Transmitter Test Report

FCC ID: A94403155S

Certificate # 1514.1

Report number:	EMC.403155.95.10.1
Prepared for:	Bose Corporation DCE - EMC 1 New York Ave, Framingham MA 01701
Product Tested:	RC35S2-27 remote control
Standards:	FCC part 15 ANSI C63.10 (2009) RSS310 issue 2 ICES-003 issue 4
Report prepared by:	Peter Boers
Signature:	
Report reviewed by:	Brent DeWitt
Signature:	
Report issue date:	April 7, 2010

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

Table of Contents:

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

1 Report Summary

1.1 Product RC35S2-27

1.2 Client Bose Corporation
1 New York Ave, Framingham MA 01701

1.3 Applicable Standards FCC part 15.B and C
ANSI C63.10 (2009)
RSS 310 issue 2
ICES-003, CAN/CSA/CISPR22

1.4 Test Results Pass ☒ Fail ☐

1.5 Test Laboratory Bose DCE laboratories
1 New York Ave
Framingham, MA 01701.
IC registration : 3232A
FCC site registration under A2LA cert. #1514

This report relates only to the items tested.

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

2 Product description

2.1. Product Information

Description:

The RC35S2-27 is a hand-held, battery operated remote control for the second zone of Bose Lifestyle systems. It operates at a frequency of 27.145 MHz

EUT Condition:

The EUT was received in good condition. Pre-production samples were tested

Setup (Cables and Accessories):

The EUT hardware was modified to enable constant transmission of the carrier for carrier output and harmonics tests. In normal (unmodified) mode transmission ceases as soon as a key is released. A built-in timer discontinues transmission after 20 seconds regardless how long a key is depressed.

Modulation

The EUT employs pulse modulation.

2.2. Scope

This report covers Transmitter test and EMC requirements under the standards listed in section 1.3 of this report.

2.3. Test Objective

Production qualification and obtaining regulatory approvals.

2.4. Conclusions

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

[**X**] meets all test standards selected in section 1.3 of this report.

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

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

3. Applicable standards, requirements and tests

RSS 310	ICES-003 CAN-CSA-CIS-22	FCC part 15	Test references:
		15.31	Measurement standard: ANSI C63.10 (2009) is used as a measurement standard for the intentional emissions of the device under test. There are no user adjustable controls that affect the level of emissions.
		15.33(b)1	The highest frequency generated or used in the device (intentional radiator) is 27.145 MHz. For an unintentional radiator, the conducted measurement range is from 150kHz to 30 MHz, and the radiated frequency range is from 30 MHz to 1 GHz.
	3	15.35	Measurement detector and bandwidth: Conducted measurements are made with a CISPR-16 compliant receiver with both an average and quasi-peak detector and 9 kHz bandwidth to the appropriate limits. Radiated measurements are made with a quasi-peak or peak detector below 1 GHz and with an average and a peak detector above 1 GHz with a bandwidth of 1 MHz.
	5.3	15.107	Conducted emissions: Not applicable. The device is battery operated.
	5.5	15.109	Radiated emissions: The device meets the radiated emission requirements with a margin of more than 20 dB. Detail measurements are contained in section 5.1 of this report.
2.3			The User Manual (OG) contains the words in both English and French "*This category II radiocommunication device complies with Industry Canada Standard RSS310*" "*Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d'Industrie Canada"*
		15.203	The antenna is permanently attached.
3.12 Table 1		15.205	The device does not operate in the restricted bands as defined in RSS310 Table 1 or FCC part 15 section 205
3.8		15.227(a)	The maximum emission in the band from 26.96 to 27.28 MHz does not exceed 10,000 microvolts per meter (80dBuV//m, average). Peak emissions meet the requirements of FCC section 15.35 (not more than 20dB above the average). Detail measurement results are in section 5.2 of this report.
Table 2, 3		15.227(b)	Emissions outside the band from 26.96 to 27.28 MHz meet the requirements for FCC part 15.209 and RSS 310 Tables 2 and 3. Detail measurement results are in section 5.1 of this report.

4 Environmental Conditions

All testing is performed under the following conditions, unless otherwise defined in the detail test report section.

Temperature: 22 ± 4 °C

Humidity: 30 – 60 % RH

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

5. Detailed Test Results.

5.1. Radiated emissions

5.1.1. Requirements

FCC rules part 15.109 (a) and 15.209, CAN-CSA-CISPR22 class B and RSS-310 table

Frequency	Distance	Limit in dBµV/m		
MHz	meters	Quasi-peak	Average	Peak
0.009 – 0.09	300		240/F(kHz)	
0.90 – 0.11	300	240/F(kHz)		
0.11– 0.49	300		240/F(kHz)	
0.49 – 1.705	30	2400/F(kHz)		
1.705 – 30	30	30		
30 – 88	3	40		
88-216	3	43.5		
216 - 960	3	46		
> 960	3		54	74

5.1.2. Test Setup

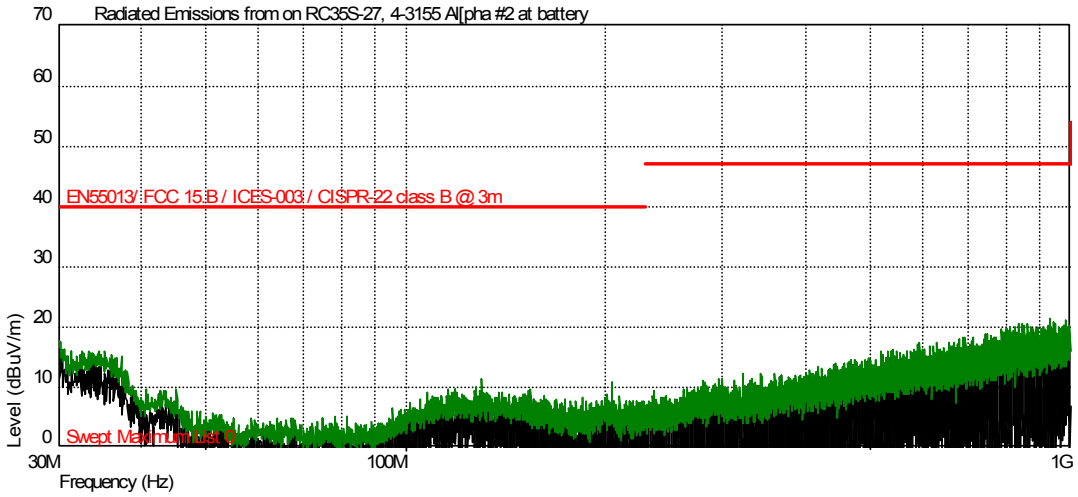
The EUT is placed on a 80 cm high non-conductive table in the position that provides the maximum field strength as determined in the transmitter output test. The EUT is tested in both “standby” mode and in a simulated operational mode (forced carrier “on”).

The measurement methodology is in accordance with ANSI C63.10 (2009). Fresh batteries are used to power the device.

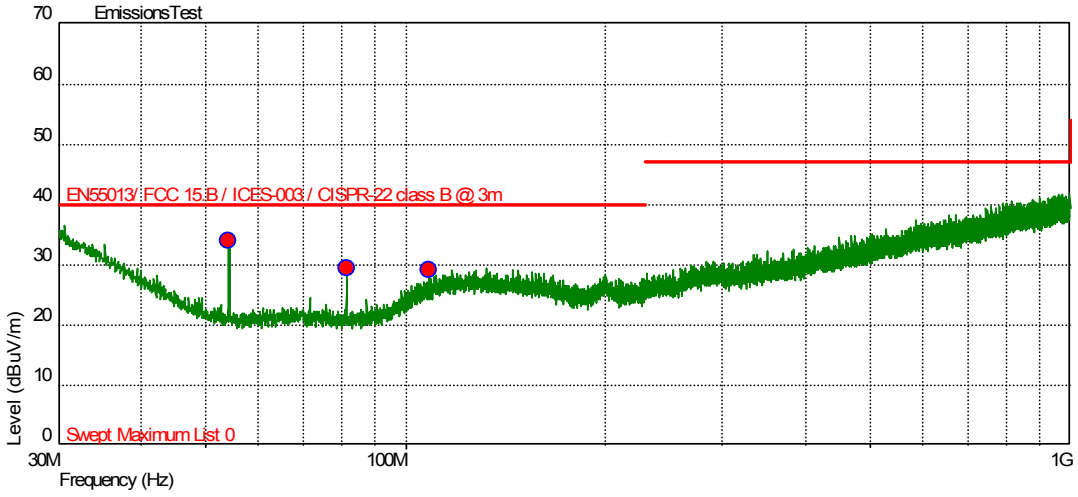
Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

5.1.3 Test data

Unit in standby - all emissions are more than 20 dB below the limit. ESU pre-amp on



TX wired “on”. Pre-amp off to prevent overload.



Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

Emission peaks:

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Comment
54.25	34.1	40.0	-5.9	2nd harmonic of the intentional radiator
81.4	29.5	40.0	-10.5	3rd harmonic of the intentional radiator
108.55	29.1	40.0	-10.9	4th harmonic of the intentional radiator

Note: all measurable emissions are harmonics of the transmitter

5.1.4. Test Equipment

Equipment Type	Manufacturer	Model	Serial or other ID	Service date	
				Last	Due
Antenna	Sunol Sciences	JB6	TN1541	8/6/2009	8/6/2010
Receiver	Rohde & Schwarz	ESU40	TN1663	7/29/2009	7/29/2010
8 GHz cable set	-	-	TN1445	5/19/2009	5/19/2010

5.1.5. Test information

Date of test: March 21, 2010 **EUT serial:** 142

Test Location: Maxwell House **Test result:** Pass

Tested by: Peter Boers

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

5.2. Output power

5.2.1. Requirements

FCC part 15.227, RSS 310 section 3.8

Frequency MHz	Level dBuV/m average	Level dBuV/m peak
26.96 - 27.28	80	100

5.2.2. Test Setup

The EUT is tested in 3 orthogonal positions on a 80 cm high non-conductive table.

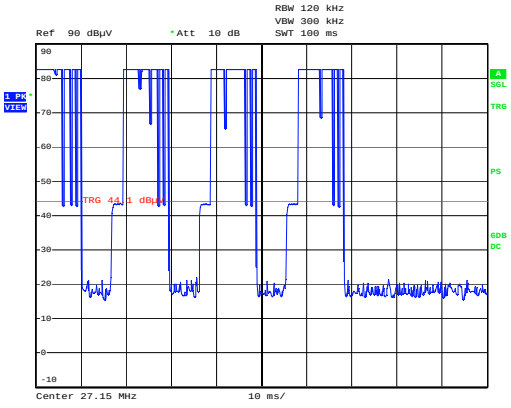
The unit is rotated around its axis and the magnetic loop antenna is rotated in order to obtain the maximum output level.

For this test the EUT is modified to provide a constant carrier output. A duty cycle correction will be needed to determine the worst case average value of the transmitted signal.

5.2.3. Test data

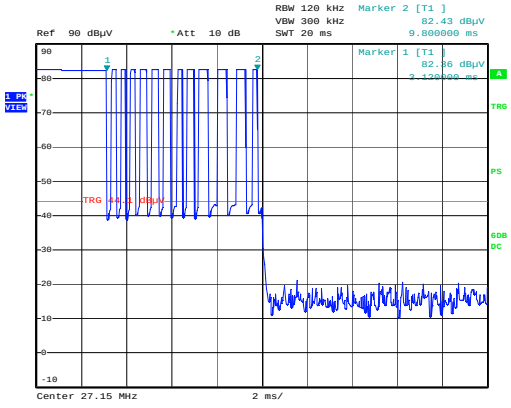
Duty cycle measurement

Initial startup (100 ms timespan)



Date: 18.MAR.2010 14:44:38

Detail on one pulse train



Date: 18.MAR.2010 14:42:01

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145

Duty cycle calculation:

Single pulse :

3.1 ms @ 100%

6.9 ms @ 50%

Net: 6.55 ms “on-time”

Occurs maximum 4 times in 100ms: 26.2 ms maximum “on-time” over 100ms

Duty cycle = 26.2% maximum. Peak to average correction factor = -11.6 dB

Output Field strength

Position	Maximum Fieldstrength (peak, dBµV/m)	Duty cycle correction (dB)	Maximum Field strength (average, dBµV/m)	Limit Average dBµV/m	Limit Peak dBµV/m	Margin dB
Normal	82.7	-11.6	71.1	80	100	-8.9
Sideways	70.9	-11.6	59.3	80	100	-20.7
Vertical	85.1	-11.6	73.5	80	100	-6.5

5.2.4. Test Equipment

Equipment Type	Manufacturer	Model	Serial or other ID	Service date	
				Last	Due
Antenna	ETS	6512	TN1501	5/7/2008	5/7/2010
Receiver	Rohde & Schwarz	ESU40	TN1663	7/29/2009	7/29/2010

5.2.5. Test information

Date of test: April 6, 2010 **EUT serial:** 2

Test Location: Maxwell House **Test result:** Pass

Tested by: Peter Boers

Bose Corporation, 1 New York Ave, Framingham, MA 01701, USA
Tel: (508) 766-6000 Fax: (508) 766-1145