# RETLIF TESTING LABORATORIES TEST REPORT R-4265N10 JUNE 3, 2004

FCC COMPLIANCE TEST REPORT ON

BOSE CORPORATION 27.145MHz REMOTE CONTROL FCC ID: A94-RCYYB

APPLICANT	MANUFACTURER						
Bose Corporation 100 Mountain Road Framingham, MA 01701	SAME						
TEST SPECIFICATION: FCC Rules and Reg	ulations Part 15, Subpart C, Para. 15.227						
TEST PROCEDURE: ANSI C63.4:2001							
TEST SAMPLE DESCRIPTION							
BRANDNAME: Bose MODEL: RC38S2-27							
TYPE: DVD Home Entertainment System Remote Control Transmitter							
POWER REQUIREMENTS: 6VDC via Internal Battery							
FREQUENCY OF OPERATION: <u>27.145MHz</u>							

### TESTS PERFORMED

15.227 (a) Field Strength of Fundamental 27.145MHz

TYPE OF TRANSMISSION: Control Signal (Pulse Recognition Codes)

APPLICABLE RULE SECTION: Part 15, Subpart C, Section 15.227

15.227 (b) Out of Band Emissions (9kHz to 1GHz)

MODULATION: Pulsed (On/Off Keying)

FCC ID: <u>A94-RCYYB</u>

#### TEST SAMPLE OPERATION

The EUT is powered by 6DC by internal battery. The device is normally manually operated and transmits a control signal for controlling functions of a DVD Home Entertainment System. For testing purposes only the EUT was configured to continuously transmit. All testing was performed with new batteries installed.

#### TEST SAMPLE / TEST PROGRAM

- The fundamental field strength at 27.145MHz did not exceed  $10,000\mu\text{V/M}$  (Average) at a test distance of 3 meters.
- The peak value of fundamental emissions did not exceed a peak field strength limit corresponding to 20dB above the maximum permitted average limit.
- The field strength of out of band emissions did not exceed the general radiated limits specified in Section 15.209.
- The device uses an internal loop antenna
- Radiated Emissions from the EUT were measured in all three axis. The attached Radiated Emissions test data is representative of the worst case orientation.

#### TEST SAMPLE / TEST PROGRAM (continued)

#### TRANSMITTER DUTY CYCLE

The maximum duty cycle as stated by the manufacturer is shown below and was determined as follows: The transmitter on time was summed and compared to the time for one full cycle in order to obtain the duty cycle. As the pulse train exceeded 100msec in duration the worst case duty cycle was determined by measuring/calculating the 100msec period with the greatest on time. The on times were determined as follows:

The worst case 100msec period contains 4 pulse bursts. The "on time" within each burst was 6.5msec resulting in a total "on time" of 26msec.

#### **Fundamental Frequency: 27.145MHz**

Transmitter On Time = 26milliseconds (maximum)

Transmitter Cycle Time = 100 milliseconds

Transmitter Duty Cycle = 26%

On Time divided by Cycle Time = Duty Cycle Factor

26 divided by 100 = 0.26 0.26 converted to dB (LOG<sub>10</sub>.26)20 = -11.7 **Duty Cycle Factor** = -11.7dB

A representative pulse train plot is included with this application as a separate attachment.

#### **GENERAL NOTES**

- 1. All readings were taken utilizing a peak detector function at a test distance of 3 meters.
- 2. The duty cycle factor was applied to the peak readings in order to determine the average value of the pulsed emissions.

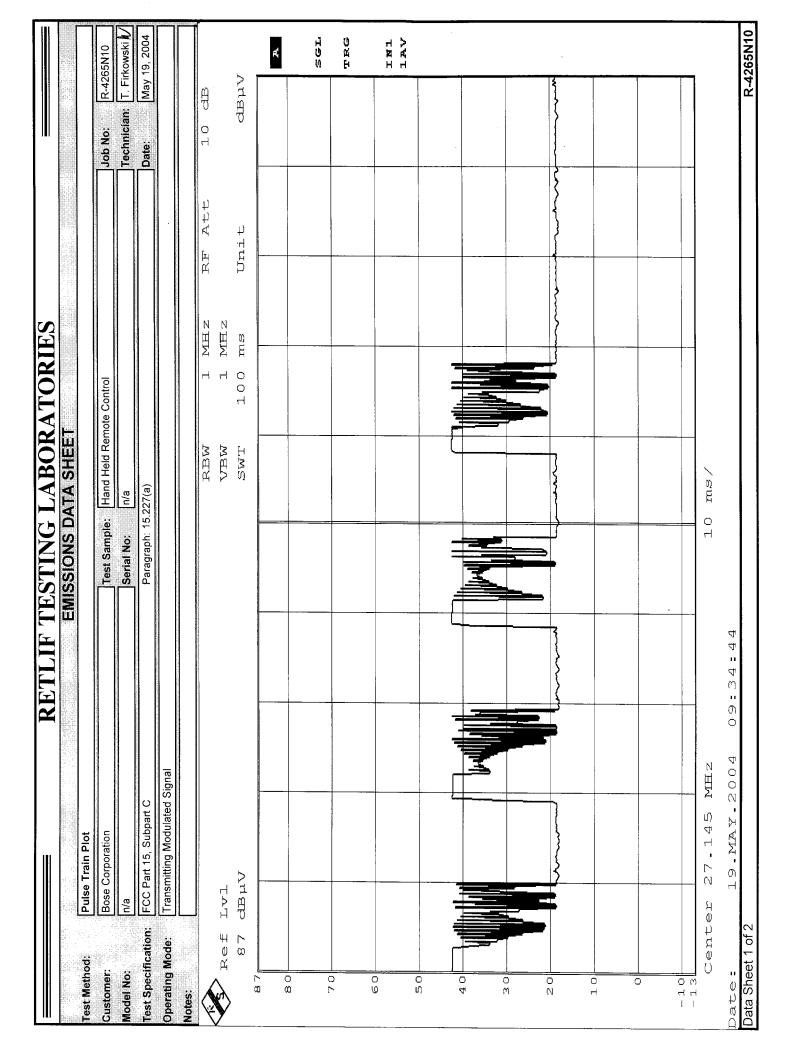
## **EQUIPMENT LISTS**

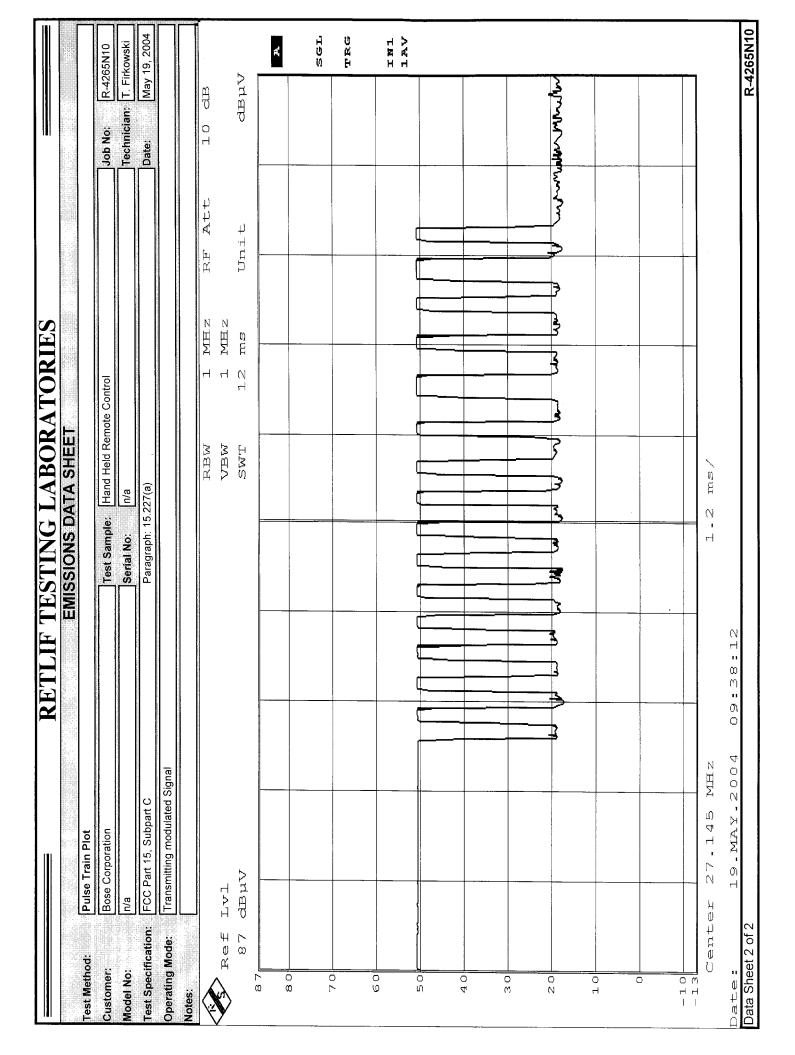
### Field Strength of Fundamental

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
3207	Loop Antenna, Active	EMCO	10 KHz - 30 MHz	6502	5/14/2003	6/14/2004
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	7/30/2003	7/30/2004
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	4/22/2004	4/22/2005

### Out of Band Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
3207	Loop Antenna, Active	EMCO	10 KHz - 30 MHz	6502	5/14/2003	6/14/2004
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	7/30/2003	7/30/2004
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	8/29/2003	8/29/2004
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	4/22/2004	4/22/2005





		E RE	TLIF	TEST	ING L	ABOF	RATOF	RIES			
				EMISSIC		TA SHEET					
Test Method	d:		al Field Streng	<b>yth</b>	_						
Customer Test Sample	lo.	Bose Corpora				Job No.	R-4265N10				
lbat Gample		Hand Held Ke	Remote Control								
Model No.	-	n/a				Serial No.	n/a				
Test Specific	cation:	FCC Part 15, Subpart C Paragraph: 15.227(a)									
Operating M	Mode:	Transmitting				Paragraph:	15.227(a)				
Technician:		T. Firkowski	Way 17, 2004								
Notes:		Test Distance Detector: Peal									
Test	Antenna/EUT	Uncorrected	Correction	Duty Cycle	Corrected				Converted	Limit	
Frequency MHz	Position Polarization/Axis	Reading dBuV	Factor dB	Factor dB	Reading			<del></del>	Reading	at 3 Meters	
27.145	X	71.26	7.71	-11.70	dBuV/m 67.27	+	+		uV/m 2426.61	uV/m 10000.00	
					<u> </u>		+	+	2420.01	10000.00	
		<u> </u>									
<del></del>	+	<del></del>	<u> </u>	<u> </u>			<del></del>				
				<del> </del>	<del> </del>						
									<del>                                     </del>	<del> </del>	
	-	<del></del>	<del>                                     </del>								
			<del></del>	-			+			<del></del>	
									<del>                                     </del>	<del></del>	
			<del></del>								
		<del></del>	<del></del>	<del>                                     </del>	<u> </u>	<del>                                     </del>			·	<del>-</del>	
									+		
,	<del></del>										
	+		<del></del>	<del>   </del>	<del>                                     </del>						
						+			-	ı ———	
		,———	<del>                                     </del>	<del>                                     </del>		<u> </u>				<u> </u>	
			<u>_</u>					<del> </del>	-	Γ	
								<u> </u>			
	<del></del>	<del></del>	<del></del>	<b></b>							
						-					
	-		<del>-</del>								
				<del></del>		<del> </del>	+	<u> </u>			
			<u> </u>					<u> </u>			
	1								Ţ		
	<del></del>										
ata Sheet	1 of 1								<u> </u>	R-4265N10	

		RE'	TLIF '	resti	ING L	ABOR	ATOR	IES			
						A SHEET					
Test Method		Out of Band	Emissions								
Customer		Bose Corpora	ition			Job No.	R-4265N10				
Test Sample		Hand Held Remote Control									
Model No.		n/a				Serial No.	n/a				
Test Specific	ation:	FCC Part 15,	Subpart C			D	F 227/5)				
Operating M	ode:	Transmitting				Paragraph: 1	5.227(D)				
			***************************************			-					
Technician: Notes:		T. Firkowski Test Distance	2 Matara		W	<b>Date:</b> May 17, 2004					
Noies;		Detector: Pea									
Test Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor	Distance Factor	Corrected Reading	Duty Cycle Factor	Corrected Reading		Converted Reading	Limit at 300 Meters	
MHz	Polarization/Axis		dB	dB	dBuV/m	dB	dBuV/m		uV/m	uV/m	
0.009	-	-	-	-	-	-	-		d viiii	266.67	
	-	-	-	-	-	-	-		-		
0.49	-	-	-	-	-	-	-		-	4.90	
										at 30 Meters	
0.49	-	-	-	-	-	-	-	-	-	49.0	
1.705	-	-	-	-	-	-		-	-	14.1	
1.705		-	-	<u>-</u>			-		-	30.0	
1.700	_	4	-	-	-	-			<del>                                     </del>	1	
30.00	-	-	-	-	-	-	_	-	-	30.0	
					<u> </u>	ļ					
	<del> </del>				1						
										<u> </u>	
									-		
							<del> </del>		1		
										···	
						<u> </u>					
										<del>                                     </del>	
				-		+			-		
	<u> </u>			-		<del>                                     </del>		<del> </del>	-		
					<del>                                     </del>	<del> </del>	<del>                                     </del>	<u> </u>			
			dB of the spe	cified test limi	t were observe	ed at the specifi	ied test distand	e throughout	the given		
	frequency spe	ectrum.									
D. (	1.1.50									D 40051115	
Data Shee	t 1 of 2									R-4265N10	

#### **RETLIF TESTING LABORATORIES** EMISSIONS DATA SHEET Test Method: Out of Band Emissions Customer Bose Corporation Job No. R-4265N10 Test Sample Hand Held Remote Control Model No. n/a Serial No. n/a Test Specification: FCC Part 15, Subpart C Paragraph: 15.227(b) Operating Mode: Transmitting T. Firkowski Date: Technician: May 17, 2004 Notes: Test Distance: 3 Meters Detector: Peak Test Antenna/EUT Uncorrected Correction **Duty Cycle** Corrected Converted Limit at 3 Meters Frequency Reading Factor Reading Reading Position Factor MHz Polarization/Axis dBuV dB dB dBuV/m uV/m uV/m 30.00 100.00 1 54.29 V/Z 1 16.14 12.03 -11.70 16.47 6.66 81.43 V/Z 20.29 12.44 -11.70 21.03 11.26 1 1 --88.00 100.0 88.00 150.0 \_ \_ -\_ 1 V/Y 108.58 18.18 14.22 -11.70 20.70 10.84 135.72 H/X 17.59 13.86 -11.70 19.75 9.72 1 162.87 H/X 19.65 15.34 -11.70 23.29 14.60 1 190.01 H/Y 17.53 16.54 -11.70 22.37 13.14 --\_ -\_ 216.00 150.0 216.00 200.0 1 ١ ı 1 1 1 1 960.00 200.0 960.00 500.0 1000.00 500.0 EUT emissions observed throughout the given frequency spectrum were recorded and evaluated. Emission levels closest to the limit are listed on this data sheet. R-4265N10 Data Sheet 2 of 2

