

RETLIF TESTING LABORATORIES  
TEST REPORT R-4265N2  
AUGUST 25, 2004

FCC COMPLIANCE TEST REPORT  
ON

BOSE CORPORATION  
27.145MHz REMOTE CONTROL TRANSCEIVER  
FCC ID: A94-RCYZH

<b>APPLICANT</b> Bose Corporation 100 Mountain Road Framingham, MA 01701	<b>MANUFACTURER</b>  SAME
---	---------------------------------

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.227

TEST PROCEDURE: ANSI C63.4:2001

**TEST SAMPLE DESCRIPTION**

BRANDNAME: Bose MODEL: RC48S2-27

TYPE: DVD Home Entertainment System Remote Control Transceiver

POWER REQUIREMENTS: 6VDC via Internal Battery

FREQUENCY OF OPERATION: 27.145MHz

MODULATION: Pulsed (On/Off Keying)

TYPE OF TRANSMISSION: Control Signal (Pulse Recognition Codes)

FCC ID: A94-RCYZH

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

**TESTS PERFORMED**

15.227 (a) Field Strength of Fundamental 27.145MHz

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

\_\_\_\_\_

## 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 $\mu$ 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 ( $\text{LOG}_{10} .26$ )20	=	-11.7
<b><i>Duty Cycle Factor</i></b>	=	<b><i>-11.7dB</i></b>

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

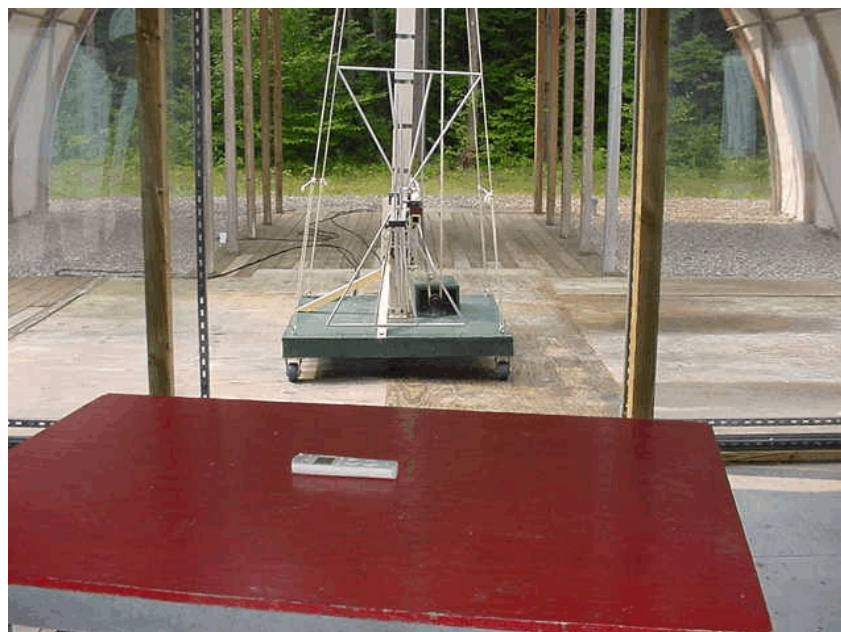
### Fundamental Field Strength

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due</b>
3207	Loop Antenna, Active	EMCO	10 KHz - 30 MHz	6502	6/1/2004	6/1/2005
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	7/30/2003	8/30/2004
4895	Spectrum Analyzer	Hewlett Packard	9kHz - 22GHz	8593EM	4/22/2004	4/22/2005

### Out of Band Emissions

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due</b>
3207	Loop Antenna, Active	EMCO	10 KHz - 30 MHz	6502	6/1/2004	6/1/2005
4029B	Test Site Attenuation	Retlif	3 / 10 Meters	RNH	7/30/2003	8/30/2004
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

## RADIATED EMISSIONS PHOTOGRAPHS



## **TEST DATA**

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

<b>Test Method:</b>	Fundamental Field Strength		
<b>Customer</b>	Bose Corporation	<b>Job No.</b>	R-4265N2
<b>Test Sample</b>	Hand Held Remote Control Transceiver		
<b>Model No.</b>	RC48S2-27	<b>Serial No.</b>	12
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.227(a)		
<b>Operating Mode:</b>	Transmitting		
<b>Technician:</b>	T. Firkowski	<b>Date:</b>	August 11, 2004
<b>Notes:</b>	Test Distance: 3 Meters Detector: Peak		

Test Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor	Duty Cycle Factor	Corrected Reading				Converted Reading	Limit at 3 Meters
MHz	Polarization/Axis	dBuV	dB	dB	dBuV/m				uV/m	uV/m
27.145	V/X	78.99	7.71	-11.70	75.00				5623.41	10000.00



# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

<b>Test Method:</b>	Out of Band Emissions	
<b>Customer</b>	Bose Corporation	<b>Job No.</b> R-4265N2
<b>Test Sample</b>	Hand Held Remote Control Transceiver	
<b>Model No.</b>	RC48S2-27	<b>Serial No.</b> 12
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.227(b)	
<b>Operating Mode:</b>	Transmitting	
<b>Technician:</b>	T. Firkowski	<b>Date:</b> August 11, 2004
<b>Notes:</b>	Test Distance: 3 Meters Detector: Peak	

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	dBuV	dB	dB	dBuV/m	dB	dBuV/m	uV/m	uV/m
0.009	-	-	-	-	-	-	-	-	266.67
0.009		-	-	-	-	-	-	-	
0.49	-	-	-	-	-	-	-	-	4.90
									at 30 Meters
0.49	-	-	-	-	-	-	-	-	49.0
0.49		-	-	-	-	-	-	-	
1.705	-	-	-	-	-	-	-	-	14.1
1.705		-	-	-	-	-	-	-	30.0
30.00	-	-	-	-	-	-	-	-	30.0

No EUT emissions within 20 dB of the specified test limit were observed at the specified test distance throughout the given frequency spectrum.

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

<b>Test Method:</b>	Out of Band Emissions		
<b>Customer:</b>	Bose Corporation	<b>Job No.:</b>	R-4265N2
<b>Test Sample:</b>	Hand Held Remote Control Transceiver		
<b>Model No.:</b>	RC48S2-27	<b>Serial No.:</b>	12
<b>Test Specification:</b>	FCC Part 15, Subpart C Paragraph: 15.227(b)		
<b>Operating Mode:</b>	Transmitting		
<b>Technician:</b>	T. Firkowski	<b>Date:</b>	August 11, 2004
<b>Notes:</b>	Test Distance: 3 Meters Detector: Peak		

Test Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor	Duty Cycle Factor	Corrected Reading				Converted Reading	Limit at 3 Meters
MHz	Polarization/Axis	dBuV	dB	dB	dBuV/m				uV/m	uV/m
30.00	-	-	-	-	-				-	100.00
	-	-	-	-	-				-	
54.29	-	-	-	-	-				-	
81.43	V/X	22.45	12.44	-11.70	23.19				14.44	
	-	-	-	-	-				-	
88.00	-	-	-	-	-				-	100.0
88.00	-	-	-	-	-				-	150.0
	-	-	-	-	-				-	
108.58	H/X	24.85	14.22	-11.70	27.37				23.36	
135.72	H/X	26.79	13.86	-11.70	28.95				28.02	
162.87	H/X	28.41	15.34	-11.70	32.05				40.04	
190.01	H/X	29.93	16.54	-11.70	34.77				54.76	
	-	-	-	-	-				-	
216.00	-	-	-	-	-				-	150.0
216.00	-	-	-	-	-				-	200.0
	-	-	-	-	-				-	
217.16	H/X	32.88	17.78	-11.70	38.96				88.72	
244.31	H/X	29.98	19.40	-11.70	37.68				76.52	
271.45	H/X	26.65	20.42	-11.70	35.37				58.65	
	-	-	-	-	-				-	
	-	-	-	-	-				-	
	-	-	-	-	-				-	
960.00	-	-	-	-	-				-	200.0
960.00	-	-	-	-	-				-	500.0
	-	-	-	-	-				-	
1000.00	-	-	-	-	-				-	500.0

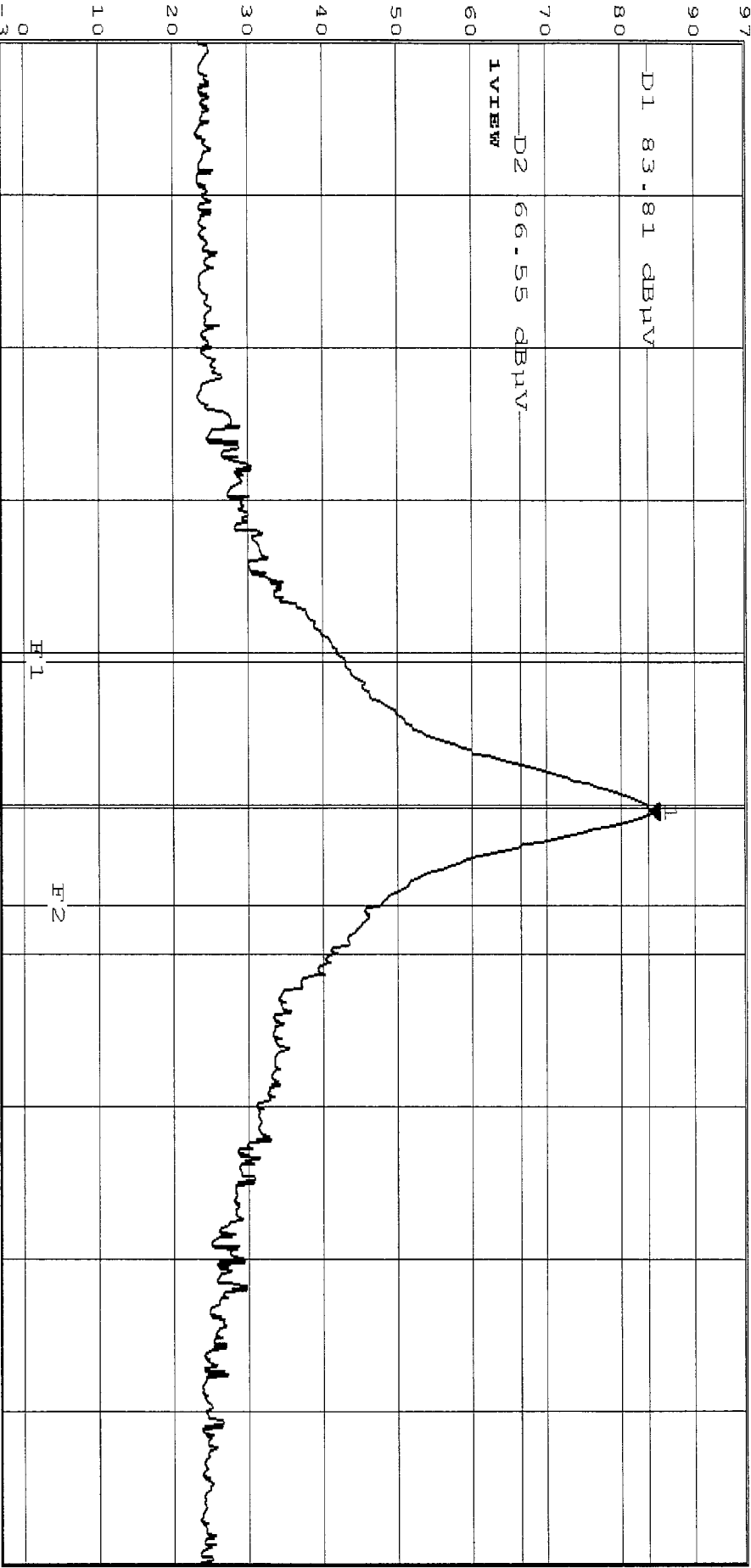
EUT emissions observed throughout the given frequency spectrum were recorded and evaluated. Emission levels closest to the limit are listed on this data sheet.

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Band Edge Emissions	Test Sample:	Hand Held Remote Control Transceiver	Job No:	R-4265N2
Customer:	Bose Corporation	Serial No:	12	Technician:	T. Filkowski
Model No:	RC48S2-27	Paragraph:	15.227(b)	Date:	August 11, 2004
Test Specification:	FCC Part 15, Subpart C	Operating Mode:			
Operating Mode:	Transmitting	Notes:			

K5 Ref Lvl 97 dBµV      Marker 1 [T1] 83.81 dBµV      RBW 30 KHZ      RT Att 20 DB  
 27.15502004 MHZ      VBW 30 KHZ      SWT 6 ms      Unit dBµV

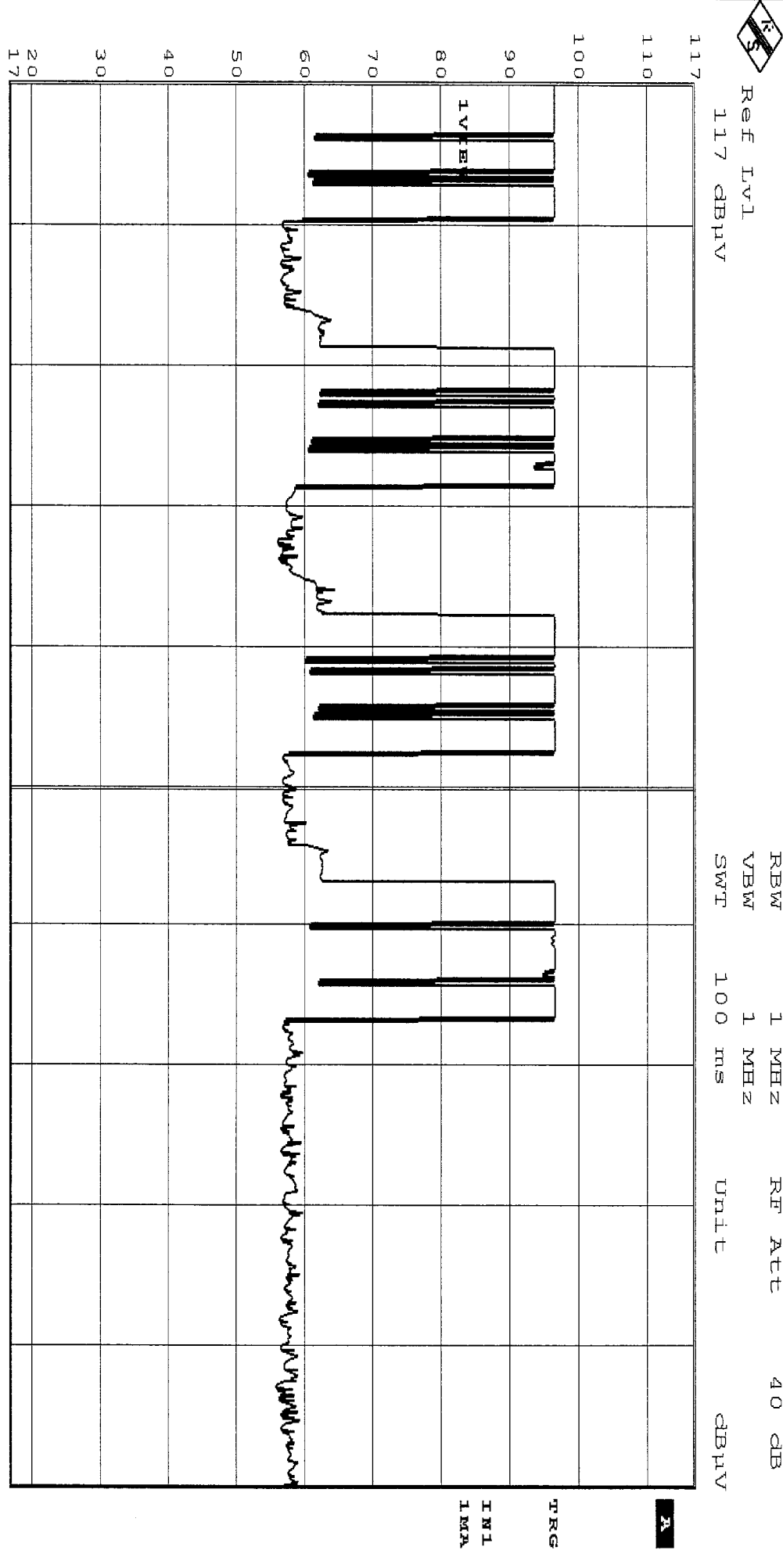


Date: 11.AUG.2004 13:16:53      Center 27.145 MHZ      Span 2 MHZ      200 KHZ/

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Pulse Train Plot		
Customer:	Bose Corporation	Test Sample:	Hand Held Remote Control Transceiver
Model No:	RC48S2-27	Serial No:	12
Test Specification:	FCC Part 15, Subpart C	Paragrph:	15.227
Operating Mode:	Transmitting		
Notes:			



# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Pulse Train Plot		
Customer:	Bose Corporation	Test Sample:	Hand Held Remote Control Transceiver
Model No:	RC48S2-27	Serial No:	12
Test Specification:	FCC Part 15, Subpart C	Paragraph:	15.227
Operating Mode:	Transmitting modulated Signal		
Notes:			

