



PRODUCT ASSURANCE ENGINEERING
Wireless Transceiver Bluetooth QHS Mode Test Report

FCC ID: A94440108 IC: 3232A-440108



Test Type: Emissions Immunity

Product Type: Wireless Headphones

Product Name/Number: Model Number(s): 440108
FCC ID: A94440108
IC: 3232A-440108

Prepared For: Product Assurance Engineering Department,
Bose Corporation

Name of manufacturing agency applying for equipment type approval: Bose Corporation

Postal Address of manufacturing Agency: The Mountain
Framingham, MA 01701
USA

Test Results: Pass Fail

Applicable Standards: FCC CFR 47 Part 15 Subpart C
Industry Canada RSS-247 Issue 2
Industry Canada RSS-GEN Issue 5

Report Number: EMC.440108.23.160.1

General Comments/Special Test Conditions:

This report relates only to the items tested. This report covers EMC marking requirements for model 440108

	Print Name	Signature	Date
Prepared By:	Bryan Cerqua	<i>Bryan H Cerqua</i>	June 9, 2023
Electrical Engineer Review* By:	Michael Royer	<i>Michael A. Royer</i>	June 9, 2023

* Since every test result is separately reviewed after its completion, the electrical engineer review indicated above represents a higher-level review to ensure this report lists and contains all applicable and appropriate requirements.

If the report carries the "accredited" logo, the reviewer must verify all the tests in this report are covered under the current ISO17025 accreditation. The A2LA-accredited logo must be removed if any of the tests in the report are not performed under the current scope of accreditation. It is the responsibility of the reviewer to ensure the A2LA advertising policy is followed.



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1. Test Report Summary

Product Information:

Description

The EUT is a wireless headphone that contains DSS/DTS transceiver IC manufactured by Qualcomm Technologies. The EUT uses Adaptive Frequency Hopping (AFH) mode, using a reduced hop set if interference is detected in band, however a minimum of fifteen channels is always maintained per Qualcomm's documentation.

Setup (Cables and Accessories)

For radio tests the radio was configured with Qualcomm Blue Suite software (details provided in SOFTWARE AND FIRMWARE section).

EUT Antenna Description

The antenna is PCB etch antenna with a maximum gain of 1.1 dBi.

SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 0.2.15+g34dc106.
The test utility software used during testing was Blue Suite version 3.3.16.

Scope:

This report covers EMC requirements. FCC CFR 47 PART 15 SUBPART C, Industry Canada RSS-247 Issue 2, and Industry Canada RSS-GEN Issue 5.

All radiated emissions measurements have been done using the internal non-removable PCB etch antenna. The antenna is permanently attached, complies with 15.203.

All conducted RF measurements were done with the trace to the internal PCB etch antenna cut. A short 8" coaxial cable with SMA connector soldered to the trace that would normally be connected to the internal EUT antenna.

Test Objective:

Verify product meets all applicable EMC requirements.

Measurement Methods:

ANSI C63.10 (2013).
RSS-Gen Issue 5 (2018)

Results:

Product complies with all applicable EMC requirements. All final results represent worst-case emissions and/or immunity.

Conclusions:

The device under test (D.U.T.):

meets all test standards selected in section 2 of this report.

does not meet all test standards selected in section 2 of this report.



2. Test Results Summary

TEST NAME	TEST RESULT PASS or N/A	COMMENT(S)
On Time and Duty Cycle	N/A	For reporting only
20 dB Occupied Bandwidth	N/A	For reporting only
99% Occupied Bandwidth	N/A	For reporting only
Conducted Output Power	Pass	
Hopping Frequency Separation	Pass	
Number of Hopping Channels	Pass	
Average Time of Occupancy	Pass	
Conducted Spurious Emissions	Pass	
Radiated Emissions 1 GHz to 25 GHz	Pass	
Radiated Emissions below 1 GHz	Pass	
AC Line Conducted Emissions.	Pass	

EUT serial numbers used for this test report:

Conducted RF: SN C1B002HDT6660F086
 Radiated emissions: SN C1B002HDT6660F061, SN C1B002HDT6660F145
 Conducted AC mains emissions: SN C1B002HDT6660F145

Note: QHS P2 – P6 modes use channels between and including 2404 to 2478 MHz which are determined by the Qualcomm Bluetooth IC.



3. Test Standards & Environmental Conditions

Test Standards

Emissions:

	Standard
<input checked="" type="checkbox"/>	FCC Part 15C
<input checked="" type="checkbox"/>	Canada RSS-247
<input checked="" type="checkbox"/>	Canada RSS-GEN

Environmental Conditions

Ambient:	
Temperature:	22±4 °C
Humidity:	30-60 % RH
Internal Battery	3.7 VDC
Voltage:	Nominal



4. Lab Accreditations / Registrations

FCC Test Site Accreditation.

Firm Name	Location	Expiration Date	Accreditation	MRA	Designation Number	Contact	Contact Title	Address	PO Box	Mail Stop	City	State	Zip Code	Country	Email	Phone	Fax
Bose Corporation	1 New York Avenue, Framingham, MA	07/31/2024	American Association for Laboratory Accreditation	N/A	US1088	Mr. Cable Best	Quality Manager	Mail Stop 450 The Mountain	N/A	450	Framingham	Massachusetts	01701	United States	Cable_Best@bose.com	1 508 766 6137	508 766 1145

Canadian Test Site Registration.

<p>BOSE CORPORATION</p> <p>1 New York Avenue Framingham, MA 01701 UNITED STATES</p> <p>Company Number: 3232A</p> <p>Contact: Mario Espinal mario_espinal@bose.com</p>	US0210	<p>RSS-GEN (2019-02-11)</p> <p>RSS-210 (2019-02-11)</p> <p>RSS-247 (2019-02-11)</p> <p>RSS-248 (2021-11-19)</p>	<p>RECOGNIZED UNTIL: 2024-07-31</p> <p>A2LA ISO/IEC 17025:2017 Expires: 2024-07-31</p>
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5. On Time & Duty Cycle

Requirement:

None; for reporting purposes only.

Measurement Method:

KDB 558074 D01 15.247 Meas Guidance v05r02 April 2, 2019 Section 6 b), zero span method.

On time & duty cycle test results:

All testing is done using the maximum packet length for maximum duty cycle shown in the table below.

Frequency (MHz)	Mode	Packet Type	Data Rate (Mbps)	Max Packet Length (Bytes)	On Time (ms)	Period (ms)	Duty Cycle (%)	1/Ton (Hz)	1/Period (Hz)
2440	QHS	P2	2	1023	4.209	5.011	84.0	237.6	199.6
2440	QHS	P6	6	1023	1.442	2.504	57.6	693.5	399.4



6. 20 dB and 99% Occupied Bandwidth

Requirement:

None; for reporting purposes only.

FCC 15.247(a)(1)

RSS-247 5.1 (1) (a)

Measurement Method:

ANSI C63.10-2013 Subclause 6.9.2 (20 dB Bandwidth)

ANSI C63.10-2013 Subclause 6.9.3 (99% Bandwidth)

RSS-Gen Issue 5, 6.7 (20 dB & 99% Bandwidth)

The EUT is connected to a spectrum analyzer. The 10 dB external pad and test cable loss (0.8 dB) is accounted for using the reference level offset feature of the spectrum analyzer. The reference level offset is set to 10.8 dB.

20 dB Occupied Bandwidth Results:

QHS P2 20 dB OBW Summary Table					
Channel	Frequency (MHz)	Mode	Data Rate Mbps	20 dB OBW (kHz)	Limit NA
Low	2404	QHS P2	2	2549	-
Middle	2440	QHS P2	2	2564	-
High	2478	QHS P2	2	2537	-
QHS P6 20 dB OBW Summary Table					
Channel	Frequency (MHz)	Mode	Data Rate Mbps	20 dB OBW (kHz)	Limit NA
Low	2404	QHS P6	6	2557	-
Middle	2440	QHS P6	6	2542	-
High	2478	QHS P6	6	2542	-



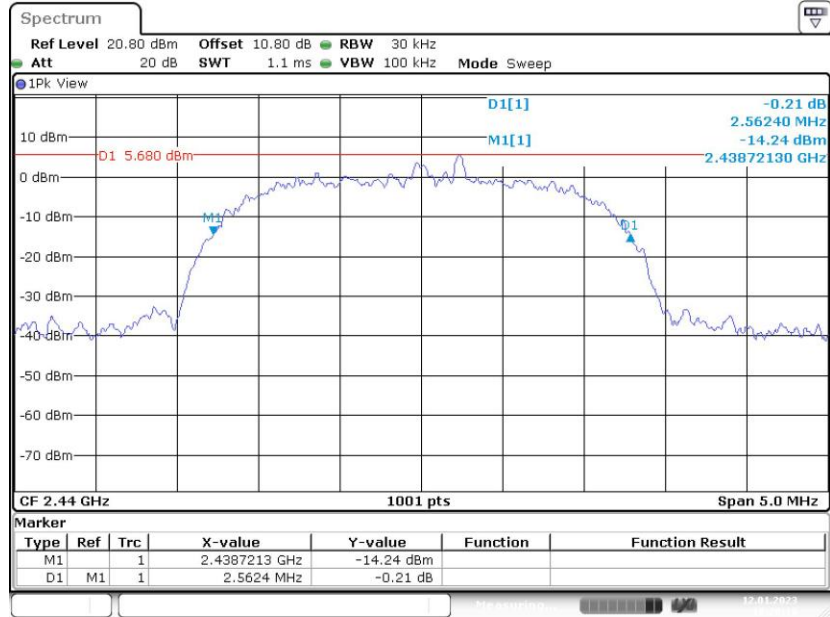
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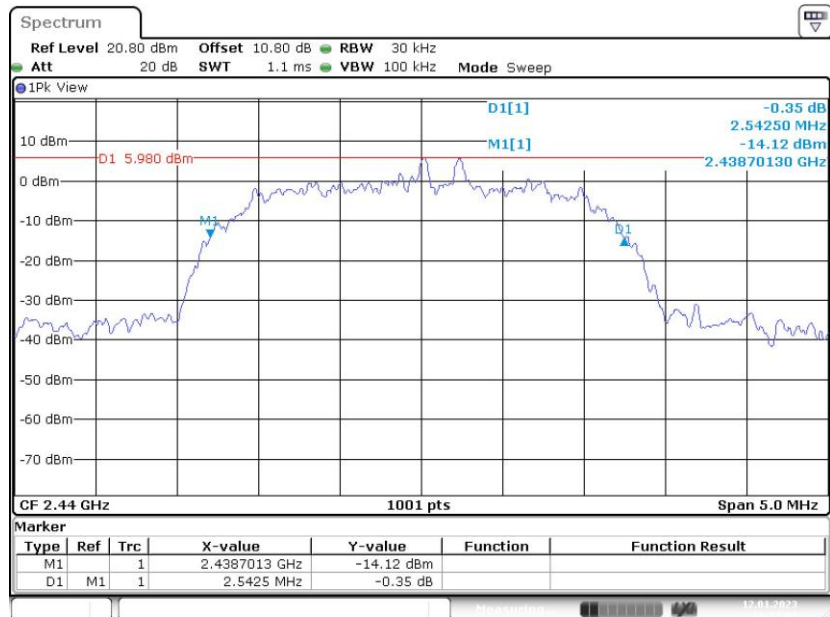
20 dB OBW plots for 2440 MHz, other frequencies measured the same way.

QHS-P2



Date: 12.JAN.2023 18:20:18

QHS-P6



Date: 12.JAN.2023 18:32:01



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99% Occupied bandwidth test results:

QHS P2 99% OBW Summary Table					
Channel	Frequency (MHz)	Mode	Data Rate Mbps	99% OBW (kHz)	Limit NA
Low	2404	QHS P2	2	2370	-
Middle	2440	QHS P2	2	2377	-
High	2478	QHS P2	2	2370	-
QHS P6 99% OBW Summary Table					
Channel	Frequency (MHz)	Mode	Data Rate Mbps	99% OBW (kHz)	Limit NA
Low	2404	QHS P6	6	2370	-
Middle	2440	QHS P6	6	2389	-
High	2478	QHS P6	6	2370	-



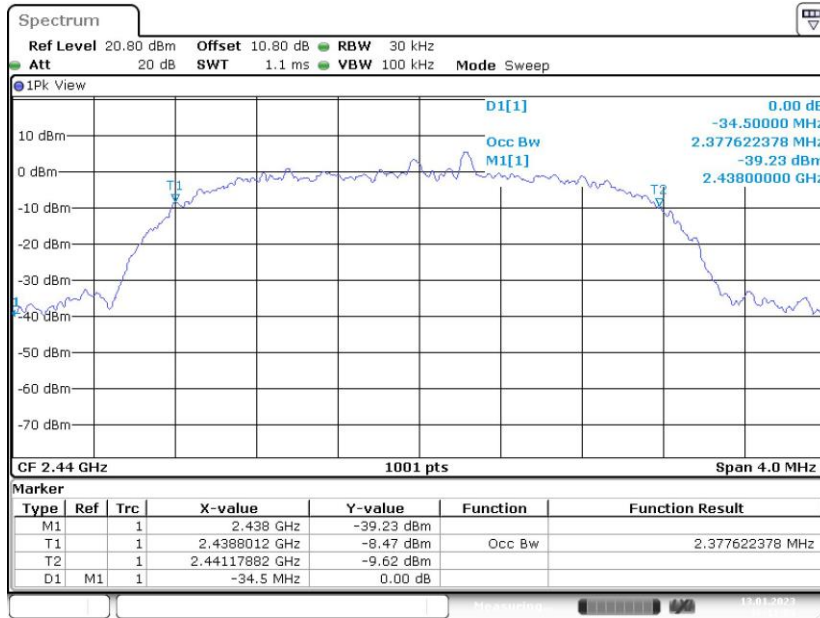
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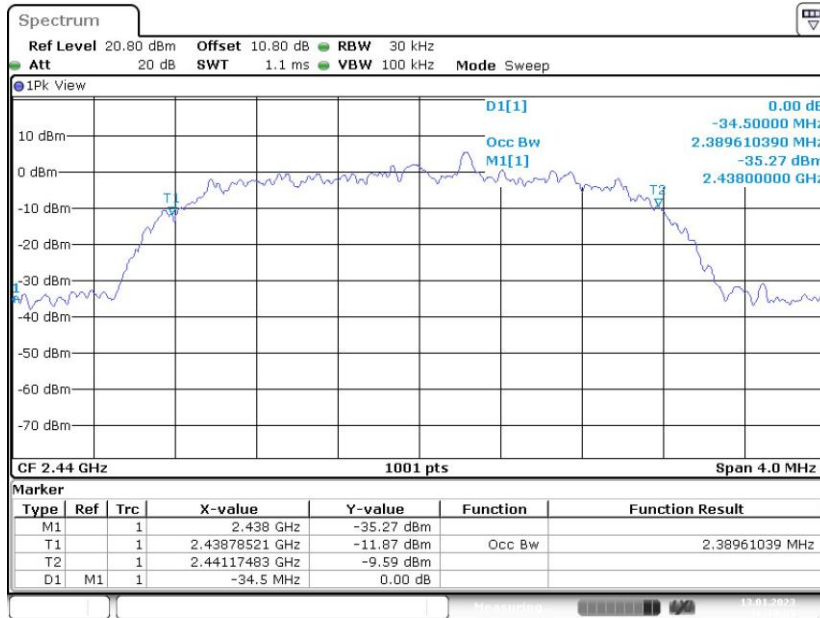
99% OBW plots for 2440 MHz, other frequencies measured the same way.

QHS-P2



Date: 13.JAN.2023 16:11:23

QHS-P6



Date: 13.JAN.2023 16:18:55



7. Conducted Output Power

Requirements:

FCC 15.247 (b) (1)

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

RSS-247 5.4 (b)

For frequency hopping systems operating in the band 2400-2483.5 MHz and employing at least 75 hopping channels, the maximum peak conducted output power shall not exceed 1 W; for all other frequency hopping systems in the band, the maximum peak conducted output power shall not exceed 0.125 W.

The e.i.r.p shall not exceed 4W, except as provide in section 5.4 (e).

In adaptive frequency hopping mode, the number of hopping channels is less than 75 therefore the power limit is 21 dBm.

Maximum antenna gain is 1.1 dBi therefore maximum e.i.r.p will be less than 4W (36 dBm) at the maximum power limit of 21 dBm.

Measurement Method:

ANSI C63.10-2013 Subclause 7.8.5

RSS-Gen Issue 5, 6.12

The EUT is connected to a spectrum analyzer, the 10 dB external pad and test cable loss (0.8 dB) is accounted for using the reference level offset feature of the spectrum analyzer. The reference level offset is set to 10.8 dB.

Conducted output power test results:

Output Power Summary Table							
Channel	Frequency (MHz)	Mode	Data Rate Mbps	Output Power (dBm)	Limit (dB)	Margin (dB)	Result
Low	2404	QHS P2	2	12.73	21	8.27	Pass
Middle	2440	QHS P2	2	12.23	21	8.77	Pass
High	2478	QHS P2	2	12.85	21	8.15	Pass
Output Power Summary Table							
Channel	Frequency (MHz)	Mode	Data Rate Mbps	Output Power (dBm)	Limit (dB)	Margin (dB)	Result
Low	2404	QHS P6	6	12.75	21	8.25	Pass
Middle	2440	QHS P6	6	12.27	21	8.73	Pass
High	2478	QHS P6	6	12.90	21	8.10	Pass



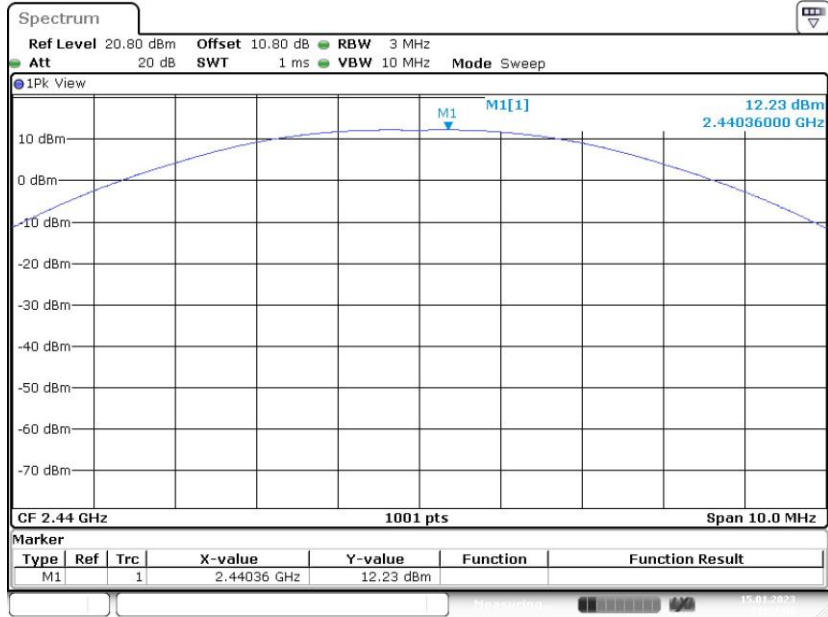
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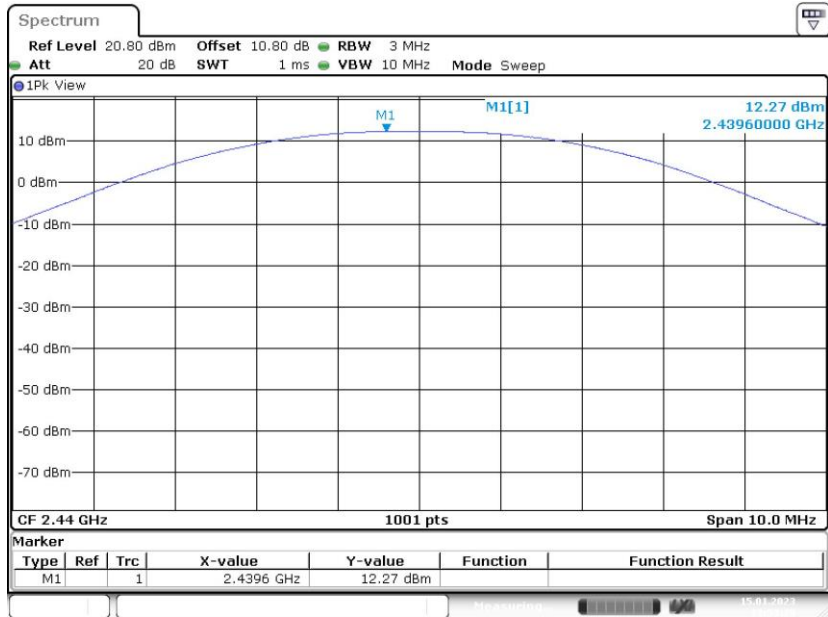
Output power plots for 2440 MHz, other frequencies measured the same way.

QHS-P2



Date: 15.JAN.2023 13:52:07

QHS-P6



Date: 15.JAN.2023 13:59:25



8. Hopping Frequency Separation

Requirements:

FCC 15.247 (a) (1)

RSS-247 5.1 (b)

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.

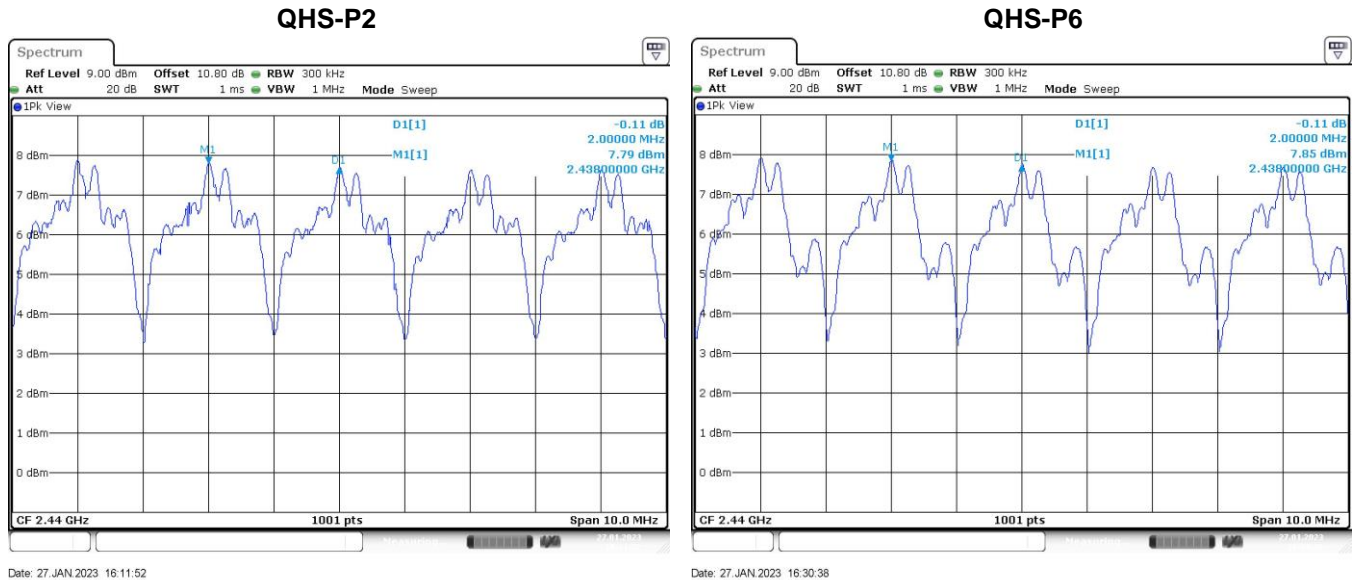
$$2/3 * (2377 \text{ kHz } 20 \text{ dB OBW}) = 1585 \text{ kHz (QHS-P2)}$$

$$2/3 * (2389 \text{ kHz } 20 \text{ dB OBW}) = 1593 \text{ kHz (QHS-P6)}$$

Measurement Method:

ANSI C63.10-2013 Subclause 7.8.2

Hopping frequency separation test results:



Both P2 & P6 modes showed 2 MHz frequency separation > 25 kHz > 2/3 of 20 dB OBW



9. Number of Hopping Channels

Requirements:

FCC 15.247 (a) (1) (iii)

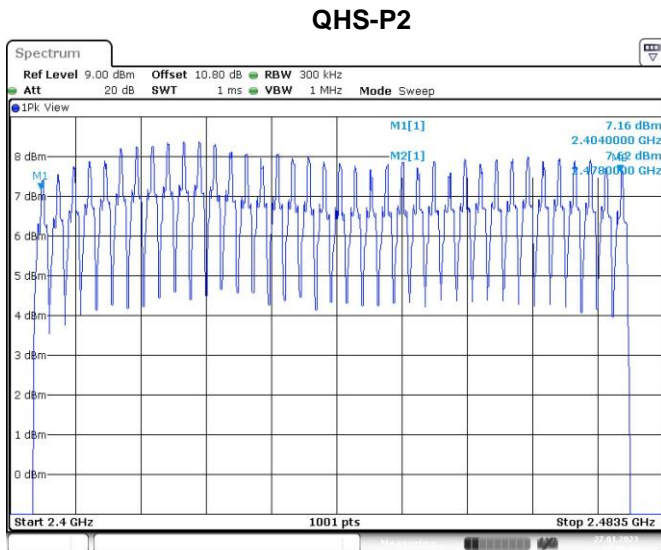
RSS-247 5.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

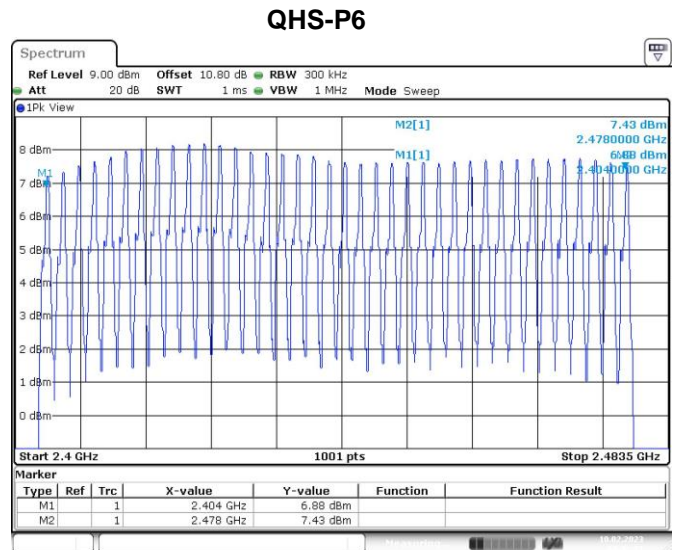
Measurement Method:

ANSI 63.10-2013 Subclause 7.8.3

Number of hopping channels test results:



Date: 27 JAN 2023 17:05:15



Date: 10 FEB 2023 08:42:21

Both QHS-P2 and QHS-P6 use 38 channels > 15 minimum.

Note: 2402 & 2480 MHz channels not used in QHS mode.



10. Average Time of Occupancy

Requirements:

FCC 15.247 (a) (1) (iii)

IC RSS-247 5.1 (d)

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.

Measurement Method

ANSI C63.10-2013 Subclause 7.8.4

Observation time = (38 hopping Channels) * 400mS = 15.2 Seconds.

Average time of occupancy test results:

QHS Hopping mode									
Channel	Frequency (MHz)	Mode	Pulse Width (mS)	Number of pulses in 1.52 S	Number of pulses in 1.52S X 10 = 15.2S	Time of occupancy (Pulse Width X Number of pulses) (mS)	Limit (mS)	Margin (mS)	Result
Middle	2440	QHS-P2	4.201	8	80	336.1	400	63.9	Pass
Middle	2440	QHS-P6	1.446	15	150	216.9	400	183.1	Pass

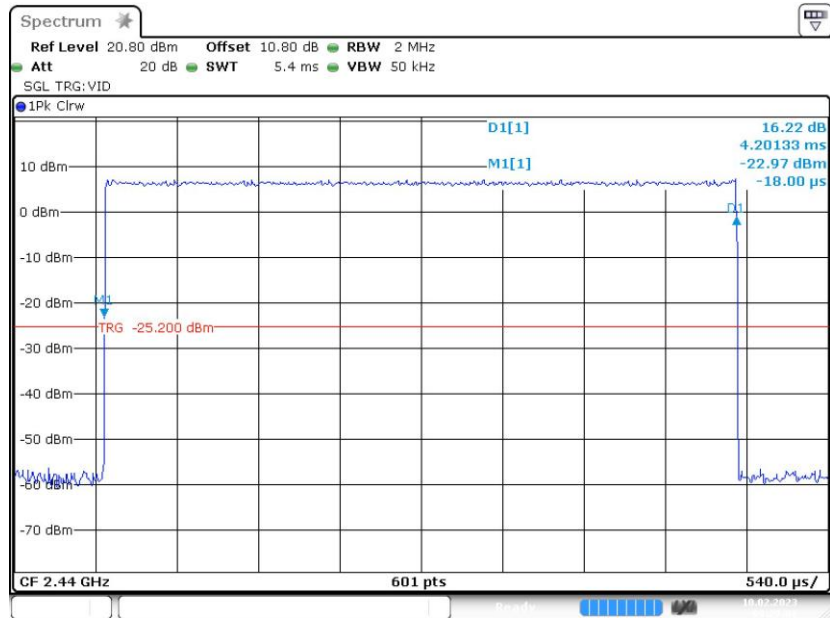


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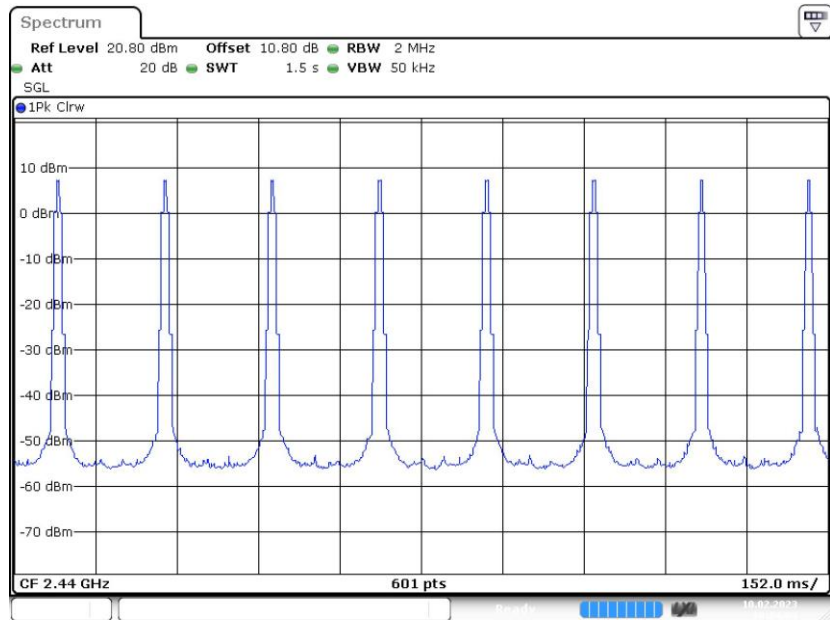


QHS-P2 Pulse width



Date: 10.FEB.2023 09:27:03

QHS-P2 Pulse count = 8



Date: 10.FEB.2023 10:24:03

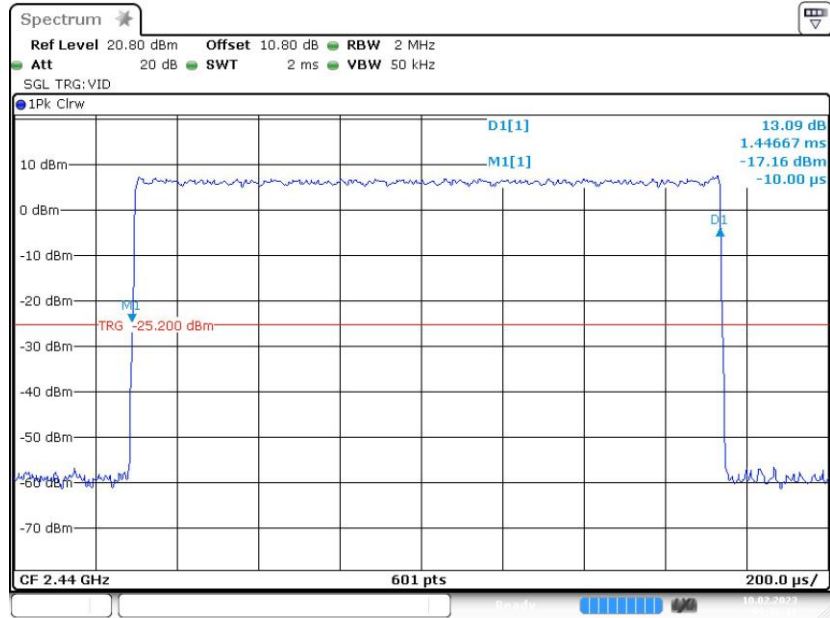


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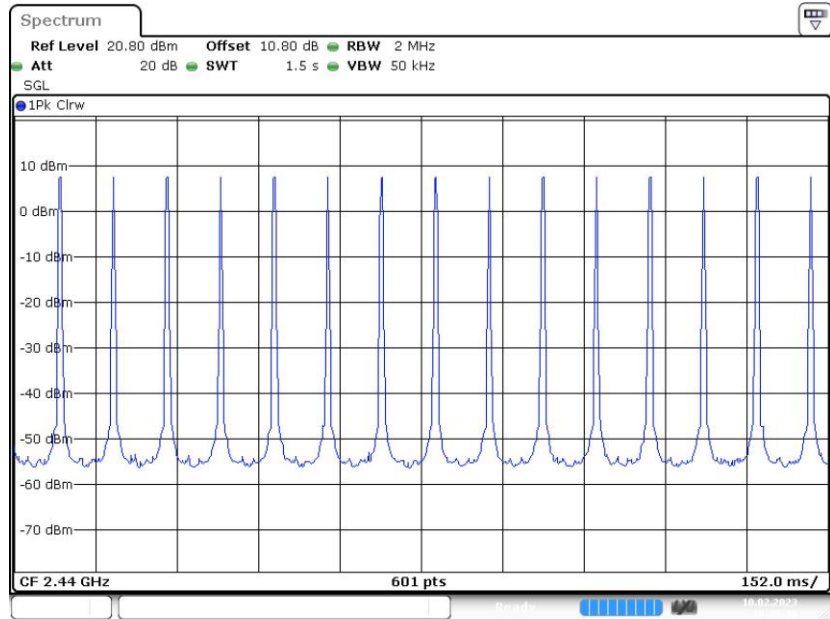
FCC ID: A94440108 IC: 3232A-440108



QHS-P6 Pulse width



QHS-P6 Pulse count = 15





11. Conducted Spurious Emissions

Requirements:

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)).

IC RSS-247 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 A8.4 (4), 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.

Note: Antenna gain outside of the wanted band was assumed to be zero. The conducted spurious readings are for additional information as the radiated readings take precedence.

Measurement Method:

ANSI C63.10-2013 Subclauses 6.10.4, 7.8.8

The EUT was tested at the maximum power setting for each mode.

Note analyzer marker search limit featured used to block out peak search from finding in band emissions.

The EUT is connected to a spectrum analyzer, the 10 dB external pad and test cable loss (0.8 dB) is accounted for using the reference level offset feature of the spectrum analyzer. The reference level offset is set to 10.8 dB.

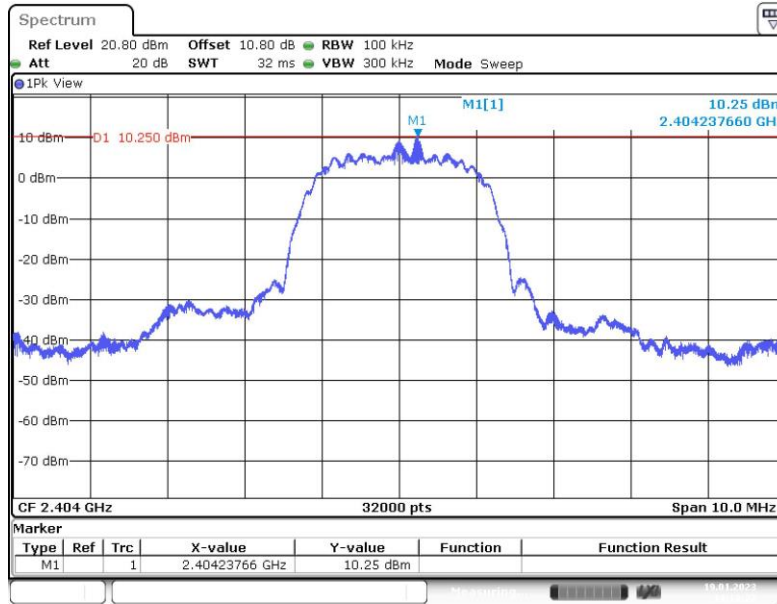
Auto sweep mode was used on the spectrum analyzer for the following measurements.

Conducted spurious emissions test results:

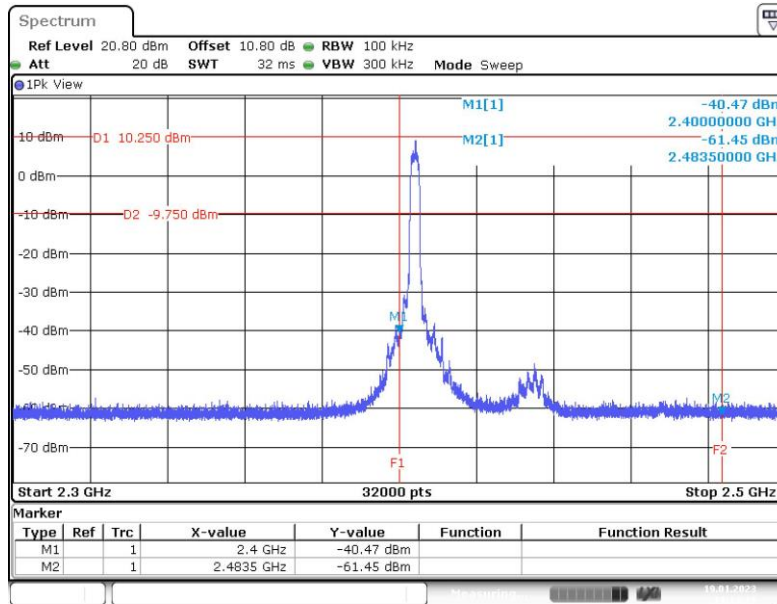
QHS-P2 Low Channel

CH1 (2404 MHz) (Non-Hopping Mode)

D1 = reference3 peak of fundamental



Date: 19 JAN 2023 14:10:27



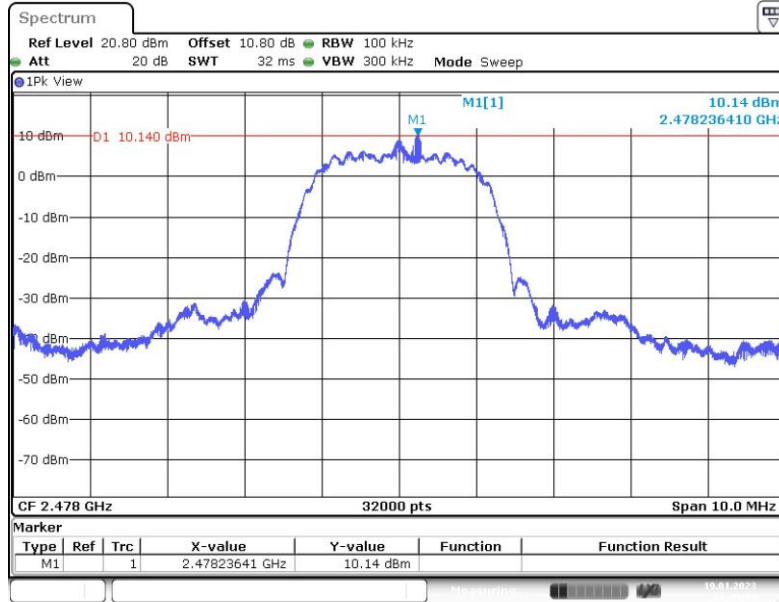
Date: 19 JAN 2023 14:13:15

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
Emissions are more than 20 dBc, pass.

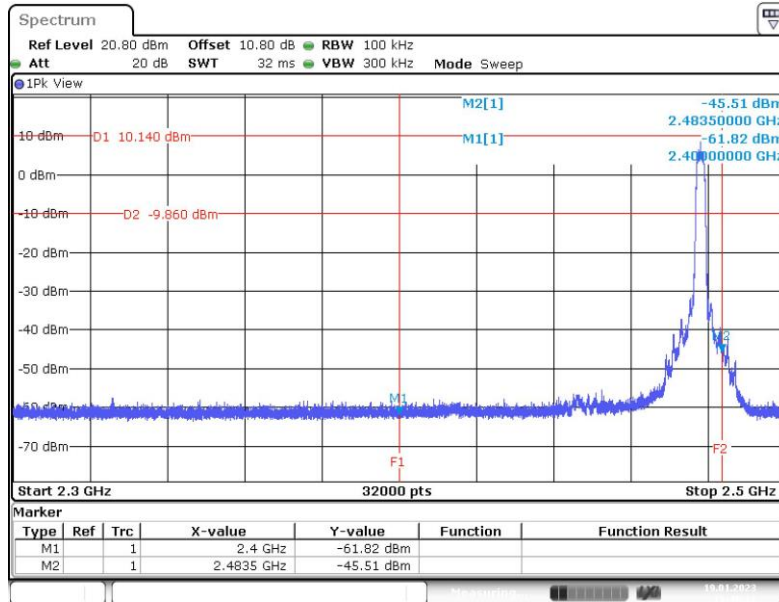
QHS-P2 High Channel

CH38 (2478 MHz) (Non-Hopping Mode)

D1 = reference3 peak of fundamental



Date: 19.JAN.2023 15:45:15



Date: 19.JAN.2023 15:48:12

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
 Emissions are more than 20 dBc, pass.



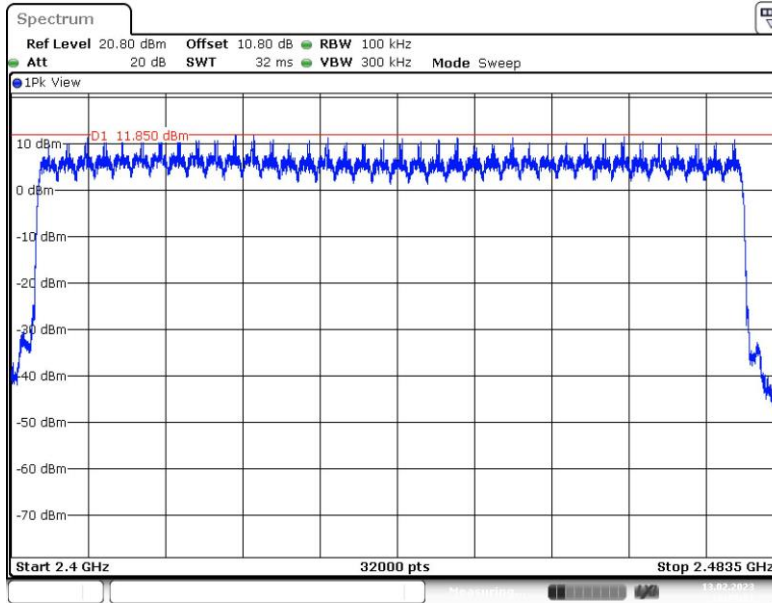
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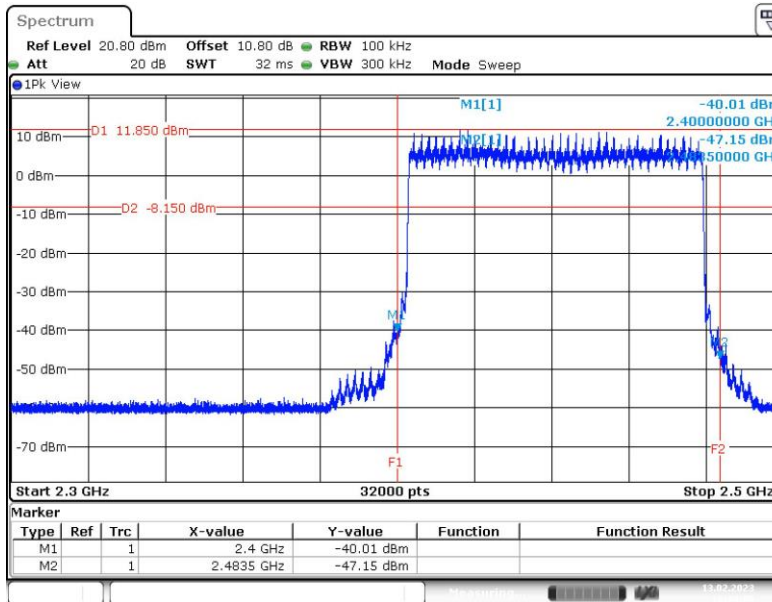


QHS-P2 Hopping mode

D1 = reference peak of fundamental



Date: 13.FEB.2023 16:24:52



Date: 13.FEB.2023 16:34:09

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
Emissions are more than 20 dBc, pass.



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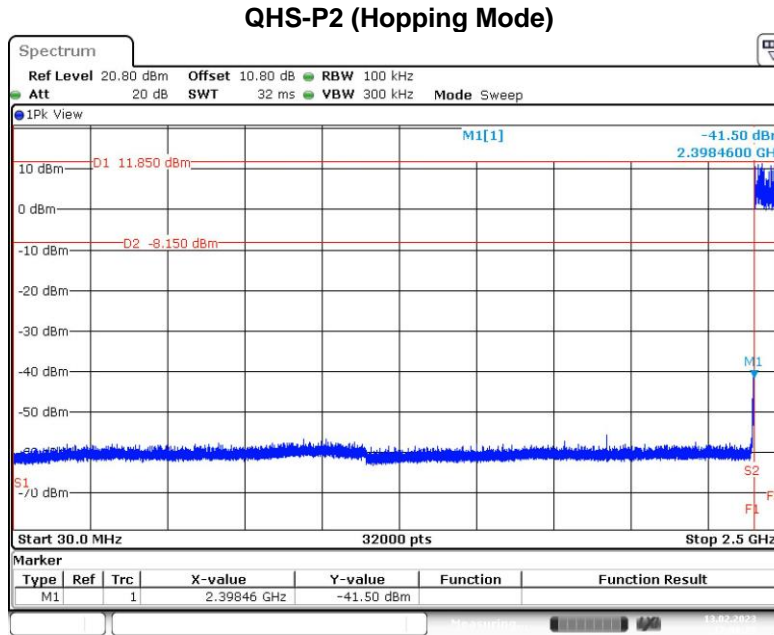


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Conducted spurious emissions, 30 MHz to 2.5GHz

Marker search limits: S1 = 30 MHz, S2 = 2400 MHz
 F1 = 2400 MHz, F2 = 2483.5 MHz

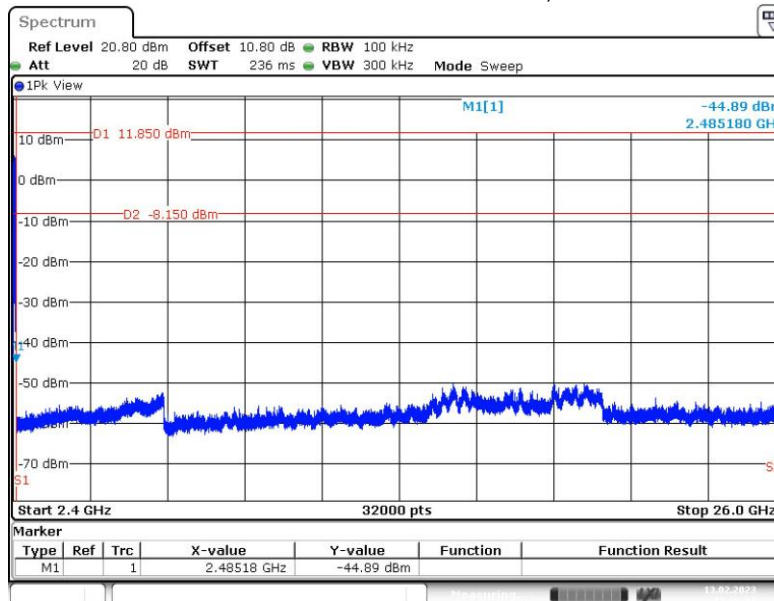
Note: In band peak power reference based on previous measurement for the same channel and mode.



Date: 13.FEB.2023 17:08:24

Conducted spurious emissions, 2400 MHz to 26 GHz

Marker search limits: S1 = 2483.5 MHz, S2 = 26 GHz.



Date: 13.FEB.2023 17:16:11

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
 Emissions are more than 20 dBc, pass.



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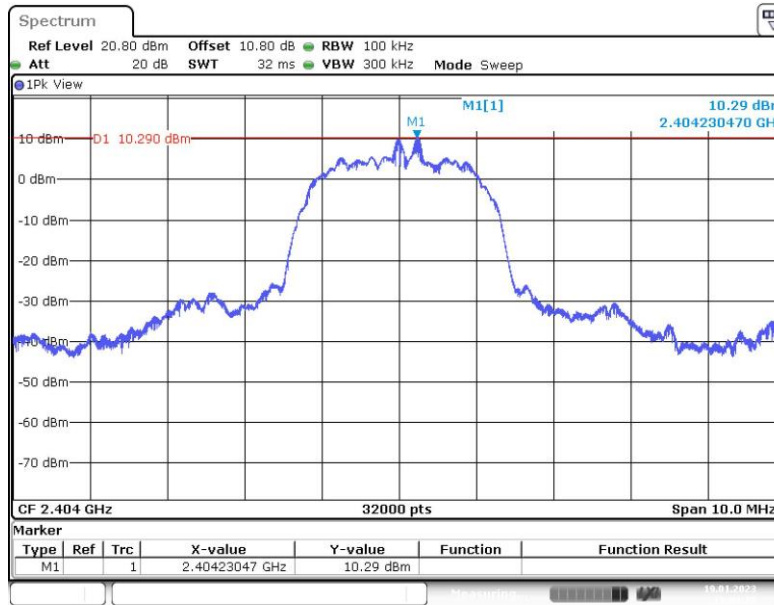
FCC ID: A94440108 IC: 3232A-440108



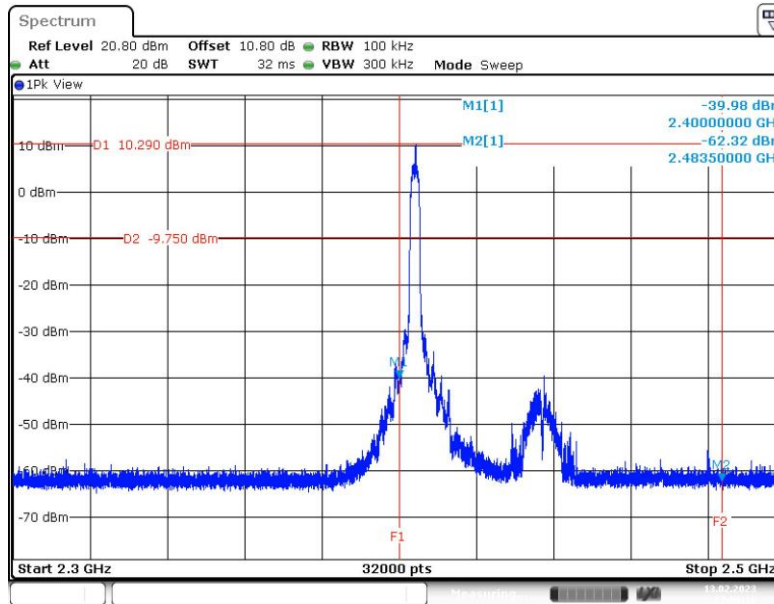
QHS-P6 Low Channel

CH1 (2404 MHz) (Non-Hopping Mode)

D1 = reference3 peak of fundamental



Date: 19.JAN.2023 15:03:28



Date: 13.FEB.2023 13:50:17

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
Emissions are more than 20 dBc, pass.



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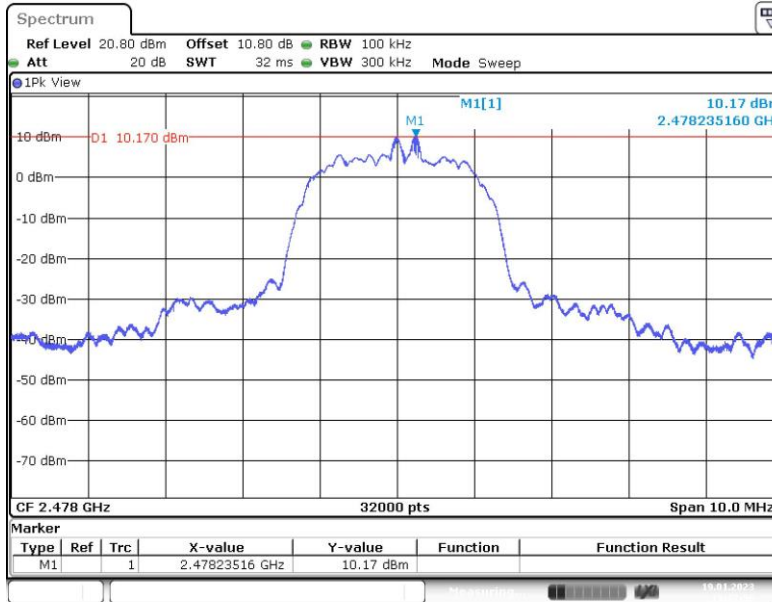
FCC ID: A94440108 IC: 3232A-440108



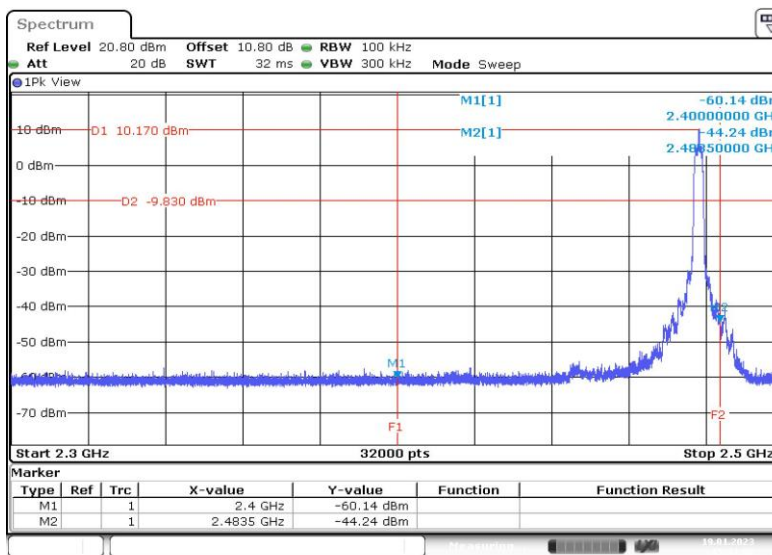
QHS-P6 High Channel

CH38 (2478 MHz) (Non-Hopping Mode)

D1 = reference3 peak of fundamental



Date: 19 JAN 2023 15:27:56



Date: 19 JAN 2023 15:31:02

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
Emissions are more than 20 dBc, pass.



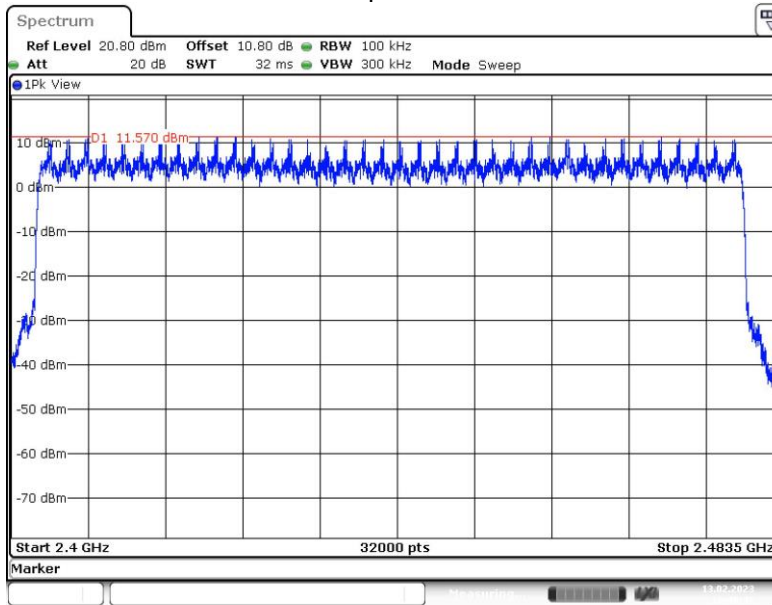
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Wireless Transceiver Bluetooth QHS Mode Test Report

FCC ID: A94440108 IC: 3232A-440108

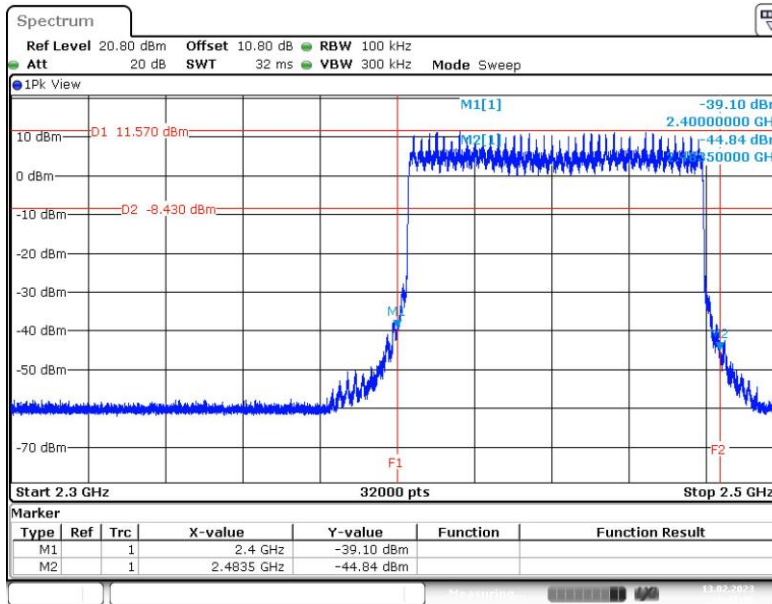


QHS-P6 Hopping mode

D1 = reference peak of fundamental



Date: 13.FEB.2023 16:40:43



Date: 13.FEB.2023 16:47:04

F1 = 2400 MHz, F2 = 2483.5 MHz (In band), D2 is at 20 dBc
Emissions are more than 20 dBc, pass.



PRODUCT ASSURANCE ENGINEERING
Wireless Transceiver Bluetooth QHS Mode Test Report

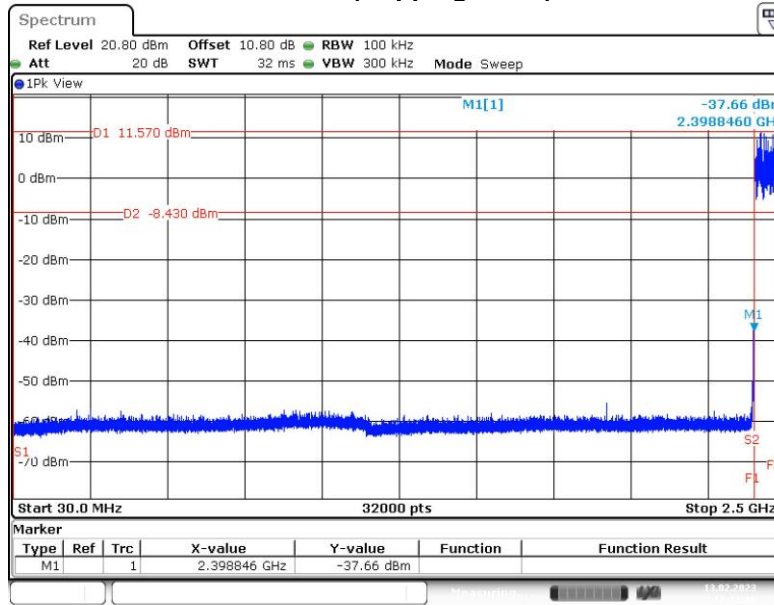
FCC ID: A94440108 IC: 3232A-440108



Conducted spurious emissions, 30 MHz to 2.5GHz

Marker search limits: S1 = 30 MHz, S2 = 2400 MHz

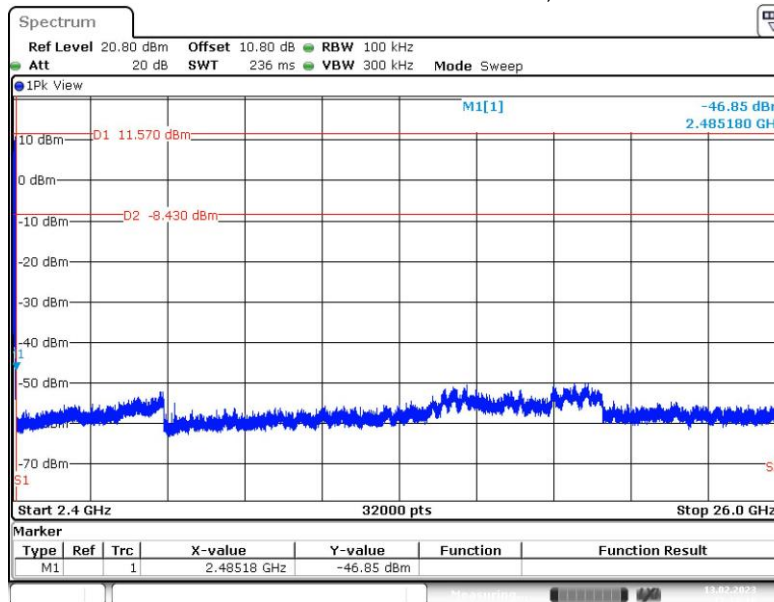
QHS-P6 (Hopping Mode)



Date: 13.FEB.2023 17:11:18

Wideband conducted spurious emissions, 2400 MHz to 26 GHz

Marker search limits: S1 = 2483.5 MHz, S2 = 26 GHz.



Date: 13.FEB.2023 17:18:18

Emissions are more than 20 dBc, pass.



PRODUCT ASSURANCE ENGINEERING
Wireless Transceiver Bluetooth QHS Mode Test Report

FCC ID: A94440108 IC: 3232A-440108



Conducted Spurious Harmonics (Pre-Screen)

Analyzer settings: RBW = 1 MHz, VBW = 3 MHz, Span = 50 MHz, **Peak Detector**, ATTN = 0 dB
Auto sweep time, Trace Max hold for 3 seconds

Reference level offset on analyzer set to 10.8 dB to account for 10 dB pad and 0.8 dB SMA test cable loss.

Setup: EUT output => 10 dB Pad => 2.4 GHz notch filter input, 2.4 GHz notch filter output => analyzer input.

Using if peak value is below the average conducted limit of -41 dBm then it is considered passing. This is a more stringent requirement than using the equivalent conducted peak limit of -21 dBm. The average conducted limit is derived from the 54 dBuV/m radiated limit at 3 meters minus a 95.2 dB correction factor which equals -41 dBm based on 0 dBi out of band EUT antenna gain. Note maximum in-band antenna gain is 1.1 dBi.

Note: Radiated emissions are the preferred method and will be shown later in this report.

Conducted Spurious Harmonics Summary Table (QHS P2)

Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P2	1	2404	2404.3	-49.6	NA	NA	NA
QHS P2	2	4808	4830.7	-65.4	-41	24.4	Pass
QHS P2	3	7212	7212.8	-56.7	-41	15.7	Pass
QHS P2	4	9616	9617.0	-56.1	-41	15.1	Pass
QHS P2	5	12020	12018.5	-56.0	-41	15.0	Pass
QHS P2	6	14424	14423.2	-64.5	-41	23.5	Pass
QHS P2	7	16828	16825.2	-61.9	-41	20.9	Pass
QHS P2	8	19232	19234.1	-57.9	-41	16.9	Pass
QHS P2	9	21636	21633.5	-64.4	-41	23.4	Pass
QHS P2	10	24040	24018.4	-65.2	-41	24.2	Pass
Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P2	1	2440	2441.0	-46.2	NA	NA	NA
QHS P2	2	4880	4888.6	-65.4	-41	24.4	Pass
QHS P2	3	7320	7323.5	-59.2	-41	18.2	Pass
QHS P2	4	9760	9764.5	-56.4	-41	15.4	Pass
QHS P2	5	12200	12204.8	-51.1	-41	10.1	Pass
QHS P2	6	14640	14646.1	-63.8	-41	22.8	Pass
QHS P2	7	17080	17093.1	-62.4	-41	21.4	Pass
QHS P2	8	19520	19527.4	-57.4	-41	16.4	Pass
QHS P2	9	21960	21958.6	-64.4	-41	23.4	Pass
QHS P2	10	24400	24409.6	-64.8	-41	23.8	Pass
Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P2	1	2478	2477.6	-43.8	NA	NA	NA
QHS P2	2	4956	4943.4	-64.8	-41	23.8	Pass
QHS P2	3	7434	7434.8	-61.7	-41	20.7	Pass
QHS P2	4	9912	9910.8	-54.6	-41	13.6	Pass
QHS P2	5	12390	12391.4	-52.7	-41	11.7	Pass
QHS P2	6	14868	14866.0	-64.4	-41	23.4	Pass
QHS P2	7	17346	17347.1	-62.1	-41	21.1	Pass
QHS P2	8	19824	19825.7	-58.6	-41	17.6	Pass
QHS P2	9	22302	22284.1	-64.7	-41	23.7	Pass
QHS P2	10	24780	24781.5	-65.0	-41	24.0	Pass



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Wireless Transceiver Bluetooth QHS Mode Test Report

FCC ID: A94440108 IC: 3232A-440108



Conducted Spurious Harmonics Summary Table (QHS P6)

Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P6	1	2404	2404.6	-49.6	NA	NA	NA
QHS P6	2	4808	4812.6	-65.2	-41	24.2	Pass
QHS P6	3	7212	7212.0	-56.9	-41	15.9	Pass
QHS P6	4	9616	9616.8	-56.3	-41	15.3	Pass
QHS P6	5	12020	12018.4	-56.3	-41	15.3	Pass
QHS P6	6	14424	14409.3	-64.4	-41	23.4	Pass
QHS P6	7	16828	16827.9	-62.4	-41	21.4	Pass
QHS P6	8	19232	19231.9	-58.4	-41	17.4	Pass
QHS P6	9	21636	21635.1	-64.2	-41	23.2	Pass
QHS P6	10	24040	24025.3	-65.3	-41	24.3	Pass
Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P6	1	2440	2440.3	-46.2	NA	NA	NA
QHS P6	2	4880	4890.5	-65.7	-41	24.7	Pass
QHS P6	3	7320	7320.0	-59.5	-41	18.5	Pass
QHS P6	4	9760	9759.6	-56.4	-41	15.4	Pass
QHS P6	5	12200	12198.4	-51.3	-41	10.3	Pass
QHS P6	6	14640	14639.8	-64.6	-41	23.6	Pass
QHS P6	7	17080	17077.2	-61.9	-41	20.9	Pass
QHS P6	8	19520	19519.9	-57.3	-41	16.3	Pass
QHS P6	9	21960	21981.7	-64.8	-41	23.8	Pass
QHS P6	10	24400	24376.3	-64.6	-41	23.6	Pass
Mode	Harmonic	CF (MHz)	Measured Frequency (MHz)	Max Peak Conducted (dBm)	Limit (dBm)	Margin (dB)	Test Results (P/F)
QHS P6	1	2478	2477.6	-43.7	NA	NA	NA
QHS P6	2	4956	4934.0	-64.4	-41	23.4	Pass
QHS P6	3	7434	7434.8	-62.1	-41	21.1	Pass
QHS P6	4	9912	9911.9	-54.7	-41	13.7	Pass
QHS P6	5	12390	12391.3	-52.7	-41	11.7	Pass
QHS P6	6	14868	14870.9	-64.4	-41	23.4	Pass
QHS P6	7	17346	17345.9	-62.1	-41	21.1	Pass
QHS P6	8	19824	19821.8	-58.7	-41	17.7	Pass
QHS P6	9	22302	22319.8	-65.3	-41	24.3	Pass
QHS P6	10	24780	24801.6	-65.6	-41	24.6	Pass



12. Radiated Emissions 1 GHz to 25 GHz

Requirement:

FCC 15.205, 15.209, 15.247 (d)

RSS-GEN Clause 8.9 (Transmitter)

Measurement Method:

ANSI C63.10-2013 6.3 to 6.6 (6.10.5 restricted band edge)
RSS-Gen 6.13

ANSI C63.10-2013 4.1.4.2.3

Reduced video bandwidth method used for making average measurements for lower and upper adjacent restricted bands. Note: The procedure listed in ANSI C63.10-2013 footnote **23** on page 28 was used to demonstrate that the proper analyzer settings were used for an average measurement using reduced video bandwidth method. The result was -6 dB different between peak using VBW = 3 MHz and average using VBW = 1 Hz.

For radiated emissions above 1 GHz the EUT is positioned 1.5m off the ground plane.
The EUT was tested in three orientations per ANSI C63.10-2013 6.3.1.
The EUT was tested at the maximum power setting for each mode.

For emissions **other** than the lower and upper adjacent restricted bands a 2.4 GHz notch filter is used between the measurement horn antenna and measurement preamp to prevent overload to the preamp due to the EUT fundamental.
The restricted band edge measurement is done using high dynamic range preamp.

Reference: ANSI C63.10-2013 6.6.4.1:

Install an appropriate filter at the input of the measurement system power amplifier. This filter shall attenuate the fundamental emission of the EUT and allow an accurate measurement of the associated harmonics and spurious emissions. The filter shall be characterized, and any attenuation/loss factors shall be accounted for in the measurement results.

EUT was evaluated in **3 orientations with vertical orientation being worst case** showing the highest emissions.

Radiated emission measurements performed using both horizontal and vertical measurement antenna polarizations with worst case highest emission being with **vertical** antenna polarization.

Spectrum analyzer auto sweep mode used on the following plots.

For lower restricted band:

Marker search limits used: Left S1 = 2310 MHz, Right S2 = 2390 MHz
F1 = 2310 MHz, F2 = 2390 MHz

For higher restricted band:

Marker search limits used: Left S1 = 2483.5 MHz, Right S2 = 2500 MHz
F1 = 2483.5 MHz, F2 = 2500 MHz

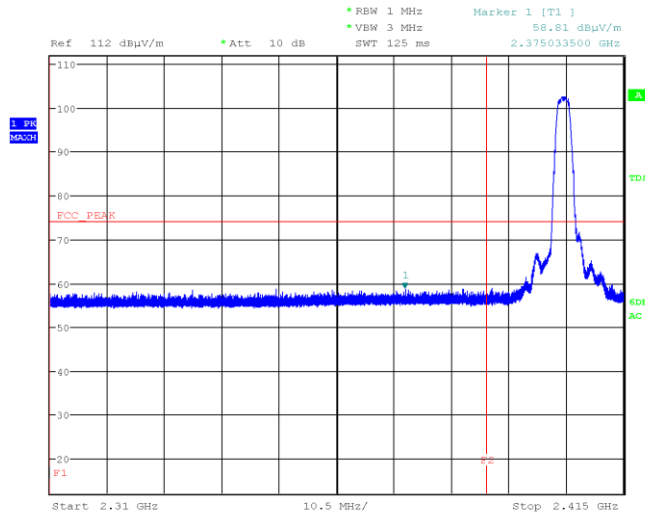
Radiated emissions 1 GHz to 25 GHz test results:

The following radiated measurements are done at a 3 meter distance.

Emissions were measured using both vertical and horizontal antenna polarizations with vertical polarization being worst case.

Lower restricted band; QHS-P2 (CH1, 2404 MHz)

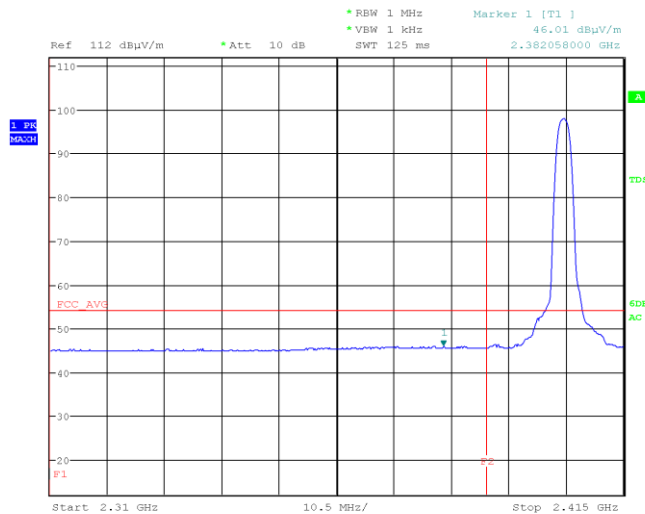
Peak detector; Peak emissions are below the peak limit.



Date: 11.MAY.2023 10:03:21

Average measurement using reduced video bandwidth of 1 kHz.

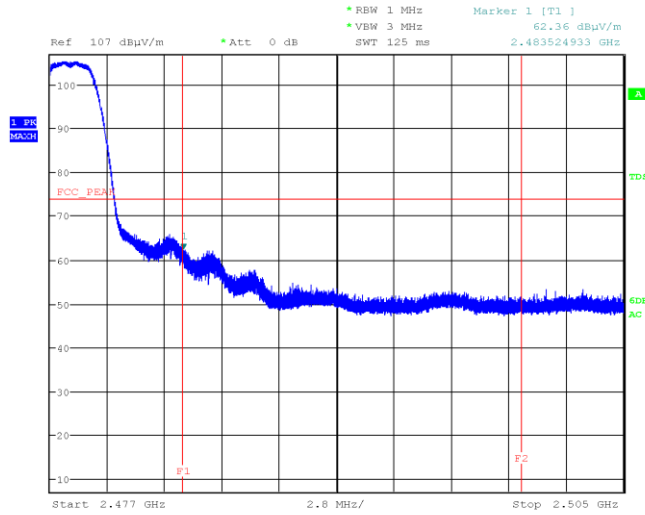
Emissions are below average limit.



Date: 11.MAY.2023 10:05:34

Upper restricted band; QHS-P2 (CH38, 2478 MHz)

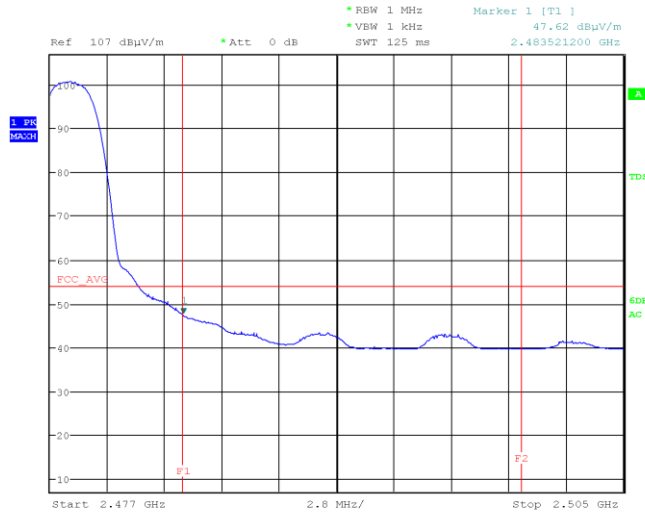
Peak detector; Peak emissions are below the peak limit.



Date: 16.MAY.2023 08:57:58

Average measurement using reduced video bandwidth of 1 kHz.

Emissions are below average limit.



Date: 16.MAY.2023 09:00:49

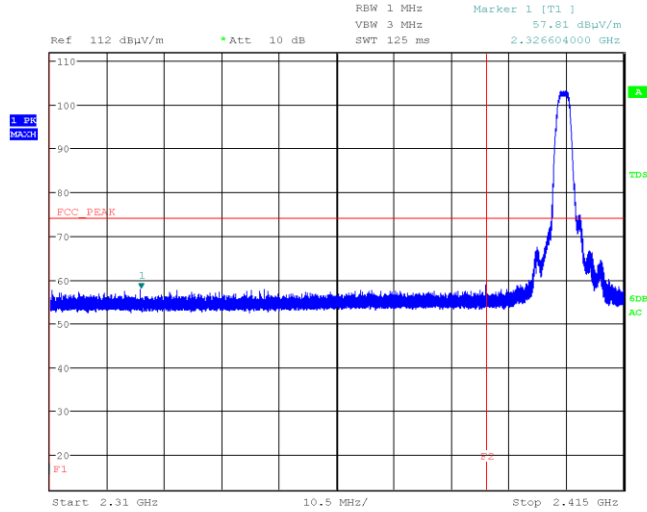


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Lower restricted band; QHS-P6 (CH1, 2404 MHz)

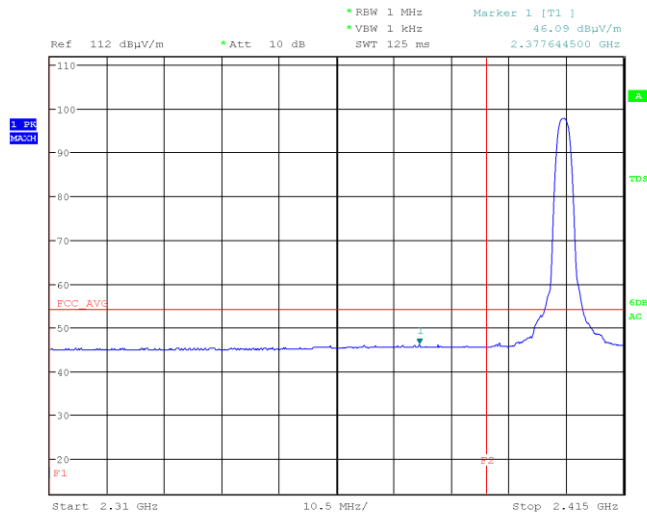
Peak detector; Peak emissions are below the peak limit.



Date: 9.MAY.2023 14:17:31

Average measurement using reduced video bandwidth of 1 kHz.

Emissions are below average limit.



Date: 11.MAY.2023 10:10:54

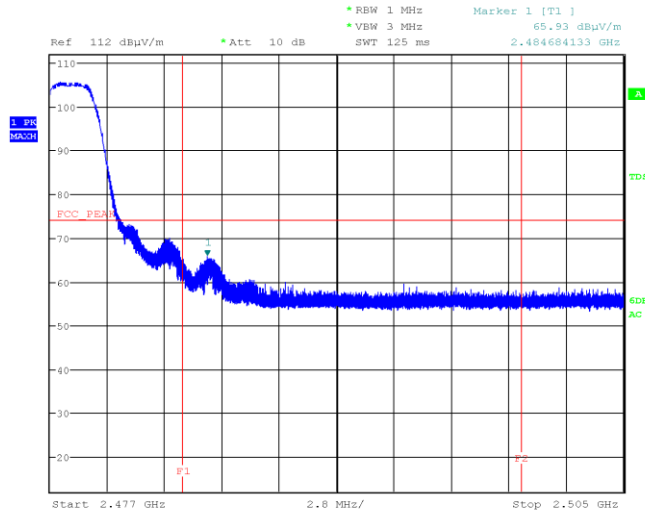


PRODUCT ASSURANCE ENGINEERING Wireless Transceiver DSS Test Report



Upper restricted band; QHS-P6 (CH38, 2478 MHz)

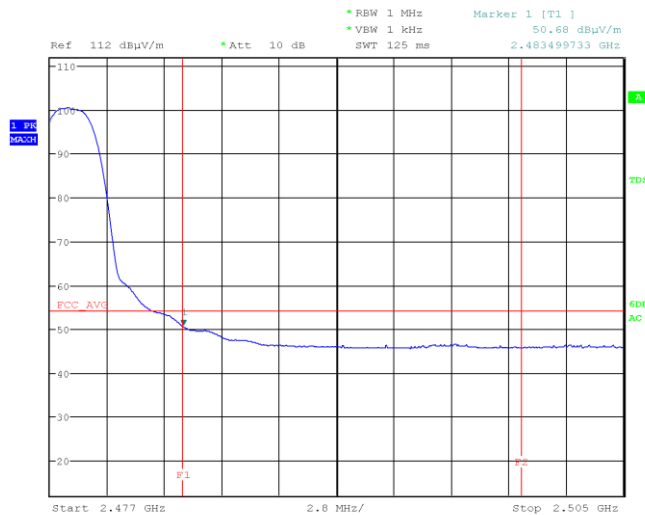
Peak detector; Peak emissions are below the peak limit.



Date: 11.MAY.2023 10:50:16

Average measurement using reduced video bandwidth of 1 kHz.

Emissions are below average limit.



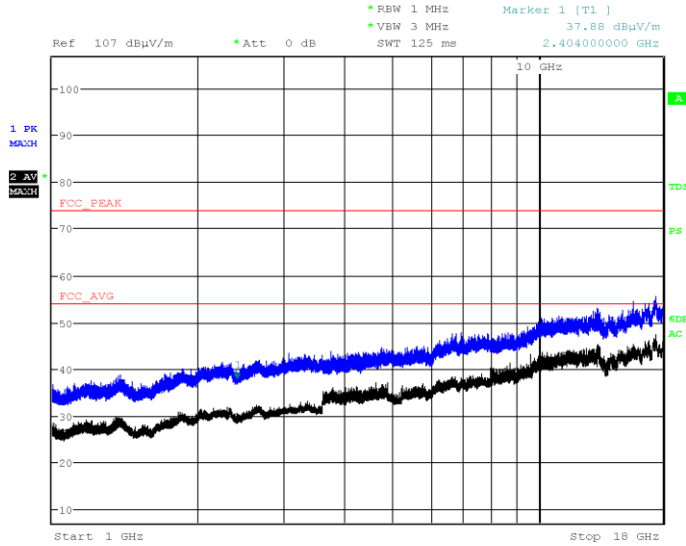
Date: 11.MAY.2023 10:48:02

Radiated emissions 1 GHz to 18 GHz

Measurements made at a 3 meter distance.

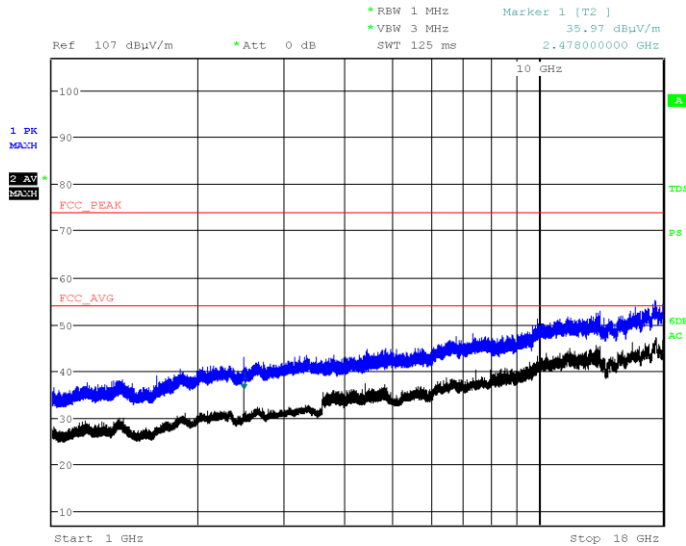
Blue trace is peak detector; black trace is average detector. (30,000 sweep points)
Measurement noise floor more than 6 dB below the respective limits

Low Channel CH1 (2404 MHz) QHS-P2



Date: 21.FEB.2023 13:51:40

High Channel CH38 (2478 MHz) QHS-P2



Date: 21.FEB.2023 14:14:56

Emissions are below their respective limits, pass

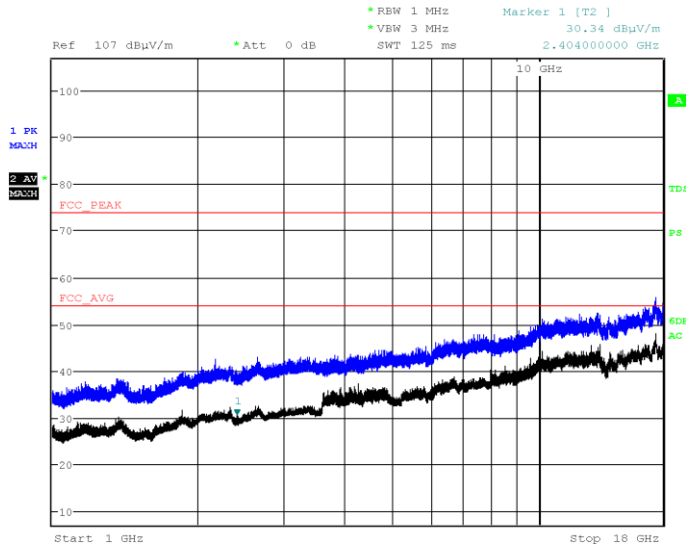
Fundamental emission is attenuated by approximately 60 dB due to the usage of a 2.4 GHz notch filter.



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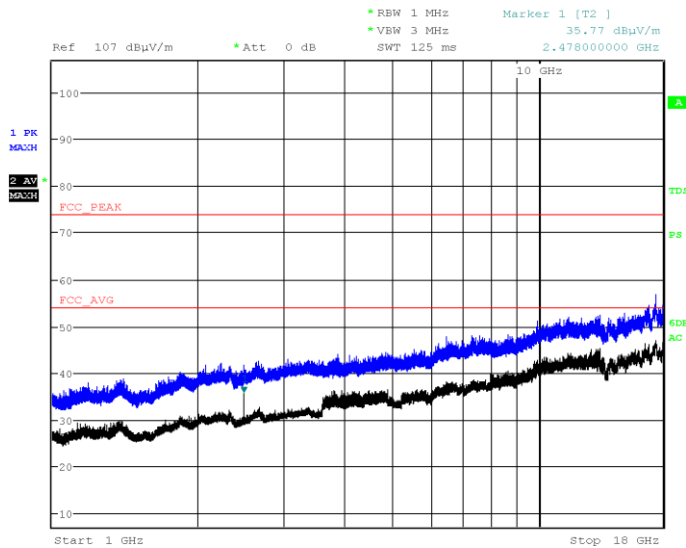


Low Channel CH1 (2404 MHz) QHS-P6



Date: 21.FEB.2023 14:30:02

High Channel CH38 (2478 MHz) QHS-P6



Date: 21.FEB.2023 14:47:48

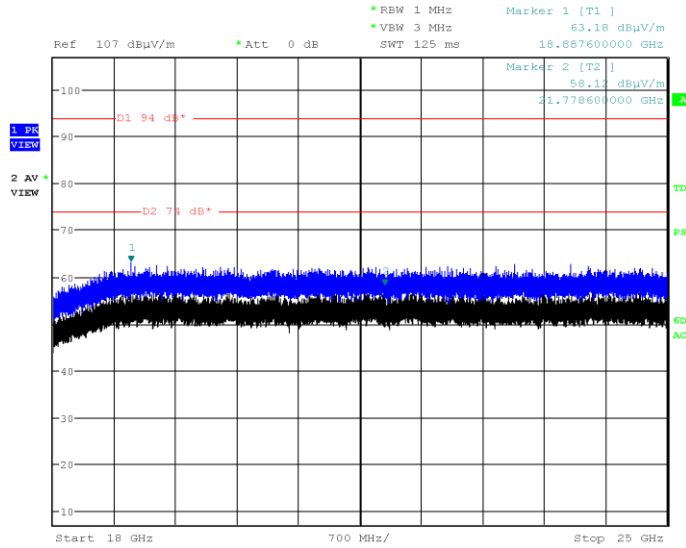
Emissions are below their respective limits, pass.

Fundamental emission is attenuated by approximately 60 dB due to the usage of a 2.4 GHz notch filter.

Radiated emissions 18 GHz to 25 GHz at 30 centimeter distance.

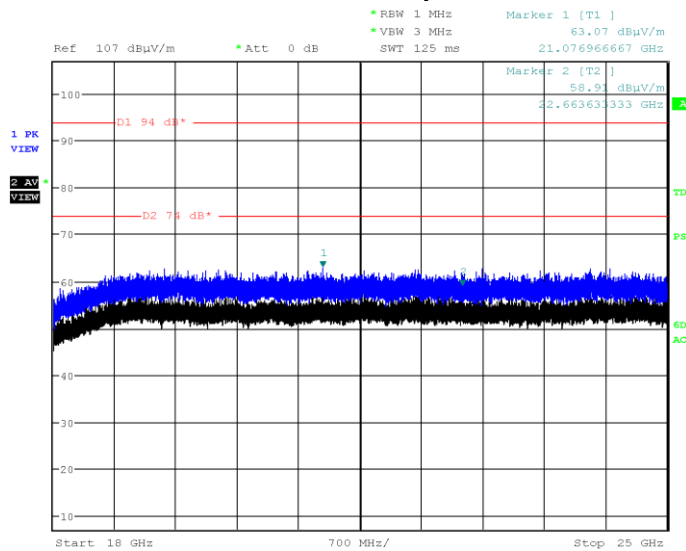
Distance is 30cm (0.3 meters), Limit lines settings based on scaling of $20\text{Log}(D1/D2) = 20\text{Log}(3\text{m}/0.3) = 20\text{Log}(10) = 20 \text{ dB}$
 Peak limit = $74 + 20 = 94 \text{ dBuV/m}$ (Display line 1)
 Average limit = $54 + 20 = 74 \text{ dBuV/m}$ (Display line 2)

**QHS-P2, CH1 = 2404 MHz @ 30cm distance.
 Measurement horn antenna polarization = Vertical**



Date: 7.MAR.2023 12:09:55

**QHS-P2, CH1 = 2404 MHz @ 30cm distance.
 Measurement horn antenna polarization = Horizontal**



Date: 7.MAR.2023 12:48:26

Peak emissions below the average limit.

The following table summarizes radiated emissions for LMH Channels for QHS-P2 and QH/S-P6.

Plots for other frequencies are similar to plots above and will not be shown.

Radiated Emissions 18 to 25 GHz @ 30cm distance.

Mode	Channel Frequency (MHz)	18 GHz to 25 GHz @ 30 centimeter distance								Measurement Antenna Polarization
		Emission Frequency Average (MHz)	Emission Frequency Peak (MHz)	Measured Amplitude	Measured Amplitude	FCC 15.247 (d)				
				(dB μ V/m)	(dB μ V/m)	Limit	Limit	Margin	Margin	
				AVG	Peak	AVG	Peak	AVG	Peak	
QHS-P2	2404	21778.0	18887.0	58.10	63.20	74.0	94.0	15.9	30.8	Vertical
QHS-P2	2404	22663.0	21077.0	58.90	63.10	74.0	94.0	15.1	30.9	Horizontal
QHS-P2	2440	24123.0	20447.0	57.70	67.80	74.0	94.0	16.3	26.2	Vertical
QHS-P2	2440	21795.0	22519.0	58.90	63.10	74.0	94.0	15.1	30.9	Horizontal
QHS-P2	2478	22027.0	21533.0	58.10	63.70	74.0	94.0	15.9	30.3	Vertical
QHS-P2	2478	21474.0	18773.0	58.90	63.50	74.0	94.0	15.1	30.5	Horizontal
QHS-P6	2404	21556.0	24627.0	59.20	63.60	74.0	94.0	14.8	30.4	Vertical
QHS-P6	2404	20188.0	19110.0	58.10	63.20	74.0	94.0	15.9	30.8	Horizontal
QHS-P6	2440	19352.0	20363.0	58.40	63.50	74.0	94.0	15.6	30.5	Vertical
QHS-P6	2440	24384.0	22569.0	58.10	63.20	74.0	94.0	15.9	30.8	Horizontal
QHS-P6	2478	23965.0	24650.0	58.30	63.60	74.0	94.0	15.7	30.4	Vertical
QHS-P6	2478	24589.0	21397.0	57.60	63.30	74.0	94.0	16.4	30.7	Horizontal

Emissions are more than 10 dB below their respective limits.

13. Radiated Emissions 30 MHz to 1 GHz

Requirement:

FCC 15.205, 15.209

RSS-Gen Clause 8.9

Measurement Method:

ANSI C63.10-2013 Subclause 6.5

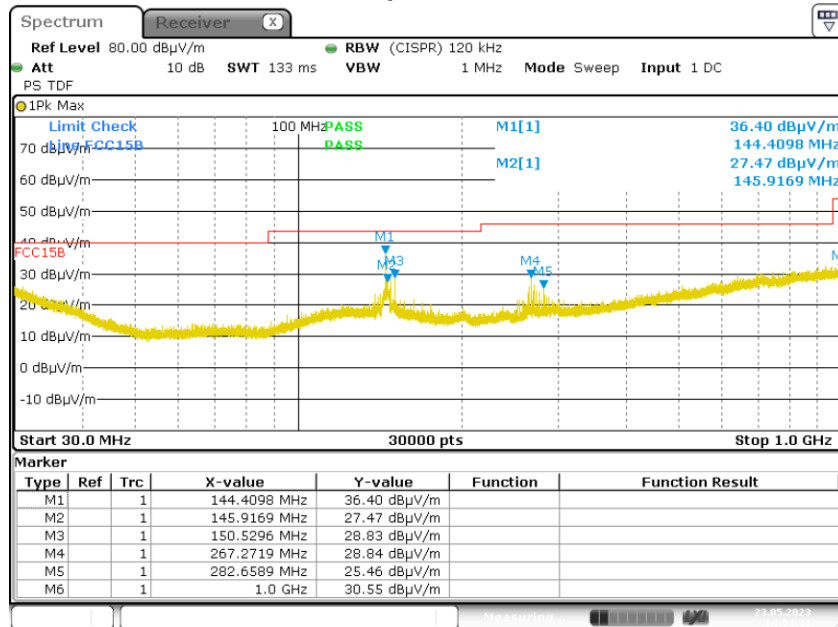
EUT on wooden table 80cm off ground plane.

Radiated emissions below 1 GHz test results:

Bluetooth mode: Playing maximum volume pink noise via Bluetooth connection from iPod.

EUT tested in 3 different orientations with and without cables attached with worst case orientation being EUT facing down on turn table without cables attached. See separate test setup photos document for details.

Horizontal antenna polarization is worst case.



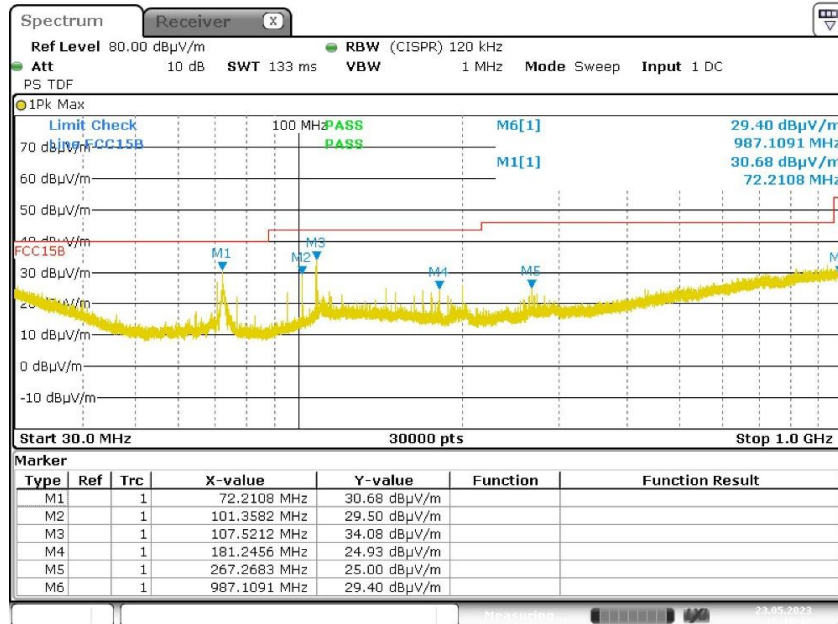
Date: 23.MAY.2023 14:34:31

QP Measurements for plot on previous page.

Emission Frequency (MHz)	Measured Amplitude (dBµV/m) QP/AVG*	Measured Amplitude (dBµV/m) Peak	15.247 (d)				Table Azimuth (0° closest to ant)	Receiving Antenna	
			Limit (dBµV/m) QP/AVG*	Limit (dBµV/m) Peak	Margin (dB) QP/AVG*	Margin (dB) Peak		Pol (H/V)	Height (Meters)
144.396	36.10	38.30	43.5	N/A	7.4	N/A	360	H	2.0
144.410	35.40	37.90	43.5	N/A	8.1	N/A	160	H	1.9
145.917	26.20	31.60	43.5	N/A	17.3	N/A	360	H	2.1
150.530	27.10	30.50	43.5	N/A	16.4	N/A	0	H	1.9
267.272	27.90	31.40	46.0	N/A	18.1	N/A	237	H	1.0
282.659	21.70	27.10	46.0	N/A	24.3	N/A	69	H	1.0
999.999	22.00	31.80	54.0	N/A	32.0	N/A	69	H	1.0

AUX Input mode: Playing maximum volume pink noise via supplied AUX cable between EUT AUX input and iPod 3.5mm output. EUT tested in 3 different orientations with worst case being with EUT facing down on turn table with all cables connected. See separate test setup photos document for details.

Vertical antenna polarization is worst case.



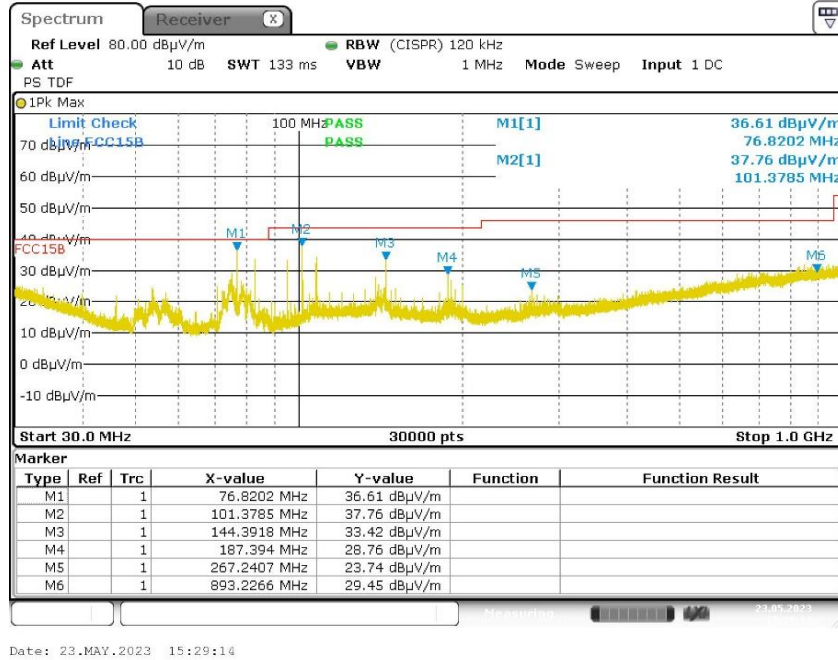
Date: 23.MAY.2023 15:10:37

QP Measurements for above plot.

Emission Frequency (MHz)	Measured Amplitude (dBµV/m) QP/AVG*	Measured Amplitude (dBµV/m) Peak	15.247 (d)				Table Azimuth (0° closest to ant)	Receiving Antenna	
			Limit (dBµV/m) QP/AVG*	Limit (dBµV/m) Peak	Margin (dB) QP/AVG*	Margin (dB) Peak		Pol (H/V)	Height (Meters)
72.211	27.80	33.00	40.0	N/A	12.2	N/A	187	V	1.9
101.358	28.40	30.10	43.5	N/A	15.1	N/A	60	V	1.0
107.521	33.30	34.90	43.5	N/A	10.2	N/A	360	V	1.0
181.246	23.30	26.30	43.5	N/A	20.2	N/A	177	V	1.0
267.268	25.00	29.00	46.0	N/A	21.0	N/A	188	V	1.0
987.109	21.90	32.10	54.0	N/A	32.1	N/A	188	V	1.0

Charging mode: EUT 's supplied USBC cable plugged into 5V USB charger plugged into 120VAC 60Hz. AUX cable plugged into EUT AUX port, far end of AUX cable is not connected to anything. See separate test setup photos document for details.

Vertical antenna polarization is worst case.



QP Measurements for above plot.

Emission Frequency (MHz)	Measured Amplitude (dBµV/m) QP/AVG*	Measured Amplitude (dBµV/m) Peak	15.247 (d)				Table Azimuth (0° closest to ant)	Receiving Antenna	
			Limit (dBµV/m) QP/AVG*	Limit (dBµV/m) Peak	Margin (dB) QP/AVG*	Margin (dB) Peak		Pol (H/V)	Height (Meters)
76.820	36.10	37.40	40.0	N/A	3.9	N/A	176	V	1.1
101.379	36.90	37.70	43.5	N/A	6.6	N/A	360	V	1.0
144.392	32.00	34.60	43.5	N/A	11.5	N/A	109	V	1.1
187.394	27.40	30.40	43.5	N/A	16.1	N/A	71	V	1.0
267.241	22.80	26.90	46.0	N/A	23.2	N/A	119	V	1.0
893.227	20.90	30.90	46.0	N/A	25.1	N/A	0	V	1.0



14. AC Line Conducted Emissions

Requirement:

FCC 15.207 (a)

RSS-Gen 8.8

Measurement Method:

ANSI C63.10-2013 Subclause 6.2

EUT on wooden table 80cm off ground plane.

AC Line conducted emissions test results:

EUT paired with iPod playing 1.5 kHz tone with power supply connected to 120VAC 60 Hz.

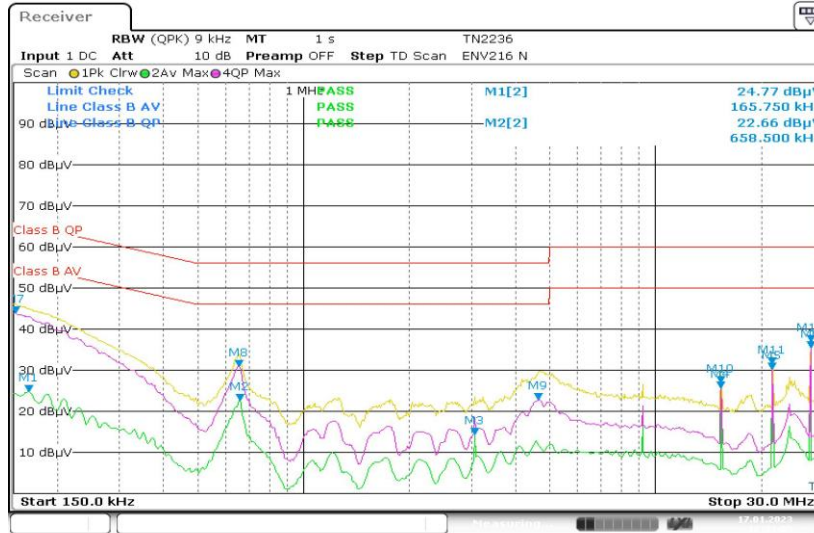


PRODUCT ASSURANCE ENGINEERING

Wireless Transceiver DSS Test Report



LISN L1



Date: 17.JAN.2023 12:33:05

Mk #	Frequency MHz	MEASURED		LIMIT		MARGIN		Notes
		dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG	
1	27.65	37.00	35.40	60.0	50.0	23.0	14.6	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
2	27.65	37.00	35.40	60.0	50.0	23.0	14.6	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
3	21.50	31.50	30.20	60.0	50.0	28.5	19.8	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
4	21.50	31.50	30.20	60.0	50.0	28.5	19.8	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
5	0.15	43.90	24.50	65.9	55.9	22.0	31.4	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
6	0.17	43.10	24.80	65.2	55.2	22.1	30.4	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
7	0.66	30.60	22.70	56.0	46.0	25.4	23.3	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
8	0.65	30.90	22.60	56.0	46.0	25.1	23.4	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
9	15.36	26.90	25.60	60.0	50.0	33.1	24.4	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
10	15.36	26.90	25.60	60.0	50.0	33.1	24.4	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
11	3.07	18.60	14.30	56.0	46.0	37.4	31.7	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz
12	4.66	22.70	11.80	56.0	46.0	33.3	34.2	LISN L1: EUT Charging & Operating BT, 120VAC 60Hz

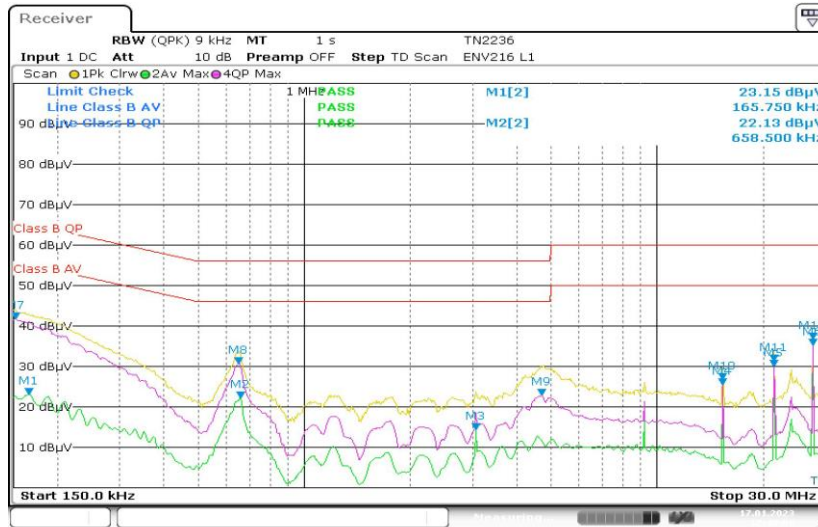


PRODUCT ASSURANCE ENGINEERING

Wireless Transceiver DSS Test Report



LISN Neutral



Date: 17.JAN.2023 12:40:09

Mk #	Frequency MHz	MEASURED		LIMIT		MARGIN		Notes
		dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG	
1	27.65	36.70	35.20	60.0	50.0	23.3	14.8	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
2	27.65	36.70	35.20	60.0	50.0	23.3	14.8	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
3	21.50	31.40	30.10	60.0	50.0	28.6	19.9	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
4	21.50	31.40	30.10	60.0	50.0	28.6	19.9	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
5	0.66	30.10	22.10	56.0	46.0	25.9	23.9	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
6	0.15	41.70	22.60	65.9	55.9	24.2	33.3	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
7	0.17	41.00	23.10	65.2	55.2	24.2	32.1	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
8	0.65	30.70	21.60	56.0	46.0	25.3	24.4	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
9	15.36	26.80	25.40	60.0	50.0	33.2	24.6	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
10	15.36	26.80	25.40	60.0	50.0	33.2	24.6	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
11	3.07	18.50	14.20	56.0	46.0	37.5	31.8	LISN N: EUT Charging & Operating BT, 120VAC 60Hz
12	4.72	22.80	11.70	56.0	46.0	33.2	34.3	LISN N: EUT Charging & Operating BT, 120VAC 60Hz



PRODUCT ASSURANCE ENGINEERING Wireless Transceiver DSS Test Report



15. Equipment List

Used For	Tracking Number	Description	Model	Make	Serial Number	Most recent calibration	Calibration Due Date	Most Recent Verification	Verification Due Date
AC Mains CE	2247	Spectrum Analyzer	ESR7	Rohde & Schwarz	101263	3/21/2022	3/20/2023		
AC Mains CE	2236	LISN	NV216	Rohde & Schwarz	101193	3/29/2022	3/28/2024		
AC Mains CE	1380	Comb Generator	CGC-510	Com-Power	311559	7/13/2022	7/13/2023		
AC Mains CE	2114	Henry Screen Room	N/A	Panashield	1698C			10/7/2022	10/7/2023
AC Mains CE	3724	Cable	RG223 16' with N connectors	Pasternack	N/A			7/6/2022	7/6/2023
RE Below 1 GHz	1375	Positioner	SC99V	Sunol Sciences	050905-1	NA	NA	NA	NA
RE Below 1 GHz	2319	EMI Analyzer	ESR26	Rohde & Schwarz	101276	3/29/2023	3/28/2024		
RE Below 1 GHz	644	3m Chamber	AP191	Rantec	1698A	10/7/2022	10/7/2023		
RE Below 1 GHz	1541	Antenna	JB6	Sunol Sciences	A050807	12/14/2021	12/14/2023		
RE Below 1 GHz	2077	Pre-Amp	Bose	MN ZX60-3018G+	N/A			9/1/2022	9/1/2023
RE Below 1 GHz	1445	Cable Set	4G	NA	NA			9/1/2022	9/1/2023
RE Below 1 GHz	2281	iPod	4G	Apple	CCQM2PAUFFCJ	N/A	N/A	N/A	N/A
RE Above 1 GHz	2602	Pre-Amp	AFS42-01001800-28-10P-42	Miteq	N/A			7/7/2022	7/7/2023
RE Above 1 GHz	1663	EMI Analyzer	ESU40	Rohde & Schwarz	100098	3/20/2022	3/19/2024		
RE Above 1 GHz	2414	2.4 GHz Notch Filter	BRM50702-07	Micro-Tronics	003			3/28/2022	3/27/2023
RE Above 1 GHz	2342	2.4 GHz Notch Filter	BRM50702-07	Micro-Tronics	001			3/28/2022	3/27/2023
RE Above 1 GHz	2385	Chamber	3 Meter	AP Americas	N/A	10/7/2022	10/7/2023		
RE Above 1 GHz	1757	Pre-Amp	JS4018004000-30-8P-A1	Miteq	1406279			7/7/2022	7/7/2023
RE Above 1 GHz	1596	Horn	AT4640	Amplifier Research	309234			7/7/2022	7/7/2023
RE Above 1 GHz	2349	Horn	3117	ETS Lindgren	00152406	2/24/2023	2/23/2025		
RE Above 1 GHz	2368	Cable	TRU-210	TRU Corporation	TRU-12767-35			3/28/2023	3/27/2024
RE Above 1 GHz	3685	Cable Set	2373, 2479, 2357	N/A	N/A			3/28/2022	3/27/2023
RE Restricted Bands	2602	Pre-Amp	AFS42-01001800-28-10P-42	Miteq	N/A			7/7/2022	7/7/2023
RE Restricted Bands	1663	EMI Analyzer	ESU40	Rohde & Schwarz	100098	3/20/2022	3/19/2024		
RE Restricted Bands	2385	Chamber	3 Meter	AP Americas	N/A	10/7/2022	10/7/2023		
RE Restricted Bands	2349	Horn	3117	ETS Lindgren	00152406	2/24/2023	2/23/2025	3/28/2023	3/28/2024
RE Restricted Bands	3685	Cable Set	2373, 2479, 2357	N/A	N/A			3/28/2022	3/27/2023
RF Conducted	2342	2.4 GHz Notch Filter	BRM50702-07	Micro-Tronics	001			3/28/2022	3/27/2023
RF Conducted	2408	EMI Analyzer	FSV40	Rohde & Schwarz	101414	3/23/2022	3/22/2023		
RF Conducted	2409	EMI Analyzer	FSV40	Rohde & Schwarz	101413	3/21/2023	3/21/2024		
RF Conducted	2404	ETS Probe	7002-008	ETS Lindgren	160035	10/24/2022	10/24/2023		

16 Measurement Uncertainty

AC Mains conducted emissions uncertainty.

Uncertainty Budget (AC mains measurements)				
Title:		Conducted RF Emissions (Mains)		
Source of Uncertainty	Value units:± dB	Distribution	Divisor	Uncertainty (± dB)
Receiver - absolute level	0.3	Rect.	1.73	0.17
Receiver - frequency response	1.0	Rect.	1.73	0.58
Receiver - attenuator switching	0.2	Rect.	1.73	0.12
Receiver - bandwidth switching	0.2	Rect.	1.73	0.12
Receiver - display	0.5	Rect.	1.73	0.29
LISN impedance	2.6	Triang.	2.45	1.06
LISN insertion loss	0.6	Norm.	2.00	0.30
Cable correction factor	0.1	Norm.	2.00	0.05
Combined uncertainty (RSS):				1.30
Coverage factor (2 sigma):				2.00
Extended uncertainty (95% confidence):				2.60

Radiated emission uncertainty (30 MHz – 1 GHz)

Uncertainty Budget				
Title:		Radiated RF Emissions (30MHz-1GHz)		
Source of Uncertainty	Value units:± dB	Distribution	Divisor	Uncertainty (± dB)
Receiver - absolute level	0.3	Rect.	1.73	0.17
Receiver - frequency response	0.8	Rect.	1.73	0.46
Receiver - attenuator switching	0.2	Rect.	1.73	0.12
Receiver - bandwidth switching	0.2	Rect.	1.73	0.12
Receiver - display	0.5	Rect.	1.73	0.29
Antenna factor	0.8	Norm.	2.00	0.38
Antenna directivity	1.0	Norm.	2.00	0.50
Preamp correction factor	0.5	Norm.	2.00	0.25
Cable correction factor	0.5	Norm.	2.00	0.25
Site imperfection - NSA	4.0	Triang.	2.45	1.63
Test table impact	1.1	Rect.	1.73	0.64
Combined uncertainty (RSS):				1.98
Coverage factor (2 sigma):				2.00
Extended uncertainty (95% confidence):				3.97

Radiated emissions above 1 GHz

Uncertainty Budget				
Title:		Radiated Emissions above 1 GHz		
Source of Uncertainty	Value units:± dB	Distribution	Divisor	Uncertainty (± dB)
RF spec anal-level-Ref.	0.6	Rect.	1.73	0.35
RF spec anal-level-Freq resp.	1.0	Rect.	1.73	0.58
RF spec anal-level-Display	0.3	Rect.	1.73	0.17
RF spec anal-level-QP det.	1.0	Rect.	1.73	0.58
Antenna factor	0.9	Norm.	2.00	0.45
Preamp corr. Factor	0.5	Rect.	1.73	0.29
Cable corr. Factor	0.5	Rect.	1.73	0.29
Combined uncertainty (RSS):				1.09
Coverage factor (2 sigma):				2.00
Extended uncertainty (95% confidence):				2.18

Conducted RF measurements

Uncertainty Budget				
Title:		Conducted RF measurements		
Source of Uncertainty	Value units:± dB	Distribution	Divisor	Uncertainty (± dB)
Analyzer - absolute level	0.3	Rect.	1.73	0.17
Analyzer - frequency response	0.5	Rect.	1.73	0.29
Analyzer - attenuator switching	0.2	Rect.	1.73	0.12
Analyzer - bandwidth switching	0.2	Rect.	1.73	0.12
Analyzer - display	0.5	Rect.	1.73	0.29
Cable correction factor	0.5	Norm.	2.00	0.25
Combined uncertainty (RSS):				0.54
Coverage factor (2 sigma):				2.00
Extended uncertainty (95% confidence):				1.07



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End of Report