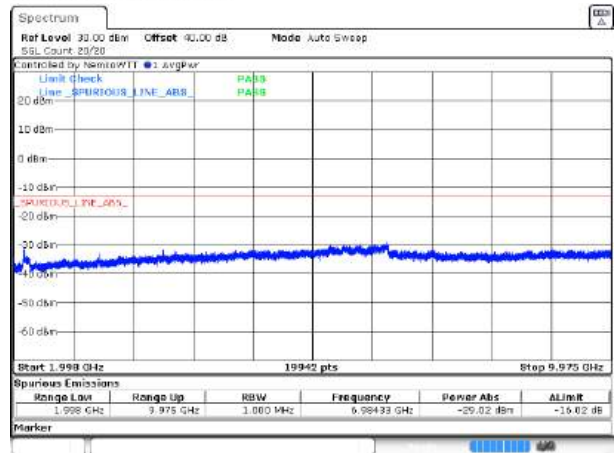
Conducted Spurious Emissions, High channel, NB



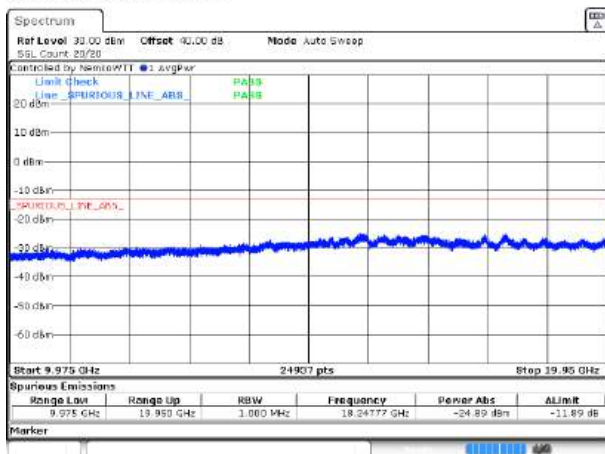
Conducted Spurious Emissions, High channel, NB



Conducted Spurious Emissions, High channel, NB

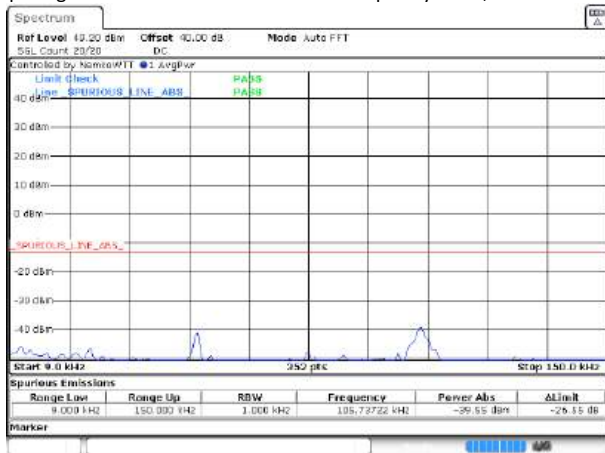


Conducted Spurious Emissions, High channel, NB

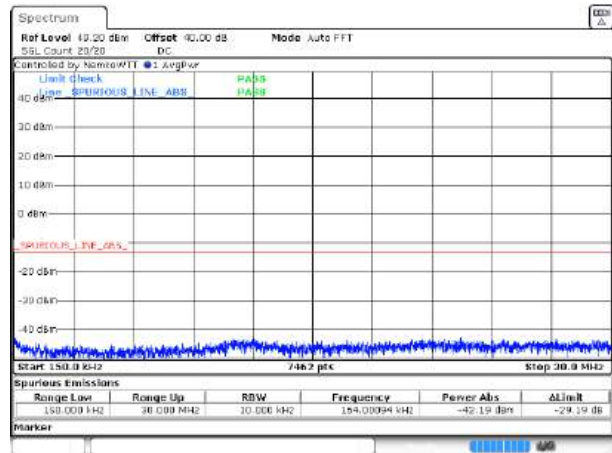


Conducted Spurious Emissions, High channel, NB

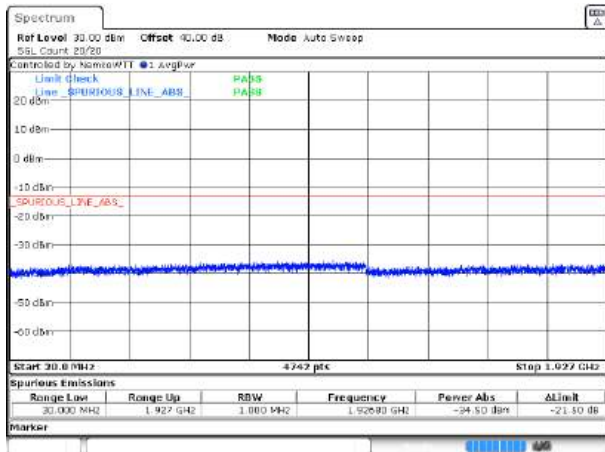
Input signal = lowest channel within the frequency block; broadband:



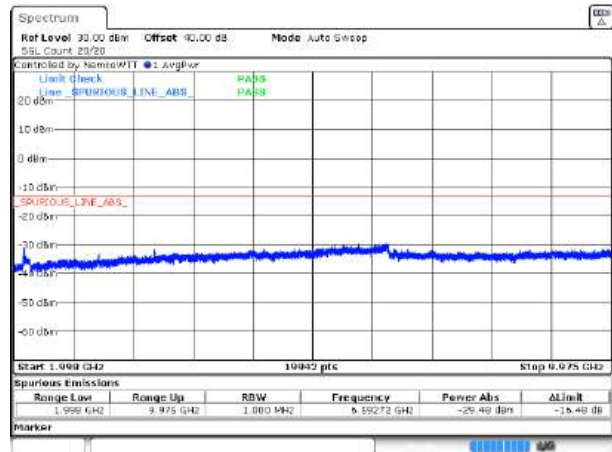
Conducted Spurious Emissions, Low channel, low frequency ran
go, EB



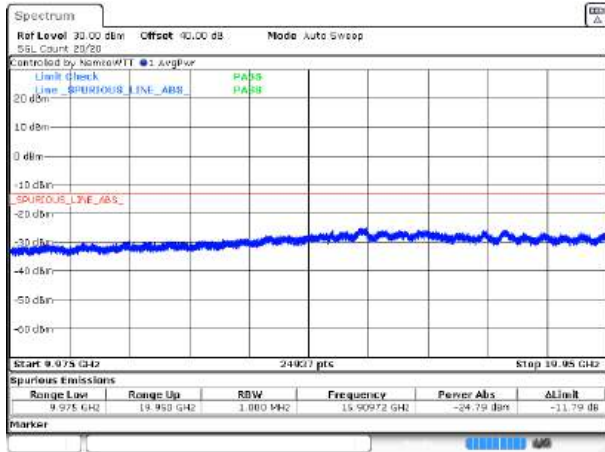
Conducted Spurious Emissions, Low channel, low frequency ran
go, EB



Conducted Spurious Emissions, Low channel, low frequency ran
go, EB

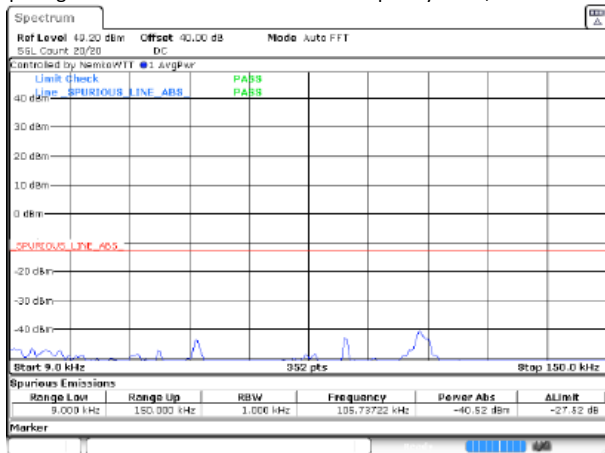


Conducted Spurious Emissions, Low channel, low frequency ran
go, EB

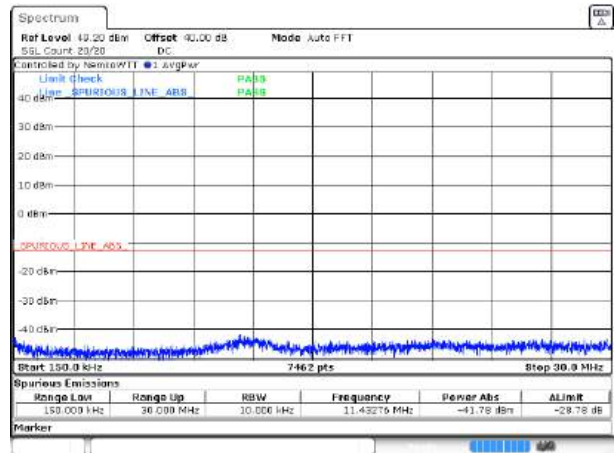


Conducted Spurious Emissions, Low channel, low frequency ran
go, EB

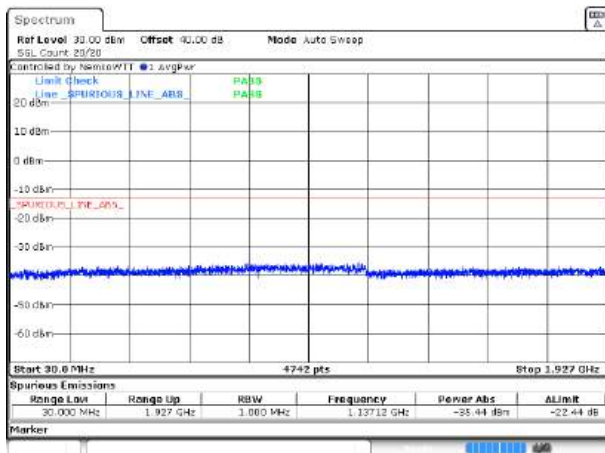
Input signal = middle channel within the frequency block; broadband:



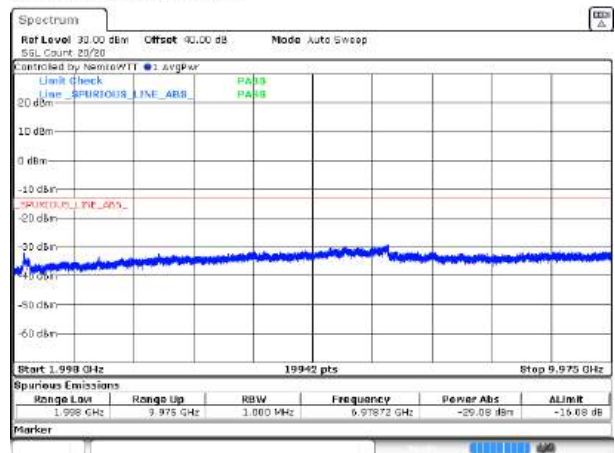
Conducted Spurious Emissions, Middle channel, 99



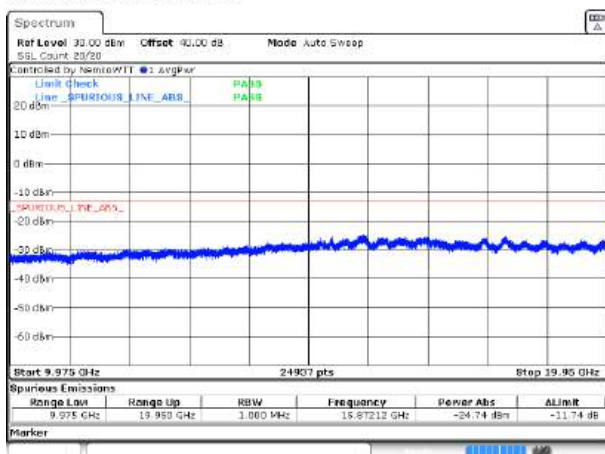
Conducted Spurious Emissions, Middle channel, 99



Conducted Spurious Emissions, Middle channel, 99

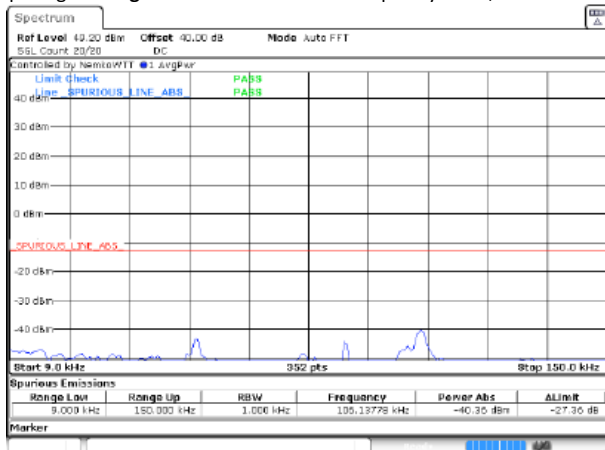


Conducted Spurious Emissions, Middle channel, 99

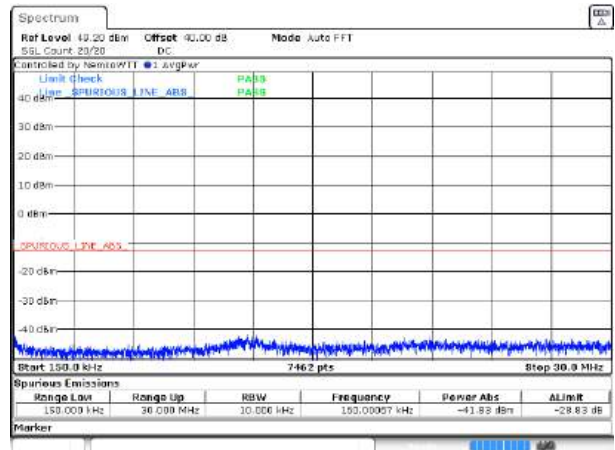


Conducted Spurious Emissions, Middle channel, 99

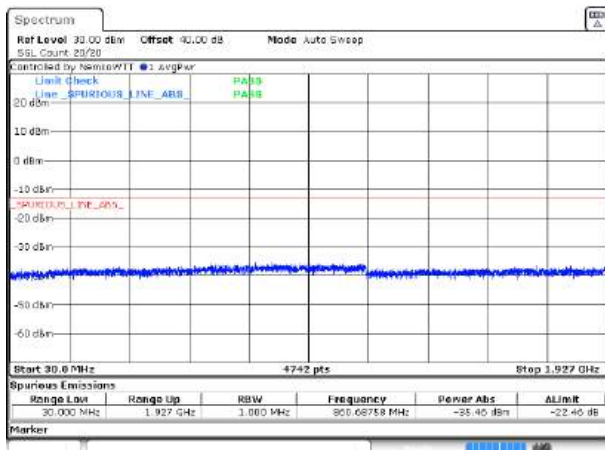
Input signal = highest channel within the frequency block; broadband:



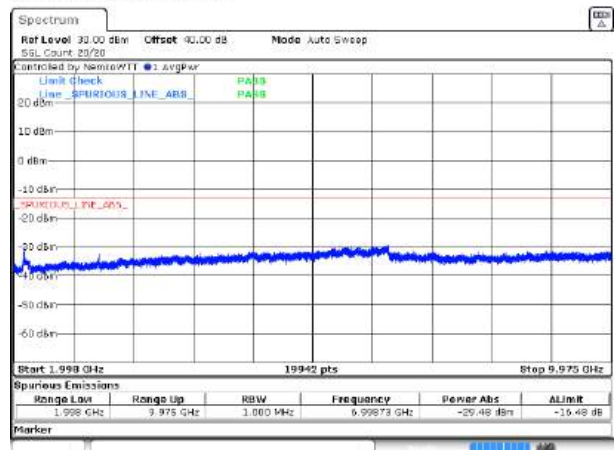
Conducted Spurious Emissions, High channel, BB



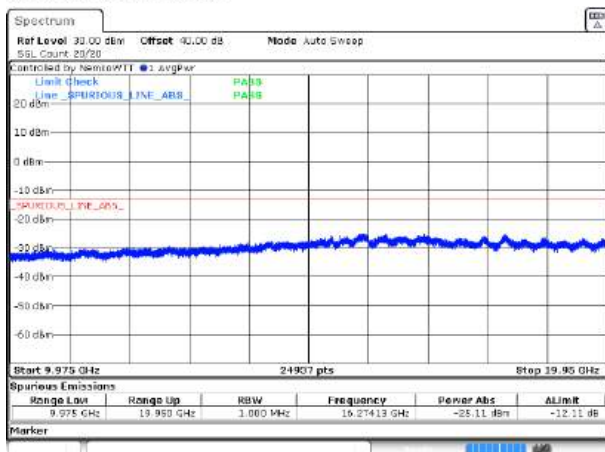
Conducted Spurious Emissions, High channel, BB



Conducted Spurious Emissions, High channel, BB



Conducted Spurious Emissions, High channel, BB

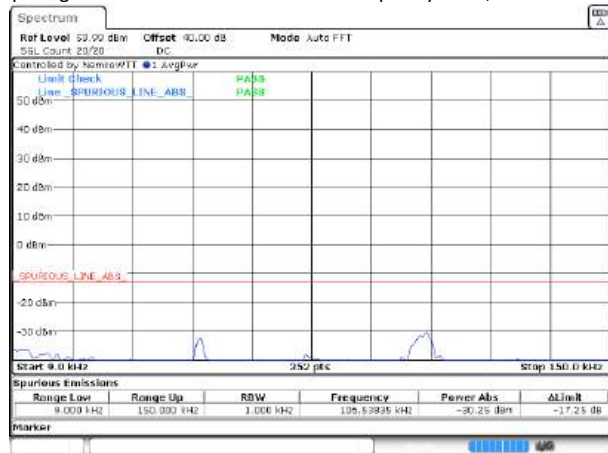


Conducted Spurious Emissions, High channel, BB

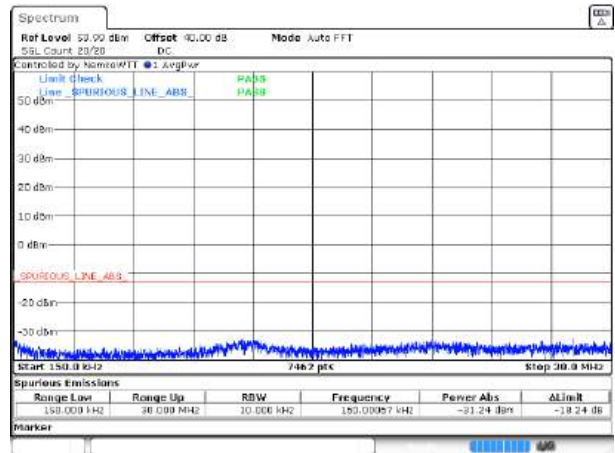
8.5.7 Test data - conducted spurious emissions:

8.5.7.1 Operating frequency band: Band 66: 2110 – 2200 MHz

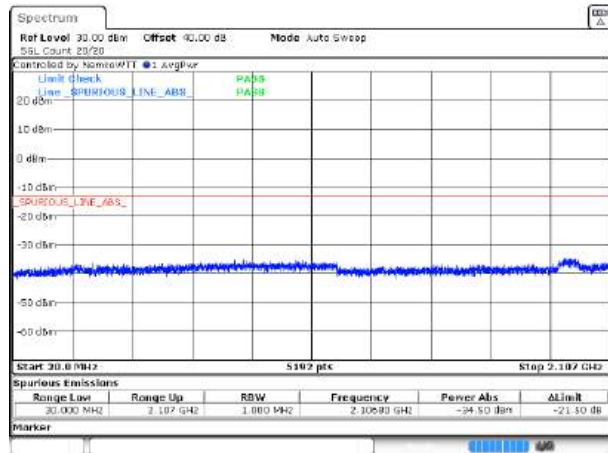
Input signal = lowest channel within the frequency block; narrowband:



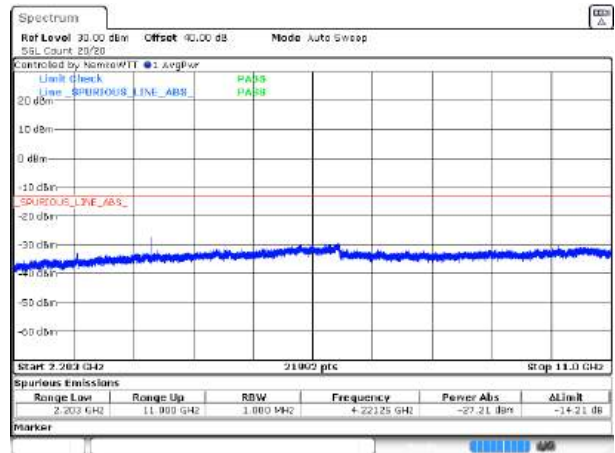
Conducted Spurious Emissions, Low channel, low frequency ran
go, NB



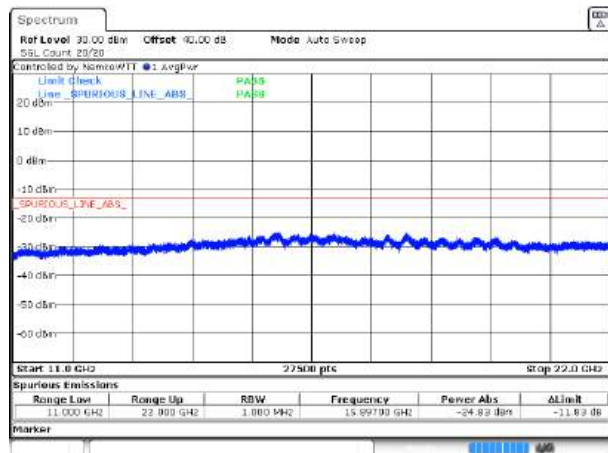
Conducted Spurious Emissions, Low channel, low frequency ran
go, NB



Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

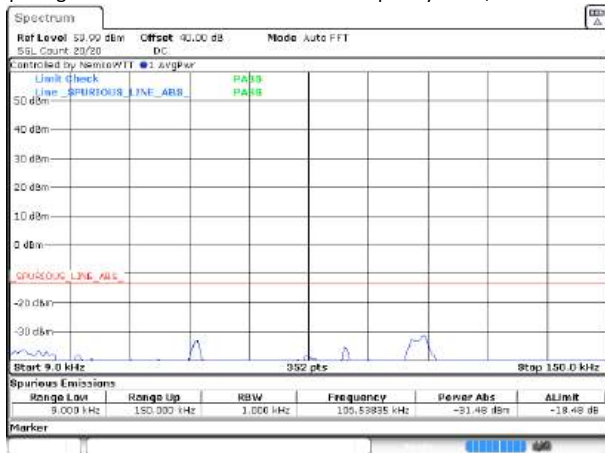


Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

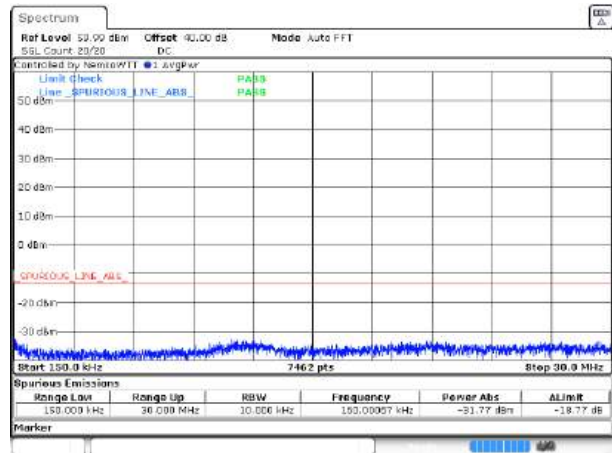


Conducted Spurious Emissions, Low channel, low frequency ran
go, NB

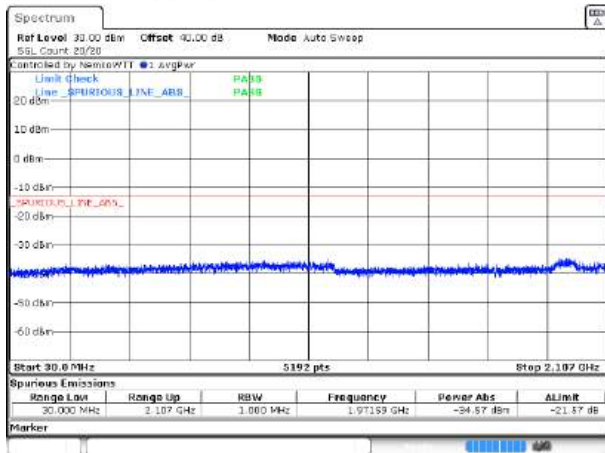
Input signal = middle channel within the frequency block; narrowband:



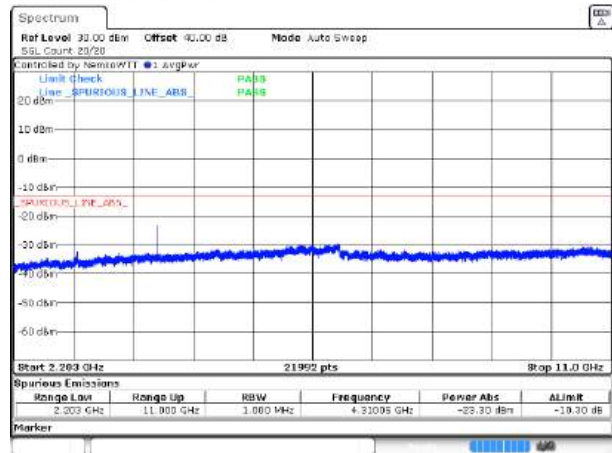
Conducted Spurious Emissions, Middle channel, NE



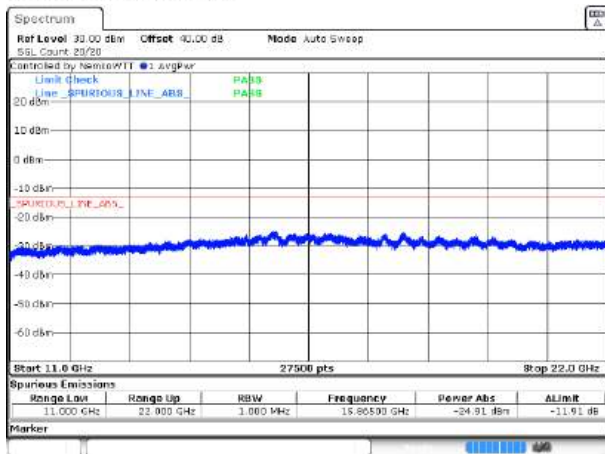
Conducted Spurious Emissions, Middle channel, NE



Conducted Spurious Emissions, Middle channel, NE

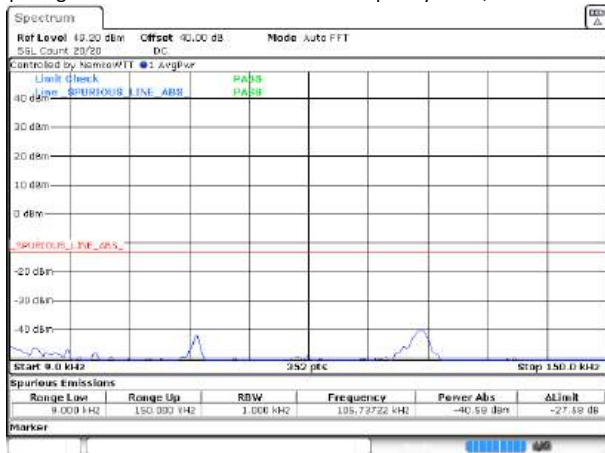


Conducted Spurious Emissions, Middle channel, NE

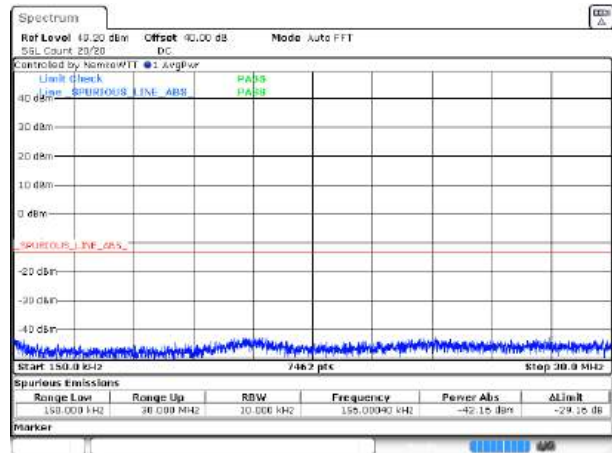


Conducted Spurious Emissions, Middle channel, NE

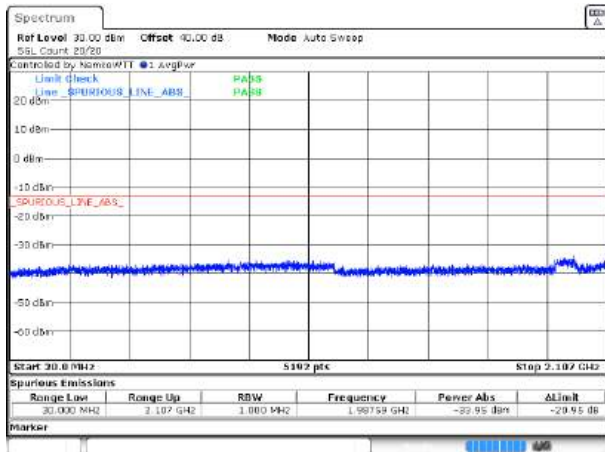
Input signal = lowest channel within the frequency block; broadband:



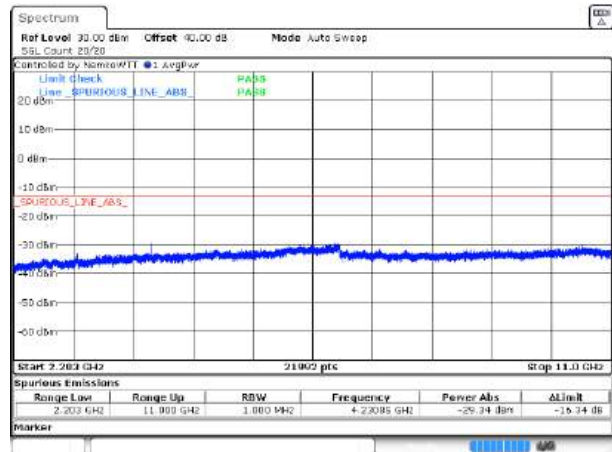
Conducted Spurious Emissions, Low channel, low frequency run
go, EB



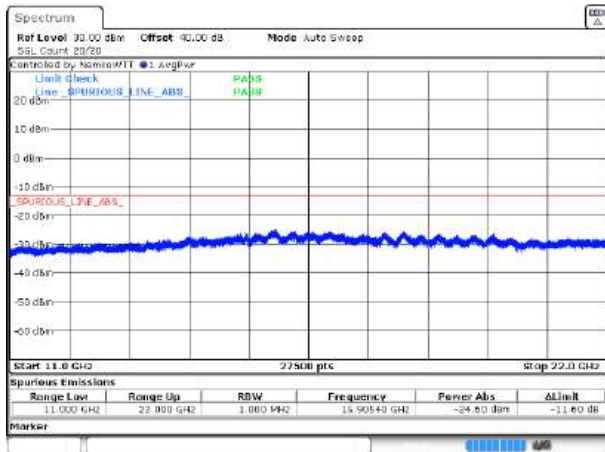
Conducted Spurious Emissions, Low channel, low frequency run
go, EB



Conducted Spurious Emissions, Low channel, low frequency run
go, EB

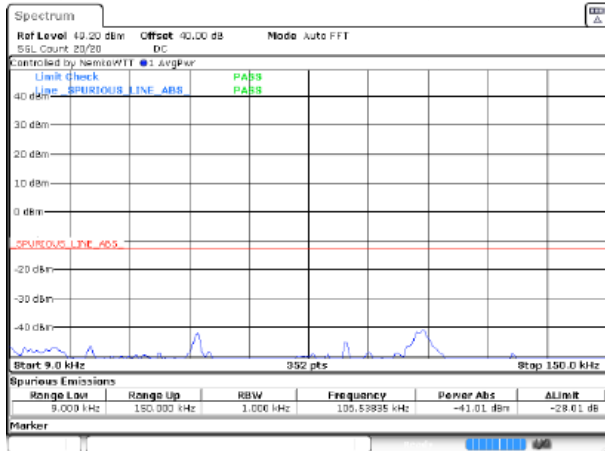


Conducted Spurious Emissions, Low channel, low frequency run
go, EB

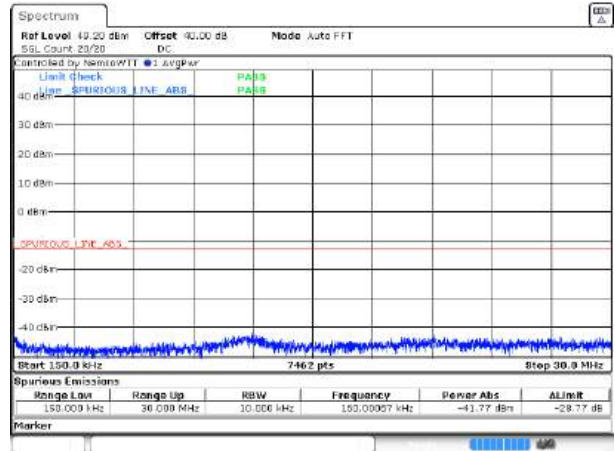


Conducted Spurious Emissions, Low channel, low frequency run
go, EB

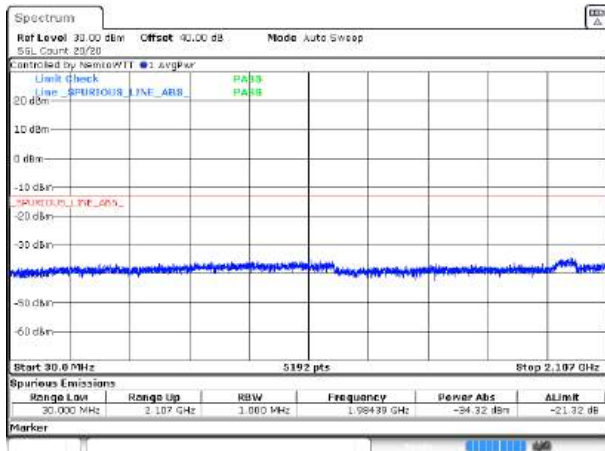
Input signal = middle channel within the frequency block; broadband:



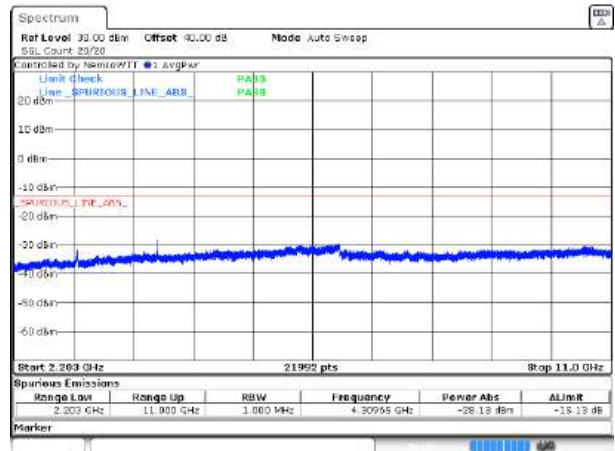
Conducted Spurious Emissions, Middle channel, 99



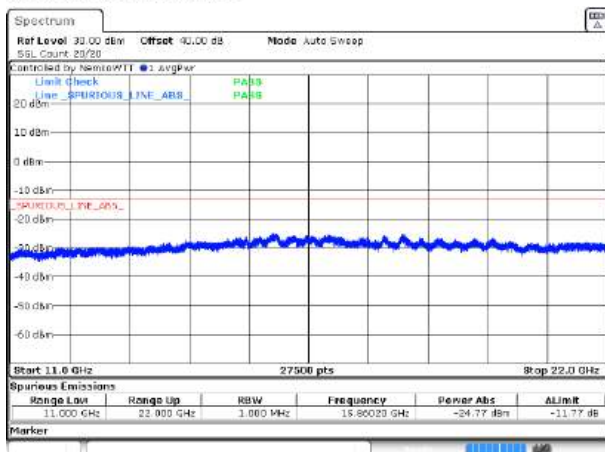
Conducted Spurious Emissions, Middle channel, 99



Conducted Spurious Emissions, Middle channel, 99



Conducted Spurious Emissions, Middle channel, 99



Conducted Spurious Emissions, Middle channel, 99

8.6 Radiated spurious emissions

8.6.1 References and limits

- FCC Part 24.238 (band 25 operation)
- FCC Part 27.53(h) (band 66 operation)
- ANSI C63.26 Clause 7.2.2.5
- KDB 935210 D05v01r05 Clause 3.8

8.6.2 Test summary

Verdict	Pass		
Test date	March 26, 2024 March 27, 2024	Temperature	22 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1008 mbar
Test location	<input type="checkbox"/> 10m semi anechoic chamber <input checked="" type="checkbox"/> 3m semi anechoic chamber <input type="checkbox"/> Other:	Relative humidity	51 %

8.6.3 Notes

Testing was performed with a narrowband test signal (MSK modulated, gaussian filter of 0.3 and data rate 270 kbps) and a broadband signal (AWGN, 4.1 MHz 99% occupied bandwidth) on lowest, middle, and highest channels of each supported frequency band. Only the worst-case data (broadband signal) are presented here.

8.6.4 Setup details

EUT power input during test	120 VAC / 60 Hz	
EUT setup configuration	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor standing <input type="checkbox"/> Other:	
Measurement details	Receiver/spectrum analyzer settings for frequencies below 1 GHz:	
	Resolution bandwidth	100 kHz
	Detector mode	– Peak (Preview measurement)
	Trace mode	Max Hold
	Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak final measurement)
	Receiver/spectrum analyzer settings for frequencies above 1 GHz:	
	Resolution bandwidth	1 MHz
	Detector mode	Peak (Preview measurement) Peak (Final measurement)
	Trace mode	Max Hold
	Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak final measurement)

8.6.5 Test data

8.6.5.1 Operating frequency band: Band 25: 1930 – 1995 MHz

Full Spectrum

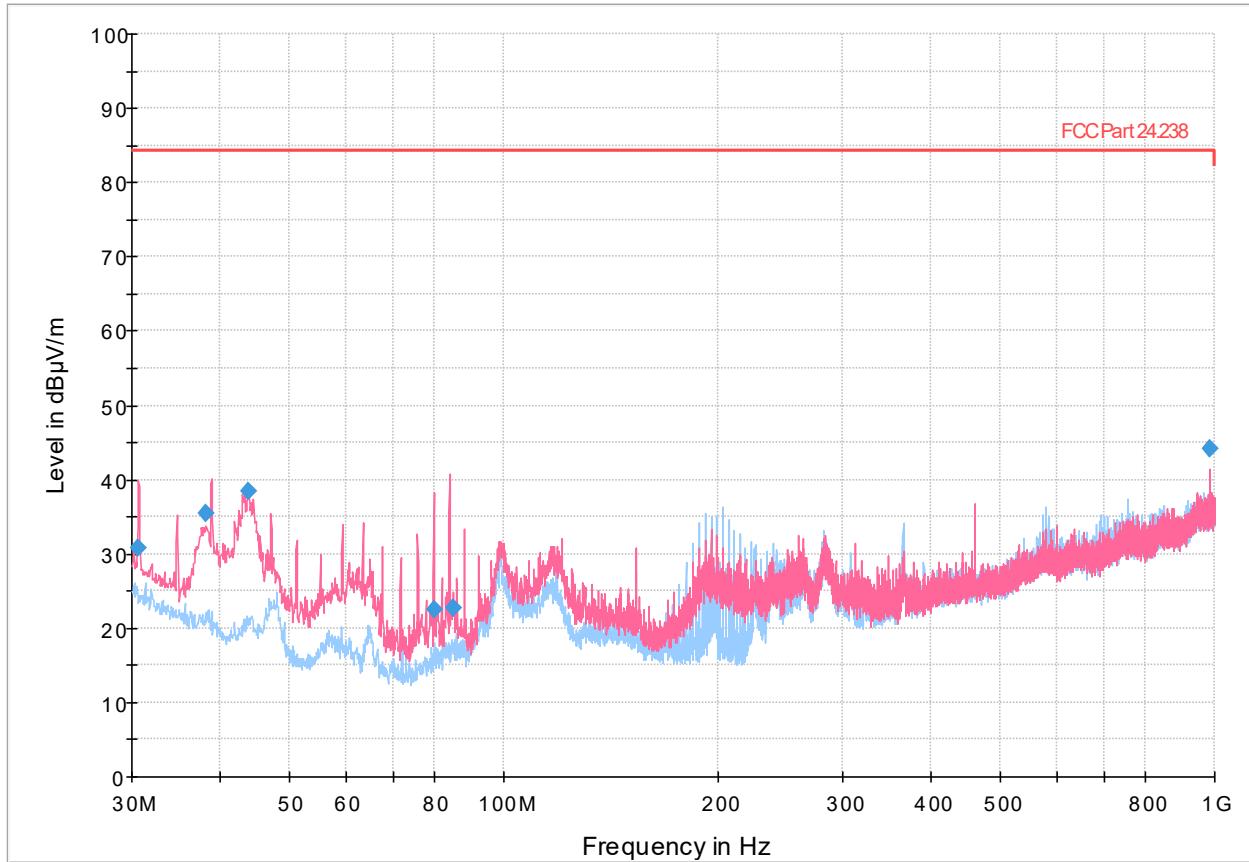


Figure 8.6-1: Radiated emissions spectral plot (30 MHz - 1 GHz) – Band 25 (1930 MHz)

Table 8.6-1: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.640000	30.86	84.38	53.52	5000.0	100.000	139.0	V	177.0	24.9
38.191667	35.43	84.38	48.95	5000.0	100.000	100.0	V	22.0	20.2
43.842500	38.52	84.38	45.86	5000.0	100.000	100.0	V	296.0	17.0
80.014167	22.57	84.38	61.81	5000.0	100.000	143.0	V	276.0	14.0
84.775833	22.82	84.38	61.56	5000.0	100.000	114.0	V	291.0	14.4
983.045833	44.23	84.38	40.15	5000.0	100.000	104.0	V	48.0	35.5

Notes:

¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

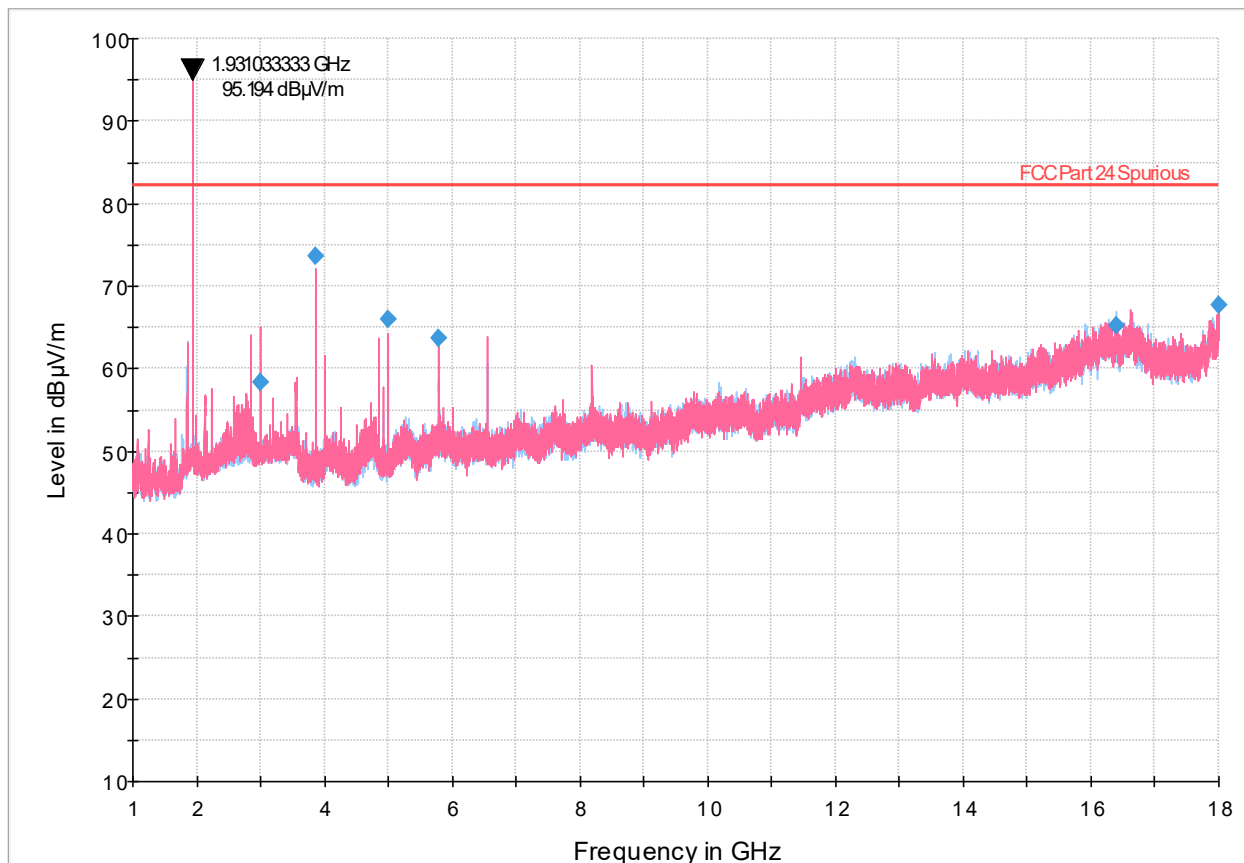


Figure 8.6-2: Radiated emissions spectral plot (1 GHz - 18 GHz) – Band 25 (1930 MHz)

Table 8.6-2: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3000.166667	58.39	82.23	23.84	100.0	1000.000	140.0	V	168.0	7.6
3862.233333	73.63	82.23	8.60	100.0	1000.000	249.0	V	303.0	9.3
4999.933333	66.04	82.23	16.19	100.0	1000.000	100.0	V	178.0	11.5
5794.000000	63.72	82.23	18.51	100.0	1000.000	212.0	V	347.0	13.9
16398.466667	65.18	82.23	17.05	100.0	1000.000	218.0	H	152.0	32.9
17997.566667	67.70	82.23	14.53	100.0	1000.000	139.0	H	0.0	35.2

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

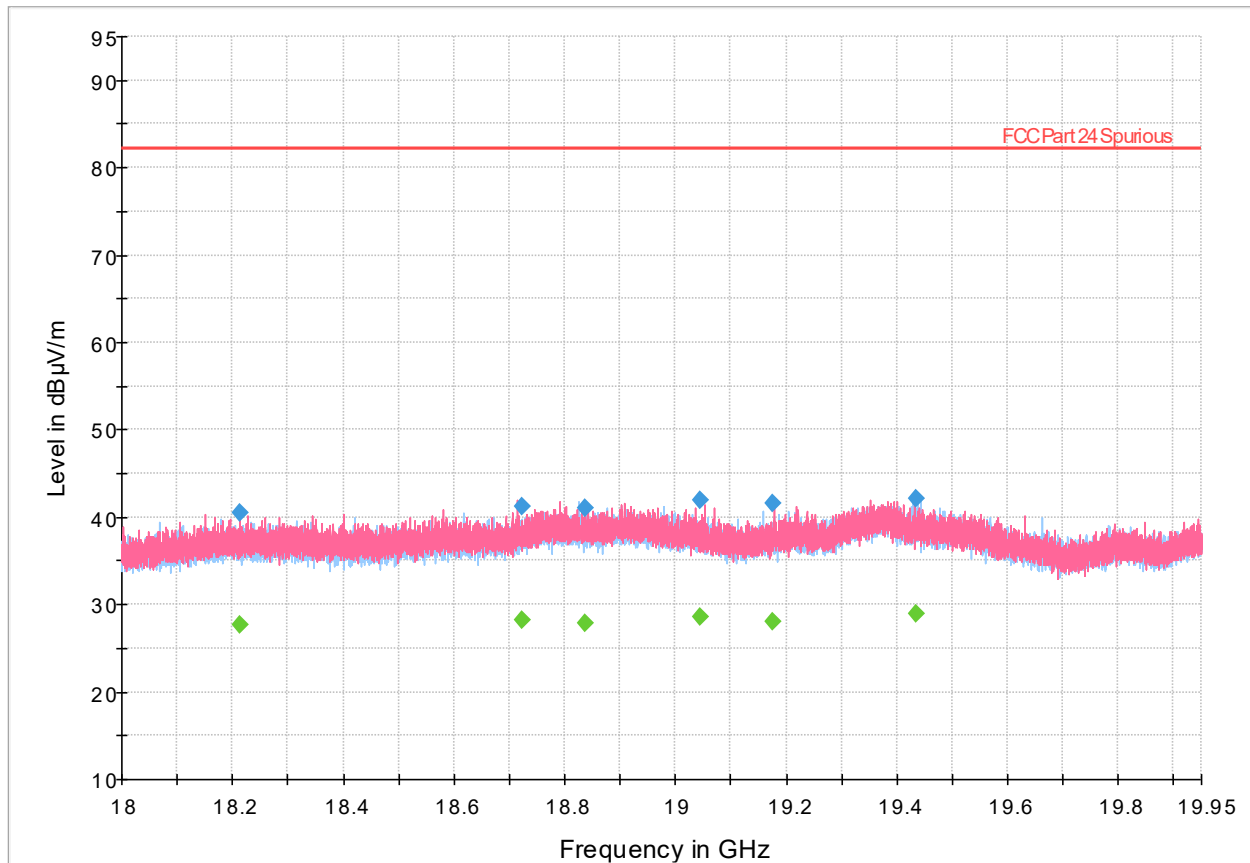


Figure 8.6-3: Radiated emissions spectral plot (18 GHz - 19.95 GHz) – Band 25 (1930 MHz)

Table 8.6-3: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18214.781250	40.47	---	82.23	41.76	5000.0	1000.000	376.0	V	339.0	15.6
18214.781250	---	27.72	---	---	5000.0	1000.000	376.0	V	339.0	15.6
18721.940625	41.22	---	82.23	41.01	5000.0	1000.000	325.0	V	34.0	15.9
18721.940625	---	28.30	---	---	5000.0	1000.000	325.0	V	34.0	15.9
18837.637500	---	27.94	---	---	5000.0	1000.000	157.0	H	0.0	15.9
18837.637500	41.07	---	82.23	41.16	5000.0	1000.000	157.0	H	0.0	15.9
19044.487500	---	28.58	---	---	5000.0	1000.000	166.0	V	90.0	16.0
19044.487500	41.86	---	82.23	40.37	5000.0	1000.000	166.0	V	90.0	16.0
19174.931250	---	28.04	---	---	5000.0	1000.000	400.0	V	148.0	16.2
19174.931250	41.55	---	82.23	40.68	5000.0	1000.000	400.0	V	148.0	16.2
19435.734375	---	29.02	---	---	5000.0	1000.000	352.0	H	0.0	16.5
19435.734375	42.18	---	82.23	40.05	5000.0	1000.000	352.0	H	0.0	16.5

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

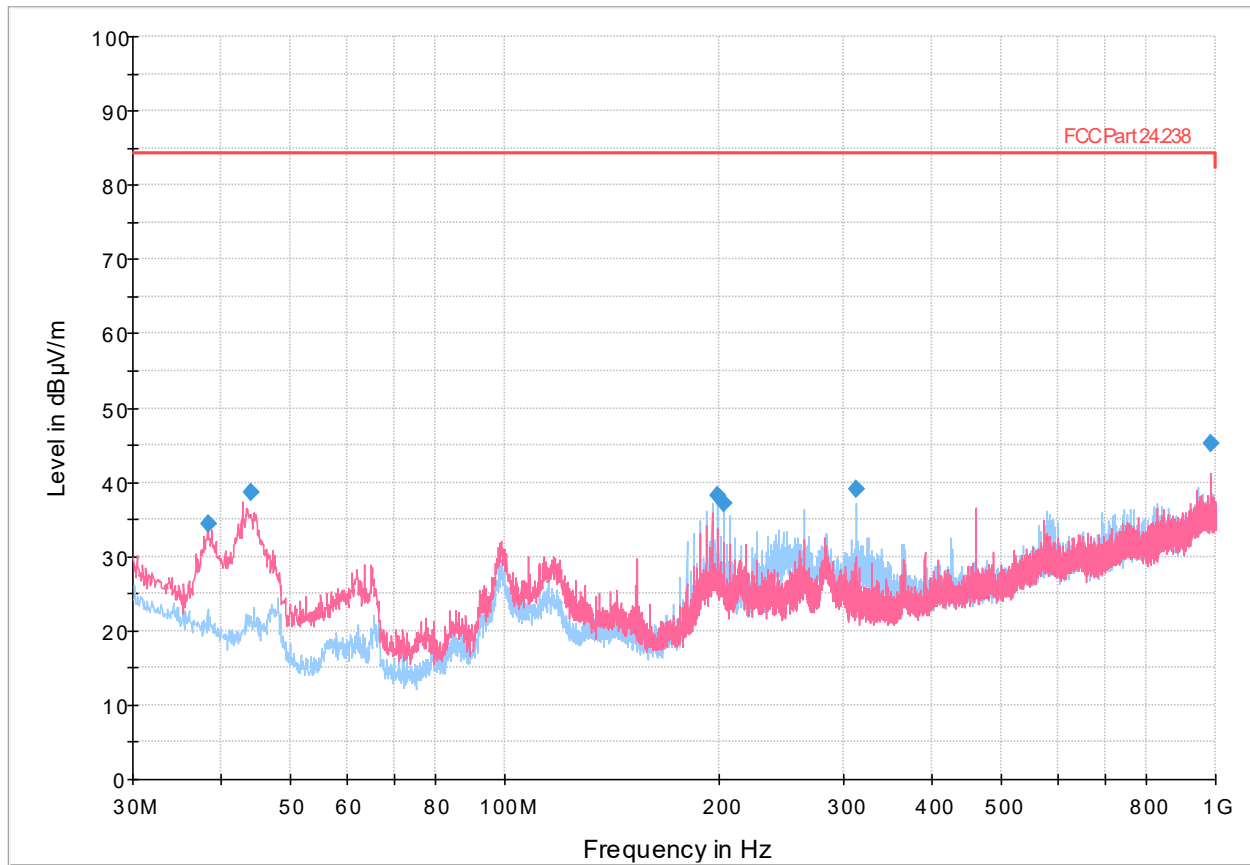


Figure 8.6-4: Radiated emissions spectral plot (30 MHz - 1 GHz) – Band 25 (1962.5 MHz)

Table 8.6-4: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
38.305000	34.39	84.38	49.99	5000.0	100.000	111.0	V	59.0	20.1
43.992500	38.62	84.38	45.76	5000.0	100.000	104.0	V	355.0	16.9
199.689167	38.18	84.38	46.20	5000.0	100.000	100.0	H	190.0	16.3
203.528333	37.07	84.38	47.31	5000.0	100.000	107.0	H	176.0	16.4
312.007500	39.00	84.38	45.38	5000.0	100.000	107.0	H	357.0	21.4
983.045833	45.20	84.38	39.18	5000.0	100.000	128.0	V	256.0	35.5

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

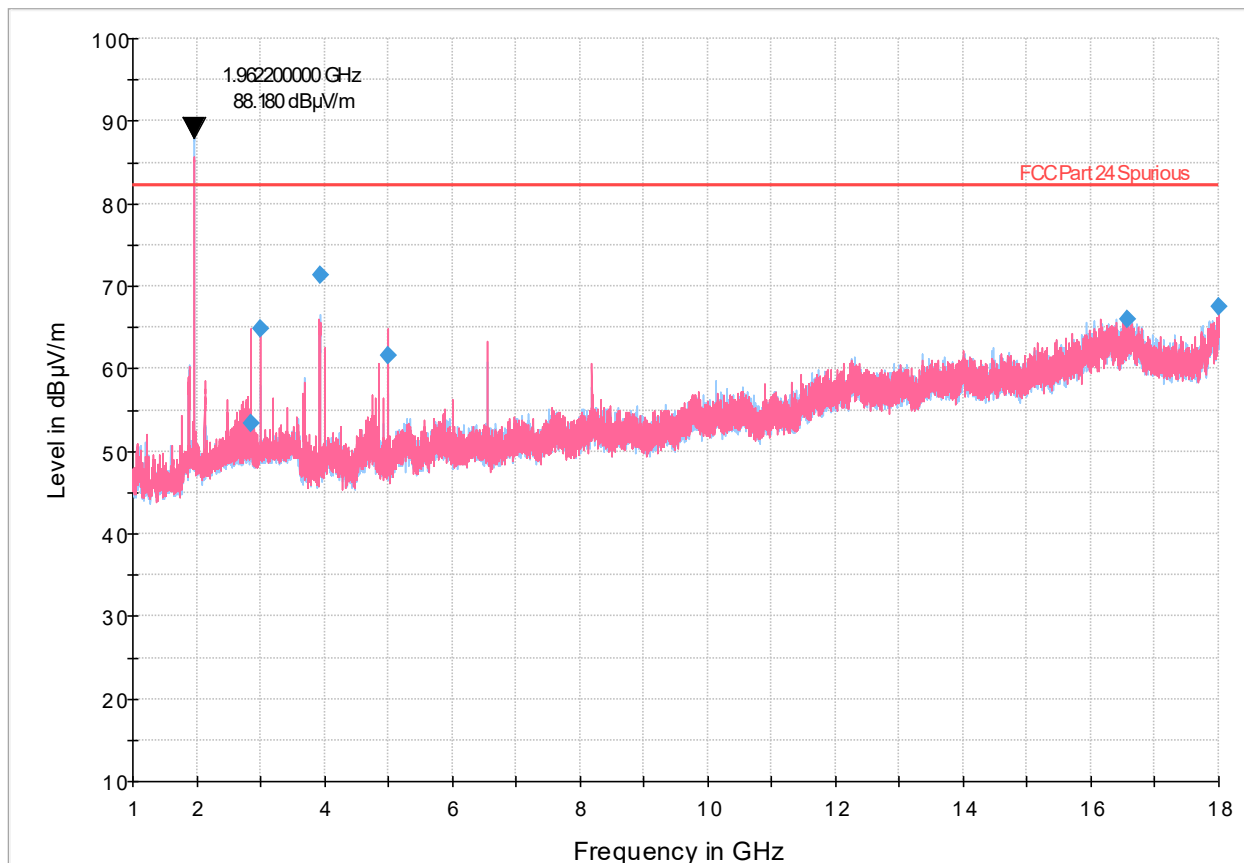


Figure 8.6-5: Radiated emissions spectral plot (1 GHz - 18 GHz) – Band 25 (1962.5 MHz)

Table 8.6-5: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2852.966667	53.44	82.23	28.79	100.0	1000.000	100.0	V	190.0	7.1
3000.166667	64.80	82.23	17.43	100.0	1000.000	126.0	V	176.0	7.6
3926.966667	71.27	82.23	10.96	100.0	1000.000	252.0	H	74.0	9.7
4999.933333	61.62	82.23	20.61	100.0	1000.000	222.0	V	175.0	11.5
16571.500000	66.07	82.23	16.16	100.0	1000.000	189.0	V	0.0	32.2
17998.866667	67.60	82.23	14.63	100.0	1000.000	222.0	H	320.0	35.2

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

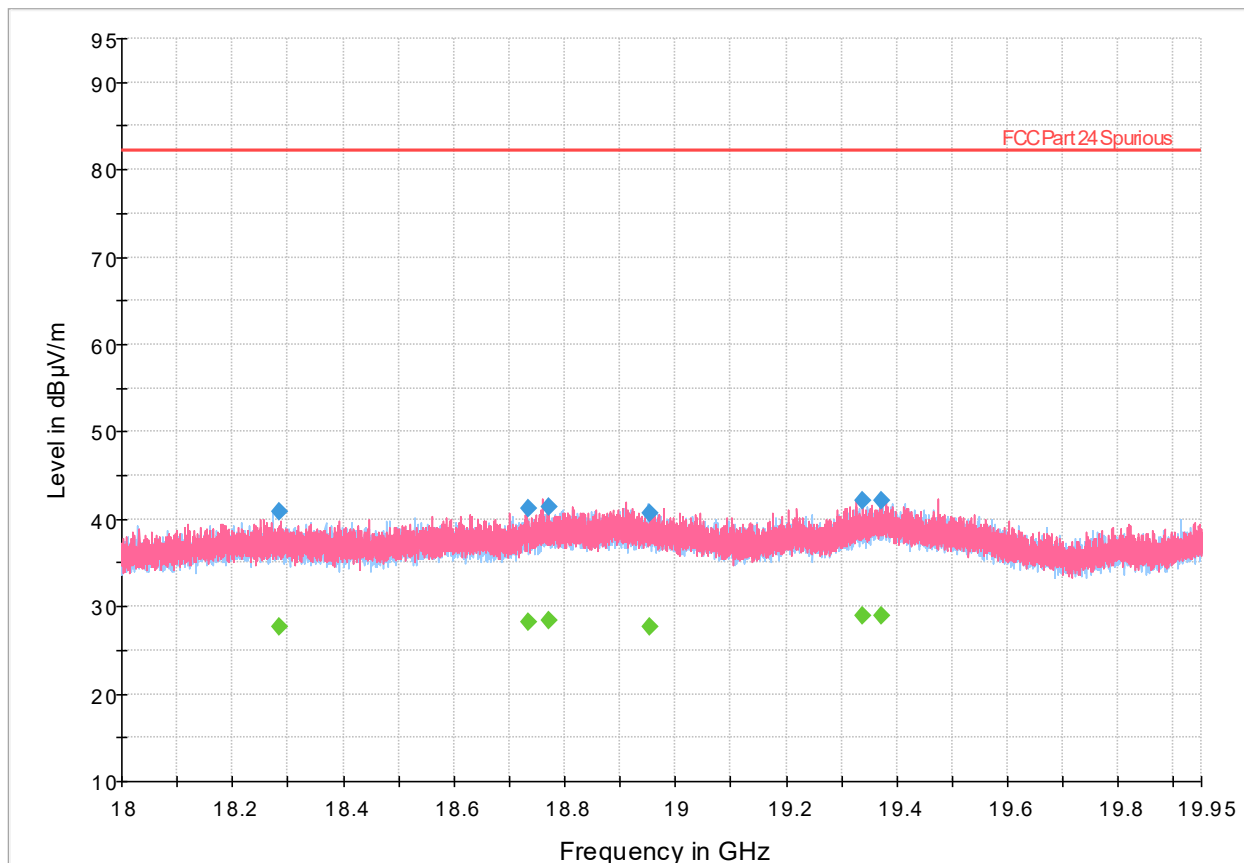


Figure 8.6-6: Radiated emissions spectral plot (18 GHz - 19.95 GHz) – Band 25 (1962.5 MHz)

Table 8.6-6: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18283.321875	40.91	---	82.23	41.32	5000.0	1000.000	312.0	H	176.0	15.5
18283.321875	---	27.62	---	---	5000.0	1000.000	312.0	H	176.0	15.5
18733.903125	---	28.26	---	---	5000.0	1000.000	400.0	V	323.0	15.9
18733.903125	41.29	---	82.23	40.94	5000.0	1000.000	400.0	V	323.0	15.9
18772.059375	41.37	---	82.23	40.86	5000.0	1000.000	375.0	V	243.0	15.9
18772.059375	---	28.33	---	---	5000.0	1000.000	375.0	V	243.0	15.9
18952.246875	40.75	---	82.23	41.48	5000.0	1000.000	400.0	H	140.0	15.9
18952.246875	---	27.65	---	---	5000.0	1000.000	400.0	H	140.0	15.9
19336.978125	---	28.90	---	---	5000.0	1000.000	367.0	V	324.0	16.7
19336.978125	42.11	---	82.23	40.12	5000.0	1000.000	367.0	V	324.0	16.7
19373.343750	42.11	---	82.23	40.12	5000.0	1000.000	128.0	V	329.0	16.7
19373.343750	---	28.91	---	---	5000.0	1000.000	128.0	V	329.0	16.7

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

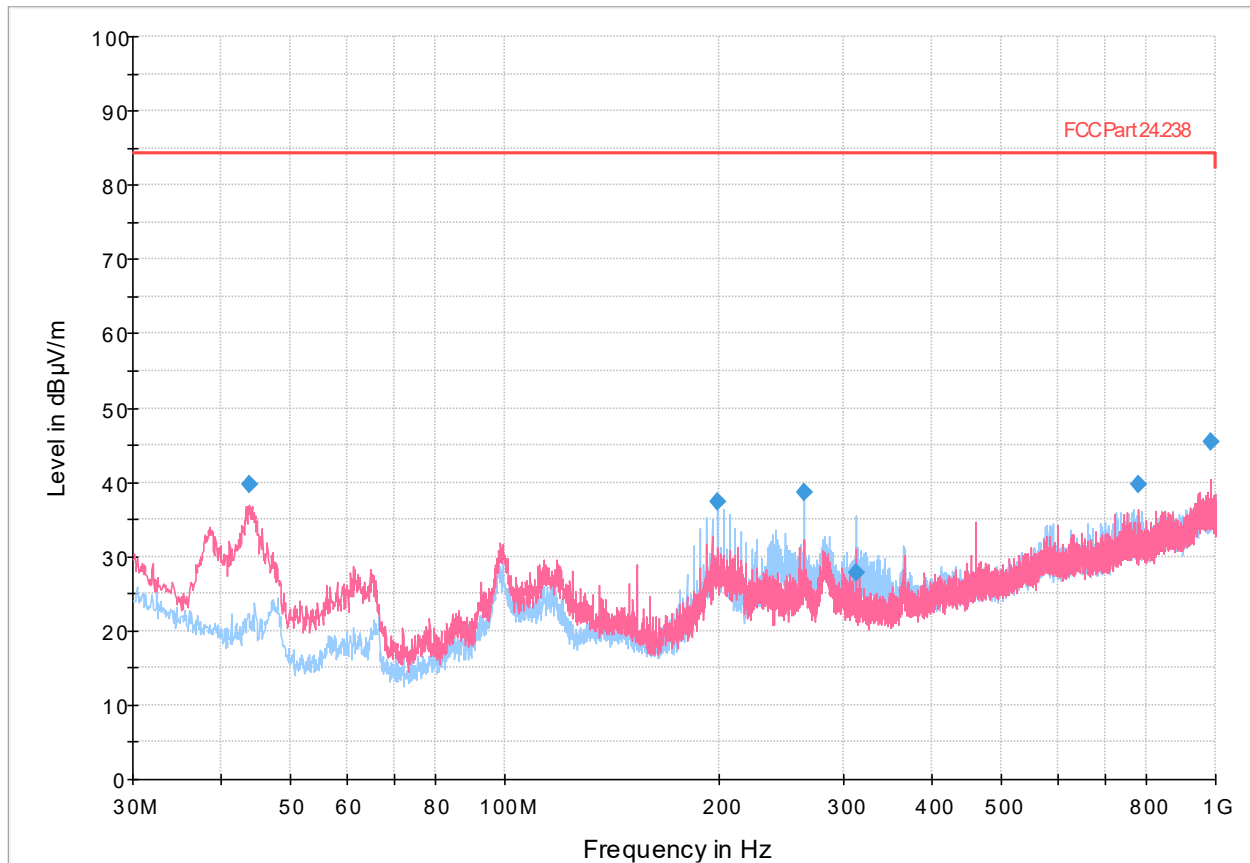


Figure 8.6-7: Radiated emissions spectral plot (30 MHz - 1 GHz) – Band 25 (1995 MHz)

Table 8.6-7: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.682500	39.64	84.38	44.74	5000.0	100.000	104.0	V	21.0	17.1
199.689167	37.44	84.38	46.94	5000.0	100.000	144.0	H	197.0	16.3
263.992500	38.58	84.38	45.80	5000.0	100.000	104.0	H	357.0	21.8
312.006667	27.82	84.38	56.56	5000.0	100.000	104.0	H	210.0	21.4
779.992500	39.79	84.38	44.59	5000.0	100.000	125.0	V	333.0	32.1
983.045833	45.44	84.38	38.94	5000.0	100.000	104.0	V	276.0	35.5

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

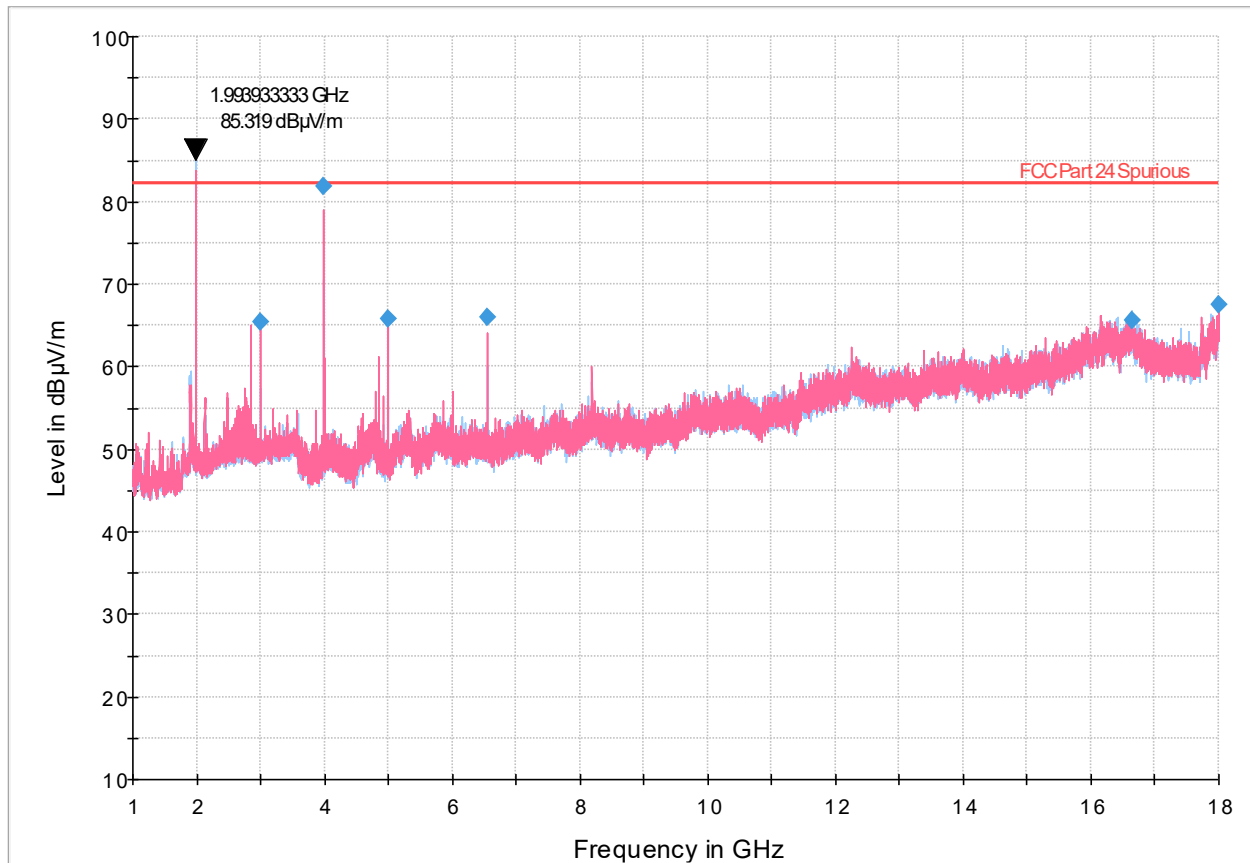


Figure 8.6-8: Radiated emissions spectral plot (1 GHz - 18 GHz) – Band 25 (1995 MHz)

Table 8.6-8: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3000.166667	65.39	82.23	16.84	100.0	1000.000	122.0	V	178.0	7.6
3986.900000	81.78	82.23	0.45	100.0	1000.000	162.0	V	110.0	10.0
4999.933333	65.75	82.23	16.48	100.0	1000.000	100.0	V	193.0	11.5
6553.733333	66.05	82.23	16.18	100.0	1000.000	281.0	V	0.0	14.5
16643.166667	65.52	82.23	16.71	100.0	1000.000	116.0	H	353.0	33.3
17993.633333	67.47	82.23	14.76	100.0	1000.000	302.0	V	0.0	34.9

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

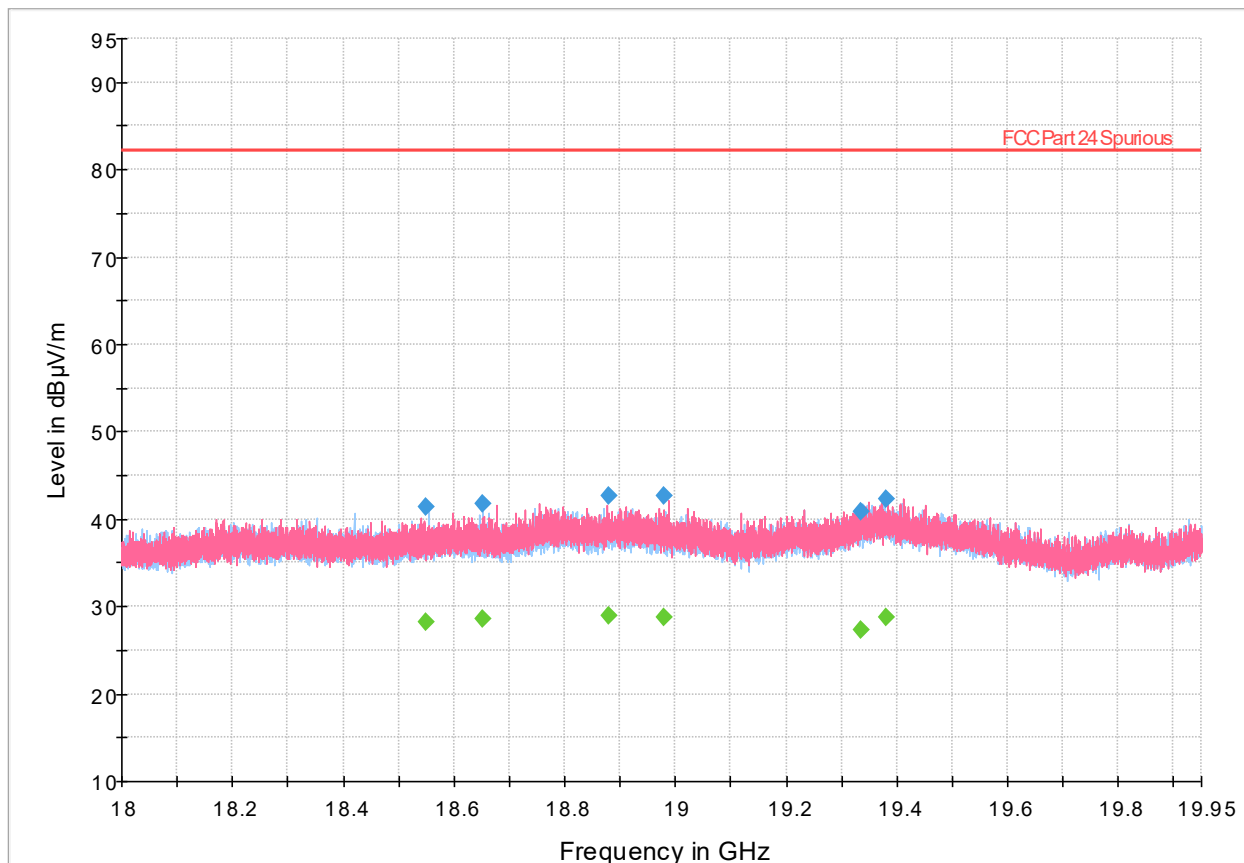


Figure 8.6-9: Radiated emissions spectral plot (18 GHz - 19.95 GHz) – Band 25 (1995 MHz)

Table 8.6-9: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18549.450000	41.37	---	82.23	40.86	5000.0	1000.000	372.0	H	0.0	16.0
18549.450000	---	28.29	---	---	5000.0	1000.000	372.0	H	0.0	16.0
18651.018750	---	28.52	---	---	5000.0	1000.000	269.0	H	32.0	16.0
18651.018750	41.83	---	82.23	40.40	5000.0	1000.000	269.0	H	32.0	16.0
18878.559375	42.74	---	82.23	39.49	5000.0	1000.000	216.0	V	267.0	15.9
18878.559375	---	29.03	---	---	5000.0	1000.000	216.0	V	267.0	15.9
18979.453125	---	28.81	---	---	5000.0	1000.000	258.0	V	0.0	16.0
18979.453125	42.63	---	82.23	39.60	5000.0	1000.000	258.0	V	0.0	16.0
19334.184375	40.90	---	82.23	41.33	5000.0	1000.000	243.0	H	354.0	16.7
19334.184375	---	27.39	---	---	5000.0	1000.000	243.0	H	354.0	16.7
19381.696875	42.23	---	82.23	40.00	5000.0	1000.000	280.0	H	32.0	16.6
19381.696875	---	28.74	---	---	5000.0	1000.000	280.0	H	32.0	16.6

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

8.6.5.2 Operating frequency band: Band 66: 2110 – 2200 MHz

Full Spectrum

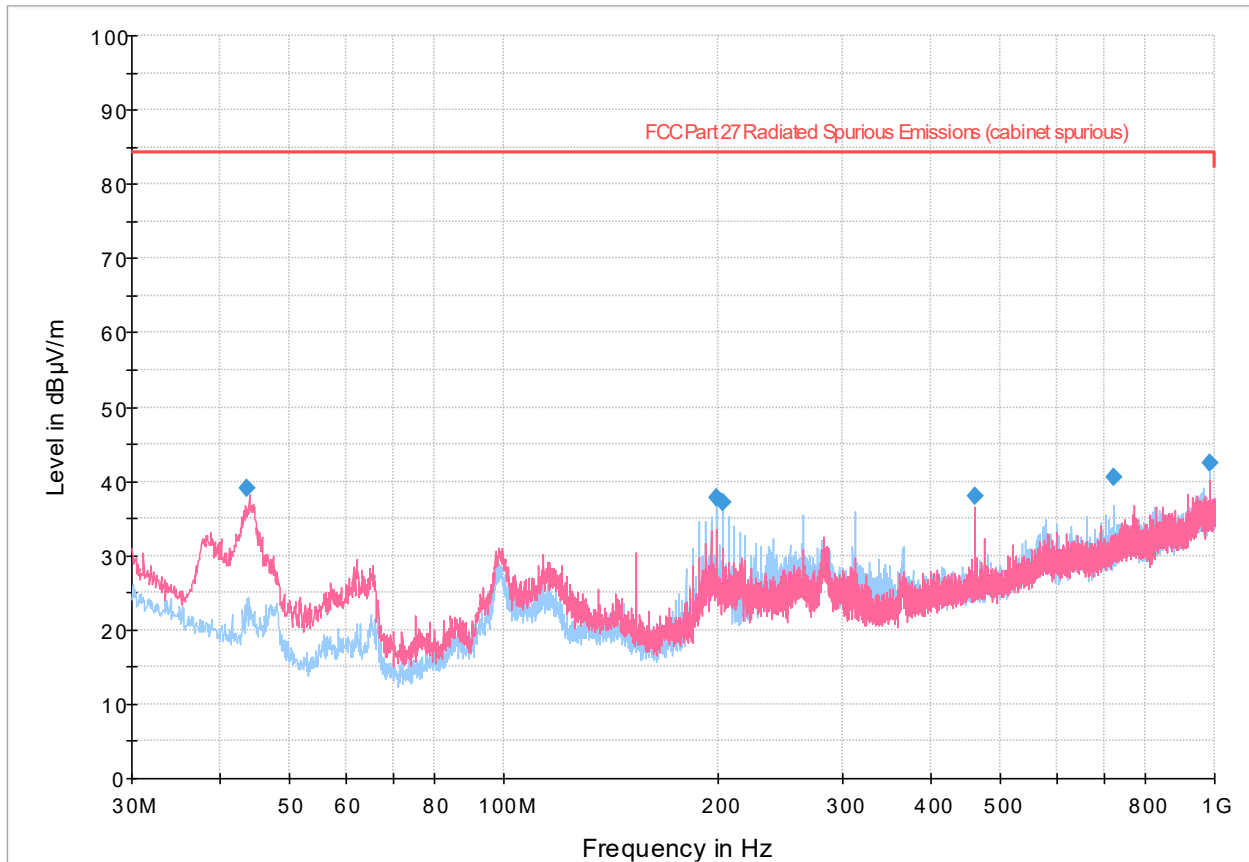


Figure 8.6-10: Radiated emissions spectral plot (30 MHz - 1 GHz) – Band 66 (2110 MHz)

Table 8.6-10: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.643333	39.05	84.38	45.33	5000.0	100.000	114.0	V	34.0	17.1
199.689167	37.74	84.38	46.64	5000.0	100.000	144.0	H	196.0	16.3
203.528333	37.11	84.38	47.27	5000.0	100.000	129.0	H	196.0	16.4
460.780833	38.04	84.38	46.34	5000.0	100.000	104.0	V	172.0	26.0
720.013333	40.65	84.38	43.73	5000.0	100.000	125.0	H	246.0	31.1
983.085833	42.42	84.38	41.96	5000.0	100.000	115.0	H	301.0	35.5

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

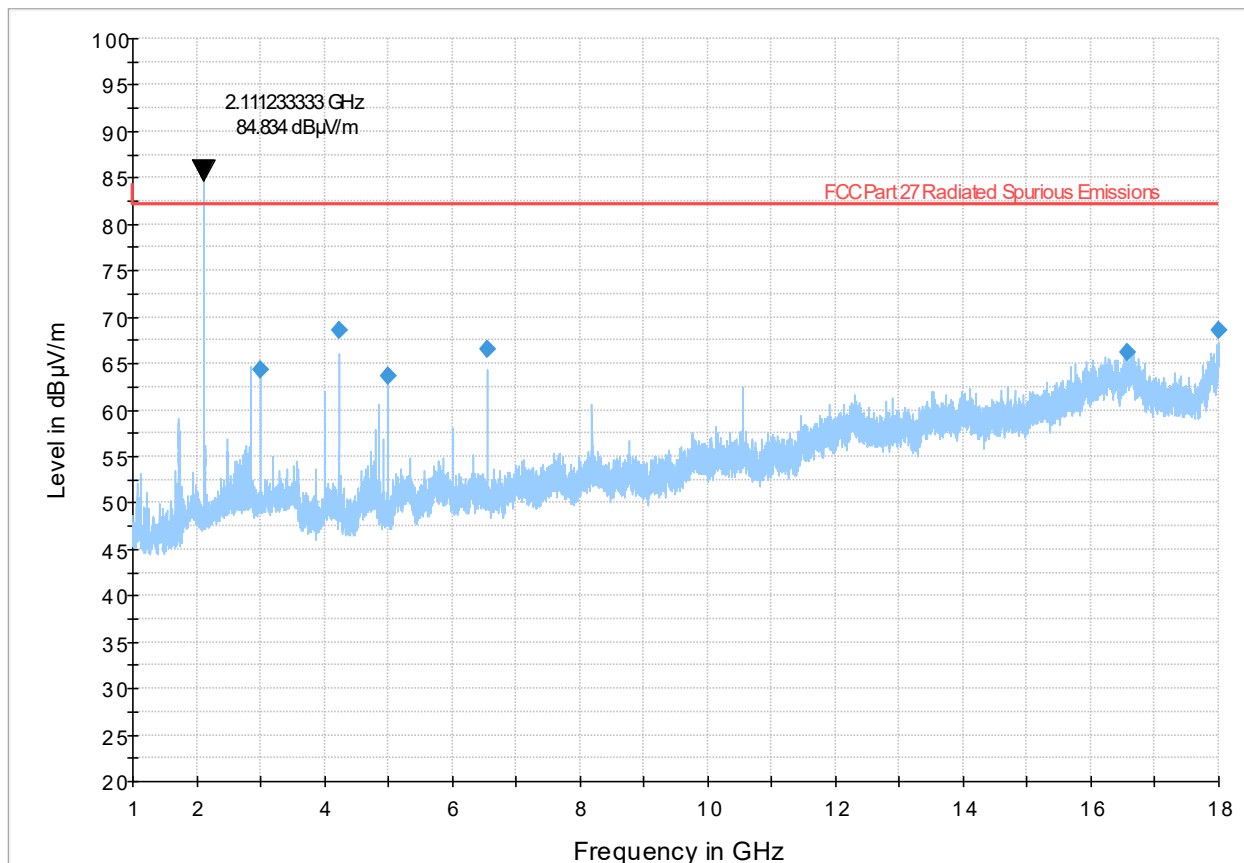


Figure 8.6-11: Radiated emissions spectral plot (1 GHz - 18 GHz) – Band 66 (2110 MHz)

Table 8.6-11: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3000.166667	64.27	82.23	17.96	5000.0	1000.000	130.0	V	175.0	7.6
4222.466667	68.55	82.23	13.68	5000.0	1000.000	164.0	V	295.0	10.5
4999.933333	63.62	82.23	18.61	5000.0	1000.000	171.0	V	176.0	11.5
6553.733333	66.53	82.23	15.70	5000.0	1000.000	281.0	V	0.0	14.5
16575.100000	66.16	82.23	16.07	5000.0	1000.000	210.0	H	314.0	32.2
17993.600000	68.64	82.23	13.59	5000.0	1000.000	279.0	V	222.0	34.9

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

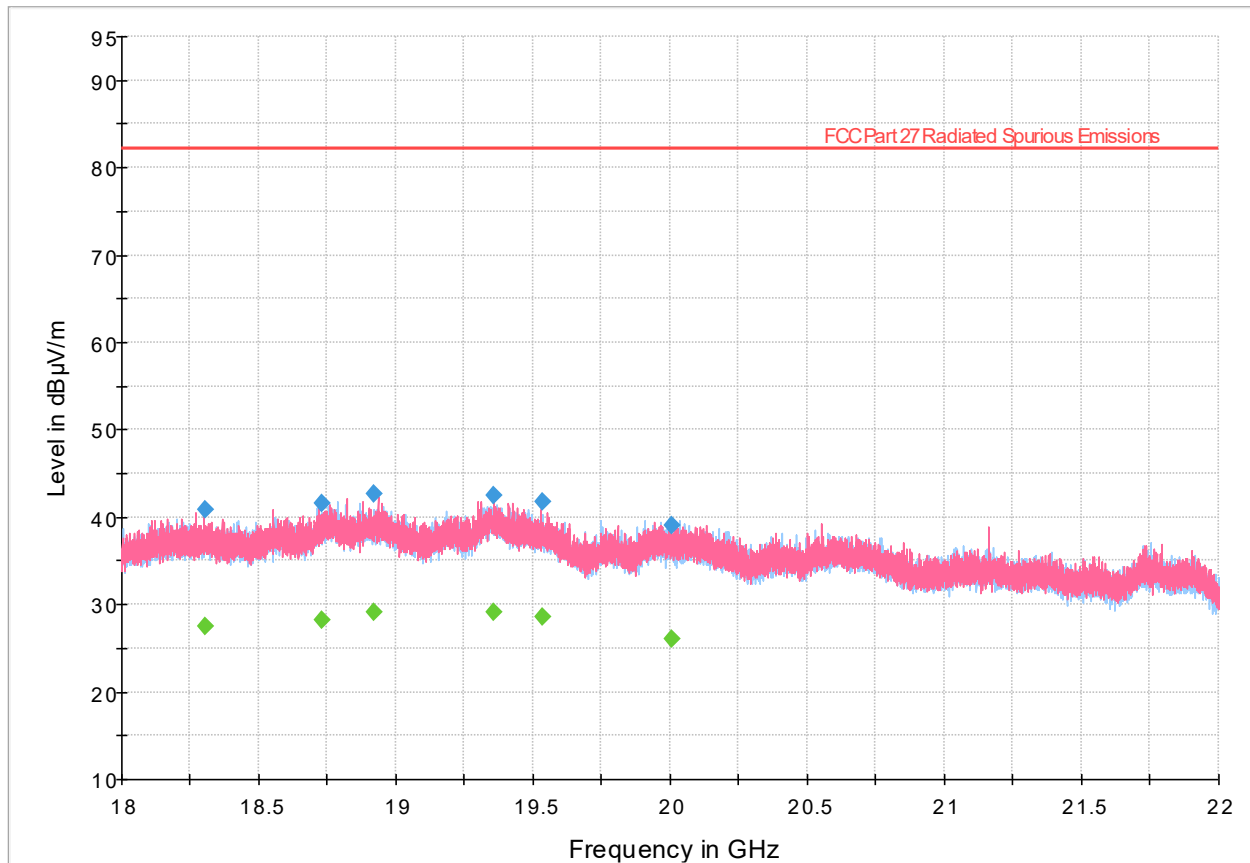


Figure 8.6-12: Radiated emissions spectral plot (18 GHz - 22 GHz) – Band 66 (2110 MHz)

Table 8.6-12: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18303.900000	40.82	---	82.23	41.41	5000.0	1000.000	100.0	V	0.0	15.4
18303.900000	---	27.50	---	---	5000.0	1000.000	100.0	V	0.0	15.4
18728.500000	---	28.31	---	---	5000.0	1000.000	351.0	V	0.0	15.9
18728.500000	41.60	---	82.23	40.63	5000.0	1000.000	351.0	V	0.0	15.9
18920.500000	42.72	---	82.23	39.51	5000.0	1000.000	346.0	V	151.0	15.9
18920.500000	---	29.08	---	---	5000.0	1000.000	346.0	V	151.0	15.9
19354.400000	42.40	---	82.23	39.83	5000.0	1000.000	166.0	V	311.0	16.7
19354.400000	---	29.09	---	---	5000.0	1000.000	166.0	V	311.0	16.7
19537.250000	41.67	---	82.23	40.56	5000.0	1000.000	228.0	V	280.0	16.3
19537.250000	---	28.64	---	---	5000.0	1000.000	228.0	V	280.0	16.3
20006.000000	---	26.06	---	---	5000.0	1000.000	120.0	H	278.0	16.5
20006.000000	39.11	---	82.23	43.12	5000.0	1000.000	120.0	H	278.0	16.5

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

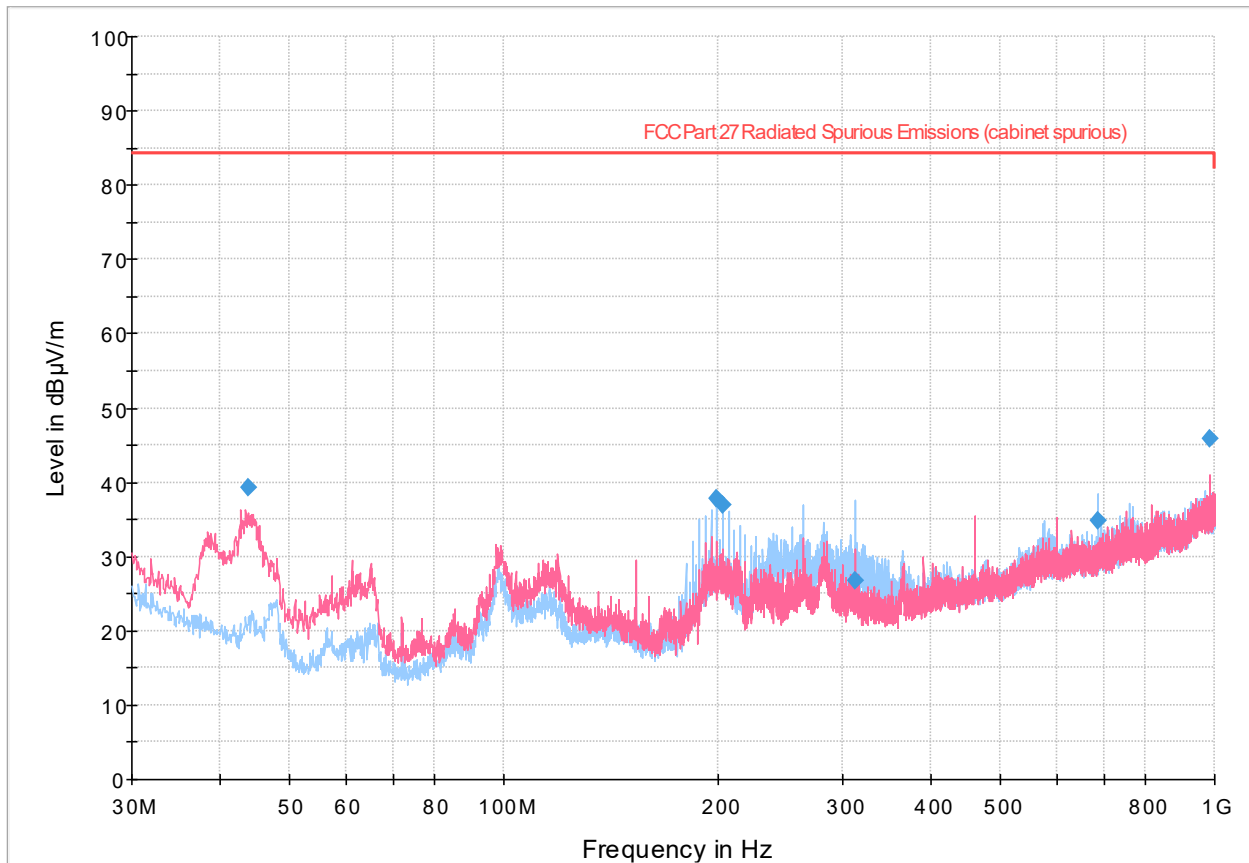


Figure 8.6-13: Radiated emissions spectral plot (30 MHz - 1 GHz) – Band 66 (2155 MHz)

Table 8.6-13: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.791667	39.22	84.38	45.16	5000.0	100.000	114.0	V	0.0	17.0
199.689167	37.69	84.38	46.69	5000.0	100.000	100.0	H	198.0	16.3
203.528333	36.99	84.38	47.39	5000.0	100.000	144.0	H	186.0	16.4
312.006667	26.69	84.38	57.69	5000.0	100.000	104.0	H	10.0	21.4
685.712500	34.83	84.38	49.55	5000.0	100.000	269.0	H	299.0	30.2
983.045833	45.95	84.38	38.43	5000.0	100.000	151.0	V	34.0	35.5

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

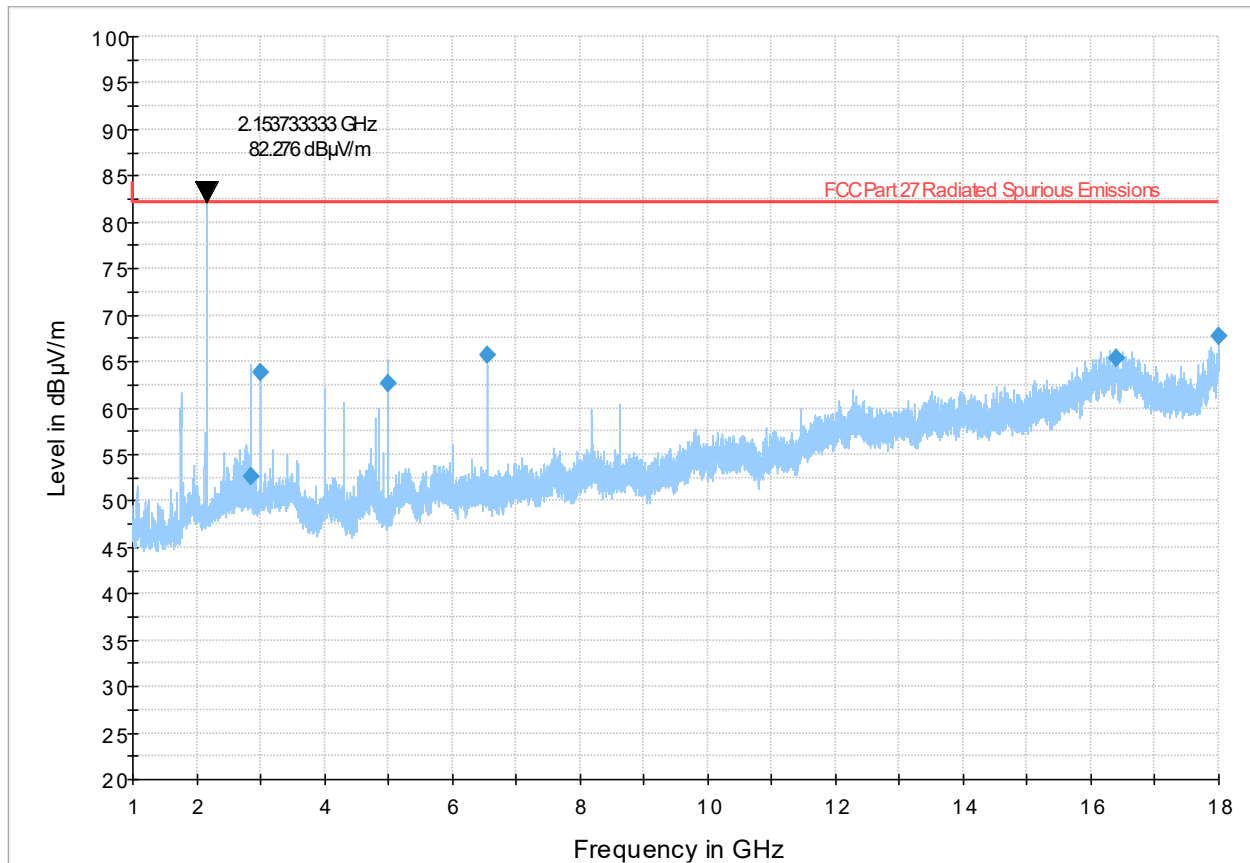


Figure 8.6-14: Radiated emissions spectral plot (1 GHz - 18 GHz) – Band 66 (2155 MHz)

Table 8.6-14: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2853.366667	52.54	82.23	29.69	100.0	1000.000	168.0	V	187.0	7.1
3000.166667	63.89	82.23	18.34	100.0	1000.000	148.0	V	174.0	7.6
4999.933333	62.71	82.23	19.52	100.0	1000.000	227.0	V	175.0	11.5
6553.733333	65.61	82.23	16.62	100.0	1000.000	119.0	V	339.0	14.5
16400.433333	65.36	82.23	16.88	100.0	1000.000	207.0	V	264.0	32.9
17999.666667	67.71	82.23	14.52	100.0	1000.000	114.0	H	203.0	35.3

- Notes:
- ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
 - ² Correction factors = antenna factor ACF (dB) + cable loss (dB)
 - ³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

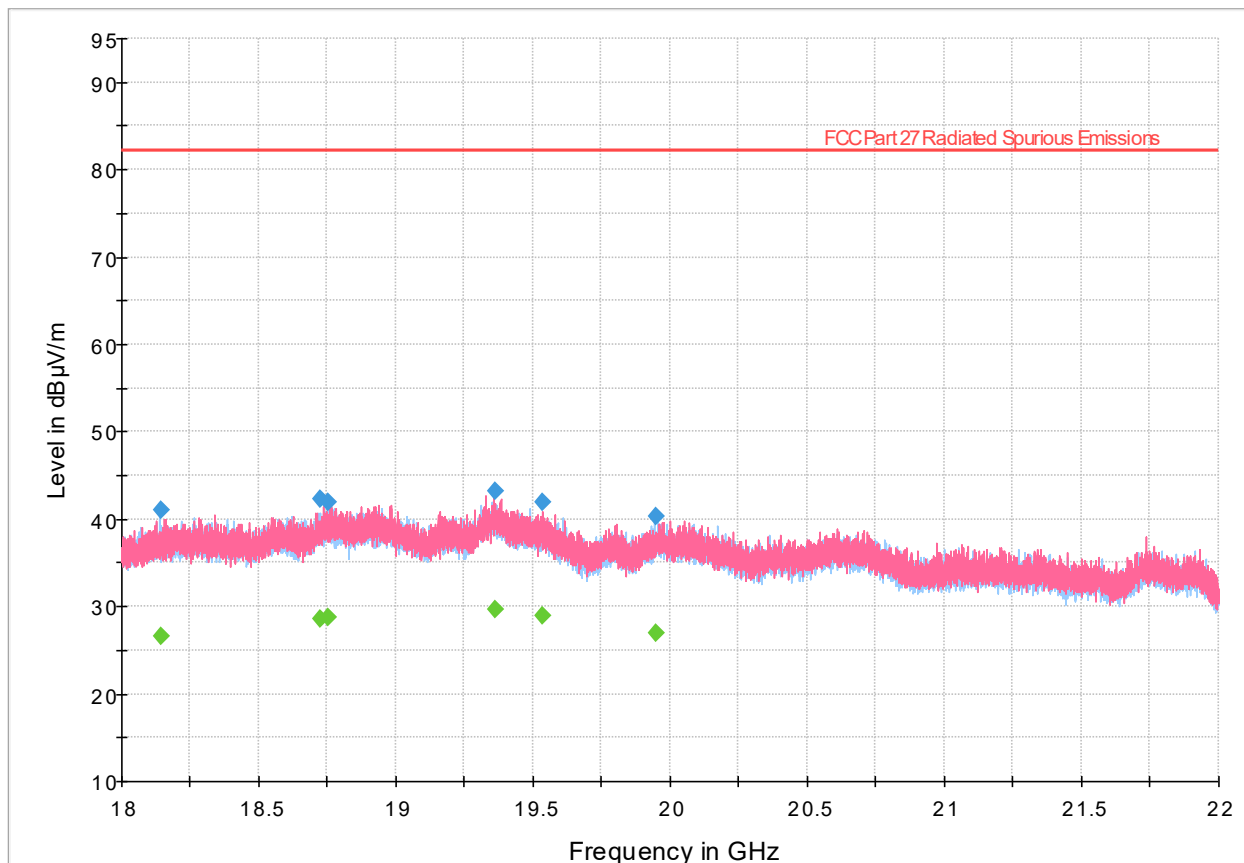


Figure 8.6-15: Radiated emissions spectral plot (18 GHz - 22 GHz) – Band 66 (2155 MHz)

Table 8.6-15: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18142.600000	---	26.69	---	---	5000.0	1000.000	217.0	H	347.0	15.6
18142.600000	40.99	---	82.23	41.24	5000.0	1000.000	217.0	H	347.0	15.6
18726.950000	42.26	---	82.23	39.97	5000.0	1000.000	380.0	V	199.0	15.9
18726.950000	---	28.57	---	---	5000.0	1000.000	380.0	V	199.0	15.9
18753.350000	41.86	---	82.23	40.37	5000.0	1000.000	325.0	V	270.0	15.9
18753.350000	---	28.75	---	---	5000.0	1000.000	325.0	V	270.0	15.9
19360.550000	---	29.75	---	---	5000.0	1000.000	346.0	V	114.0	16.7
19360.550000	43.14	---	82.23	39.09	5000.0	1000.000	346.0	V	114.0	16.7
19532.000000	41.97	---	82.23	40.26	5000.0	1000.000	366.0	V	219.0	16.3
19532.000000	---	28.89	---	---	5000.0	1000.000	366.0	V	219.0	16.3
19945.600000	40.29	---	82.23	41.94	5000.0	1000.000	248.0	H	341.0	16.2
19945.600000	---	26.97	---	---	5000.0	1000.000	248.0	H	341.0	16.2

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)
² Correction factors = antenna factor ACF (dB) + cable loss (dB)
³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

End of test report