Nemko

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RADIO TEST REPORT – 405984-1TRFWL

Type of assessment:

Class II permissive change

Applicant:

Avaya Inc.

Product name (type):

Avaya B199/ Konftel 800 IP Conference phone

Avaya Model:

B199

Konftel Model:

800

FCC ID:

TYM-FLAM

IC Registration number:

3794C-FLAM

Specifications:

- FCC 47 CFR Part 15 Subpart C, §15.247
- RSS-247, Issue 2, Feb 2017, Section 5

Date of issue: October 8, 2020

Andrey Adelberg, Senior EMC/RF Specialist

Tested by

Signature

Yong Huang, EMC/RF Specialist

Reviewed by

Signature

Lab locations

Company name	Nemko Canada Inc.			
Facilities	*Ottawa site:* 303 River Road Ottawa, Ontario Canada K1V 1H2 Tel: +1 613 737 9680 Fax: +1 613 737 9691	*Montréal site:* 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8 Tel: +1 514 694 2684 Fax: +1 514 694 3528	*Cambridge site:* 1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2 Tel: +1 519 650 4811	*Almonte site:* 1500 Peter Robinson Road West Carleton, Ontario Canada K0A 1L0 Tel: +1 613 256-9117

Test site registration	Organization	Recognition numbers and location
	FCC/ISED	FCC: CA2040; IC: 2040A-4 (Ottawa/Almonte); FCC: CA2041; IC: 2040G-5 (Montreal); CA0101 (Cambridge)
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.

Copyright notification

Table of Contents

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
RSS-247, Issue 2, Feb 2017, Section 5	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.2 Test methods

DA 00-705, Released March 30, 2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
ANSI C63.10 v2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.3 Exclusions

None

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.

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	October 8, 2020	Original report issued

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 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 for Radio*

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

Company name	Avaya Inc.
Address	250 Sidney Street, Belleville, Ontario, Canada K8P 3Z3

5.3 Manufacturer

Company name	Avaya Inc.
Address	4655 Great America Parkway, Santa Clara, CA 95054-1233 USA

5.4 EUT information

Product name	Avaya B199 // Konftel 800 IP Conference Phone
Model	B199, 800
Serial number	E1A9410014 (Radiated sample); E1A9360262 (Conducted sample)
Item number	910101088
Operating conditions	EUT has software version 1.0.2.0.13 installed. RF testing was carried out with the use of serial data lines installed directly to the Panasonic RF module. Panasonic RF test sw PAN13xxx was used to control RF transmit functions (frequency, power level and modulation).
Product description and theory of operation	The EUT is an IP conference phone with Bluetooth connectivity.

5.5 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	
Frequency Min (MHz)	2402 (π/4-DQPSK, 8-DPSK); 2403 (GFSK)	
Frequency Max (MHz)	2479 (π/4-DQPSK, 8-DPSK); 2481 (GFSK)	
Channel numbers	0–78	
RF power Max (W), Conducted	0.00360 (5.56 dBm GFSK); 0.0114 (0.57 dBm π/4-DQPSK); 0.00121 (0.82 8-DPSK)	
Measured BW (kHz), 99% OBW	793 (GFSK); 1210 (π/4-DQPSK); 1210 (8-DPSK)	
Type of modulation	GFSK, π/4-DQPSK, 8-DPSK	
Emission classification	F1D	
Transmitter spurious, dBµV/m @ 3 m	55.90 @ 2390 MHz (GFSK); 56.48 @ 2483.5 MHz (π/4-DQPSK); 56.05 @ 2483.5 MHz (8-DPSK)	
Power supply requirements	−48 V_{DC} (via external 100–240 V_{AC}, 50/60 Hz PoE adapter)	
Antenna information	Integral antenna 2.7 dBi gain	

5.6 EUT setup details

5.6.1 EUT Exercise and monitoring

Methods used to exercise the EUT and all relevant ports:

- EUT was exercised from computer using *PAN13XX_Test_V1.3* application with *CC256xB_initscripts_TIInit_6.7.16_bt Sep 2020.script* for continuous transmission.

Configuration details:

- The EUT setup in a configuration that was expected to produce the highest amplitude emissions relative to the limit and that satisfy normal operation/installation practice by the end user.
- The type and construction of cables used in the measurement set-up were consistent with normal or typical use. Cables with mitigation features (for example, screening, tighter/more twists per length, ferrite beads) have been noted below:
  - The following deviations were:
  - None
- The EUT was setup in a manner that was consistent with its typical arrangement and use. The measurement arrangement of the EUT, local AE and associated cabling was representative of normal practice. Any deviations from typical arrangements have been noted below:
  - The following deviations were:
  - For antenna port (conducted) measurements, antenna was unsoldered, and matching connector was attached.

5.6 EUT setup details, continued

5.6.2 EUT test configuration

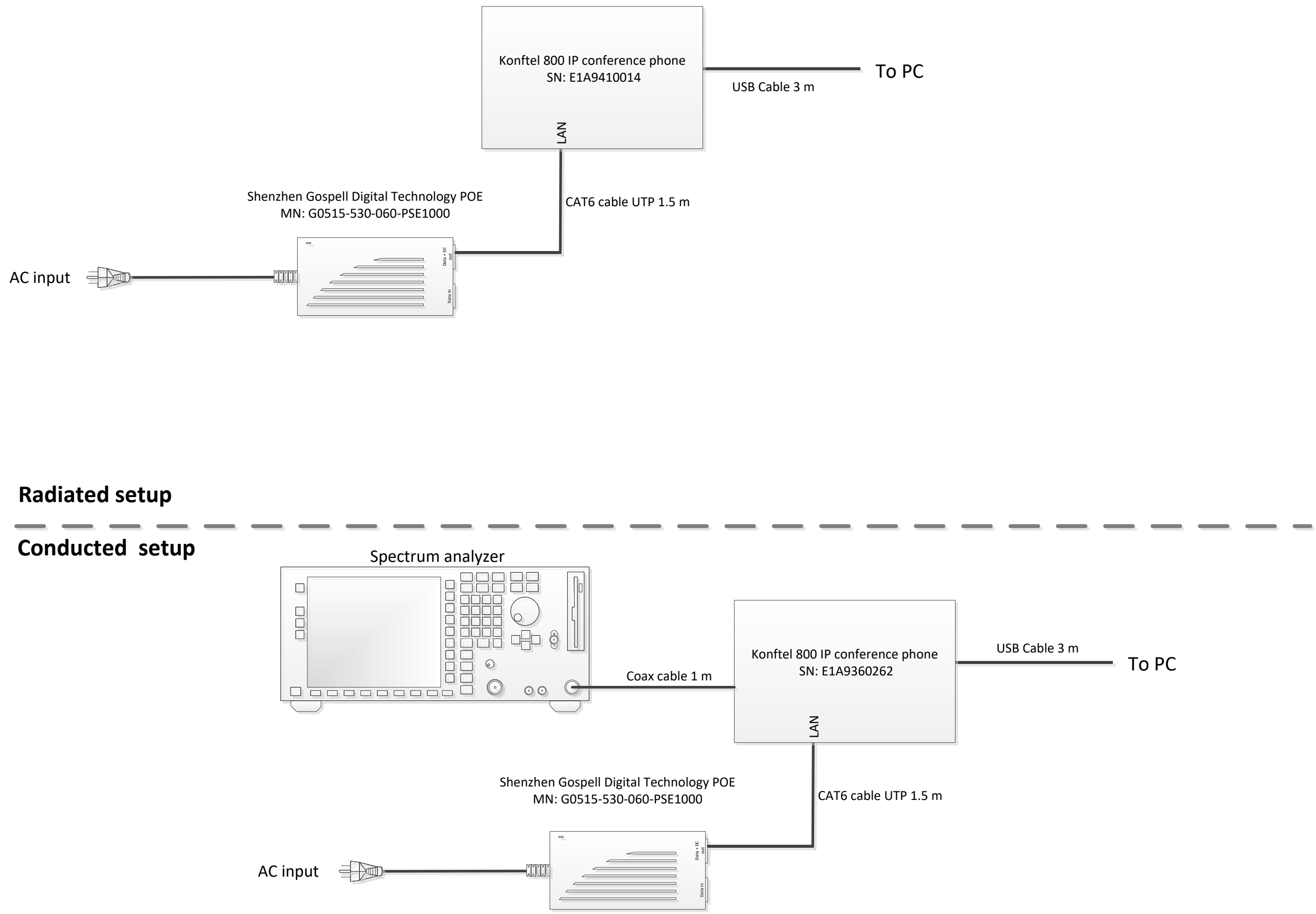


Figure 5.6-1: *Test setup block diagram*

Section 6 Summary of test results

6.1 Testing location

Test location (s)	Ottawa

6.2 Testing period

Test start date	September 22, 2020	Test end date	October 2, 2020

6.3 Sample information

Receipt date	September 1, 2020	Nemko sample ID number(s)	2, 9

6.4 FCC Part 15 Subpart C, general requirements test results

Table 6.4-1: *FCC general requirements results*

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31l	Variation of power source	Pass
§15.31(m)	Number of tested frequencies	Pass
§15.203	Antenna requirement	Pass

6.5 FCC Part 15 Subpart C, intentional radiators test results for frequency hopping spread spectrum systems

Table 6.5-1: *FCC 15.247 results for FHSS*

Part	Test description	Verdict
§15.247(a)(1)(iii)	Requirements for operation in the 2400–2483.5 MHz band	Pass
§15.247(b)(1)	Maximum peak output power in the 2400–2483.5 MHz band and 5725–5850 MHz band	Pass
§15.247(d)	Spurious emissions	Pass

6.6 ISED RSS-Gen, Issue 5, test results

Table 6.6-1: *RSS-Gen results*

Part	Test description	Verdict
7.3	Receiver radiated emission limits	Not applicable
7.4	Receiver conducted emission limits	Not applicable
6.9	Operating bands and selection of test frequencies	Pass
8.8	AC power-line conducted emissions limits	Pass

Notes: [1] According to sections 5.2 and 5.3 of RSS-Gen, Issue 5 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

6.7 ISED RSS-247, Issue 2, test results for frequency hopping spread spectrum systems (FHSS)

Table 6.7-1: *RSS-247 results for FHSS*

Part	Test description	Verdict
5.1 (a)	Bandwidth of a frequency hopping channel	Pass
5.1 (b)	Minimum channel spacing	Pass
5.1 (d)	Systems operating in the 2400–2483.5 MHz band	Pass
5.4 (b)	Transmitter output power and e.i.r.p. requirements Systems operating in the 2400–2483.5 MHz band	Pass
5.5	Unwanted emissions	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	TDK	SAC-3	FA002047	1 year	January 24, 2021
Flush mount turntable	Sunol	FM2022	FA002082	—	NCR
Controller	Sunol	SC104V	FA002060	—	NCR
Antenna mast	Sunol	TLT2	FA002061	—	NCR
61505 AC source	Chroma	61509	FA003036	—	VOU
Receiver/spectrum analyzer	Rohde & Schwarz	ESU 26	FA002043	1 year	November 8, 2020
Spectrum analyzer	Rohde & Schwarz	FSU	FA001877	1 year	October 31, 2020
Horn (1–18 GHz)	ETS Lindgren	3117	FA002840	1 year	January 25, 2021
Horn antenna (1–18 GHz)	EMCO	3115	FA000825	1 year	October 31, 2020
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002873	1 year	November 4, 2020
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002877	1 year	November 4, 2020
Bilog antenna (20–3000 MHz)	Sunol	JB3	FA002108	1 year	January 14, 2021
Horn antenna (18–40 GHz)	EMCO	3116	FA001847	1 year	November 7, 2020
Pre-amplifier (18–26 GHz)	Narda	BBS-1826N612	FA001550	—	VOU
Notch Filter (2.4-2483.5 MHz)	Microwave Circuits	N0124413	FA002367	1 year	February 3, 2021

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

Section 8 Testing data

8.1 Variation of power source

8.1.1 References, definitions and limits

FCC 15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.1.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 30, 2020

8.1.3 Observations, settings and special notes

The testing was performed as per ANSI C63.10 Section 5.13.

a) Where the device is intended to be powered from an external power adapter, the voltage variations shall be applied to the input of the adapter provided with the device at the time of sale. If the device is not marketed or sold with a specific adapter, then a typical power adapter shall be used.
b) For devices, where operating at a supply voltage deviating ±15% from the nominal rated value may cause damages or loss of intended function, test to minimum and maximum allowable voltage per manufacturer's specification and document in the report.
c) For devices with wide range of rated supply voltage, test at 15% below the lowest and 15% above the highest declared nominal rated supply voltage.
d) For devices obtaining power from an input/output (I/O) port (USB, firewire, etc.), a test jig is necessary to apply voltage variation to the device from a support power supply, while maintaining the functionalities of the device.

For battery-operated equipment, the equipment tests shall be performed using a variable power supply.

8.1.4 Test data

EUT Power requirements:	☒ AC	☐ DC	☐ Battery
If EUT is an AC or a DC powered, was the noticeable output power variation observed?	☐ YES	☒ NO	☐ N/A
If EUT is battery operated, was the testing performed using fresh batteries?	☐ YES	☐ NO	☒ N/A
If EUT is rechargeable battery operated, was the testing performed using fully charged batteries?	☐ YES	☐ NO	☒ N/A

8.2 Number of frequencies

8.2.1 References, definitions and limits

FCC 15.31(m):
Measurements on intentional radiators or receivers shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table.

RSS-Gen 6.9:
Except where otherwise specified, measurements shall be performed for each frequency band of operation for which the radio apparatus is to be certified, with the device operating at the frequencies in each band of operation shown in table below. The frequencies selected for measurements shall be reported in the test report.

Table 8.2-1: *Frequency Range of Operation*

Frequency range over which the device operates (in each band)	Number of test frequencies required	Location of measurement frequency inside the operating frequency range
1 MHz or less	1	Center (middle of the band)
1–10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near center and 1 near low end

Note: “near” means as close as possible to or at the centre / low end / high end of the frequency range over which the device operates.

8.2.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 30, 2020

8.2.3 Observations, settings and special notes

Per ANSI C63.10 Subclause 5.6.2.1:
The number of channels tested can be reduced by measuring the center channel bandwidth first and then applying the following relaxations as appropriate:

a) For each operating mode, if the measured channel bandwidth on the middle channel is at least 150% of the minimum permitted bandwidth, then it is not necessary to measure the bandwidth on the high and low channels.
b) For multiple-input multiple-output (MIMO) systems, if the measured channel bandwidth on testing the middle channel exceeds the minimum permitted bandwidth by more than 50% on one transmit chain, then it is not necessary to repeat testing on the other chains.
c) If the measured channel bandwidth on the middle channel is less than 50% of the maximum permitted bandwidth, then it is not necessary to measure the bandwidth on the high and low channels.

8.2.4 Test data

Table 8.2-2: *Test channels selection*

Modulation	Start of Frequency range, MHz	End of Frequency range, MHz	Frequency range bandwidth, MHz	Low channel, MHz	Mid channel, MHz	High channel, MHz
π/4-DQPSK; 8-DPSK	2400	2483.5	83.5	2402	2440	2479
GFSK	2400	2483.5	83.5	2403	2440	2481

8.3 Antenna requirement

8.3.1 References, definitions and limits

FCC 15.203:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.
FCC 15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-Gen, section 6.8:
The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report.

8.3.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 30, 2020

8.3.3 Observations, settings and special notes

None

8.3.4 Test data

Must the EUT be professionally installed?	☐ YES	☒ NO	
Does the EUT have detachable antenna(s)?	☐ YES	☒ NO	
If detachable, is the antenna connector(s) non-standard?	☐ YES	☐ NO	☒ N/A

8.4 AC power line conducted emissions limits

8.4.1 References, definitions and limits

FCC 15.207(a):
Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

ANSI: C63.10 subclause 6.2
If the EUT normally receives power from another device that in turn connects to the public utility ac power lines, measurements shall be made on that device with the EUT in operation to demonstrate that the device continues to comply with the appropriate limits while providing the EUT with power. If the EUT is
operated only from internal or dedicated batteries, with no provisions for connection to the public utility ac power lines (600 VAC or less) to operate the EUT (such as an adapter), then ac power-line conducted measurements are not required.
For direct current (dc) powered devices where the ac power adapter is not supplied with the device, an “off-the-shelf” unmodified ac power adapter shall be used. If the device is supposed to be installed in a host (e.g., the device is a module or PC card), then it is tested in a typical compliant host.

ISED RSS-Gen 8.8:
A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in table below.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in table below. The more stringent limit applies at the frequency range boundaries.

Table 8.4-1: *Conducted emissions limit*

Frequency of emission, MHz	Conducted limit, dBµV	
	Quasi-peak	Average**
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Note: * - The level decreases linearly with the logarithm of the frequency.
** - A linear average detector is required.

8.4.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 30, 2020

8.4.3 Observations, settings and special notes

The EUT was set up as tabletop configuration per ANSI C63.10-2013 measurement procedure.

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

EMI Receiver settings for preview measurements:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Peak and Average
Trace mode	Max Hold
Measurement time	1000 ms

Receiver settings for final measurements:

Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Detector mode	Quasi-Peak and Average
Trace mode	Max Hold
Measurement time	1000 ms

8.4.4 Test data

Table 8.4-2: *Conducted emissions – from AC mains power ports results*

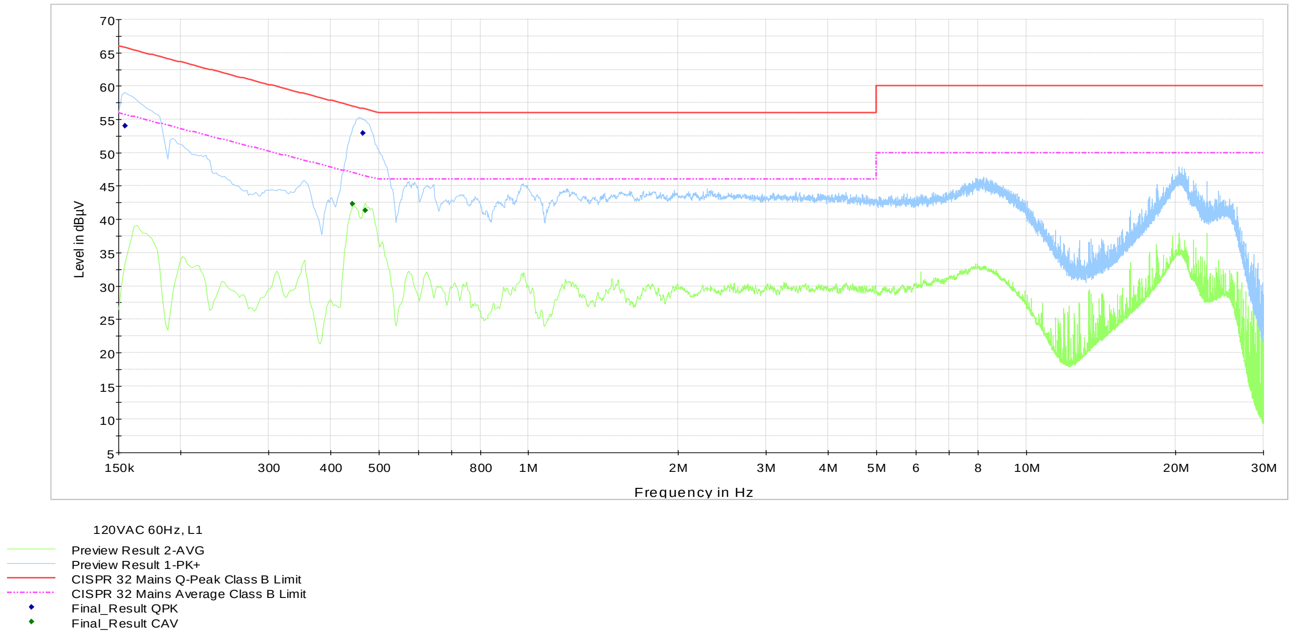
Frequency (MHz)	Quasi-Peak result[1 and 3] (dBμV)	Quasi-Peak limit (dBμV)	Quasi-Peak margin (dB)	Conductor	Correction factor[2] (dB)
0.46500	52.9	56.6	3.7	Phase	9.9
0.46500	52.4	56.6	4.2	Neutral	9.9

Frequency (MHz)	CAverage result[1 and 3] (dBμV)	CAverage limit (dBμV)	CAverage margin (dB)	Conductor	Correction factor[2] (dB)
0.44250	42.3	47.0	4.7	Phase	9.9
0.46950	41.3	46.5	5.2	Phase	9.9
0.44025	41.1	47.1	6.0	Neutral	9.9
0.48525	41.5	46.3	4.8	Neutral	9.9

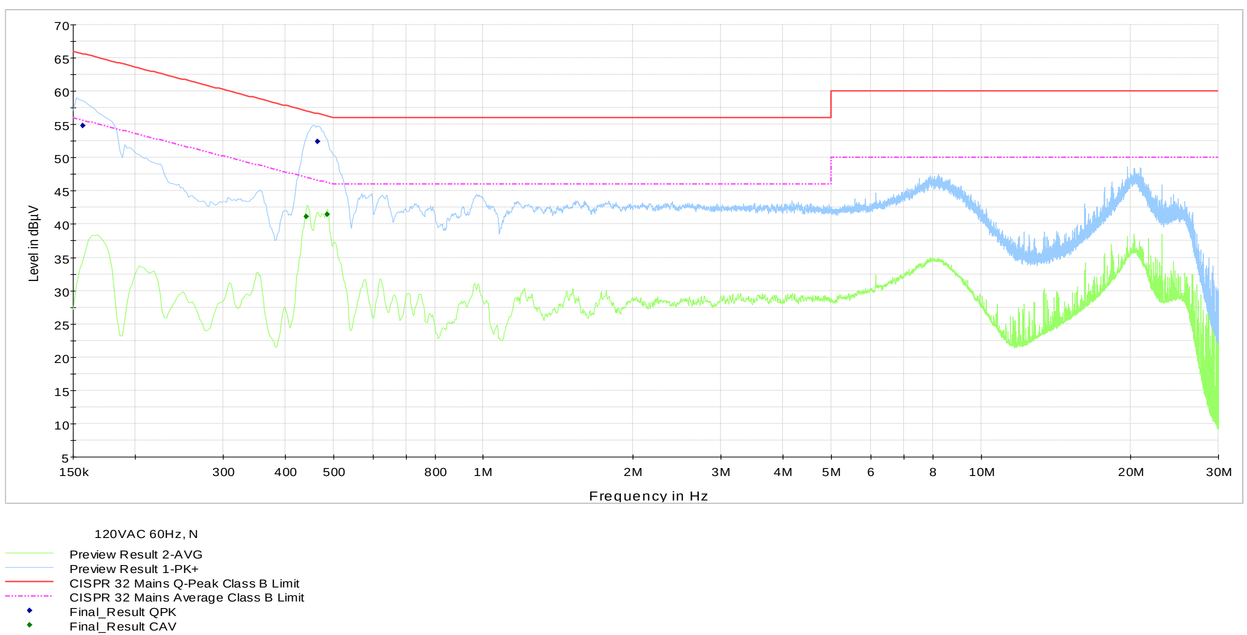
Notes:
[1] Result (dBμV) = receiver/spectrum analyzer value (dBμV) + correction factor (dB)
[2] Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)
[3] Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Sample calculation: 43.5 dBμV (result) = 33.6 dBμV (receiver reading) + 9.9 dB (Correction factor)

Test data, continued



Plot 8.4-1: *Conducted emissions on phase line*



Plot 8.4-2: *Conducted emissions on neutral line*

8.5 Frequency Hopping Systems requirements, 2 GHz operation

8.5.1 References, definitions and limits

FCC 15.247(a)(1):

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

(iii) Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

(f) For the purposes of this section, hybrid systems are those that employ a combination of both frequency hopping and digital modulation techniques. The frequency hopping operation of the hybrid system, with the direct sequence or digital modulation operation turned-off, shall have an average time of occupancy on any frequency not to exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4. The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Table 8.5-1: *Summary of the basic requirements*

$P_{max\text{-}pk} \leq 1$ W	$P_{max\text{-}pk} \leq 0.125$ W
$N_{ch} \geq 75$	$N_{ch} \geq 15$
$\Delta f \geq$ MAX { 25 kHz, $BW_{20\,dB}$ }	$\Delta f \geq$ MAX [MAX { 25 kHz, $0.67 \times BW_{20\,dB}$ } OR MAX{25 kHz, $BW_{20\,dB}$}]
max. $BW_{20\,dB}$ not specified	max. $BW_{20\,dB}$ not specified
$t_{ch} \leq 0.4$ s for T = 0.4×Nch	$t_{ch} \leq 0.4$ s for T = 0.4×Nch

Note: t_{ch} = average time of occupancy; T = period; N_{ch} = # hopping frequencies; BW = bandwidth; Δf = hopping channel carrier frequency separation

ISED RSS-247 Section 5.1:

a) The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system's radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

b) FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400–2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W.

d) FHSs operating in the band 2400–2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

5.3 Hybrid systems

Hybrid systems employ a combination of both frequency hopping and digital transmission techniques and shall comply with the following:

a. With the digital transmission operation of the hybrid system turned off, the frequency hopping operation shall have an average time of occupancy on any frequency not exceeding 0.4 seconds within a duration in seconds equal to the number of hopping frequencies multiplied by 0.4.

8.5.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 23, 2020

8.5.3 Observations, settings and special notes

Carrier frequency separation was tested per ANSI C63.10 subclause 7.8.2. Spectrum analyser settings:

Resolution bandwidth	Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
Video bandwidth	≥ RBW
Frequency span	Wide enough to capture the peaks of two adjacent channels
Detector mode	Peak
Trace mode	Max Hold

Number of hopping frequencies was tested per ANSI C63.10 subclause 7.8.3. Spectrum analyser settings:

Resolution bandwidth	To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
Video bandwidth	≥ RBW
Frequency span	The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
Detector mode	Peak
Trace mode	Max Hold

Time of occupancy (dwell time) was tested per ANSI C63.10 subclause 7.8.4. Spectrum analyser settings:

Resolution bandwidth	shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.
Video bandwidth	≥ RBW
Frequency span	Zero span, centered on a hopping channel.
Detector mode	Peak
Trace mode	Max Hold

20 dB and 99% occupied bandwidth was tested per ANSI C63.10 subclause 6.9.2. Spectrum analyser settings:

Resolution bandwidth	1–5% of the 20 dB bandwidth
Video bandwidth	≥ RBW
Frequency span	approximately 2 to 5 times the 20 dB and 99% occupied bandwidth, centered on a hopping channel
Detector mode	Peak
Trace mode	Max Hold

8.5.4 Test data

***Table 8.5-2:** 20 dB bandwidth results*

Modulation	Frequency, MHz	20 dB bandwidth, kHz
GFSK	2403	713.14
	2440	705.13
	2481	705.13
π/4-DQPSK	2402	1330.13
	2440	1330.13
	2479	1338.14
8-DPSK	2402	1306.09
	2440	1306.09
	2479	1298.08

***Table 8.5-3:** 99% occupied bandwidth results*

	Frequency, MHz	99% occupied bandwidth, kHz
GFSK	2403	793.27
	2440	777.24
	2481	785.26
π/4-DQPSK	2402	1209.94
	2440	1201.92
	2479	1209.94
8-DPSK	2402	1201.92
	2440	1201.92
	2479	1209.94

***Table 8.5-4:** Carrier frequency separation results*

Modulation	Carrier frequency separation, kHz	Minimum limit*, kHz	Margin, kHz
GFSK	506.41	475.43	30.98
π/4-DQPSK	1000.00	892.09	107.91
8-DPSK	1000.00	870.73	129.27

Note: Max power is ≤ 0.125 W, therefore minimum limit is 2/3 of 20 dB BW.

***Table 8.5-5:** Number of hopping frequencies results for all modulations*

Number of hopping frequencies*	Minimum limit	Margin
79	15	64

Note: *EUT transmits on all Bluetooth channels 0 to 78.

***Table 8.5-6:** Average time of occupancy results*

Modulation	Dwell time of each pulse, ms	Number of pulses within 100 ms	Number of pulses** within period	Total dwell time within *period, ms	Limit, ms	Margin, ms
GFSK	0.396	2	632	250.272	400.000	149.728
π/4-DQPSK	1.201	1	316	379.516	400.000	20.484
8-DPSK	0.852	1	316	269.232	400.000	130.768

Note: *Measurement period is 31.6 s = 0.4 s × 79 channels
**Number of pulses was counted within 100 ms interval and then multiplied by the 31.6 s/0.1 s = 316.

Test data, continued

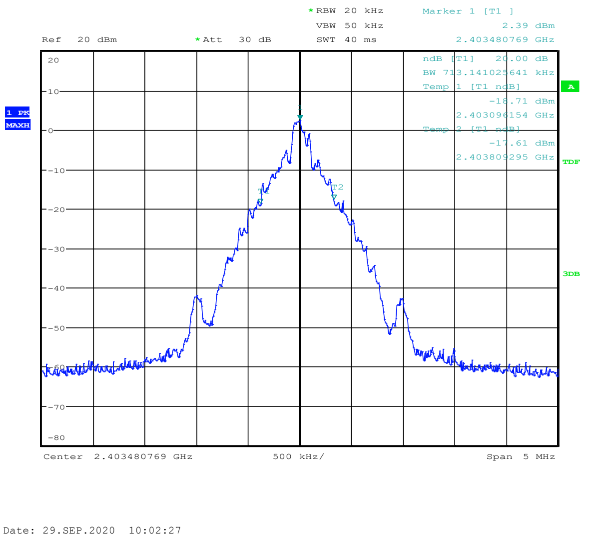


Figure 8.5-1: *20 dB bandwidth sample plot*

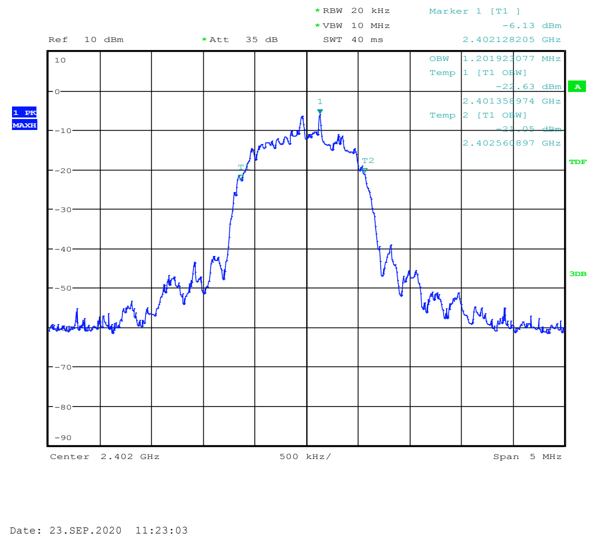


Figure 8.5-2: *99% occupied bandwidth sample plot*

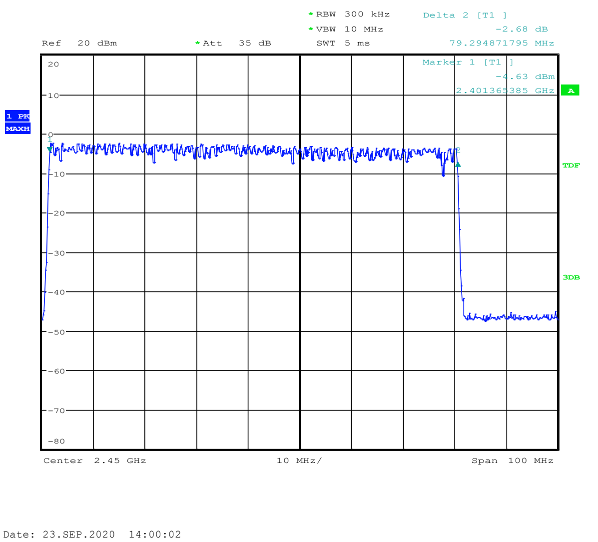


Figure 8.5-3: *Number of hopping channels sample plot*

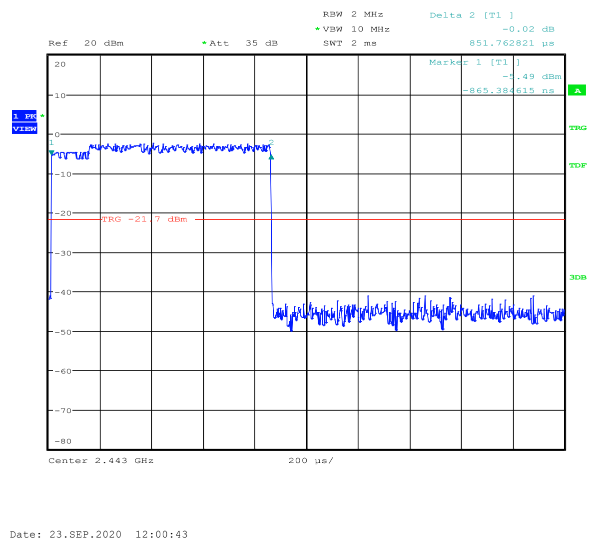


Figure 8.5-4: *Dwell time, sample plot*

Test data, continued

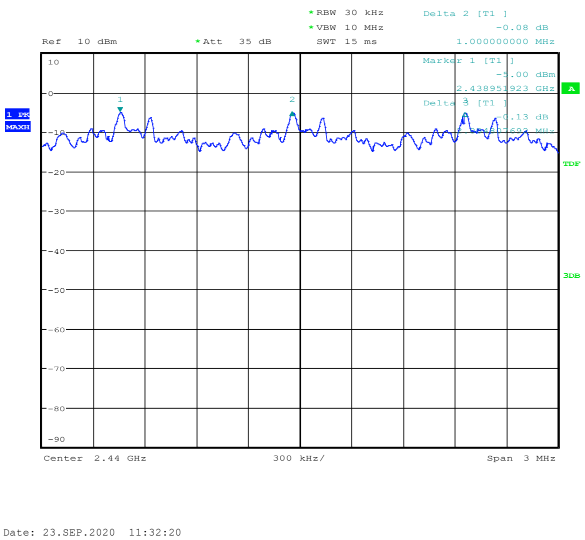


Figure 8.5-5: *Channel frequency separation sample plot*

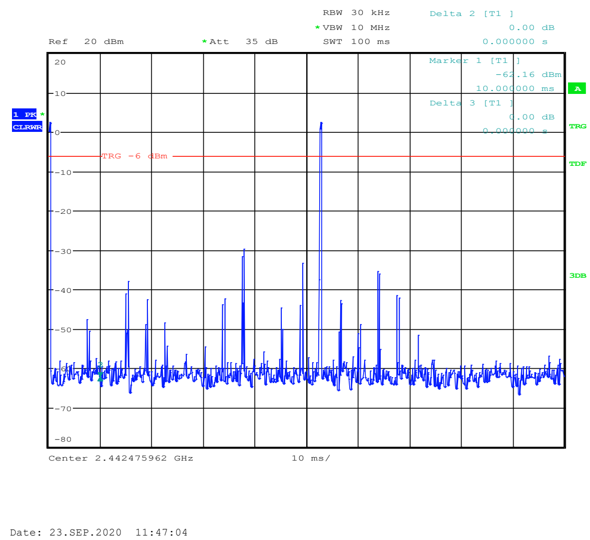


Figure 8.5-6: *Number of pulses within 100 ms.*

8.6 Transmitter output power and e.i.r.p. requirements for FHSS 2 GHz

8.6.1 References, definitions and limits

FCC 15.247(b):

(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:

(1) For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt (30 dBm). For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts (21 dBm).

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

ISED RSS-247 Section 5.4(b):

For FHSs operating in the band 2400–2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W (30 dBm) if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W (21 dBm) if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W (36 dBm), except as provided in section 5.4(e).

Section 5.4(e)

Fixed point-to-point systems in the bands 2400–2483.5 MHz and 5725–5850 MHz are permitted to have an e.i.r.p. higher than 4 W provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding an e.i.r.p. of 4 W.

8.6.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 23, 2020

8.6.3 Observations, settings and special notes

Conducted output power was tested per ANSI C63.10 subclause 7.8.5. The hopping shall be disabled for this test. Spectrum analyser settings:

Resolution bandwidth	> 20 dB bandwidth of the emission being measured
Video bandwidth	≥ RBW
Frequency span	approximately 5 times the 20 dB bandwidth, centered on a hopping channel
Detector mode	Peak
Trace mode	Max Hold

8.6.4 Test data

Table 8.6-1: *Output power and EIRP results*

Modulation	Frequency, MHz	Output power, dBm	Output power limit, dBm	Output power margin, dB	Antenna gain, dBi	EIRP, dBm	EIRP limit, dBm	EIRP margin, dB
GFSK	2403	5.56	30.00	24.44	2.70	8.26	36.00	27.74
	2440	5.21	30.00	24.79	2.70	7.91	36.00	28.09
	2481	4.91	30.00	25.09	2.70	7.61	36.00	28.39
π/4-DQPSK	2402	0.57	30.00	29.43	2.70	3.27	36.00	32.73
	2440	-0.60	30.00	30.60	2.70	2.10	36.00	33.90
	2479	-1.34	30.00	31.34	2.70	1.36	36.00	34.64
8-DPSK	2402	0.82	30.00	29.18	2.70	3.52	36.00	32.48
	2440	0.28	30.00	29.72	2.70	2.98	36.00	33.02
	2479	-0.77	30.00	30.77	2.70	1.93	36.00	34.07

EIRP = Output power + Antenna gain

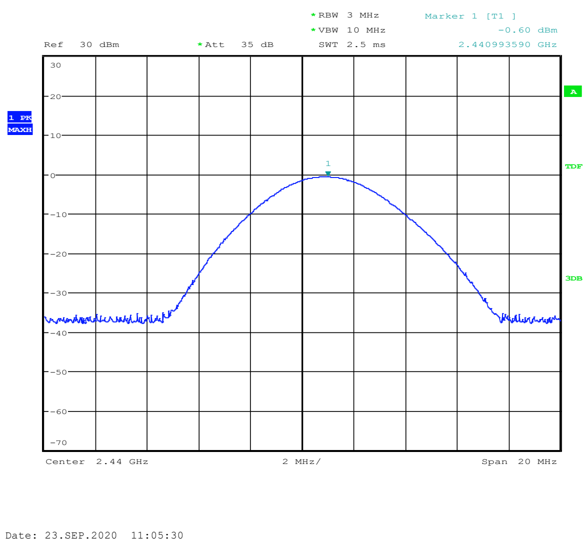


Figure 8.6-1: *Output power sample plot*

8.7 Spurious (out-of-band) unwanted emissions

8.7.1 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)).

ISED RSS-247 Section 5.5:
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Table 8.7-1: *FCC §15.209 and RSS-Gen – Radiated emission limits*

Frequency, MHz	Field strength of emissions µV/m	Field strength of emissions dBµV/m	Measurement distance, m
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
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 8.7-2: *ISED restricted frequency bands*

MHz	MHz	MHz	GHz
0.090–0.110	12.57675–12.57725	399.9–410	7.25–7.75
0.495–0.505	13.36–13.41	608–614	8.025–8.5
2.1735–2.1905	16.42–16.423	960–1427	9.0–9.2
3.020–3.026	16.69475–16.69525	1435–1626.5	9.3–9.5
4.125–4.128	16.80425–16.80475	1645.5–1646.5	10.6–12.7
4.17725–4.17775	25.5–25.67	1660–1710	13.25–13.4
4.20725–4.20775	37.5–38.25	1718.8–1722.2	14.47–14.5
5.677–5.683	73–74.6	2200–2300	15.35–16.2
6.215–6.218	74.8–75.2	2310–2390	17.7–21.4
6.26775–6.26825	108–138	2483.5–2500	22.01–23.12
6.31175–6.31225	149.9–150.05	2655–2900	23.6–24.0
8.291–8.294	156.52475–156.52525	3260–3267	31.2–31.8
8.362–8.366	156.7–156.9	3332–3339	36.43–36.5
8.37625–8.38675	162.0125–167.17	3345.8–3358	Above 38.6
8.41425–8.41475	167.72–173.2	3500–4400	
12.29–12.293	240–285	4500–5150	
12.51975–12.52025	322–335.4	5350–5460	

Note: Certain frequency bands listed in Table 8.7-2 and above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

Table 8.7-3: *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			

8.7.2 Test summary

Verdict	Pass		
Tested by	Andrey Adelberg	Test date	September 23, 2020

8.7.3 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 at a distance of 3 m.
Average was calculated from peak results using duty cycle correction factor (DCCF).
GFSK Pulse width = 0.396 ms, 2 pulses within 100 ms; DCCF = MAX(−20 dB or 20 × Log_{10} ((0.396 × 2) / 100) = −42.03 dB)
π/4-DQPSK Pulse width = 1.201 ms; DCCF = MAX(−20 dB or 20 × Log_{10} (1.201 / 100) = −38.41 dB)
8DPSK Pulse width = 0.852 ms; DCCF = MAX(−20 dB or 20 × Log_{10} (0.852 / 100) = −41.39 dB)
DCCF of the maximum (−20 dB) was used for average calculation.

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 conducted spurious emissions measurements:

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

8.7.4 Test data

Table 8.7-4: *Radiated field strength measurement results*

Modulation	Channel	Frequency, MHz	Peak Field strength, dBµV/m		Margin, dB	Average Field strength, dBµV/m		Margin, dB
			Measured	Limit		Calculated	Limit	
GFSK	Low	2390	55.90	74.00	18.10	35.90	54.00	18.10
GFSK	Low	7209	50.34	74.00	23.66	30.34	54.00	23.66
GFSK	Mid	7320	49.81	74.00	24.19	29.81	54.00	24.19
GFSK	High	2483.5	55.88	74.00	18.12	35.88	54.00	18.12
π/4-DQPSK	Low	2390	53.17	74.00	20.83	33.17	54.00	20.83
π/4-DQPSK	Low	7206	48.02	74.00	25.98	28.02	54.00	25.98
π/4-DQPSK	Mid	7320	49.92	74.00	24.08	29.92	54.00	24.08
π/4-DQPSK	High	2483.5	56.48	74.00	17.52	36.48	54.00	17.52
8-DPSK	Low	2390	53.66	74.00	20.34	33.66	54.00	20.34
8-DPSK	Low	7206	48.26	74.00	25.74	28.26	54.00	25.74
8-DPSK	Mid	7320	49.08	74.00	24.92	29.08	54.00	24.92
8-DPSK	High	2483.5	56.05	74.00	17.95	36.05	54.00	17.95

Note: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable.
Average field strength was calculated: Peak field strength + DCCF (−20 dB)

Test data, continued

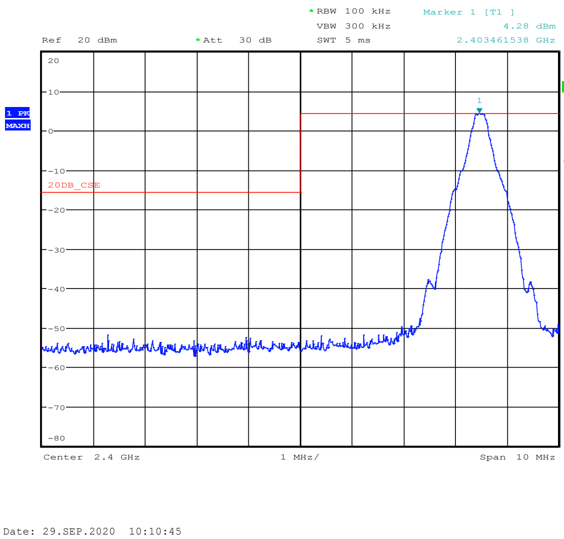


Figure 8.7-1: *Band edge spurious emissions at 2400 MHz for GFSK modulation*

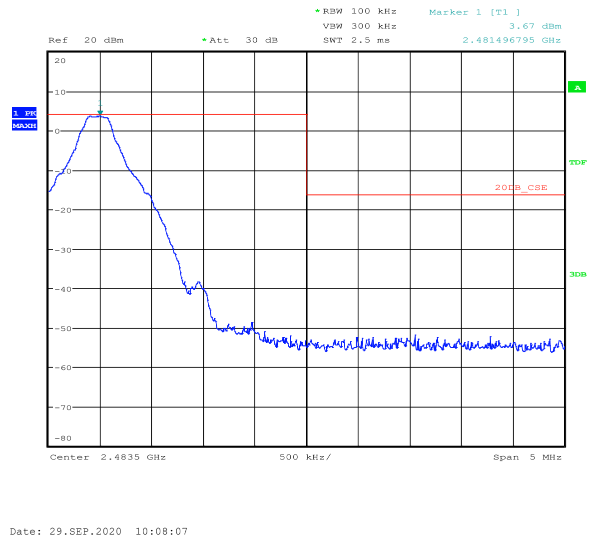


Figure 8.7-2: *Band edge spurious emissions at 2483.5 MHz for GFSK modulation*

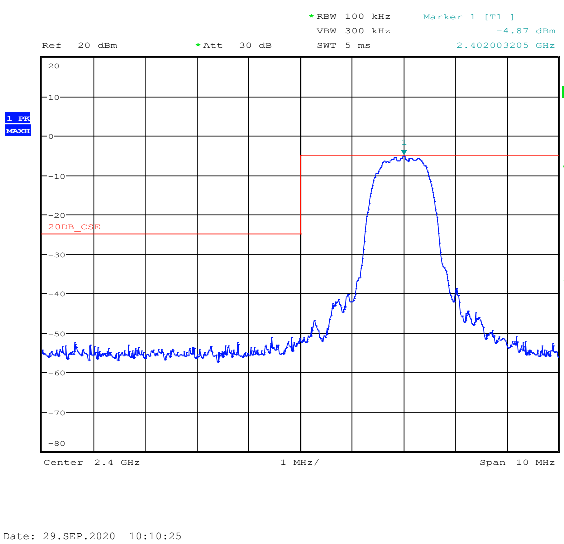


Figure 8.7-3: *Band edge spurious emissions at 2400 MHz for π/4-DQPSK modulation*

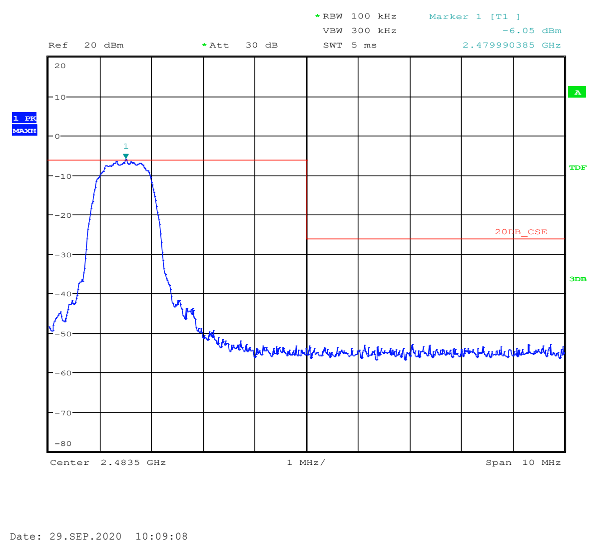


Figure 8.7-4: *Band edge spurious emissions at 2483.5 MHz for π/4-DQPSK modulation*

Test data, continued

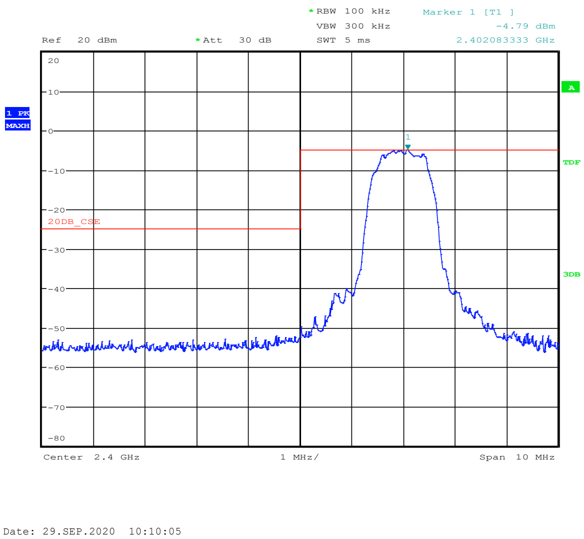


Figure 8.7-5: *Band edge spurious emissions at 2400 MHz for 8-DPSK modulation*

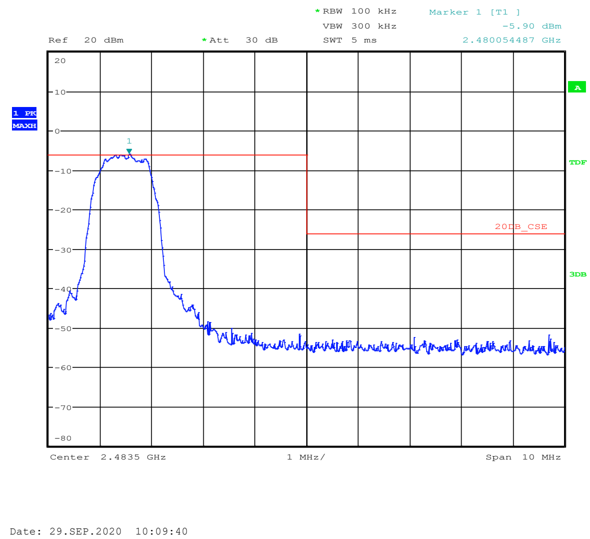


Figure 8.7-6: *Band edge spurious emissions at 2483.5 MHz for 8-DPSK modulation*

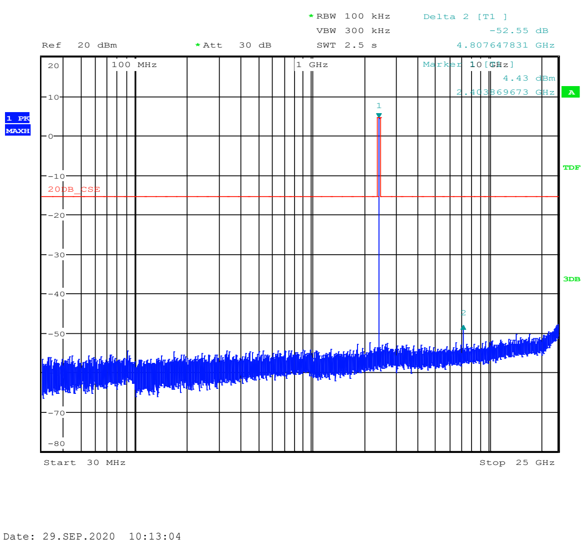


Figure 8.7-7: *Conducted spurious emissions for GFSK modulation at low channel*

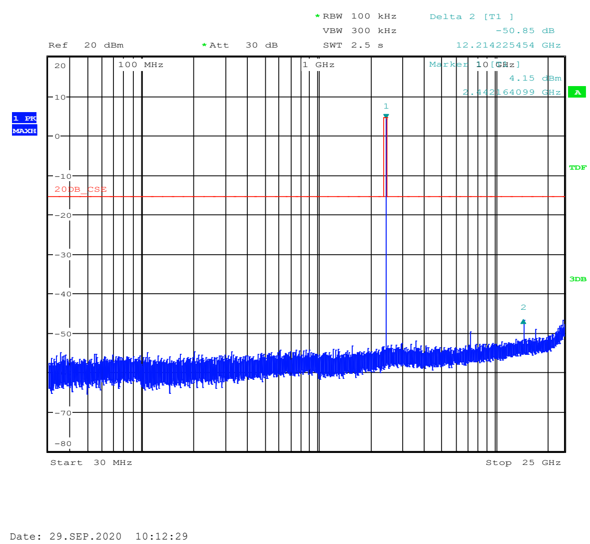


Figure 8.7-8: *Conducted spurious emissions for GFSK modulation at mid channel*

Test data, continued

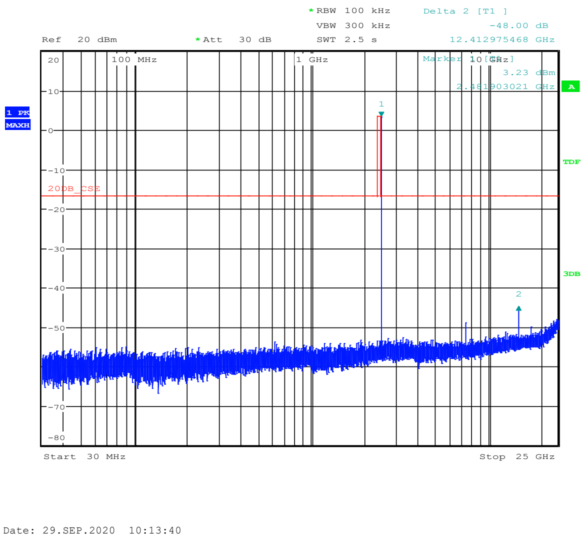


Figure 8.7-9: *Conducted spurious emissions for GFSK modulation at high channel*

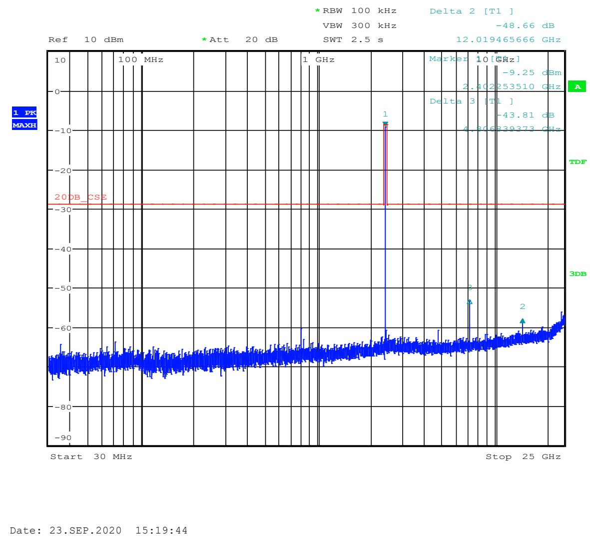


Figure 8.7-10: *Conducted spurious emissions for π/4-DQPSK modulation at low channel*

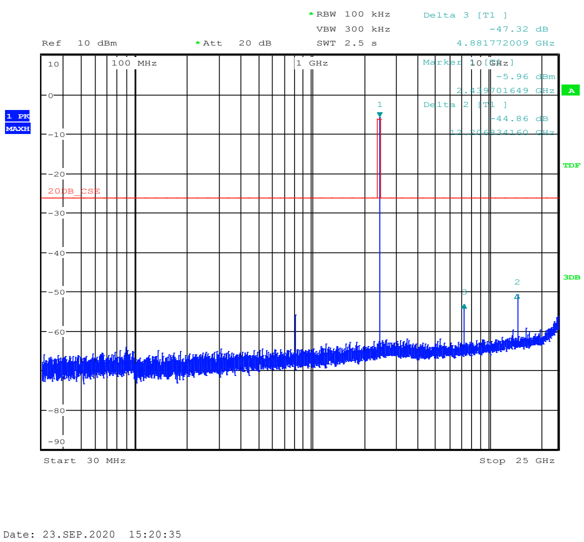


Figure 8.7-11: *Conducted spurious emissions for π/4-DQPSK modulation at mid channel*

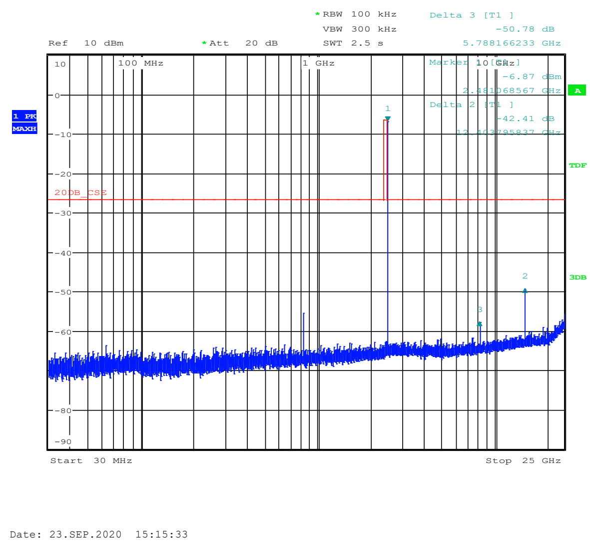


Figure 8.7-12: *Conducted spurious emissions for π/4-DQPSK modulation at high channel*

Test data, continued

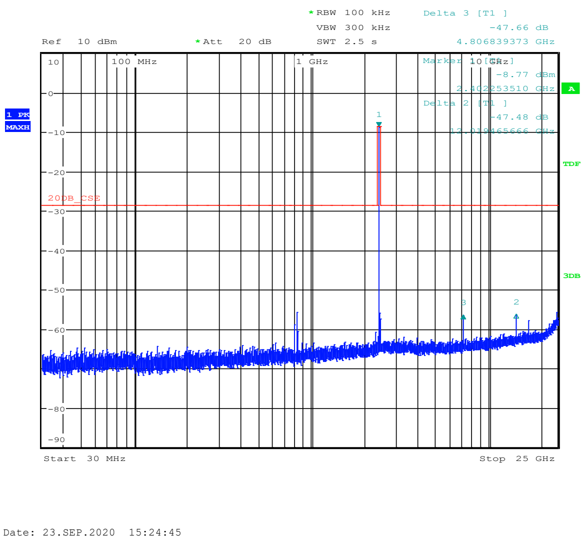


Figure 8.7-13: *Conducted spurious emissions for 8-DPSK modulation at low channel*

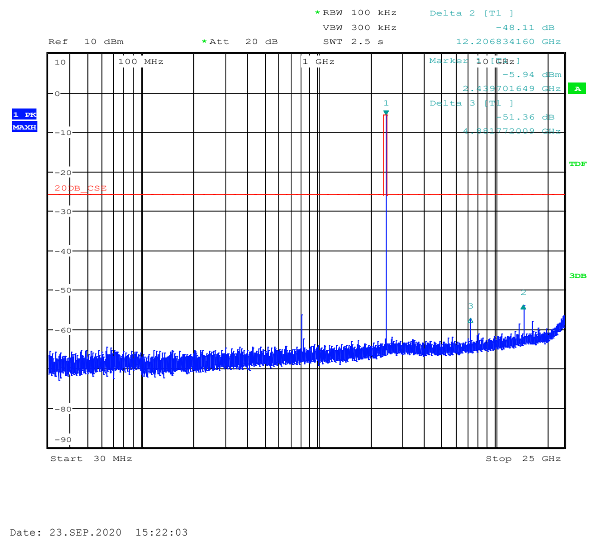


Figure 8.7-14: *Conducted spurious emissions for 8-DPSK modulation at mid channel*

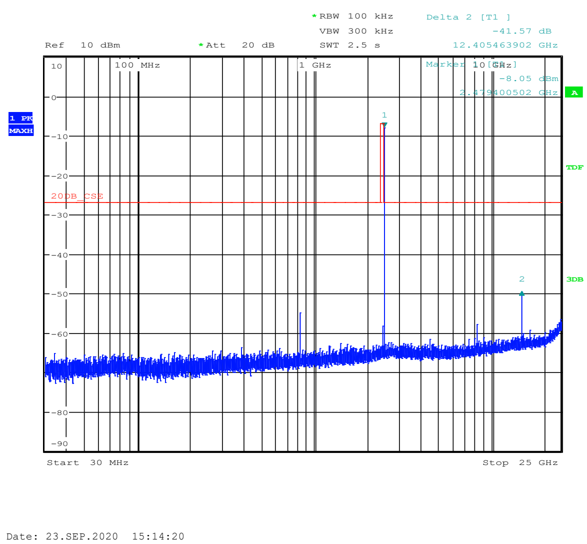


Figure 8.7-15: *Conducted spurious emissions for 8-DPSK modulation at high channel*

Test data, continued

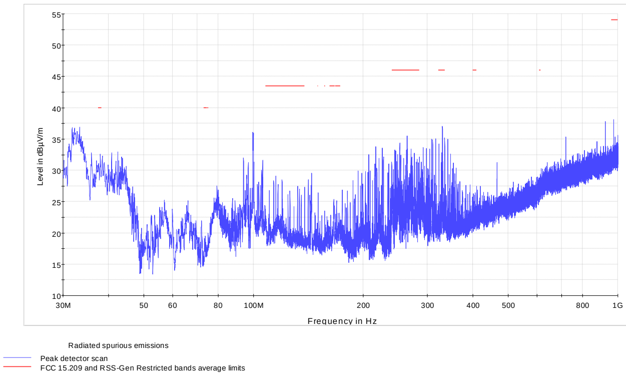


Figure 8.7-16: *Radiated spurious emissions below 1 GHz for GFSK modulation low channel*

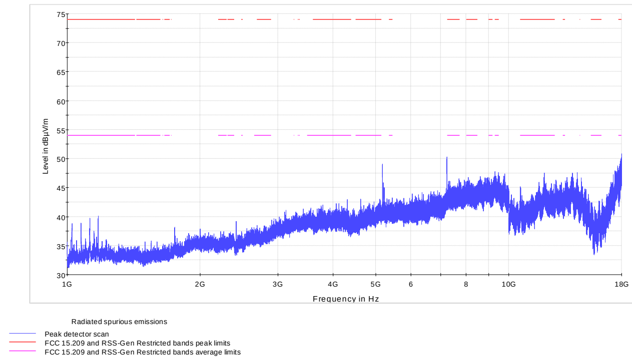


Figure 8.7-17: *Radiated spurious emissions within 1–18 GHz for GFSK modulation low channel*

Figure 8.7-18: *Radiated spurious emissions above 18 GHz for GFSK modulation low channel*

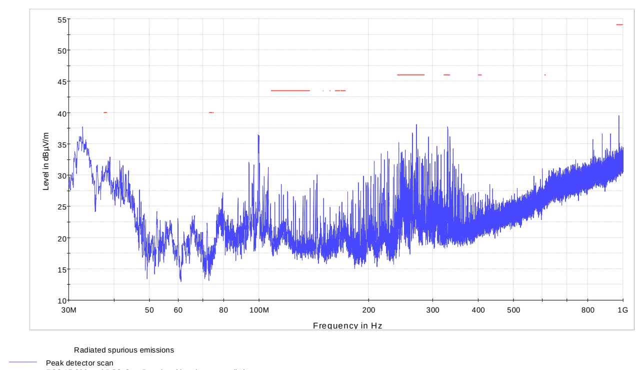


Figure 8.7-19: *Radiated spurious emissions below 1 GHz for GFSK modulation mid channel*

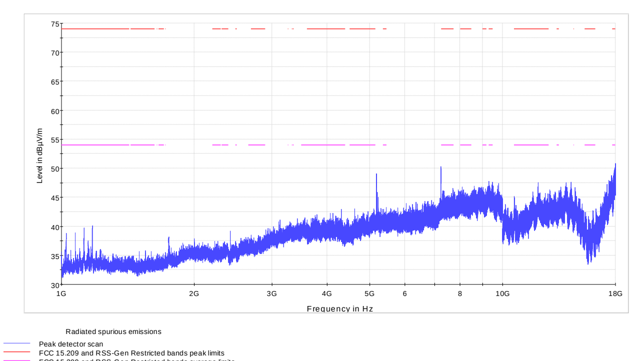


Figure 8.7-20: *Radiated spurious emissions within 1–18 GHz for GFSK modulation mid channel*

Figure 8.7-21: *Radiated spurious emissions above 18 GHz for GFSK modulation mid channel*

Test data, continued

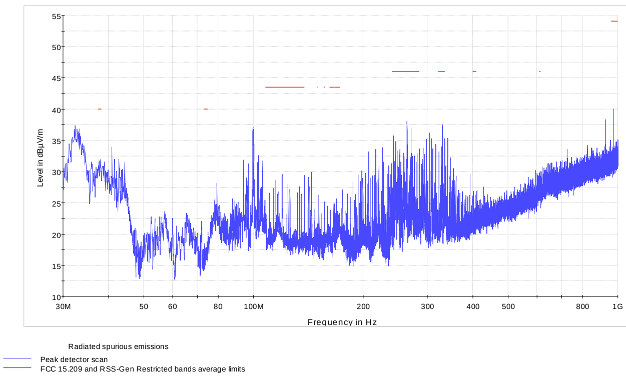


Figure 8.7-22: *Radiated spurious emissions below 1 GHz for GFSK modulation high channel*

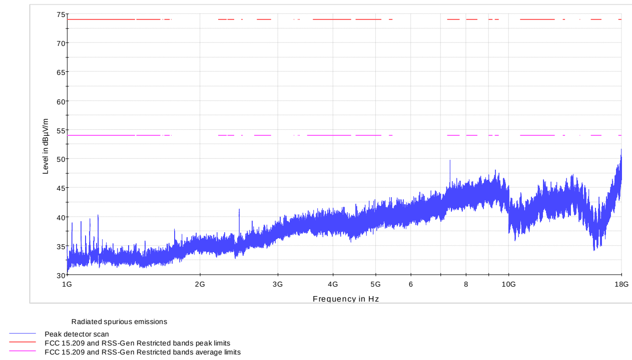


Figure 8.7-23: *Radiated spurious emissions within 1–18 GHz for GFSK modulation high channel*

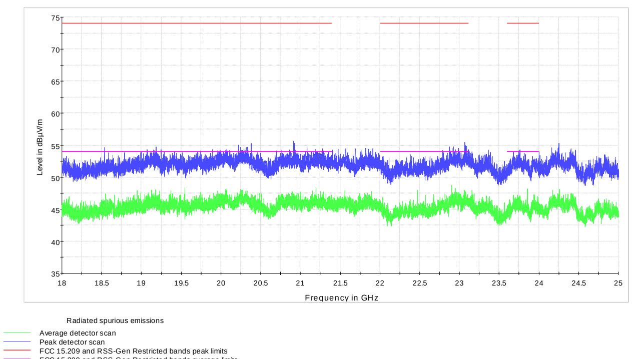


Figure 8.7-24: *Radiated spurious emissions above 18 GHz for GFSK modulation high channel*

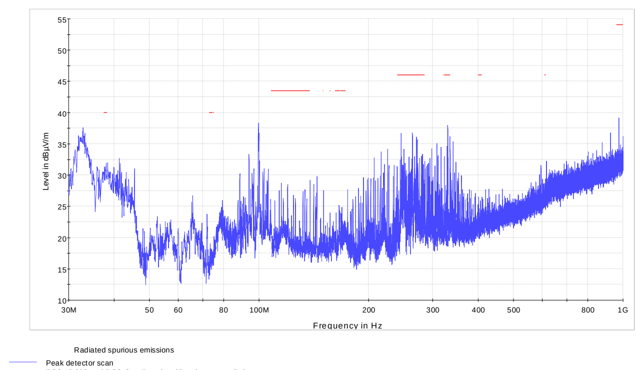


Figure 8.7-25: *Radiated spurious emissions below 1 GHz for π/4-DQPSK modulation low channel*

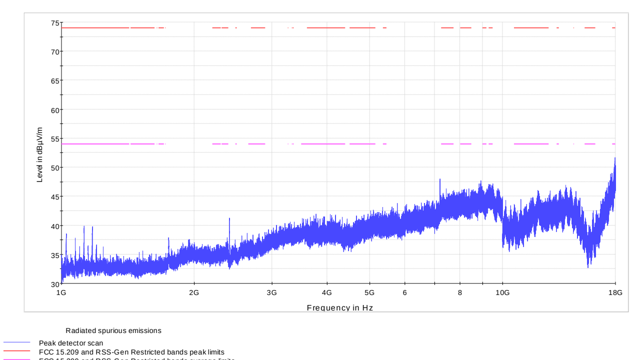


Figure 8.7-26: *Radiated spurious emissions within 1–18 GHz for π/4-DQPSK modulation low channel*

Figure 8.7-27: *Radiated spurious emissions above 18 GHz for π/4-DQPSK modulation low channel*

Test data, continued

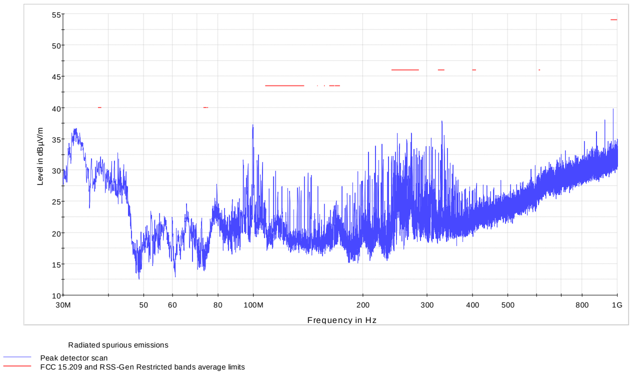


Figure 8.7-28: *Radiated spurious emissions below 1 GHz for π/4-DQPSK modulation mid channel*

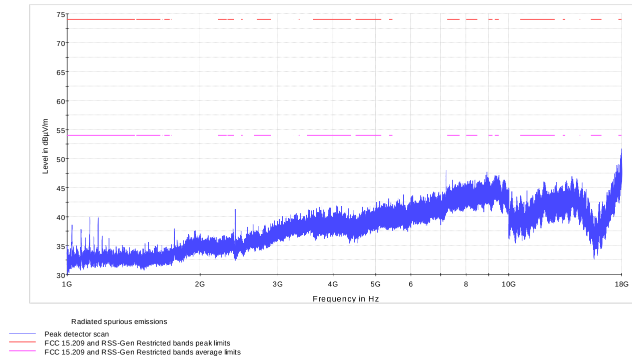


Figure 8.7-29: *Radiated spurious emissions within 1–18 GHz for π/4-DQPSK modulation mid channel*

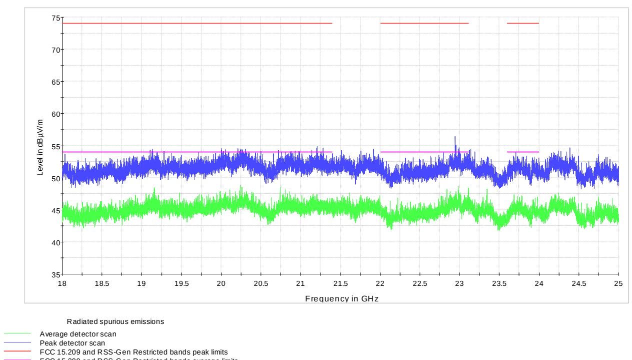


Figure 8.7-30: *Radiated spurious emissions above 18 GHz for π/4-DQPSK modulation mid channel*

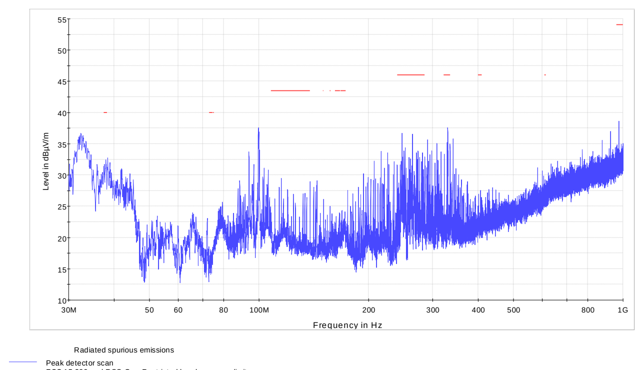


Figure 8.7-31: *Radiated spurious emissions below 1 GHz for π/4-DQPSK modulation high channel*

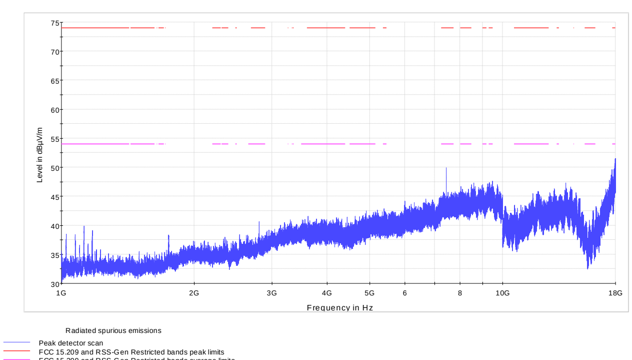


Figure 8.7-32: *Radiated spurious emissions within 1–18 GHz for π/4-DQPSK modulation high channel*

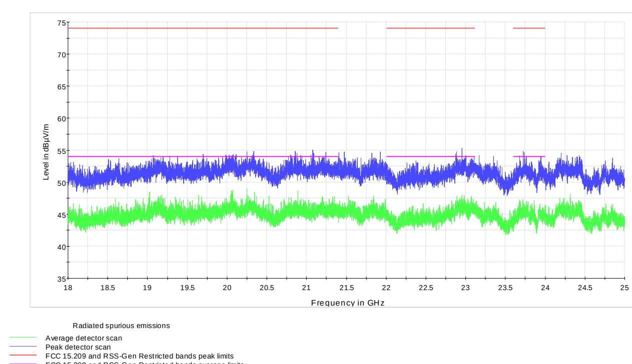


Figure 8.7-33: *Radiated spurious emissions above 18 GHz for π/4-DQPSK modulation high channel*

Test data, continued

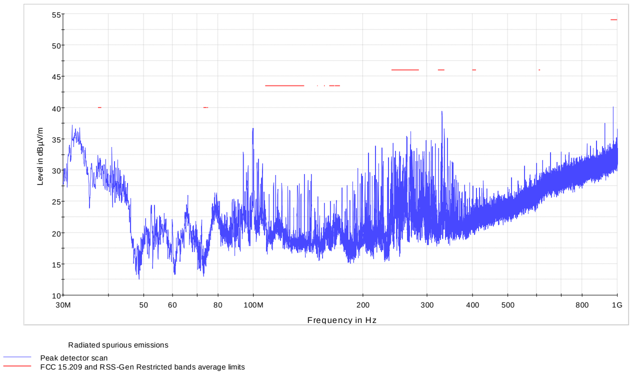


Figure 8.7-34: *Radiated spurious emissions below 1 GHz for 8-DPSK modulation low channel*

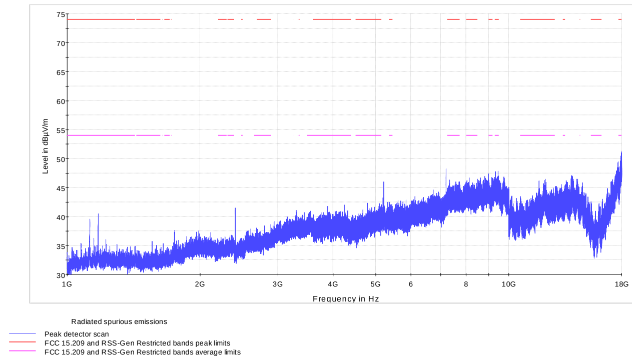


Figure 8.7-35: *Radiated spurious emissions within 1–18 GHz for 8-DPSK modulation low channel*

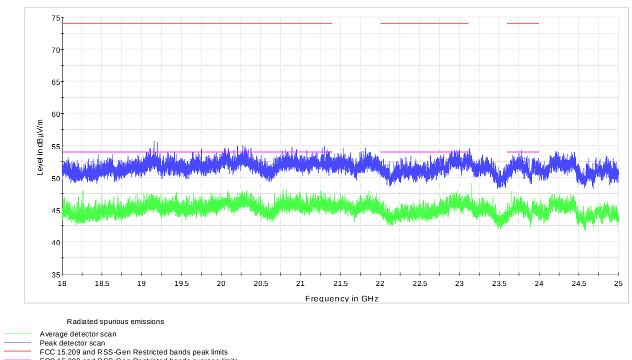


Figure 8.7-36: *Radiated spurious emissions above 18 GHz for 8-DPSK modulation low channel*

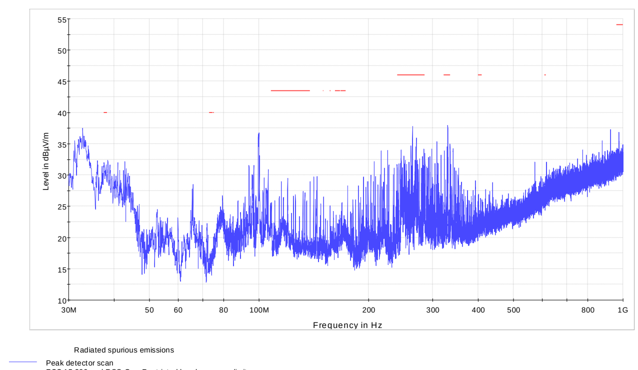


Figure 8.7-37: *Radiated spurious emissions below 1 GHz for 8-DPSK modulation mid channel*

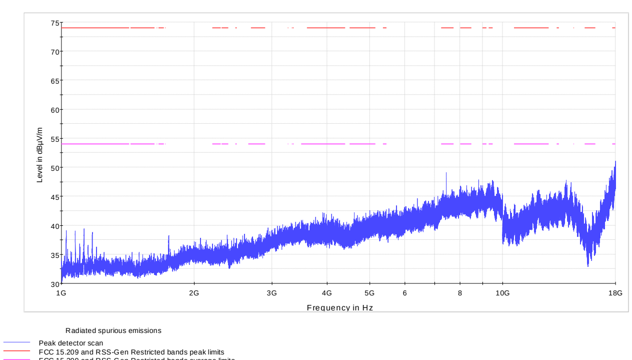


Figure 8.7-38: *Radiated spurious emissions within 1–18 GHz for 8-DPSK modulation mid channel*

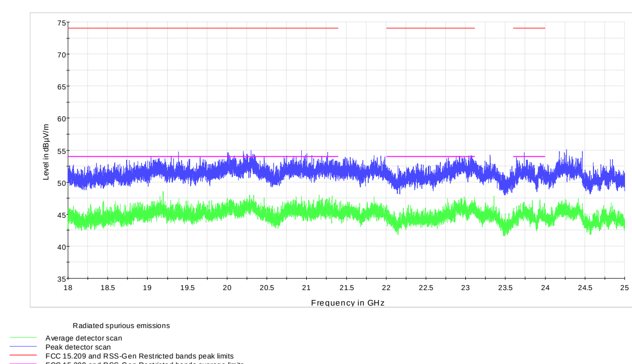


Figure 8.7-39: *Radiated spurious emissions above 18 GHz for 8-DPSK modulation mid channel*

Test data, continued

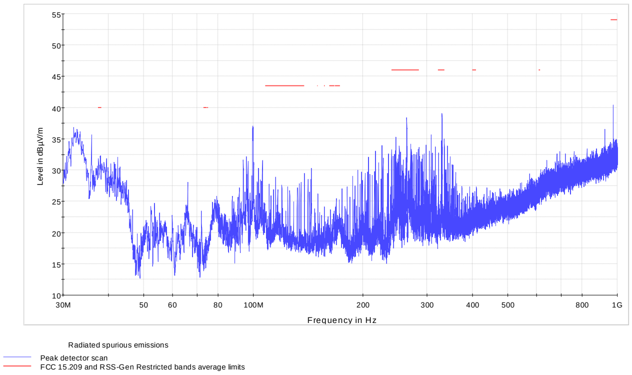


Figure 8.7-40: *Radiated spurious emissions below 1 GHz for 8-DPSK modulation high channel*

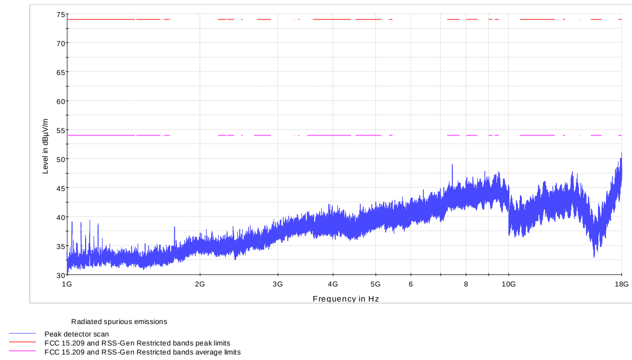


Figure 8.7-41: *Radiated spurious emissions within 1–18 GHz for 8-DPSK modulation high channel*

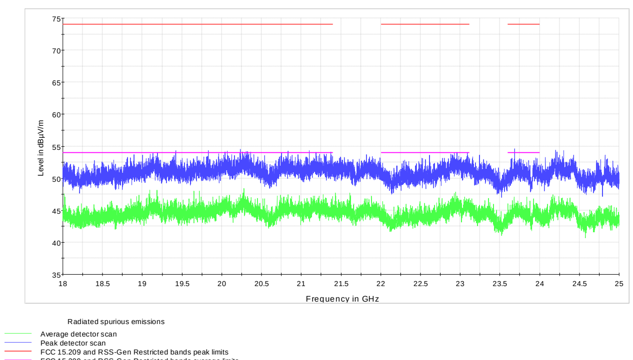


Figure 8.7-42: *Radiated spurious emissions above 18 GHz for 8-DPSK modulation high channel*

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: *Bottom view photo*

End of the test report