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RADIO TEST REPORT – 433532-2R2TRFWL

Type of assessment:

Transmitters' co-location

Applicant:

Astus

Product:

Telematic device for vehicle

Model:

Astus QC25 WW BLE

FCC ID:

SFPASTUS-QC25

Contains FCC ID's:

2AA9B04 (BLE)

R17ME910G1WW (LTE)

Specifications:

- FCC 47 CFR Part 15 Subpart C, §15.247
- FCC 47 CFR Part 27
- FCC 47 CFR Part 22 Subpart H

Date of issue: September 27, 2021

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SCC File Number: 15064 (Ottawa/Almonte); 151100 (Montreal); 151097 (Cambridge)

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Test site identifier	**Organization**	**Ottawa/Almonte**	**Montreal**	**Cambridge**
	FCC:	CA2040	CA2041	CA0101
	ISED:	2040A-4	2040G-5	24676
Website	www.nemko.com			

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 contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.247	Operation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–585 MHz
FCC 47 CFR Part 27	Miscellaneous Wireless Communications Services
FCC 47 CFR Part 22 Subpart H	Public Mobile Services, Cellular Radiotelephone Service

1.2 Test methods

558074 D01 15.247 Meas Guidance v05r02 (April 2, 2019)	Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules.
ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.26 v2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

1.3 Exclusions

As per quotation (Q102176118r3), the purpose of this report is verification of transmitters colocation. Only inter-modulation products within restricted bands were assessed, other requirements were excluded from the scope of this report.

Partial testing was performed on the product with the transmitter operating to confirm that the host product meets the FCC requirements. This investigation of the final product was done by spot checking emissions from the device while operating the host as a composite system. This testing was performed with the host product configured in typical operational modes to check the spurious emissions for compliance with all the applicable rules.

The evaluation was done to ensure there are no additional radiated spurious emissions generated due to simultaneous-transmission operations compared to single transmitter operations testing, and to ensure compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules. All other requirements are excluded from the scope of this report.

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.3 above. Results obtained indicate that the product under test complies In full with the requirements tested. The test results relate only to the items tested.
Determining compliance is based on the results of the compliance measurement, not taking into account measurement uncertainty, in accordance with section 1.3 of ANSI C63.10 v2013.

See "Summary of test results" for full details.

1.5 Test report revision history

Table 1.5-1: *Test report revision history*

Revision #	Date of issue	Details of changes made to test report
TRF	June 14, 2021	Original report issued
R1TRF	June 25, 2021	Section 2.3 updated.
R2TRF	September 27, 2021	Removed ISED specification and updated FCC ID and model name.

Section 2 Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

There were no modifications performed to the EUT during this assessment.

2.2 Technical judgment

None

2.3 Model variant declaration

As declared by the applicant, the EUT model Astus QC25 WW BLE has been chosen to be representative for all other models in the model family. The model family, and the description of the variations, are as follows:

1. The power output and CAN #2 (let's call them "optional features") are available on the Auxiliary connector.
2. If the customer does not require the optional features, the product will be shipped in its case which does not contain the opening to access the connector. This helps to better protect the product against dust and liquids.
3. If the customer wishes to use the optional features, the product will be shipped in its case which contains the opening to access and plug into the connector.

2.4 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3 Test conditions

3.1 Atmospheric conditions

Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

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.

3.2 Power supply range

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

Section 4 Measurement uncertainty

4.1 Uncertainty of measurement

UKAS Lab 34 and TIA-603-B have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada, Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products.

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Table 4.1-1: *Measurement uncertainty calculations*

Test name	Measurement uncertainty, ±dB
All antenna port measurements	0.55
Occupied bandwidth	4.45
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55

Section 5 Information provided by the applicant

5.1 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 contained 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.

5.2 Applicant/Manufacture

Applicant name	Astus
Applicant address	101 boulevard Roland-Therrien (suite 500), Longueuil, Quebec, Canada, J4H 4B9
Manufacturer	Same as applicant

5.3 EUT information

Product	Telematic device for vehicle
Model	Astus QC25 WW BLE
Serial number	WW-3660046
Part number	QC25-WW
Power supply requirements	DC: 12.5 V
Product description and theory of operation	Collect telematic data from the vehicle, including CAN bus data and GPS positions. Transmit the data to a remote server with its embedded cellular radio. The QC25 is also equipped with a BLE module.

5.4 Radio technical information

Category of Wideband Data Transmission equipment	☐ Frequency Hopping Spread Spectrum (FHSS) equipment ☒ Other types of Wideband Data Transmission equipment (e.g. DSSS, OFDM, etc.).
Frequency band	2400–2483.5 MHz (BLE) 4G LTE: B1 (1920–1980 MHz), B2 (1850–1910 MHz), B3 (1710–1785 MHz), B4 (1710–1755 MHz), B5 (2500–2570 MHz), B8 (880–915 MHz), B12 (669–716 MHz), B13 (777–787 MHz), B18 (815–830 MHz), B19 (830–845 MHz), B20 (832–862 MHz), B25 (1850–1915 MHz), B26 (814–849 MHz), B27 (807–824 MHz), B28 (703–748 MHz), B66 (1710–1780 MHz), B71 (663–698 MHz) and B85 (698–716 MHz) 2G LTE: B2 (1850–1910 MHz), B3 (1710–1785 MHz), B5 (824–849 MHz) and B8 (880–915 MHz)
Frequency Min (MHz)	2402 (BLE)
Frequency Max (MHz)	2480 (BLE)
Type of modulation	4G: QPSK/BPSK 2G: GMSK BLE (GFSK)
Emission classification	2G LTE: G7D. 4G LTE: W7D / G7D / G7W / GXW. BLE: F1D
Antenna information	Abracon ACAR4008-S698, Gain: -1.55 dBi @ 700 MHz to 1.75 dBi @ 2700 MHz (max 4.10 dBi @ 1710 MHz) BLE : The EUT uses a non-detachable antenna to the intentional radiator. Internal to the Rigado module BMD-300 (FCC approved), GPS: Taoglass GP.1575.18.2.A.02

5.5 EUT setup details

5.5.1 Radio exercise details

Operating conditions	- Astus QC25 WW BLE (the EUT) powered through a 6 meters harness - 12.5 VDC power is applied to the EUT - I/O set as an input (to simulate the vehicle's ignition) - 85mA resistive load is installed on the power output at the auxiliary connector. On a 2 meters harness. - CAN bus #1 terminated with a 120 ohms resistor. Used as the command and status port for the test operator. Wired outside the semi anechoic chamber. - CAN bus #2 from the auxiliary connector. Set in loopback mode. On a 2 meters unterminated wire pair. - CAN bus #2 from the main OBD2 connector. Set in loopback mode. The wire pair is 2 meters long. Terminated with a 120 ohms resistor. - GPS enabled - BLE transmission forced to low (2402 MHz), mid (2438 MHz) and high (2480 MHz) frequency. Under control of the test operator. The BLE is not paired while in test. - Cellular radio transmission forced to 2G 824 MHz (band 5), 2G 1909 MHz (band 2), 4G 663 MHz (band 71), 4G 814 MHz (band 26), 4G 815 MHz (band 18) and 4G 1920 MHz (band 1). Under control of the test operator. The EUT is not connected to the cell operator nor the remote Astus server while in test. EUT details: SN: WW-3660046, PN: QC25-WW, Main board RL: 7, Mezzanine board RL: 5 Sorftware details: EUT Bootloader: 2.15.116, EUT Firmware: 2.16.15.1 Telit LE910-WW1 cellular radio: 37.00.413 uBlox BMD-300 BLE radio: 2.14.243.0
Transmitter state	BLE Transmitter set into continuous mode during testing time. LTE Transmitter set into 'AT#TESTMODE' during testing time.

Tx Combination	BLE Tx	LTE Tx Frequency
Scenario 1	2402 MHz (Low Channel)	824 MHz
Scenario 2	2402 MHz (Low Channel)	1909 MHz
Scenario 3	2402 MHz (Low Channel)	663 MHz
Scenario 4	2402 MHz (Low Channel)	814 MHz
Scenario 5	2480 MHz (High Channel)	815 MHz
Scenario 6	2480 MHz (High Channel)	1920 MHz

5.5.2 EUT setup configuration

Table 5.5-1: *EUT sub assemblies*

Description	Brand name	Model, Part number, Serial number, Revision level
Astus QC25 WW BLE	ASTUS	SN: WW-3660046

Table 5.5-2: *EUT interface ports*

Description	Qty.
CAN Bus port	2
I/O port	1
Power Output	1
Auxiliary connector port	1

Table 5.5-3: *Support equipment*

Description	Brand name	Model, Part number, Serial number, Revision level
Laptop	Vostro	S/N 34735277773
CAN to USB adaptor (PEAK)	GridConnect	MN: EH-002021-303499
0-30 Vdc power supply	BK Precision 1550	SN: 1150083307

Table 5.5-4: *Inter-connection cables*

Cable description	From	To	Length (m)
Twisted pair non shielded cable CAN	EUT Can Bus port 2 on OBD2 connector.	Terminated with a 120 ohms resistor.	2
Twisted pair non shielded cable CAN	EUT Can Bus port 2 on Auxiliary connector	Terminated with a 120 ohms load	2
Single non shielded wire	DC power supply	EUT I/O* on OBD2 connector	6
Pair non shielded cable	EUT Power output port on Auxiliary connector	ohms load	2
Non shielded power (12 Vdc typical) and GND	DC power supply	EUT power input port on OBD2 connector	6

Note: (*) Used as an input.

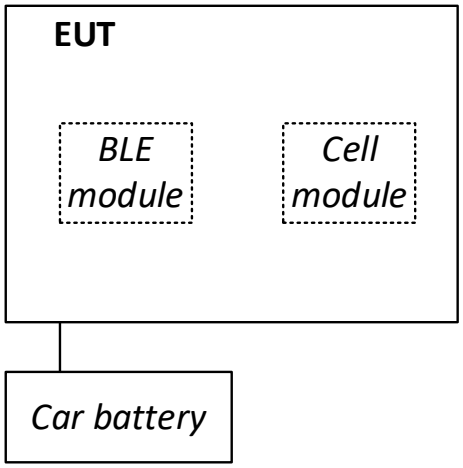


Figure 5.5-1: *Radiated testing block diagram*

Note: All supporting equipment were outside of chamber.

Section 6 Summary of test results

6.1 Testing location

Test location (s)	Montreal

6.2 Testing period

Test start date	May 17, 2021	Test end date	May 25, 2021

6.3 Sample information

Receipt date	May 10, 2021	Nemko sample ID number(s)	1

6.4 FCC test results

Table 6.4-1: *FCC requirements results*

Test description	Verdict
Spurious emissions, various standards	Pass

Section 7 Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber (Emissions)	TDK	SAC-3	FA002532e	2 year	February 25, 2022
Flush mount turntable	Sunol	FM2022	FA002550	—	NCR
Controller	Sunol	SC104V	FA002551	—	NCR
Antenna mast	Sunol	TLT2	FA002552	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	March 16, 2022
Bilog antenna (20–2000 MHz)	Sunol	JB1	FA002517	1 year	March 3, 2022
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 40	FA002071	1 year	March 16, 2022
Horn antenna (18–40 GHz)	EMCO	3116	FA002487	2 year	March 4, 2023
Horn antenna (1–18 GHz)	EMCO	3115	FA001451	1 year	February 16, 2022
Pre-amplifier (0.5–18 GHz)	Com-Power	PAM-118A	FA002561	1 year	September 22, 2021
Pre-amplifier (18–40 GHz)	Com-Power	PAM-840	FA002508	1 year	September 24, 2021
Spectrum analyzer	Rohde & Schwarz	FSV 40	FA002731	1 year	March 23, 2022
50 Ω coax cable	C.C.A.	None	FA002605	—	VOU
50 Ω coax cable	C.C.A.	None	FA002831	—	VOU

Notes: NCR - no calibration required, VOU - verify on use

Section 8 Testing data

8.1 Spurious (out-of-band) unwanted emissions

8.1.1 References, definitions and limits

FCC §15.247:

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

FCC §22.917:

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53:

On any frequency outside the authorized bands, the power of any emission shall be attenuated outside the band below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB;

Table 8.1-1: *FCC §15.209 – Radiated emission limits*

	Field strength of emissions		
Frequency, MHz	**µV/m**	**dBµV/m**	**Measurement distance, m**
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Table 8.1-2: *FCC restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

8.1.2 Test summary

Verdict	Pass		
Tested by	Redwanul Rasel	Test date	May 17 - May 25, 2021

8.1.3 Observations, settings and special notes

- As part of the current assessment, the test range of 9 kHz to 10th harmonic has been fully considered and compared to the actual frequencies utilized within the EUT. Since the EUT contains a transmitter in the GHz range, the EUT has been deemed compliant without formal testing in the 9 kHz to 30 MHz test range, therefore formal test results (tabular data and/or plots) are not provided within this test report.
- EUT was set to transmit with 100 % duty cycle.
- Radiated measurements were performed 30 MHz to 18 GHz at a distance of 3 m.
- Radiated measurements were performed 18 GHz to 25 GHz at a distance of 1 m.
- DTS emissions in restricted frequency bands test was performed as per KDB 558074, section 8.6 with reference to ANSI C63.10 subclause 11.12.
- DTS band-edge emission measurements test was performed as per KDB 558074, section 8.7 with reference to ANSI C63.10 subclause 11.13.

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Average
Trace mode:	Max Hold

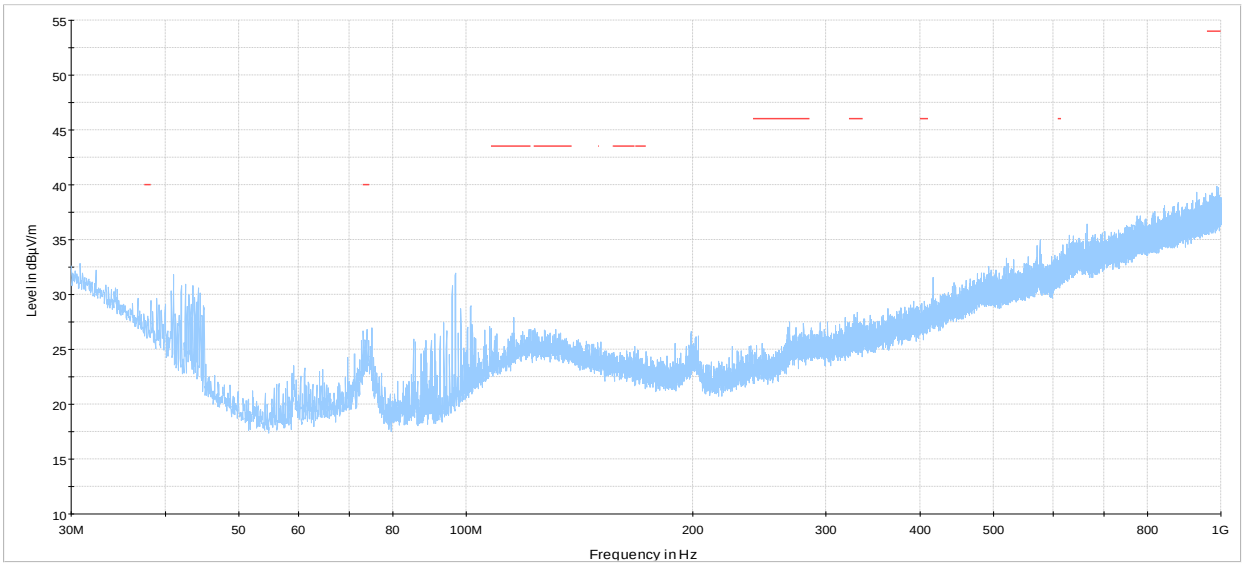
8.1.4 Test data

Table 8.1-3: *Radiated field strength measurement results*

Frequency, MHz	Frequency, MHz	Peak Field strength, dBµV/m		Margin, dB	Average Field strength, dBµV/m		Margin, dB
		Measured	Limit		Measured	Limit	
LTE (1909) & BLE (Low)	2390.0	57.14	74.00	16.86	48.77	54.00	5.23
LTE (824) & BLE (Low)	2390.0	57.29	74.00	16.71	49.17	54.00	4.83
LTE (814) & BLE (Low)	2390.0	57.31	74.00	16.69	48.62	54.00	5.38
LTE (663) & BLE (Low)	2390.0	56.70	74.00	17.30	49.31	54.00	4.69
LTE (1920) & BLE (High)	2483.5	57.44	74.00	16.56	48.92	54.00	5.08
LTE (815) & BLE (High)	2483.5	57.82	74.00	16.18	49.01	54.00	4.99

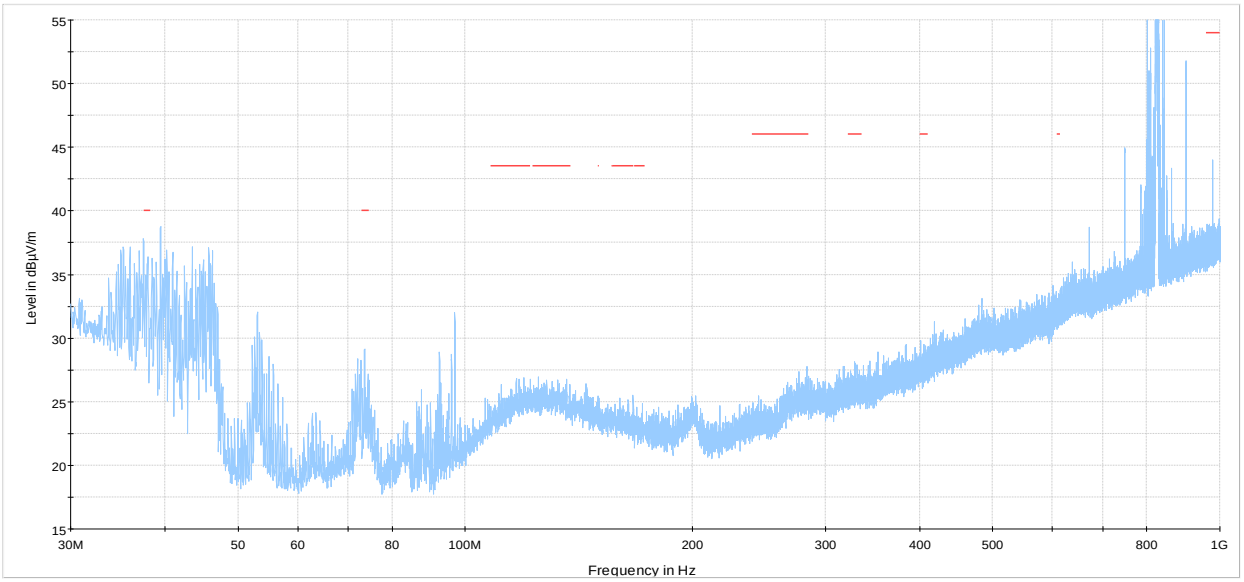
Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.

Test data, continued



NEX-433532 - May 18, 2021 - Frequency : 1909 MHz
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

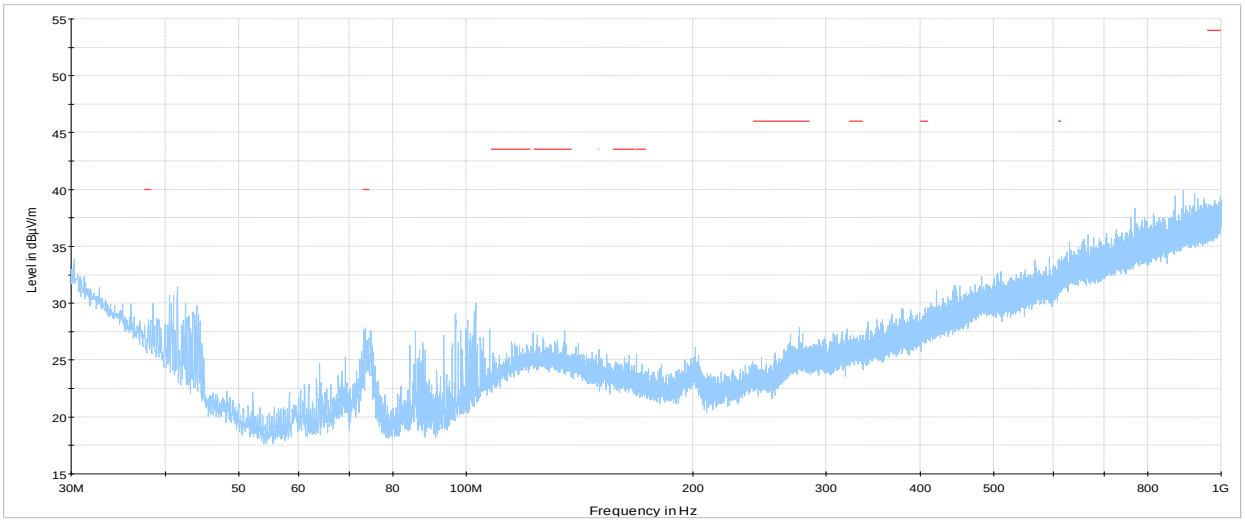
Figure 8.1-1: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 1909 MHz)*



NEX-433532, May 17, 2021, frequency: 824MHz
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

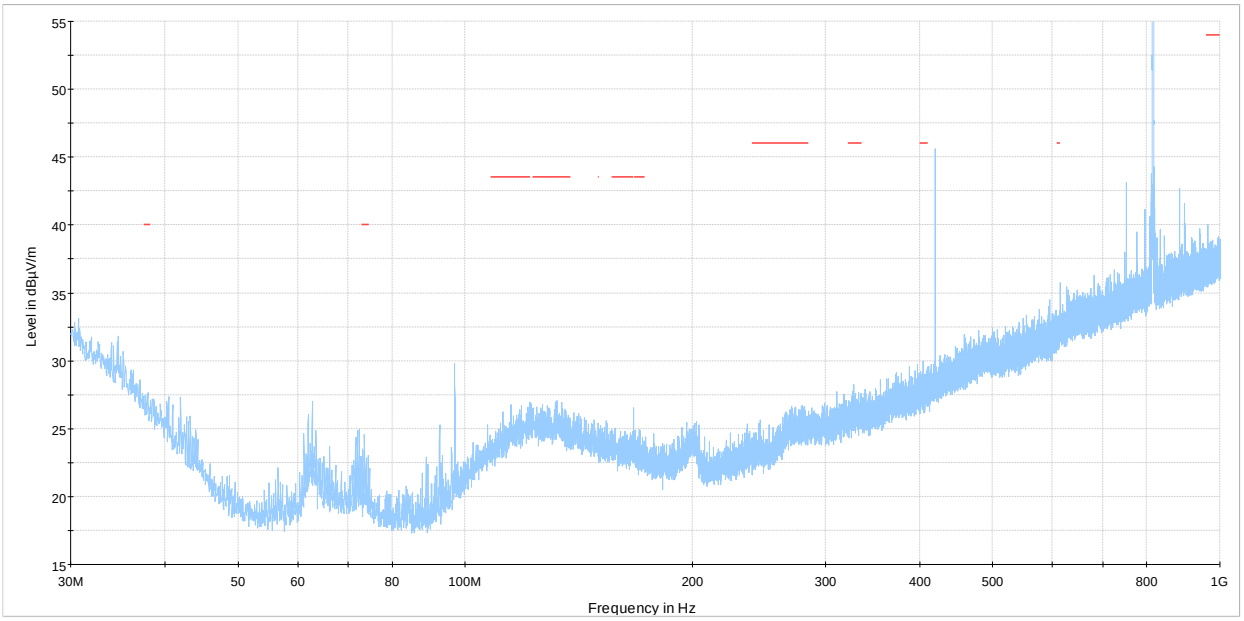
Figure 8.1-2: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 824 MHz)*

Test data, continued



NEX-433532 - May 18, 2021 - Frequency: 1920 MHz
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

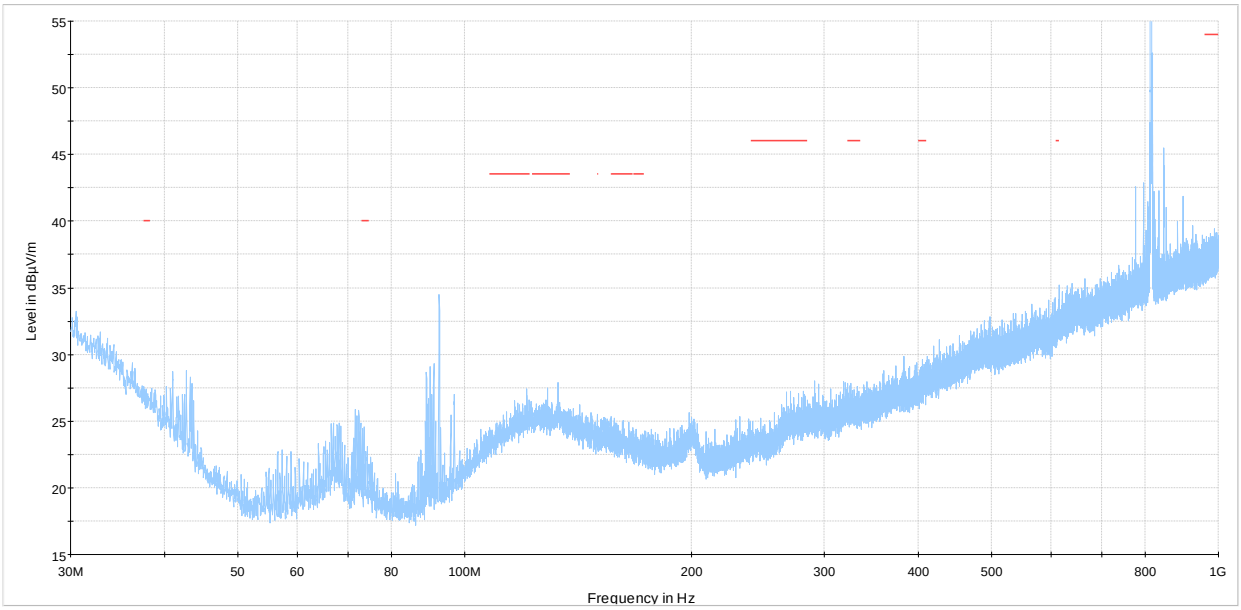
Figure 8.1-3: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 1920 MHz)*



NEX-433532, May 17, 2021 Channel 18
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

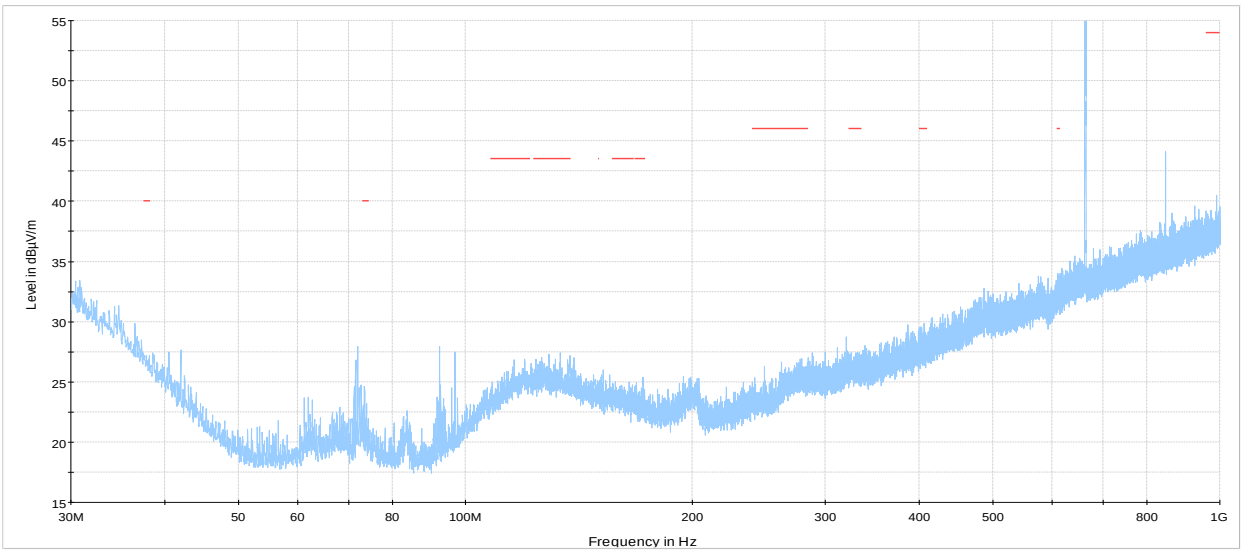
Figure 8.1-4: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 815 MHz)*

Test data, continued



NEX-433532, May 17, 2021, frequency: 814MHz
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

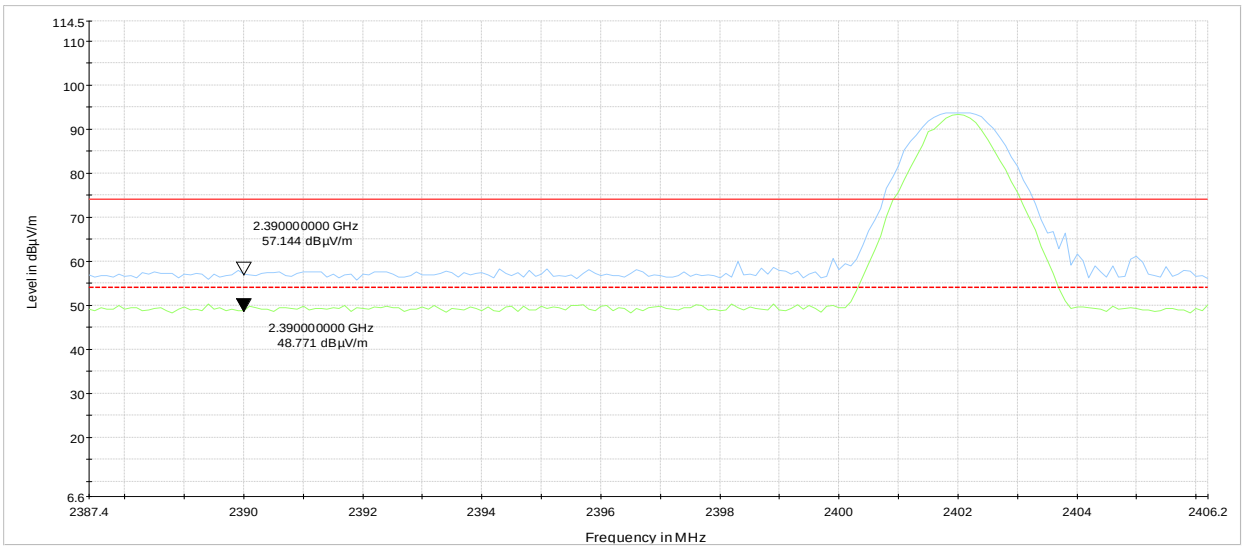
Figure 8.1-5: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 814 MHz)*



NEX-433532, May 17, 2021 channel 71
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB

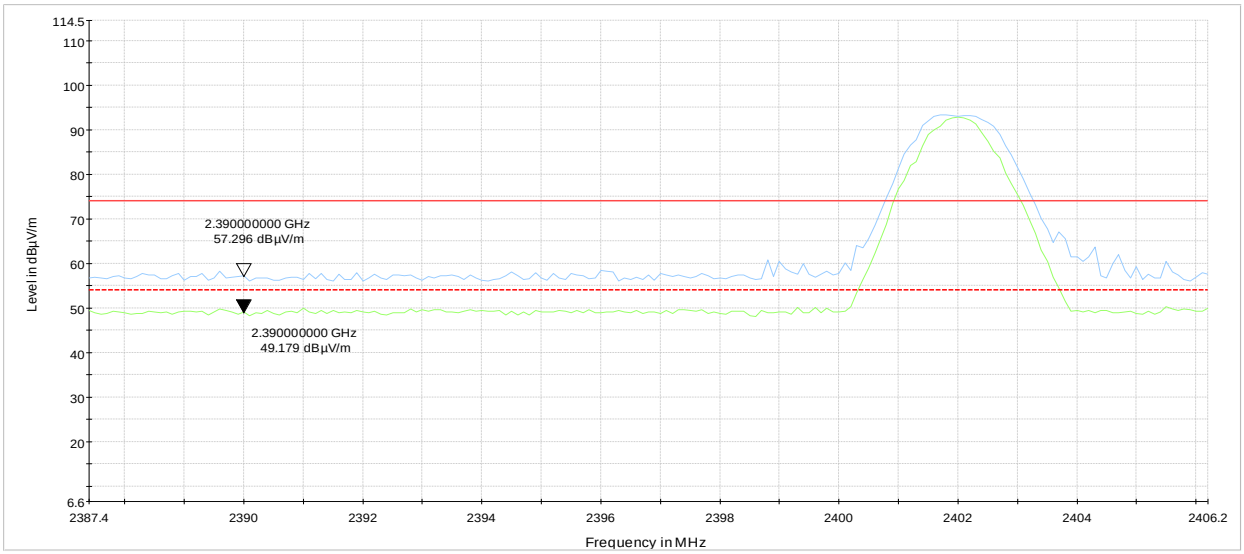
Figure 8.1-6: *Radiated spurious emissions for 30 MHz to 1 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 663 MHz)*

Test data, continued



NEX-433532 - May 20, 2021 - Channel 2 and BLE (Low channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

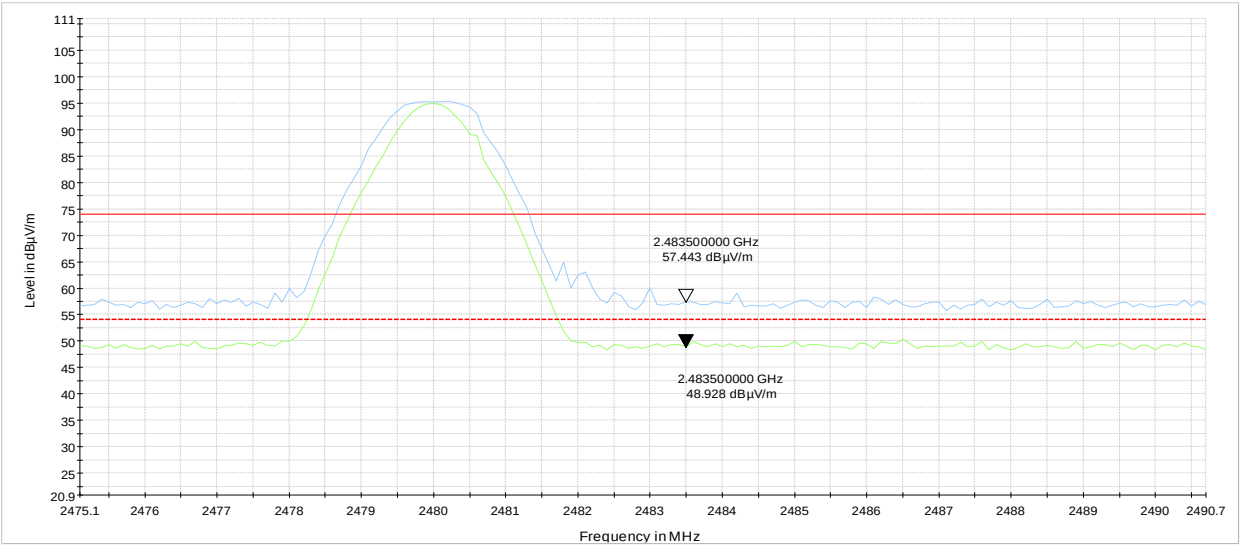
Figure 8.1-7: *Band edge for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 1909 MHz)*



NEX-433532 - May 20, 2021 - Channel 5 and BLE (Low channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

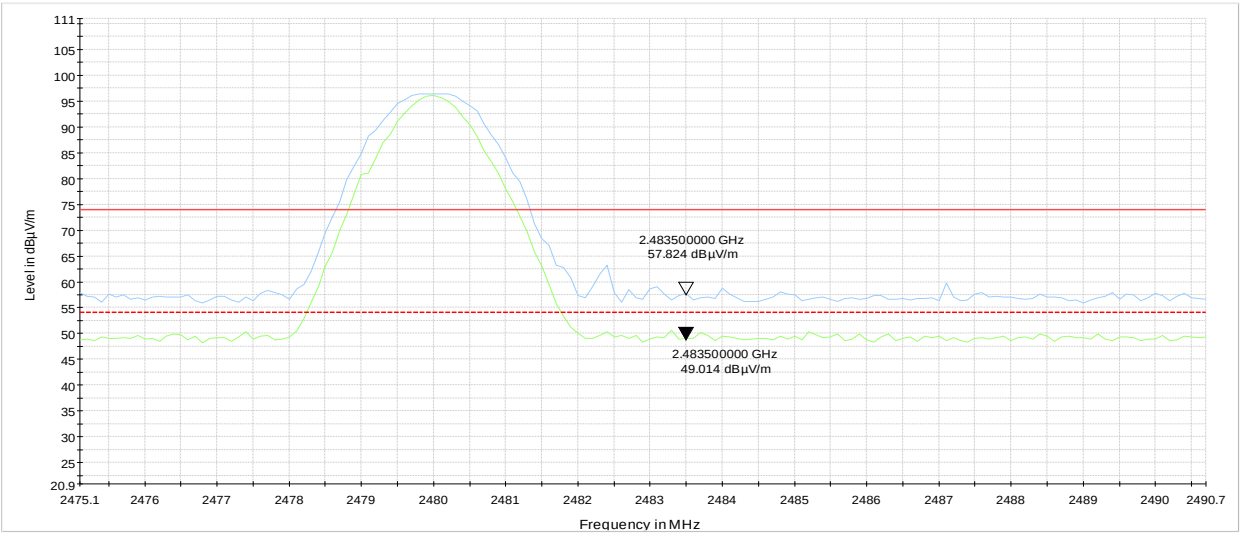
Figure 8.1-8: *Band edge for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 824 MHz)*

Test data, continued



NEX-433532 - May 20, 2021 - Channel 7 and BLE (High channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

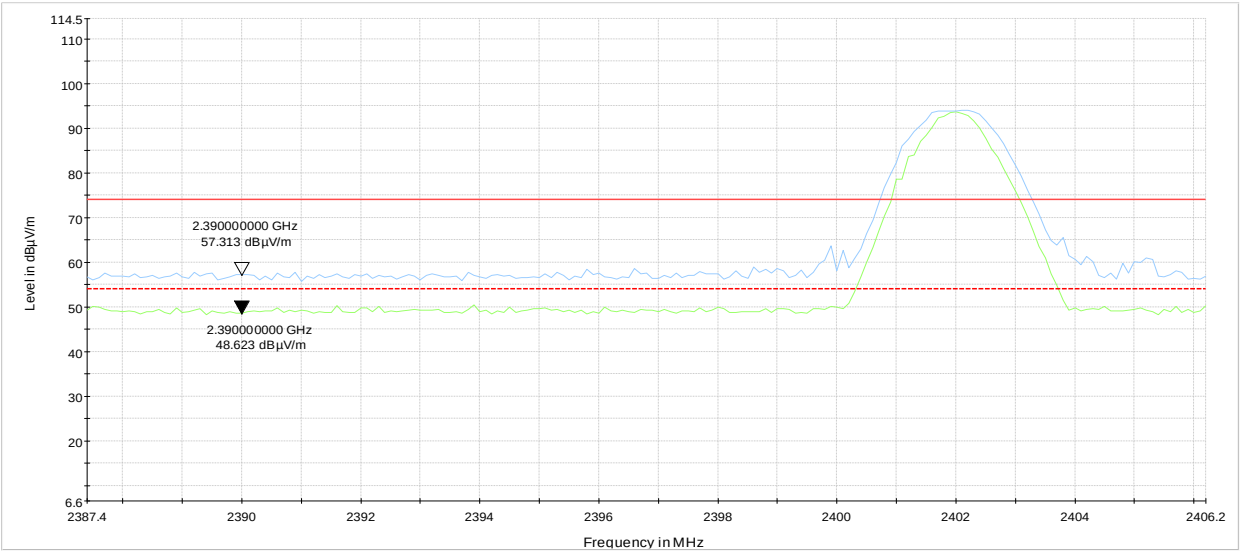
Figure 8.1-9: *Band edge for 1 GHz to 3 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 1920 MHz)*



NEX-433532 - May 20, 2021 - Channel 18 and BLE (High channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

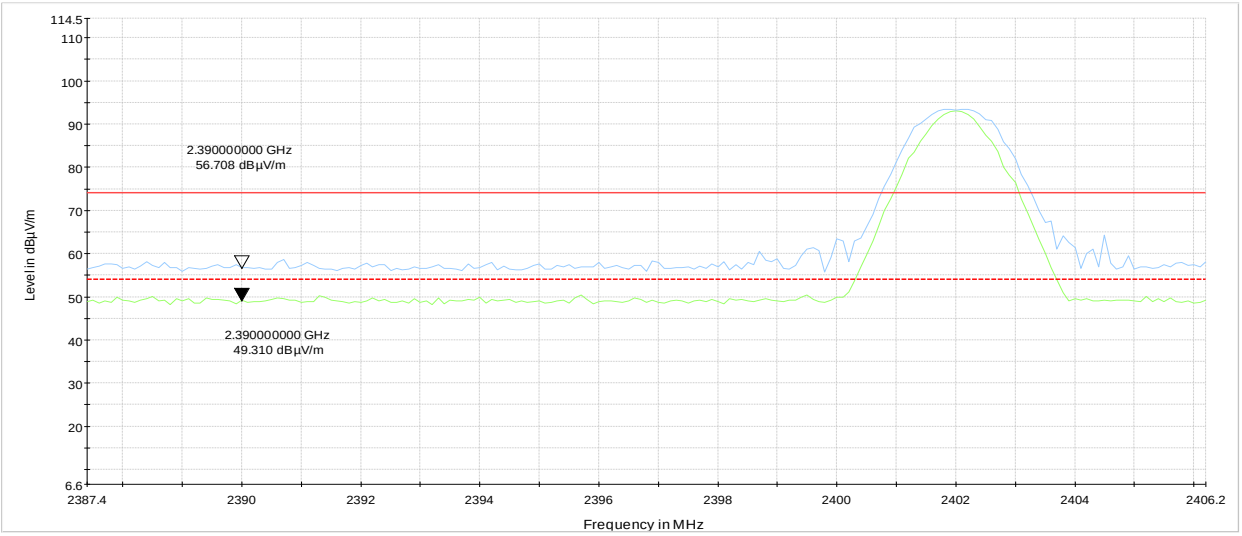
Figure 8.1-10: *Band edge for 1 GHz to 3 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 815 MHz)*

Test data, continued



NEX-433532 - May 20, 2021 - Channel 26 and BLE (Low channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

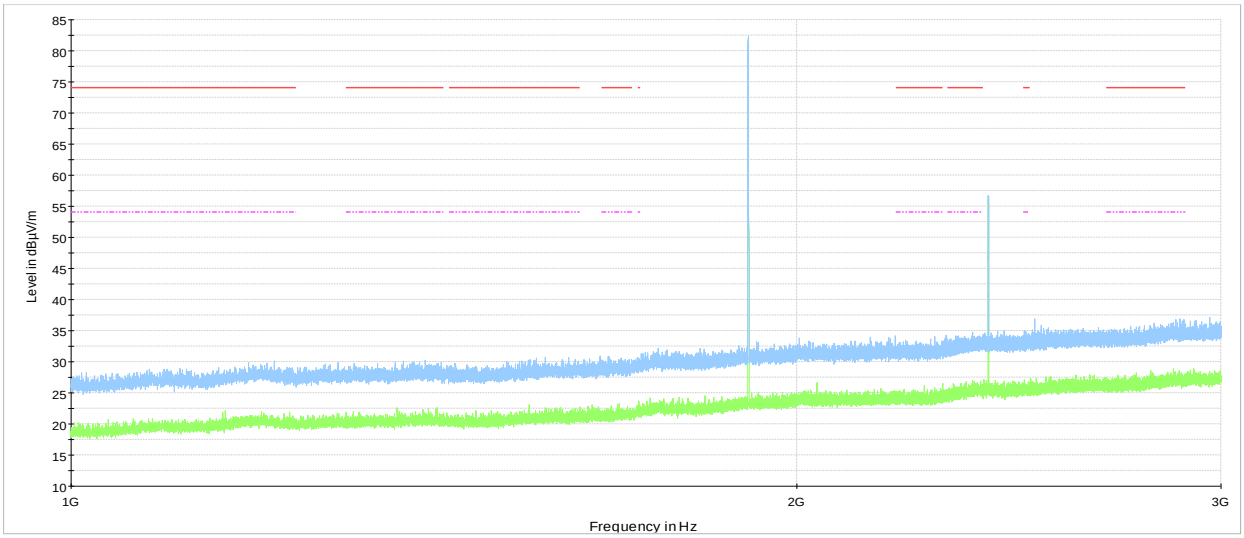
Figure 8.1-11: *Band edge for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 814 MHz)*



NEX-433532 - May 20, 2021 - Channel 71 and BLE (Low channel)
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15 and ICES-003 Limit - Class B (PK), 3 m
FCC Part 15 and ICES-003 Limit - Class B (Avg), 3 m

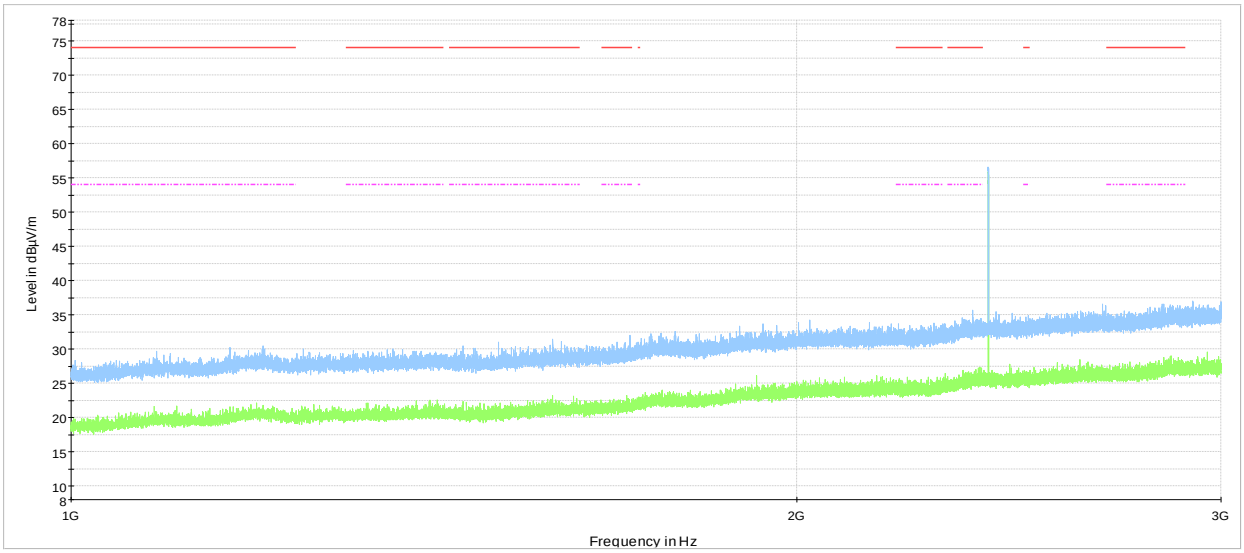
Figure 8.1-12: *Band edge for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 663 MHz)*

Test data, continued



NEX-433532 - May 18, 2021 - Channel 2
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

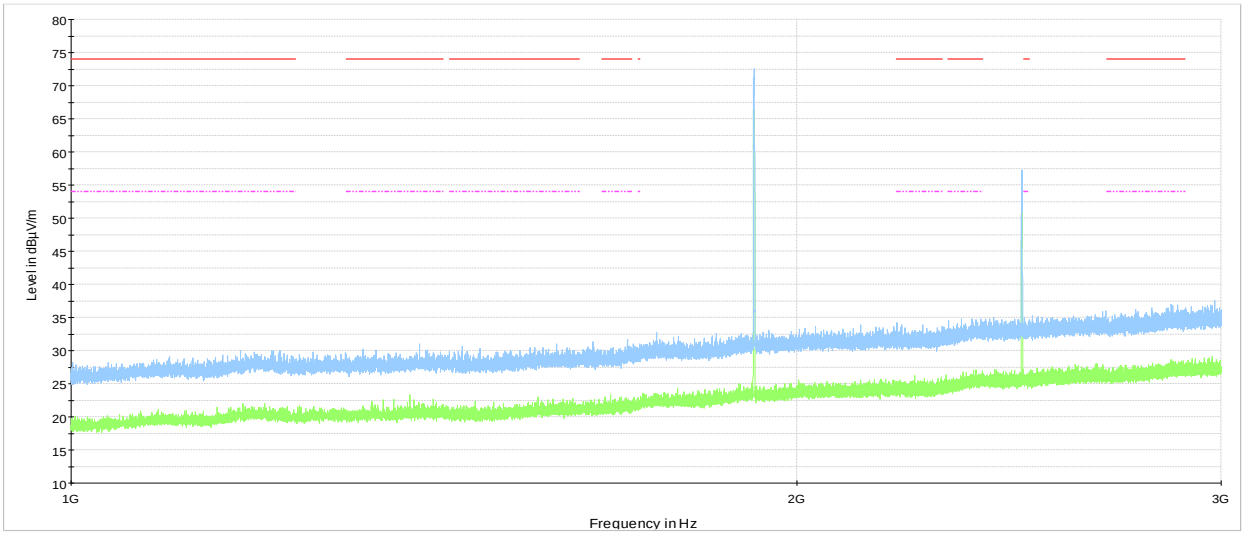
Figure 8.1-13: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 1909 MHz)*



NEX-433532 - May 18, 2021 - Channel 5
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

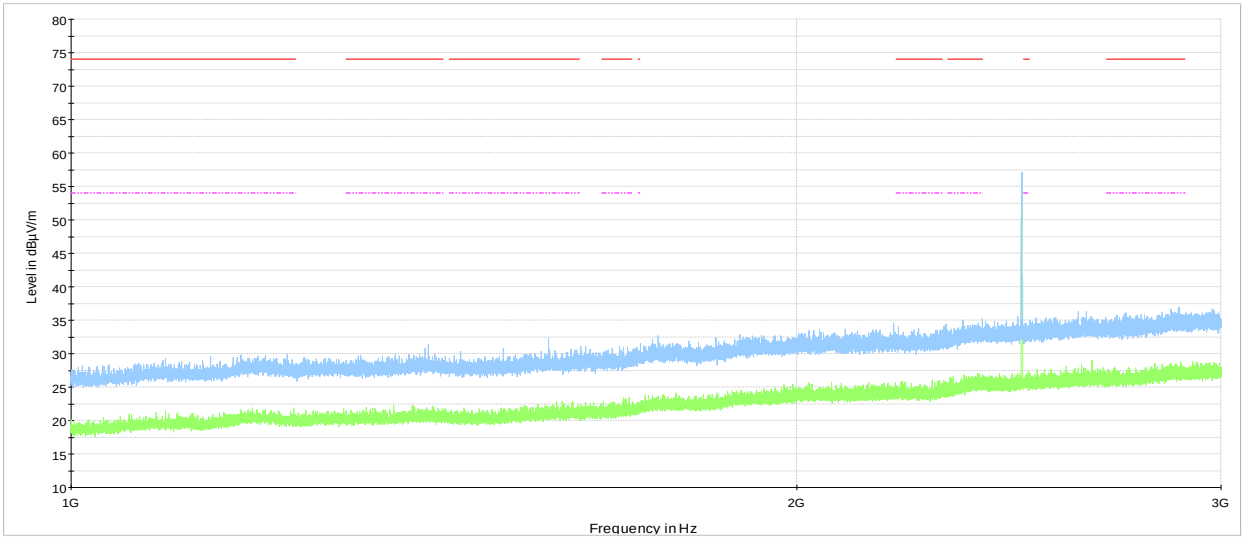
Figure 8.1-14: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 824 MHz)*

Test data, continued



NEX-433532 - May 18, 2021 - Channel 7
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

Figure 8.1-15: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 1920 MHz)*



NEX-433532 - May 18, 2021 - Channel 18
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

Figure 8.1-16: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 815 MHz)*

Test data, continued

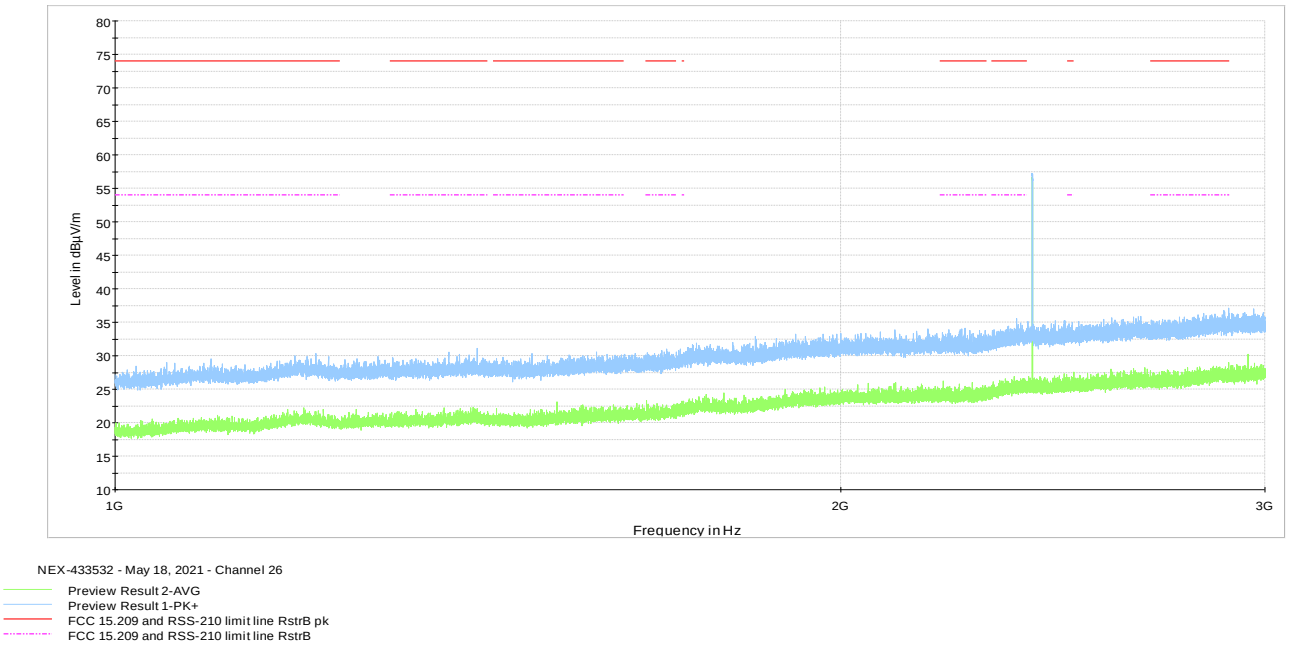


Figure 8.1-17: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 814 MHz)*

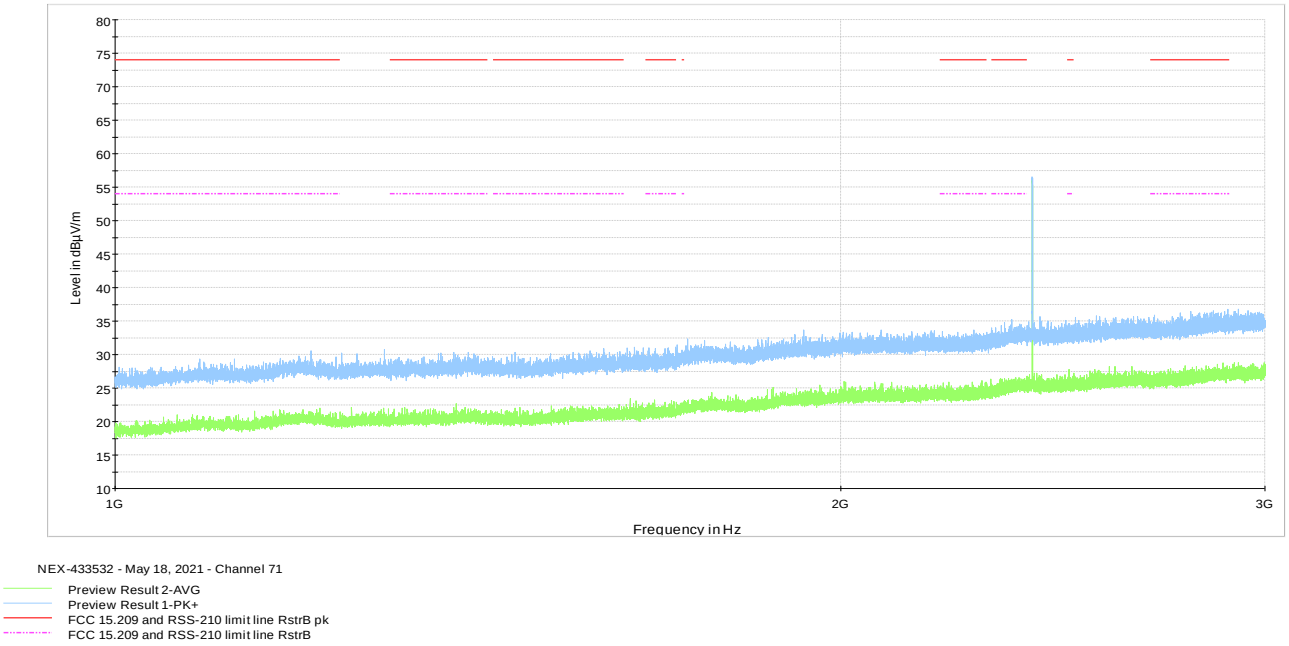
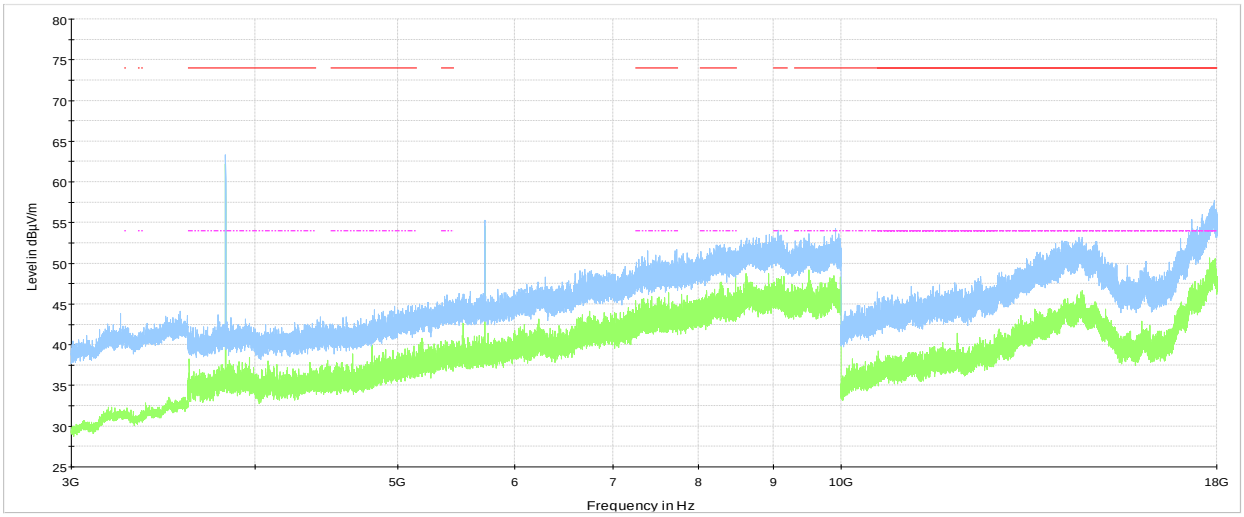


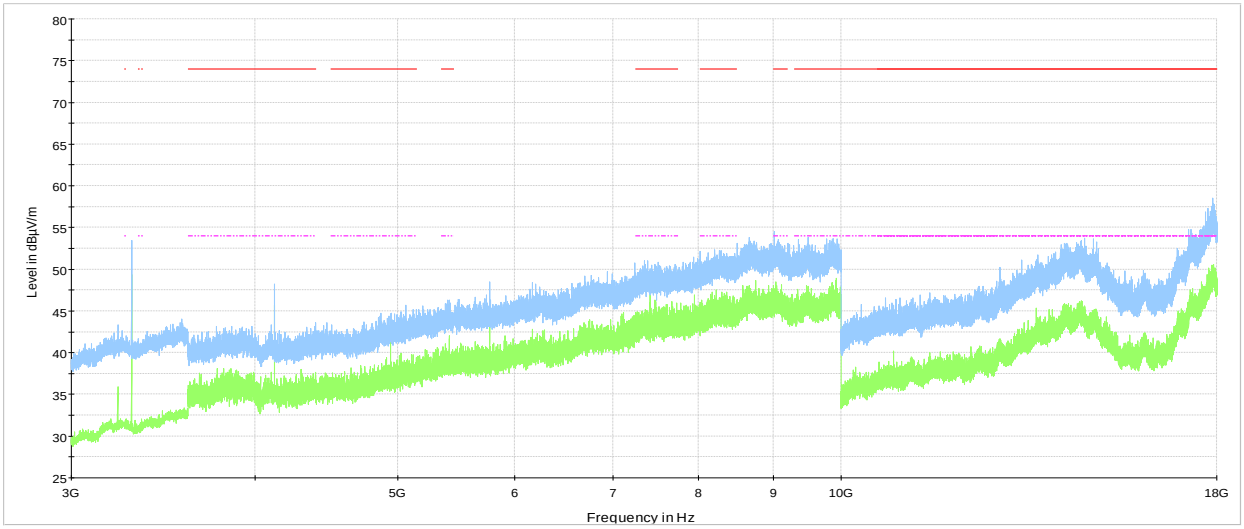
Figure 8.1-18: *Radiated spurious emissions for 1 GHz to 3 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 663 MHz)*

Test data, continued



NEX-433532 - May 19, 2021 - Channel 2
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

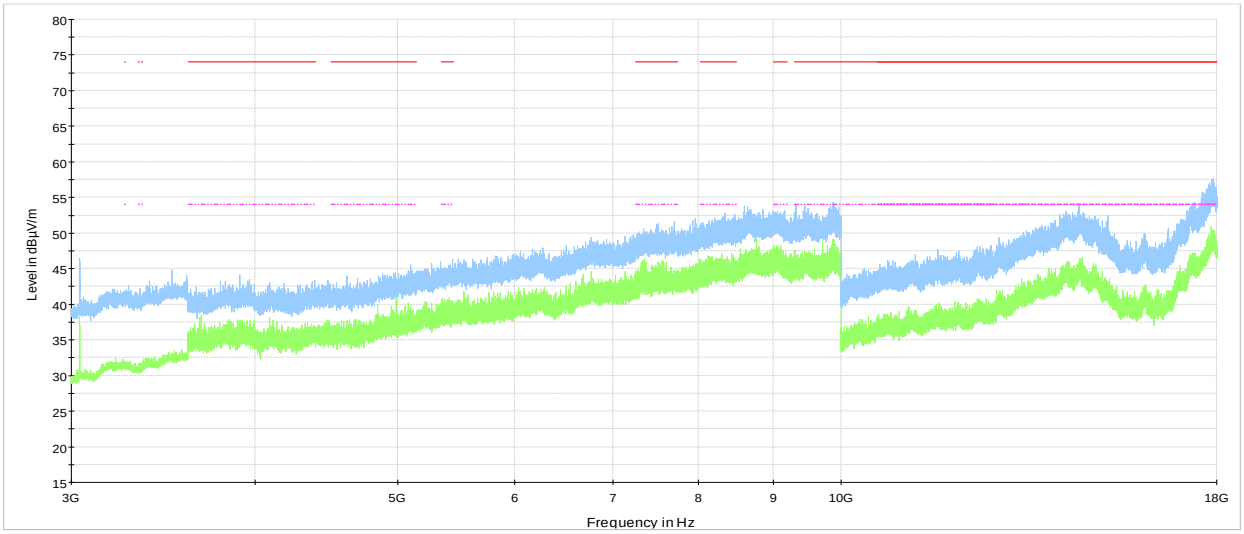
Figure 8.1-19: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 1909 MHz)*



NEX-433532 - May 19, 2021 - Channel 5
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

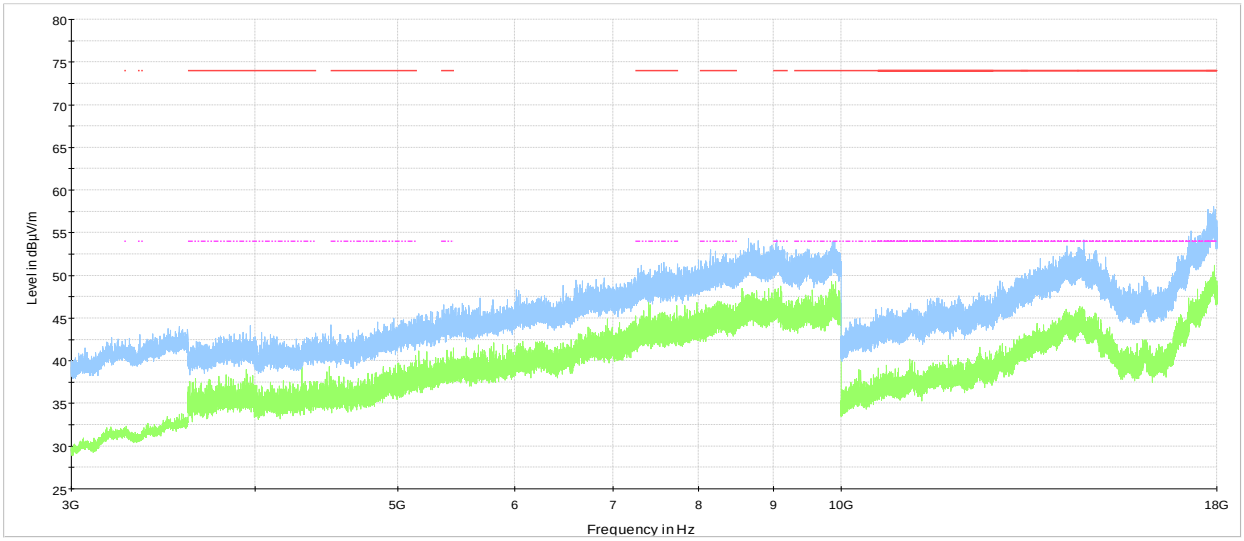
Figure 8.1-20: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 824 MHz)*

Test data, continued



NEX-433532 - May 19, 2021 - Channel 7
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

Figure 8.1-21: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 1920 MHz)*



NEX-433532 - May 19, 2021 - Channel 18
Preview Result 2-AVG
Preview Result 1-PK+
FCC 15.209 and RSS-210 limit line RstrB pk
FCC 15.209 and RSS-210 limit line RstrB

Figure 8.1-22: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 815 MHz)*

Test data, continued

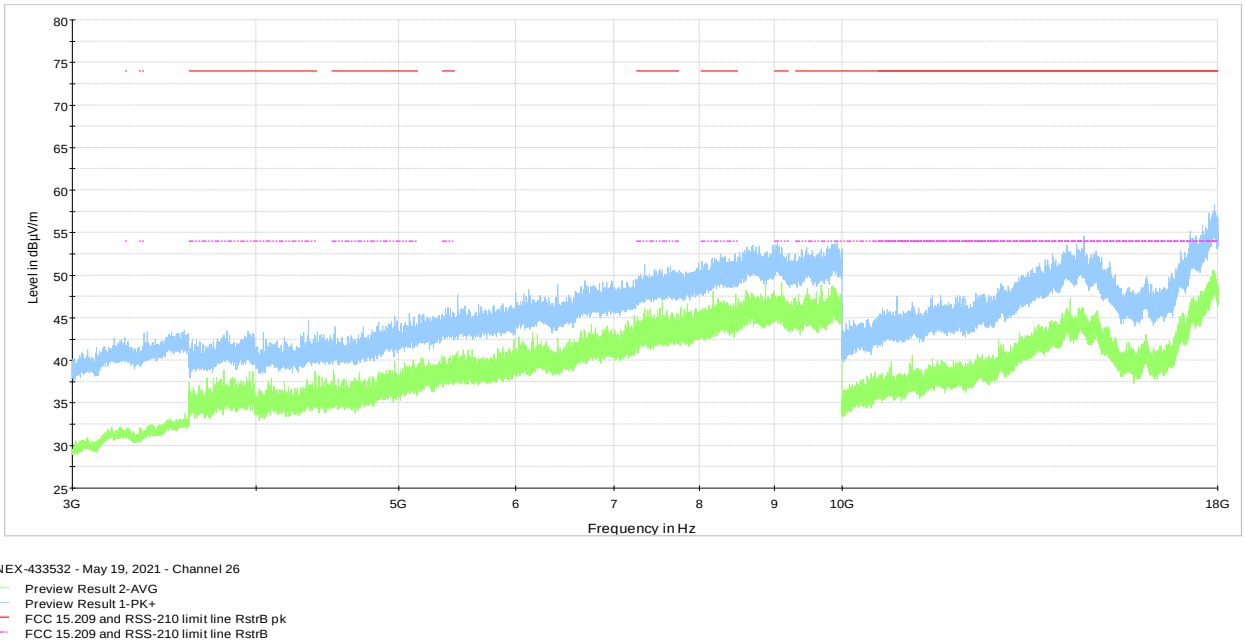


Figure 8.1-23: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 814 MHz)*

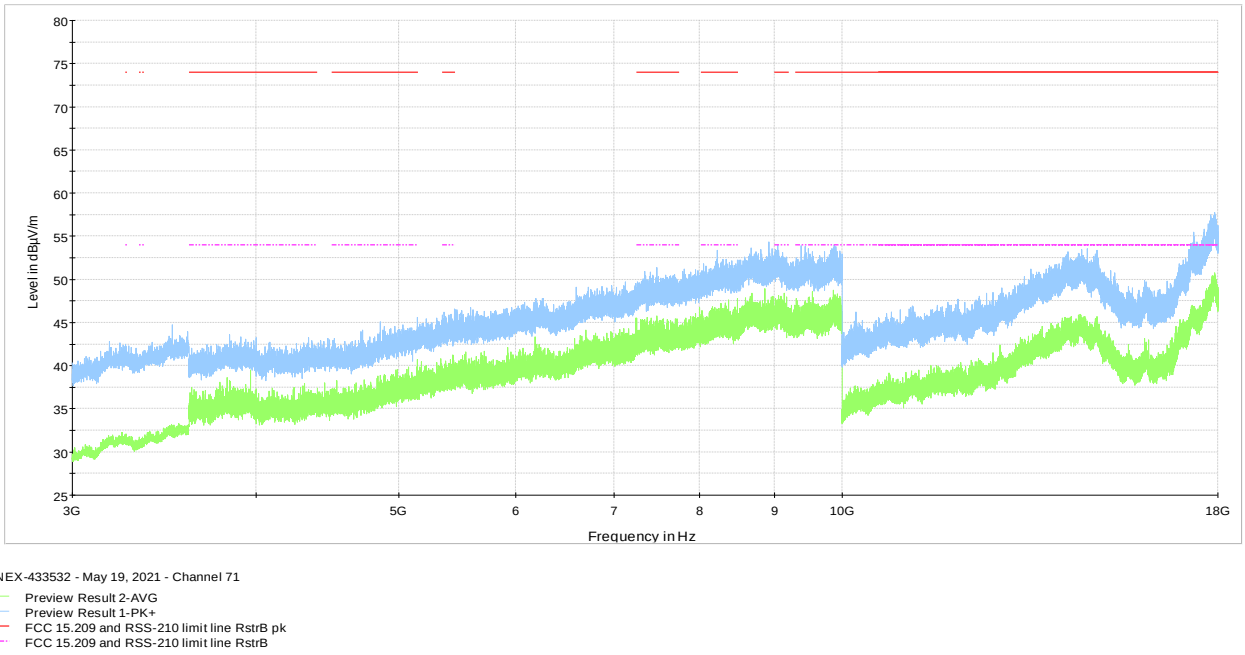


Figure 8.1-24: *Radiated spurious emissions for 3 GHz to 18 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 663 MHz)*

Test data, continued

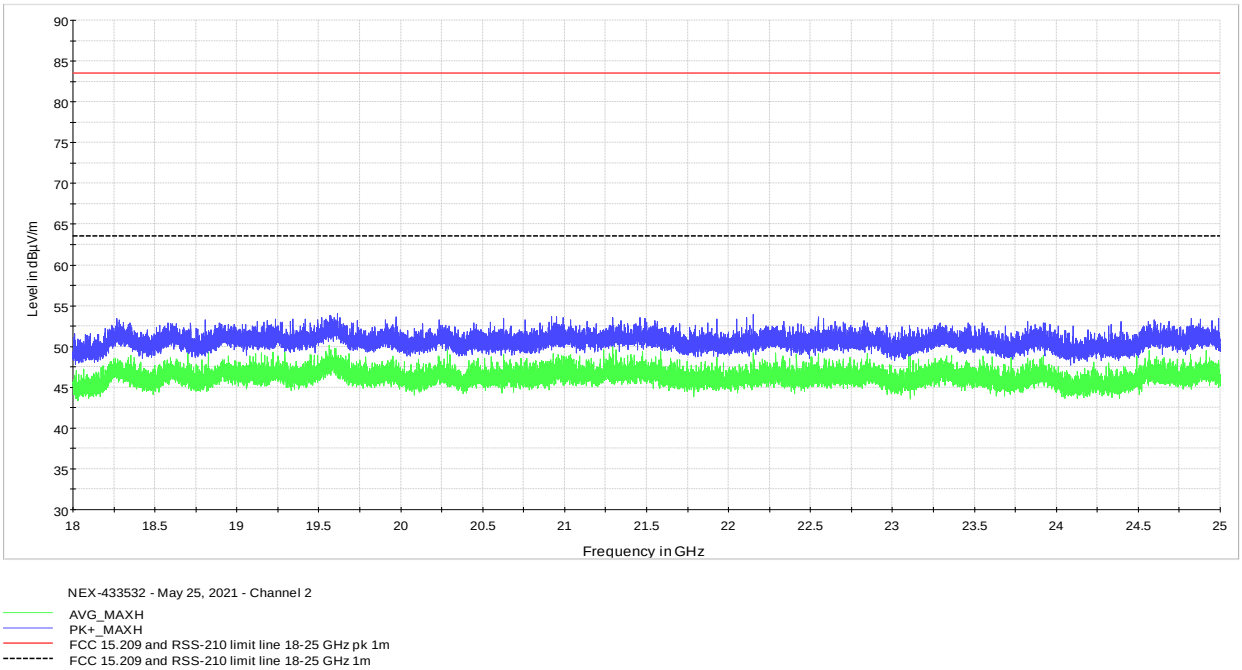


Figure 8.1-25: *Radiated spurious emissions for 18 GHz to 25 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 1909 MHz)*

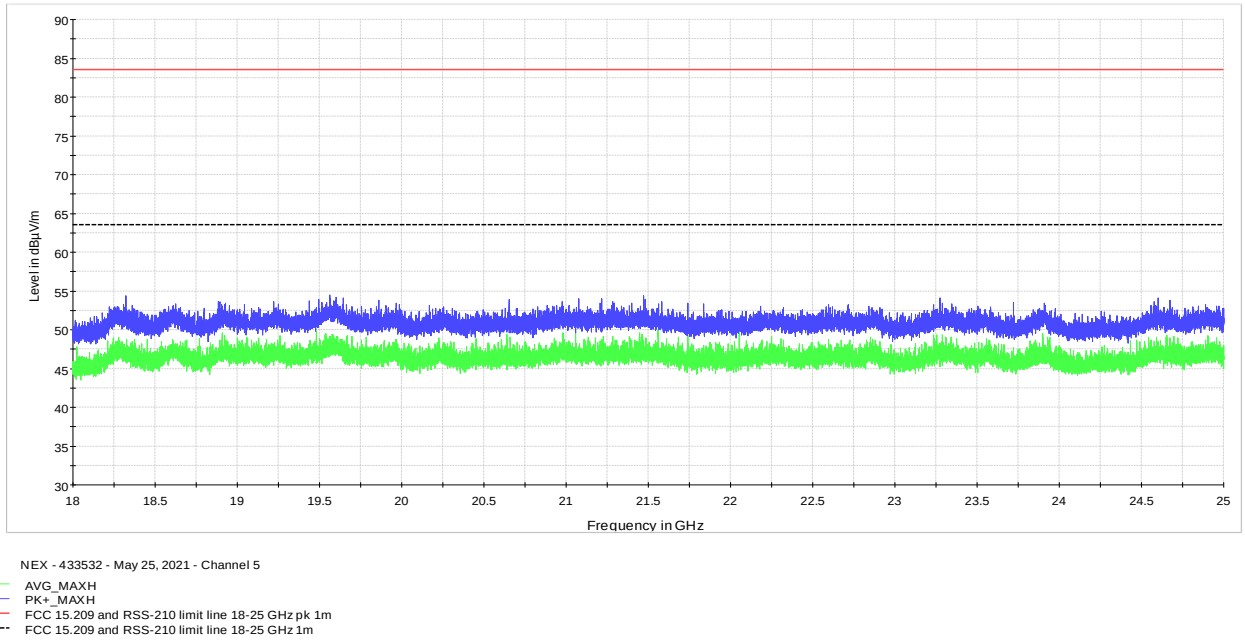


Figure 8.1-26: *Radiated spurious emissions for 18 GHz to 25 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 824 MHz)*

Test data, continued

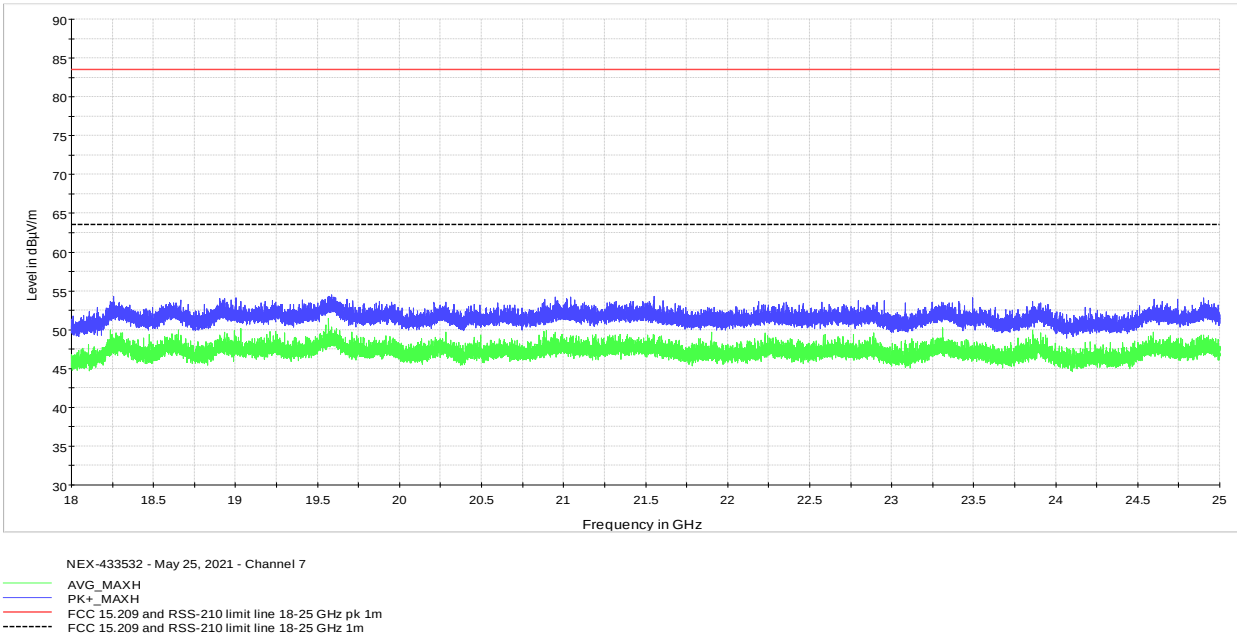


Figure 8.1-27: *Radiated spurious emissions for 18 GHz to 24 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 1920 MHz)*

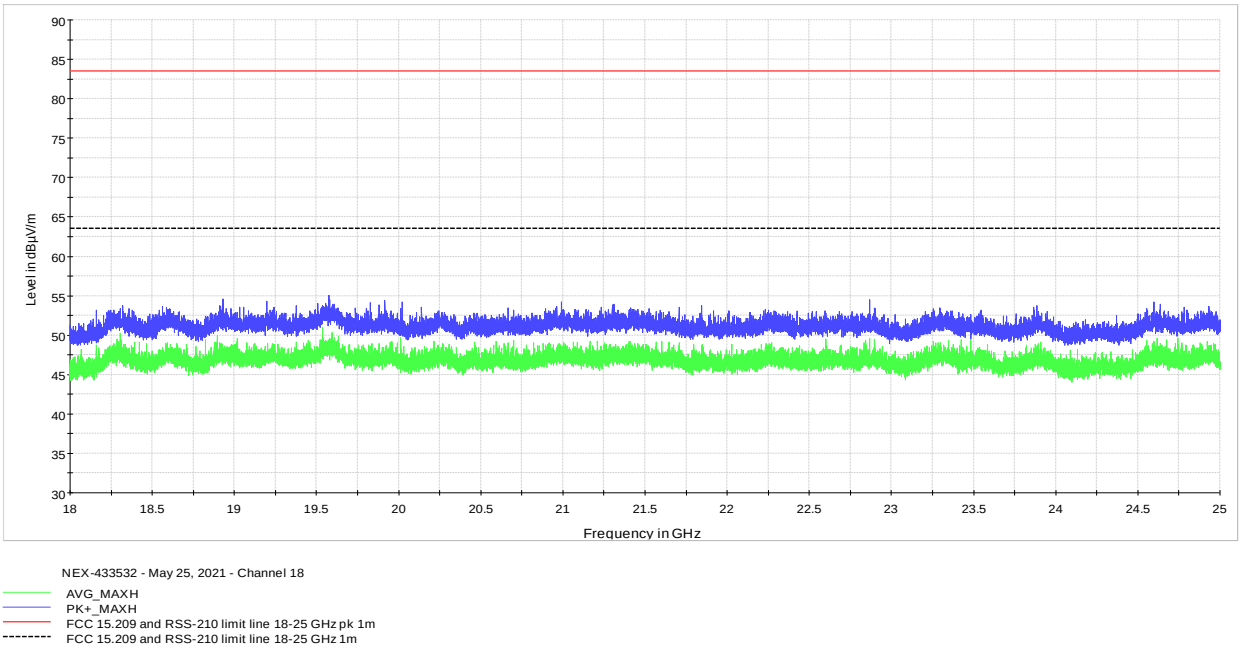


Figure 8.1-28: *Radiated spurious emissions for 18 GHz to 25 GHz for Tx @ BLE (High channel, frequency 2480 MHz) and LTE (frequency 815 MHz)*

Test data, continued

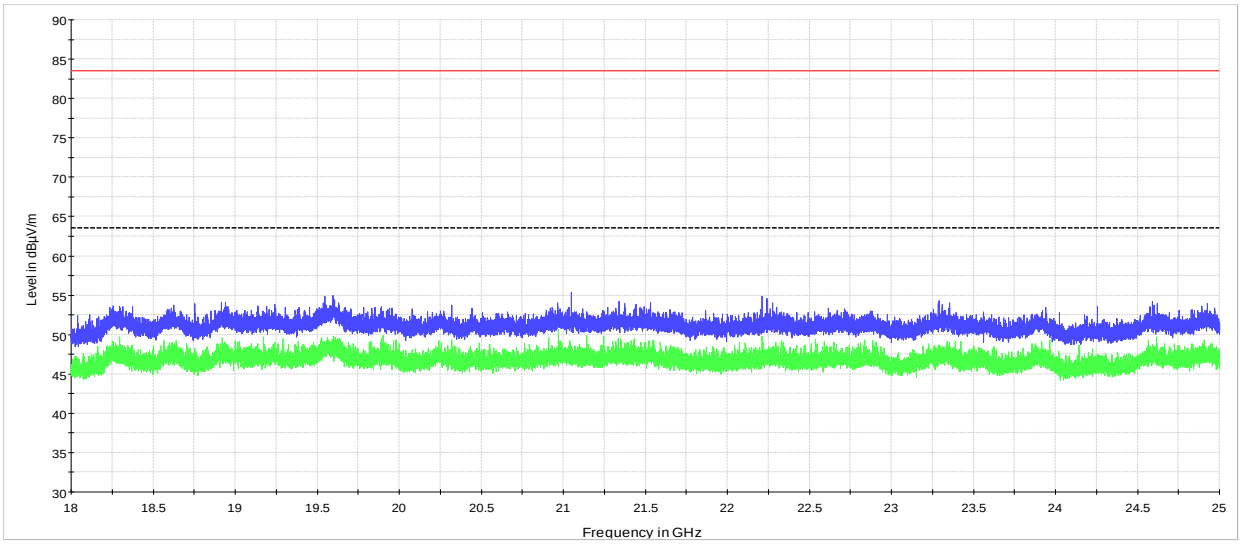


Figure 8.1-29: *Radiated spurious emissions for 18 GHz to 25 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 814 MHz)*

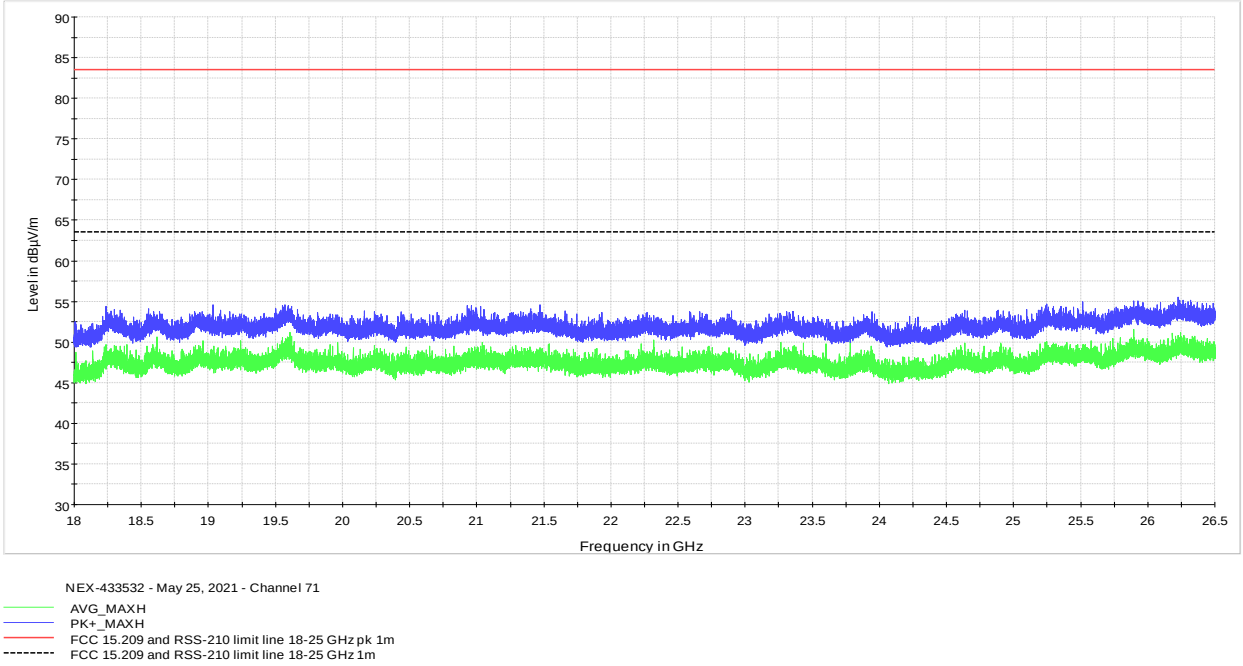


Figure 8.1-30: *Radiated spurious emissions for 18 GHz to 25 GHz for Tx @ BLE (Low channel, frequency 2402 MHz) and LTE (frequency 663 MHz)*

Section 9 EUT photos

9.1 External photos

Figure 9.1-1: *Front view photo*

Figure 9.1-2: *Rear view photo*

Figure 9.1-3: *Side view photo*

Figure 9.1-4: *Side view photo*

Figure 9.1-5: *Top view photo*

Figure 9.1-6: *Bottom view photo*

Figure 9.1-7: *Label location*

Figure 9.1-8: *Label example*

(End of the test report)