Test Type: Emissions [X] Immunity []

Product Type: Wireless Headphones

Product Name/Number: *Model Numbers: BMD0003 and BMD0004*
FCC ID: A94429638
IC: 3232A-429638

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

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

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

Report Number: *EMC.429638.18.282.4*

General Comments/Special Test Conditions:
This report relates only to the items tested. This report covers EMC marking requirements for
Enter product and any special modifications or test conditions.

	Print Name	Signature	Date
Prepared By:	Karl Klemm		16 OCT 2018
Electrical Engineer Review* By:	Nathan Cross		16 OCT 2018

* 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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Test Report Summary

Product Information:

Description

The EUT is a wireless headphone that contains DSS/DTS transceivers, manufactured by Cambridge Silicon Radio, CSR8675. 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.

The two models 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. Model BMD003 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 S008AHU0500160 power supply was used for charging.

EUT Antenna Description

The antenna is an internal PIF variant with antenna gain of 5.65 dBi formed by printed circuit board etch.

SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 0.6.3
The test utility software used during testing was Polycomm, version 0.2.1.0 and CSR Blue Suite version 2.6.2.

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	Jason Haley		15 October 2018

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	07/31/2020	Carole Park	Quality Manager

Canadian Test Site Registration.

Radiated emissions below 1GHz were performed in Test Site 3232A-1. Radiated emissions above 1GHz were performed in Test Site 3232A-2.

Scope of Accreditation for: Bose Corporation

Test Site	OATS 3m	OATS 10m	OATS 30m	Chamber 3m	Chamber 10m	Expiry Date
3232A-2	No	No	No	Yes	No	2020-06-27
3232A-1	No	No	No	Yes	No	2020-04-25

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:

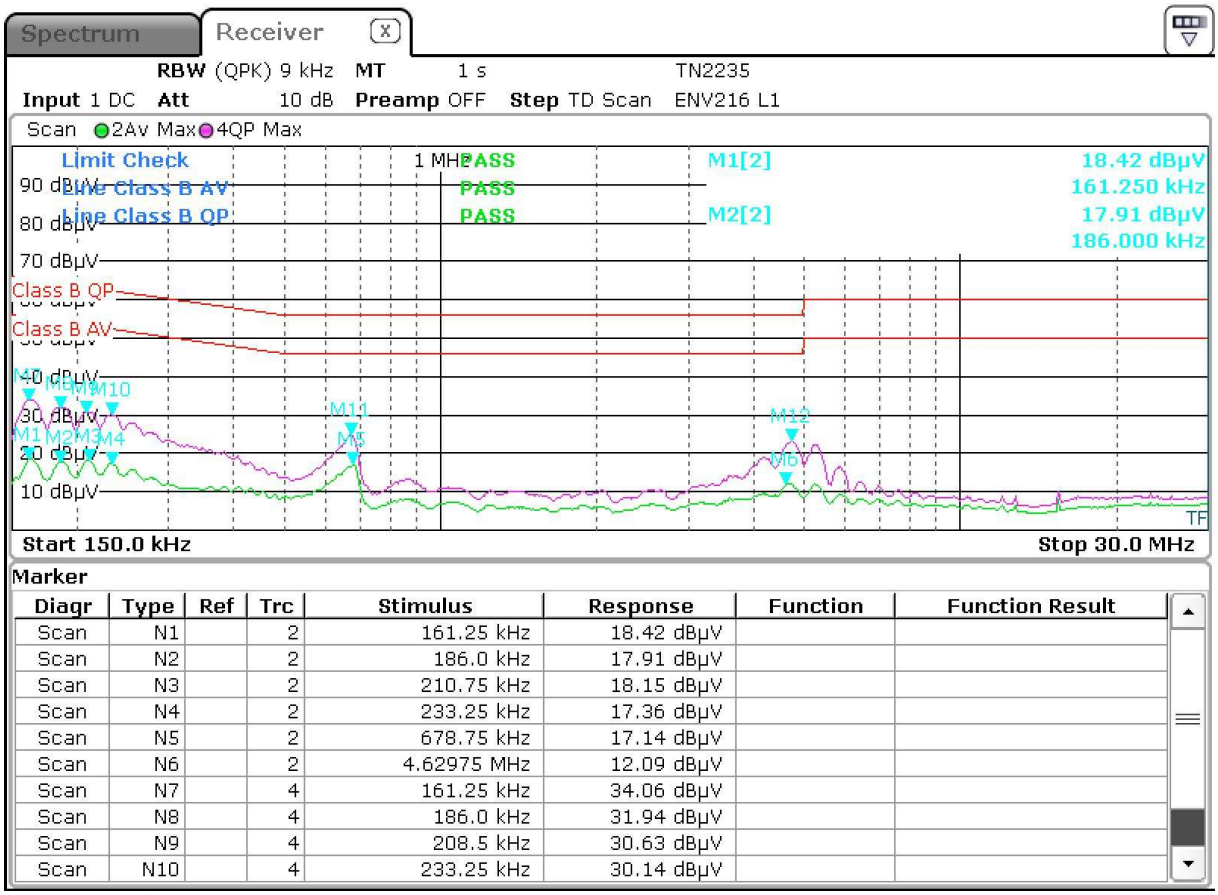
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The test receiver is set to a resolution bandwidth of 9 kHz. Quasi-peak and average detectors were used. Line conducted data is recorded for both line and neutral.

Test setup details:

EUT being charged by a representative AC to DC converter

Test Results:

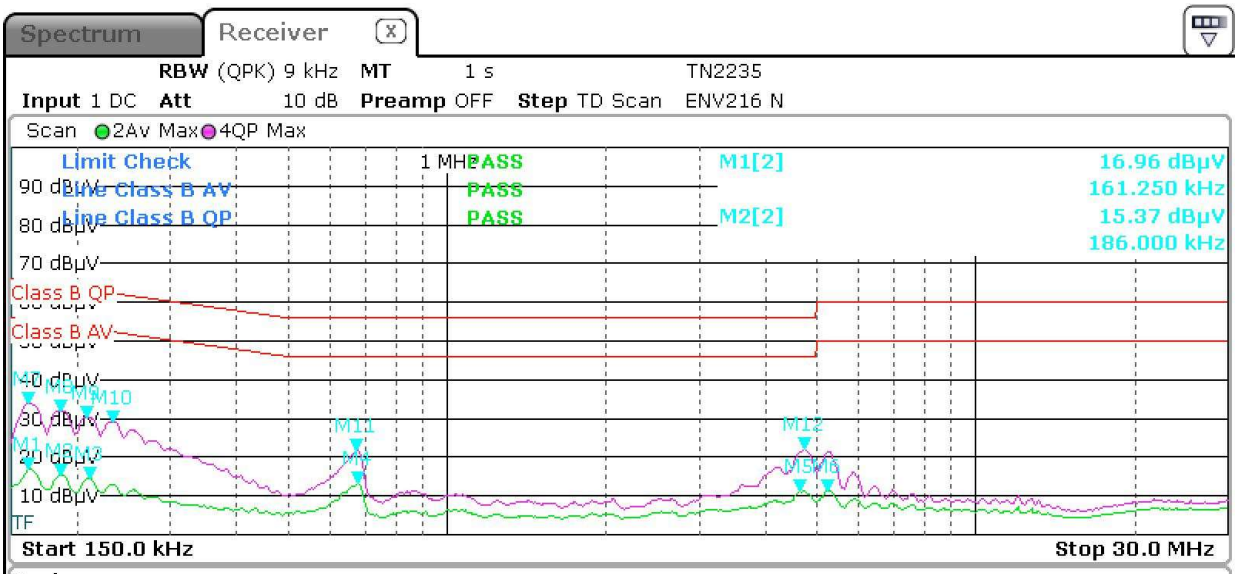
EUT S/N:	814580U01990083AA	☒L1 ☐Neutral	☒120V 60Hz ☐230V 50Hz	☐GNDED ☒UN-GNDED
EUT Setup:	EUT being charged by a representative AC to DC converter			
EUT Mods:	None			
Comments:				



Diagr	Type	Ref	Trc	Stimulus	Response	Function	Function Result
Scan	N1		2	161.25 kHz	18.42 dBµV		
Scan	N2		2	186.0 kHz	17.91 dBµV		
Scan	N3		2	210.75 kHz	18.15 dBµV		
Scan	N4		2	233.25 kHz	17.36 dBµV		
Scan	N5		2	678.75 kHz	17.14 dBµV		
Scan	N6		2	4.62975 MHz	12.09 dBµV		
Scan	N7		4	161.25 kHz	34.06 dBµV		
Scan	N8		4	186.0 kHz	31.94 dBµV		
Scan	N9		4	208.5 kHz	30.63 dBµV		
Scan	N10		4	233.25 kHz	30.14 dBµV		

FCC 15B and CISPR 32 Class B Product						
Frequency	MEASURED		LIMIT		MARGIN	
MHz	dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG
0.1613	34.10	18.40	65.4	55.4	31.3	37.0
0.1860	31.90	17.90	64.2	54.2	32.3	36.3
0.2108	30.60	18.20	63.2	53.2	32.6	35.0
0.2333	30.10	17.40	62.3	52.3	32.2	34.9
0.6788	24.80	17.10	56.0	46.0	31.2	28.9
4.7423	23.30	12.10	56.0	46.0	32.7	33.9

EUT S/N:	814580U01990083AA	☐L1 ☒Neutral	☒120V 60Hz ☐230V 50Hz	☐GNDED ☒UN-GNDED
EUT Setup:	EUT being charged by a representative AC to DC converter			
EUT Mods:	None			
Comments:				



Marker

Diagr	Type	Ref	Trc	Stimulus	Response	Function	Function Result
Scan	N1		2	161.25 kHz	16.96 dBµV		
Scan	N2		2	186.0 kHz	15.37 dBµV		
Scan	N3		2	210.75 kHz	14.57 dBµV		
Scan	N4		2	678.75 kHz	13.28 dBµV		
Scan	N5		2	4.65225 MHz	11.43 dBµV		
Scan	N6		2	5.25075 MHz	11.43 dBµV		
Scan	N7		4	161.25 kHz	33.93 dBµV		
Scan	N8		4	186.0 kHz	31.83 dBµV		
Scan	N9		4	208.5 kHz	30.22 dBµV		
Scan	N10		4	233.25 kHz	29.20 dBµV		

FCC 15B and CISPR 32 Class B Product						
Frequency	MEASURED		LIMIT		MARGIN	
MHz	dBµV QP	dBµV AVG	dBµV QP	dBµV AVG	dB QP	dB AVG
0.1613	33.90	17.00	65.4	55.4	31.5	38.4
0.1860	31.80	15.40	64.2	54.2	32.4	38.8
0.2108	30.20	14.60	63.2	53.2	33.0	38.6
0.2333	29.20	13.00	62.3	52.3	33.1	39.3
0.6788	21.90	13.30	56.0	46.0	34.1	32.7
4.7423	22.00	11.40	56.0	46.0	34.0	34.6
5.2508	21.40	11.40	60.0	50.0	38.6	38.6

Test Equipment Used:

TN	Description	Model	S/N	Manufacturer	Most Recent Calibration	Calibration Due Date
2247	EMI Test Receiver, 7GHZ	ESR7	101263	Rohde & Schwarz	04-Apr-2018	04-Apr-2019
1380	Conducted Comb Generator	CGC-510	311559	Com-Power Corporation	Verify before use	
2235	2-LINE V-NETWORK	ENV216	101192	Rohde & Schwarz	17-Jan-2018	17-Jan-2020

Date(s) of test: 31-Jul-18

End of Report