Test Type: Emissions [X] Immunity []

Product Type: Wireless Headphones

Product Name/Number: *Model Number(s): BMD0011*
FCC ID: A94BMD0011
IC: 3232A-BMD0011

Prepared For: *Product Assurance Engineering Department, Bose Corporation*

Test Results: Pass [**X**] Fail []

Applicable Standards: Mains Conducted Interference within:
FCC CFR 47 Part 15 Subpart B
FCC CFR 47 Part 15 Subpart C
Industry Canada RSS-247 Issue 2
Industry Canada RSS-GEN Issue 5

Report Number: *EMC.433948.20.174.4*

General Comments/Special Test Conditions:
This report relates only to the items tested. This report covers EMC marking requirements for BMD0011

	Print Name	Signature	Date
Prepared By:	Karl Klemm		6/26/2020
Electrical Engineer Review* By:	Bryan Cerqua		6/24/2020

* 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 or the reviewer to ensure the A2LA advertising policy is followed.

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Tests Performed (Table of Contents):

Test Report Summary

Product Information:

Description

The EUT is a wireless headphone that contains DSS/DTS transceivers, manufactured by Qualcomm Technologies, QCC5127. The EUT uses Adaptive Frequency Hopping (AFH) mode, using a reduced hop set if interference is detected in band, however a minimum of 20 channels is always maintained.

There are two frame styles (Soprano and Tenor) which use identical electronics and are differentiated only by cosmetic differences in the enclosure. The differences in the enclosures have no impact on the transmitter function or characteristics. The Soprano frame style was used for testing.

Setup (Cables and Accessories)

Power line conducted emissions was performed while the EUT battery is charging from an external power supply. The EUT cannot charge and play audio at the same time. EUT is not sold with a power supply so when necessary a Bose model number MOPP5V1.3C-1U-US power supply was used for charging.

EUT Antenna Description

The antenna is an internal PIF variant with antenna gain of 2.8 dBi formed by printed circuit board etch.

SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 0.3.103
The test utility software used during testing was Polycomm version 2.6.0 and Blue Suite version 3.2.3.

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.

Test Objective:

Verify product meets all applicable EMC requirements.

Measurement Method:

ANSI C63.10 (2013).

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.):
[**X**] meets all test standards selected in section 2 of this report.
[ ] does not meet all test standards selected in section 2 of this report.

Affirmation of Test Results:

	Print Name	Signature	Date
Testing Engineer/Technician	Kevin Thibodeau	Kevin Thibodeau	6/26/2020

Test Standards

Emissions:

	Standard
[X]	FCC Part 15C
[X]	Canada RSS-247
[X]	Canada RSS-GEN

Environmental Conditions

Ambient:

Temperature:	22±4 °C
Humidity:	30-60 %RH
Mains Voltage:	[X] 5 Vdc

FCC Test Site Accreditation.

Firm Name	Location	Accreditation	MRA	Designation Number	Expiration Date	Contact	Contact Title
Bose Corporation	1 New York Avenue, Framingham, MA	American Association for Laboratory Accreditation	N/A	US1088	09/30/2020	Carole Park	Quality Manager

Canadian Test Site Registration.

Organization	CAB identifier	Scope / Recognition Date (yyyy-mm-dd)	Expiration (yyyy-mm-dd)
BOSE CORPORATION 1 New York Avenue Framingham, MA 01701 UNITED STATES Website: https://www.bose.com/en_us/index.html **ISED#: 3232A** Contact: Benjamin Cerretani benjamin_cerretani@bose.com	US0210	RSS-GEN (2019-02-11) RSS-210 (2019-02-11) RSS-247 (2019-02-11)	**RECOGNIZED UNTIL:** **2020-07-31** A2LA ISO/IEC 17025:2005 Expires: 2020-07-31

Powerline Conducted Emissions

Requirement:

For radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits below, as measured using a 50 µH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.

For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

AC power-line conducted emissions limits

Frequency	Limits dB(µV)	
MHz	Quasi-peak	Average
0.15 -0.5	66-56	56-46
0.5 – 1.6	56	46
1.6 – 30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

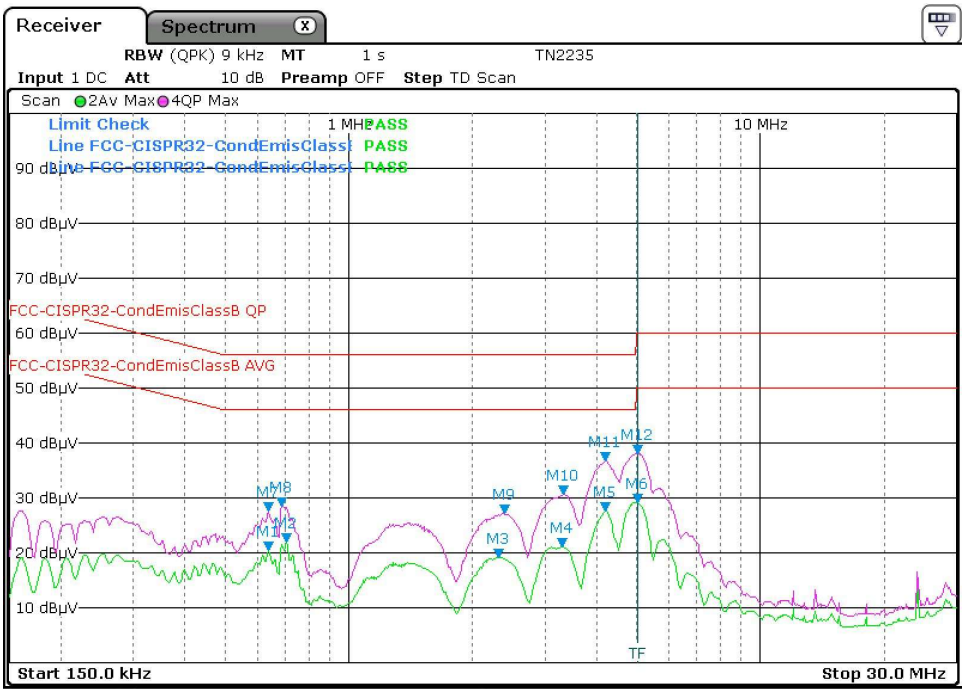
Test Procedure:

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The test receiver is set to a resolution bandwidth of 9 kHz. Quasi-peak and average detectors were used. Line conducted data is recorded for both line and neutral.

Test setup details:

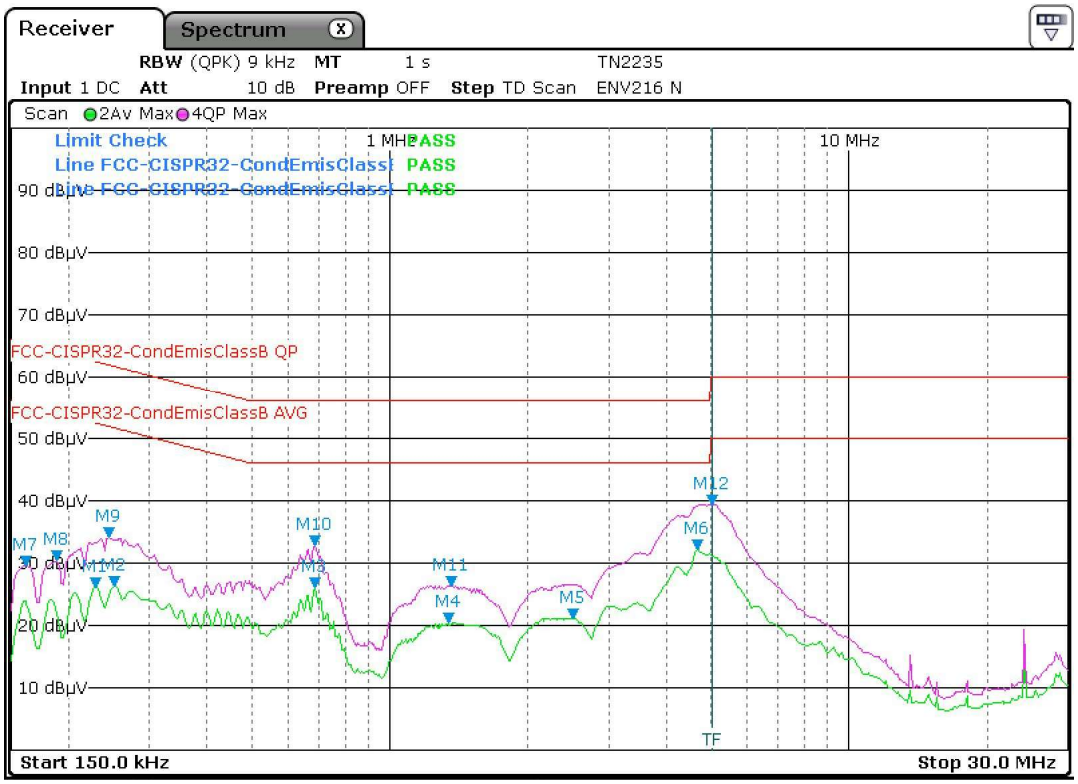
EUT is connected to a power supply and charging; no audio is playing. EUT is not provided with a power supply; using Bose power supply MN: MOPP5V1.3C-1U-US.

Test Results:



EUT S/N:	082071U01161063AE	☒L1 ☐Neutral	☒120V 60Hz ☐230V 50Hz	☐GNDED ☒UN-GNDED
EUT Setup:	EUT tested in charging mode. EUT will not play Bluetooth while in charging mode			
Comments:	Emissions checked at various levels of battery charge; no difference seen. Plot taken with EUT reporting battery at 60% charge level.			

FCC 15B and CISPR 32 Class B Product								
Mk	Frequency	MEASURED		LIMIT		MARGIN		
#	MHz	dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG	Notes
1	0.6405	27.60	20.50	56.0	46.0	28.4	25.5	
2	0.7080	28.30	21.90	56.0	46.0	27.7	24.1	
3	2.3168	26.90	19.10	56.0	46.0	29.1	26.9	
4	3.3023	30.50	21.00	56.0	46.0	25.5	25.0	
5	4.2090	36.70	27.70	56.0	46.0	19.3	18.3	
6	5.0280	38.00	29.20	60.0	50.0	22.0	20.8	
7	0.6405	27.60	20.50	56.0	46.0	28.4	25.5	
8	0.6878	28.40	21.50	56.0	46.0	27.6	24.5	
9	2.3865	27.20	19.00	56.0	46.0	28.8	27.0	
10	3.3248	30.60	21.00	56.0	46.0	25.4	25.0	
11	4.2090	36.70	27.70	56.0	46.0	19.3	18.3	
12	5.0235	38.00	29.20	60.0	50.0	22.0	20.8	



EUT S/N:	082071U01161063AE	☐L1 ☒Neutral	☒120V 60Hz ☐230V 50Hz	☐GNDED ☒UN-GNDED
EUT Setup:	Charging mode.			
Comments:	Emissions checked at various levels of battery charge; no difference seen. Plot taken with EUT reporting battery at 60% charge level.			

FCC 15B and CISPR 32 Class B Product								
Mk	Frequency	MEASURED		LIMIT		MARGIN		
#	MHz	dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG	Notes
1	0.2288	33.20	26.20	62.5	52.5	29.3	26.3	
2	0.2513	33.70	26.30	61.7	51.7	28.0	25.4	
3	0.6855	32.90	26.00	56.0	46.0	23.1	20.0	
4	1.3470	26.20	20.50	56.0	46.0	29.8	25.5	
5	2.5125	26.60	21.20	56.0	46.0	29.4	24.8	
6	4.6793	39.10	32.20	56.0	46.0	16.9	13.8	
7	0.1613	29.60	24.00	65.4	55.4	35.8	31.4	
8	0.1883	30.40	22.10	64.1	54.1	33.7	32.0	
9	0.2445	34.10	24.60	61.9	51.9	27.8	27.3	
10	0.6878	32.90	26.00	56.0	46.0	23.1	20.0	
11	1.3650	26.40	20.50	56.0	46.0	29.6	25.5	
12	5.0483	39.40	31.20	60.0	50.0	20.6	18.8	

Test Equipment Used:

TN	Description	Model	S/N	Manufacturer	Most Recent Service	Service Due Date
2319	EMI Test Receiver	ESR26	101276	Rohde & Schwarz	26-Mar-2019	23-Jun-2020
2235	2-LINE V-NETWORK	ENV216	101192	Rohde & Schwarz	07-Apr-2020	07-Apr-2022
1380	Conducted Comb Generator	CGC-510	311559	Com-Power Corporation	15-Mar-2019	2-Jul-2020
2114	Henry Room (Screen Room III)	N/A	1698C	Panashield Inc.	12-Aug-2019	11-Aug-2020

Date(s) of test: 29-MAY-2020

End of Report