RETLIF TESTING LABORATORIES
TEST REPORT R-4265N6
JUNE 3, 2004

FCC COMPLIANCE TEST REPORT
ON

BOSE CORPORATION
DVD HOME ENTERTAINMENT SYSTEM CONSOLE
WITH
27.145MHz TRANSCEIVER
FCC ID: A94-AVYYB

APPLICANT	MANUFACTURER
Bose Corporation 100 Mountain Road Framingham, MA 01701	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: AV18

TYPE: DVD Home Entertainment System Console with 27.145MHz Transceiver

POWER REQUIREMENTS: 120VAC, 60Hz via external brick power supply

FREQUENCY OF OPERATION: 27.145MHz

MODULATION: Pulsed (On/Off Keying)

TYPE OF TRANSMISSION: Data transmission in response to command from handheld remote

FCC ID: A94-AVYYB

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)

15.207 (b) (2) Conducted Emissions (535kHz - 1705kHz)

TEST SAMPLE OPERATION

The EUT is a DVD Home Entertainment System Console with 27.145MHz transceiver. The EUT is powered by 120VAC, 60Hz via an external brick power supply. The device is normally automatically operated and transmits information back to a handheld remote control in response to a specific command received from the handheld remote. For testing purposes only the EUT was configured to continuously transmit.

TEST SAMPLE / TEST PROGRAM

- The fundamental field strength at 27.145MHz did not exceed 10,000µV/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 operates as a carrier current system and uses the power cord as the transmit antenna. In addition an auxiliary antenna is also supplied. When the auxiliary antenna is used it acts as an additional antenna in conjunction with the powerline. The auxiliary antenna connects via a non-standard 2mm jack on the rear of the console which satisfies the unique antenna connector requirement of 15.203.
- Both the power cord antenna and auxiliary antenna were reorientated during radiated emissions testing in order to maximize the emissions from the EUT.
- Conducted emissions from the EUT did not exceed 1000uV (60dBuV) in the frequency range of 535kHz to 1705kHz using a 50uH/50ohm LISN as specified in 15.207 (b) (2).

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 "on time" within the 100msec period was 33msec.

Fundamental Frequency: 27.145MHz

Transmitter On Time	=	33milliseconds (maximum)
Transmitter Cycle Time	=	100 milliseconds
Transmitter Duty Cycle	=	33%
On Time divided by Cycle Time	=	Duty Cycle Factor
33 divided by 100	=	0.33
0.33 converted to dB (LOG_{10} .33)20	=	-9.6
Duty Cycle Factor	**=**	***-9.6dB***

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. If necessary 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

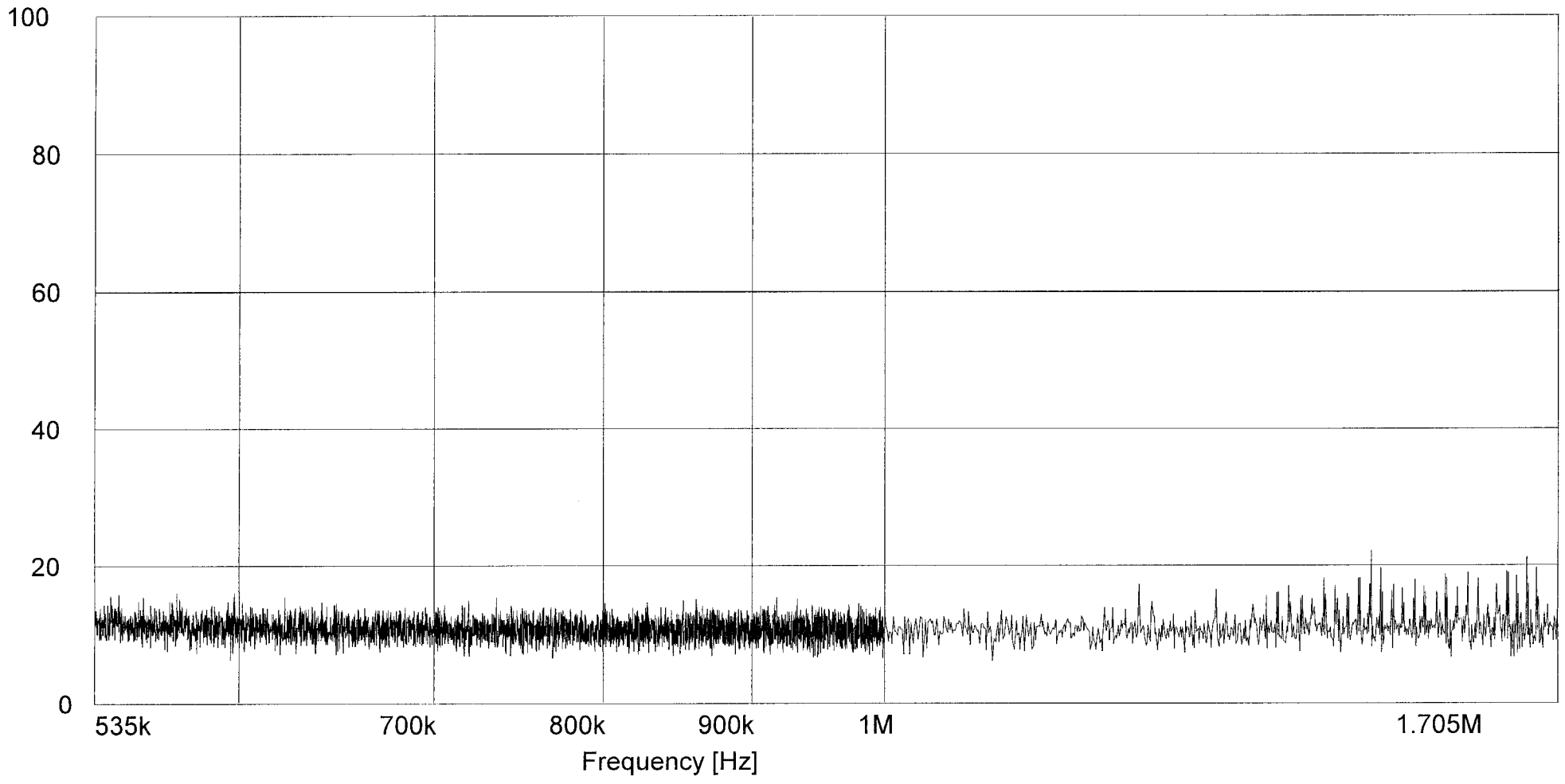
Conducted Emissions

EN	Type	Manufacturer	Description	Model No.	Cal Date	Due
4027	LISN	Solar Electronics	10 KHz - 30 MHz	9252-50-R-24BNC	10/20/2003	10/20/2004
4028	Isolation Transformer	Acme	N/A	120x240	1/25/2004	1/25/2005
5030D	10 DB Atten. (50 ohm)	Narda	DC - 12.4 GHz	757C-10	2/3/2004	2/3/2005
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESI26	9/5/2003	9/5/2004

RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

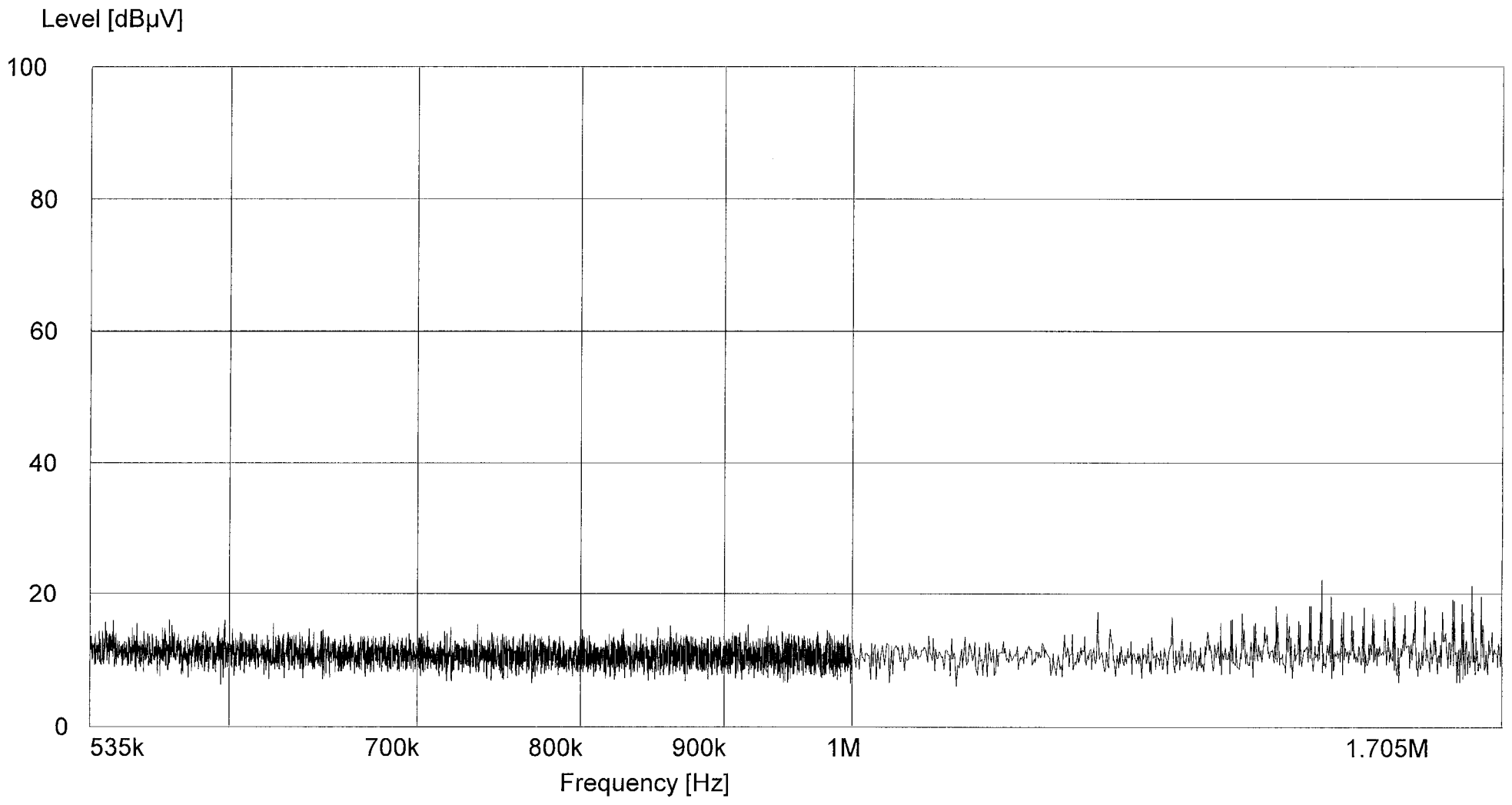
Test Method:	**Conducted Emissions 535 kHz to 1.705 MHz**				
Customer:	Bose Corporation	**Test Sample:**	RF Remote Control Transceiver Console	**Job No:**	R-4265N6
Model No:	AV18	**Serial No:**	035413940890017AE	**Technician:**	T. Firkowski
Test Specification:	FCC Part 15, Subpart C	Paragraph: 15.207(b)		**Date:**	June 7, 2004
Operating Mode:	Transmitting				
Notes:	Lead Tested: 120 VAC 60 Hz Hot Peak Readings to Quasi-Peak Limits				



RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

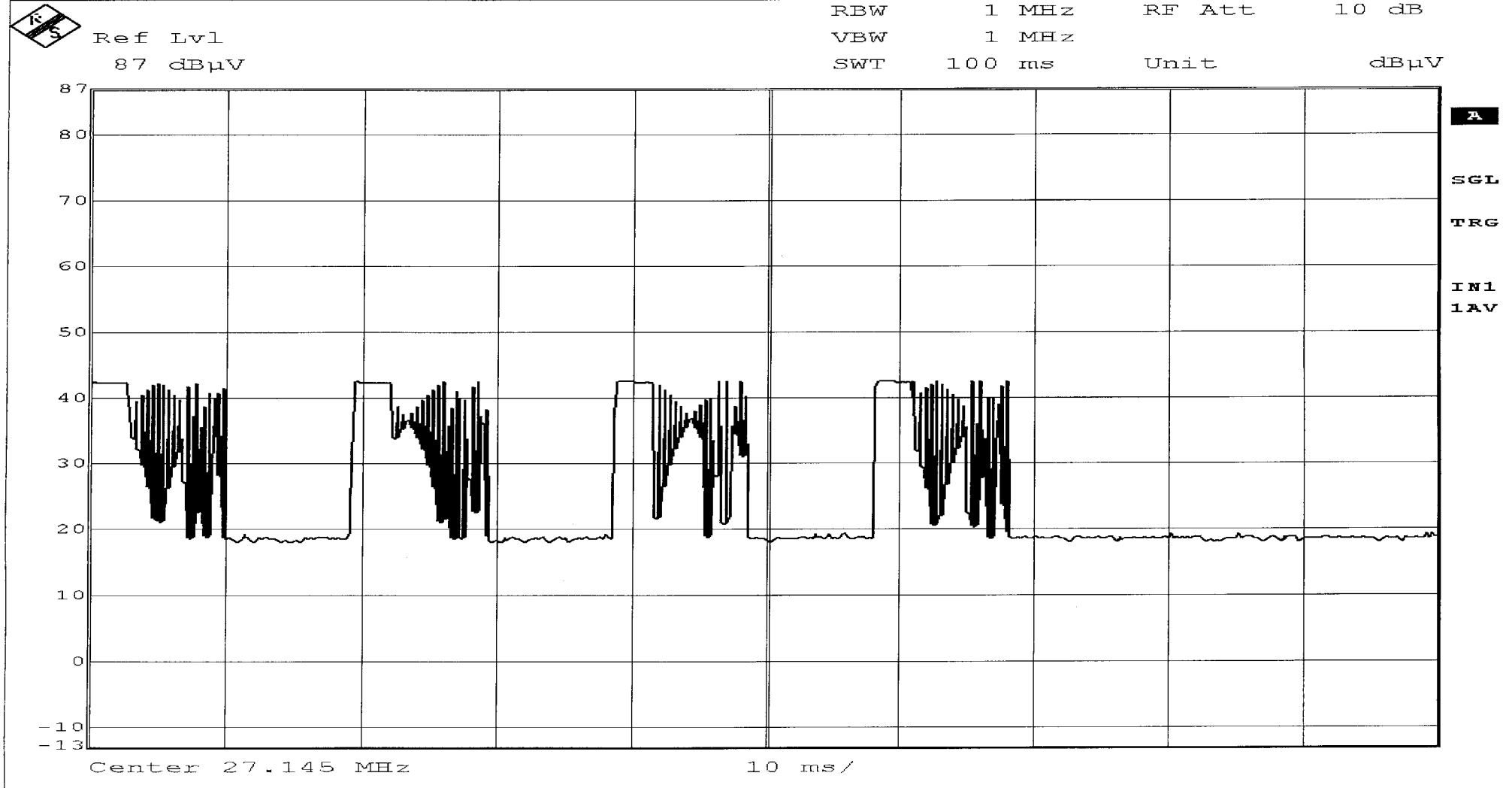
Test Method:	**Conducted Emissions 535 kHz to 1.705 MHz**				
Customer:	Bose Corporation	**Test Sample:**	RF Remote Control Transceiver Console	**Job No:**	R-4265N6
Model No:	AV18	**Serial No:**	035413940890017AE	**Technician:**	T. Firkowski
Test Specification:	FCC Part 15, Subpart C	Paragraph: 15.207(b)		**Date:**	June 7, 2004
Operating Mode:	Tranmitting				
Notes:	Lead Tested: 120 VAC 60 Hz Neutral Peak Readings to Quasi-Peak Limits				



RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

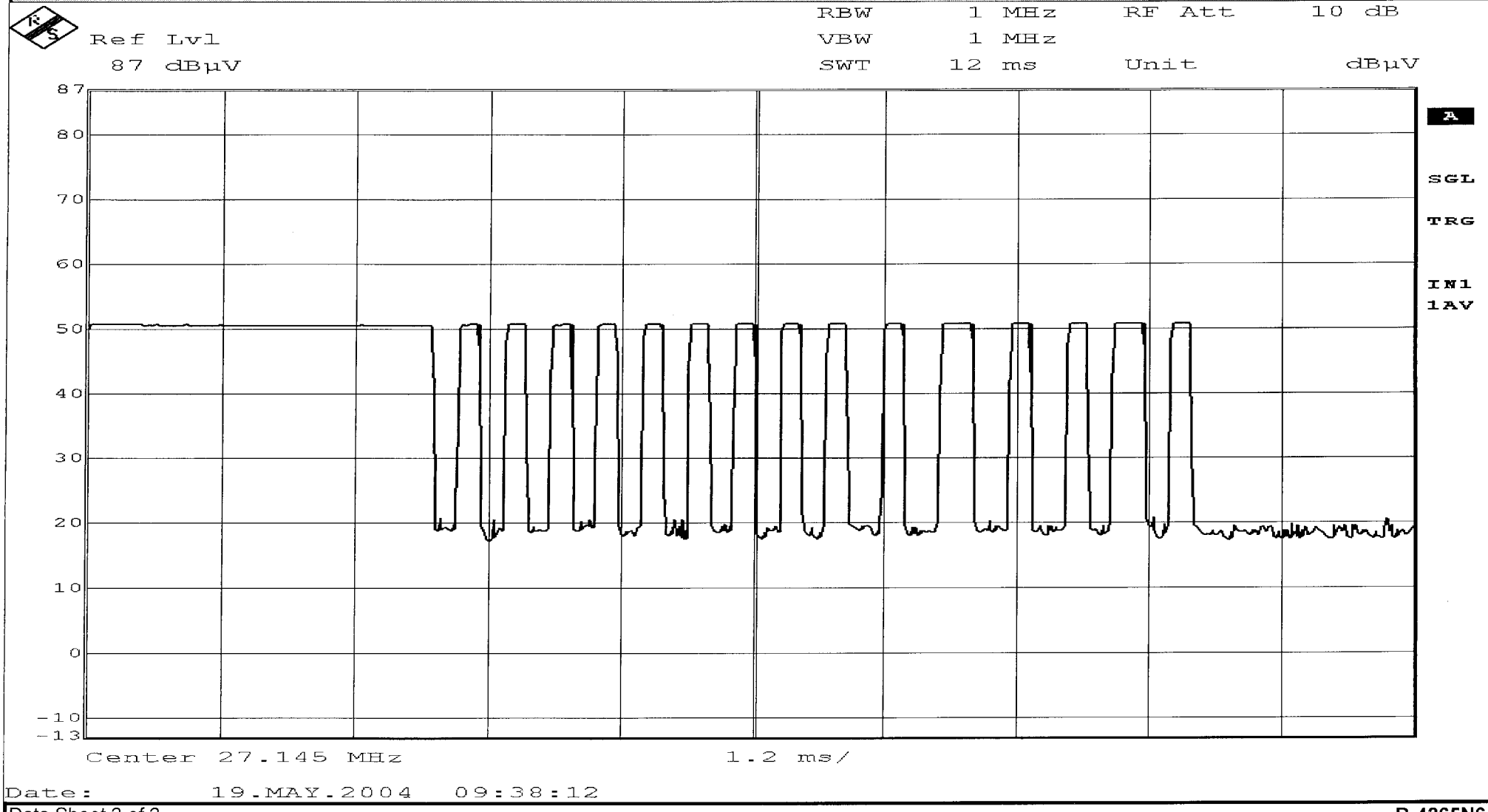
Test Method:	Pulse Train Plot				
Customer:	Bose Corporation	**Test Sample:**	RF Remote Control Transceiver Console	**Job No:**	R-4265N6
Model No:	AV18	**Serial No:**	035413940890017AE	**Technician:**	T. Firkowski
Test Specification:	FCC Part 15, Subpart C	Paragraph: 15.227(a)		**Date:**	May 19, 2004
Operating Mode:	Transmitting Modulated Signal				
Notes:	Representative Pulse Train				



RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:	Pulse Train Plot				
Customer:	Bose Corporation	**Test Sample:**	RF Remote Control Transceiver Console	**Job No:**	R-4265N6
Model No:	AV18	**Serial No:**	035413940890017AE	**Technician:**	T. Firkowski
Test Specification:	FCC Part 15, Subpart C	Paragraph: 15.227(a)		**Date:**	May 19, 2004
Operating Mode:	Transmitting modulated Signal				
Notes:					



RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:	**Fundamental Field Strength**		
Customer	Bose Corporation	**Job No.**	R-4265N6
Test Sample	RF Remote Control Transceiver Console		
Model No.	AV18	**Serial No.**	035413940890017AE
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.227(a)		
Operating Mode:	Transmitting		
Technician:	T. Firkowski	**Date:**	May 19, 2004
Notes:	Test Distance: 3 Meters Detector: Peak		

Test Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor		Corrected Reading				Converted Reading	Limit at 3 Meters
MHz	Polarization/Axis	dBuV	dB		dBuV/m				uV/m	uV/m
27.145	X	64.51	7.71		72.22				4083.19	10000.00

RETLIF TESTING LABORATORIES

EMISSIONS DATA SHEET

Test Method:	**Out of Band Emissions**		
Customer	Bose Corporation	**Job No.**	R-4265N6
Test Sample	RF Remote Control Transceiver Console		
Model No.	AV18	**Serial No.**	035413940890017AE
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.227(b)		
Operating Mode:	Transmitting		
Technician:	T. Firkowski	**Date:**	May 19, 2004
Notes:	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	-	-	-	-	-	-	-		-	30.0
I	-	-	-	-	-	-	-		-	I
0.49	-	-	-	-	-	-	-		-	30.0
										at 30 Meters
0.49	-	-	-	-	-	-	-	-	-	49.0
I	-	-	-	-	-	-	-	-	-	I
1.71	-	-	-	-	-	-	-	-	-	14.1
1.71	-	-	-	-	-	-	-	-	-	30.0
I	-	-	-	-	-	-	-	-	-	I
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

Test Method:	**Out of Band Emissions**		
Customer	Bose Corporation	**Job No.**	R-4265N6
Test Sample	RF Remote Control Transceiver Console		
Model No.	AV18	**Serial No.**	035413940890017AE
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.227(b)		
Operating Mode:	Transmitting		
Technician:	T. Firkowski	**Date:**	May 19, 2004
Notes:	Test Distance: 3 Meters Detector: Peak		

Test Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor		Corrected Reading				Converted Reading	Limit at 3 Meters
MHz	Polarization/Axis	dBuV	dB		dBuV/m				uV/m	uV/m
30.00	-	-	-		-				-	100.00
	-	-	-		-				-	
54.29	-	-	-		-				-	
81.43	V/X	26.95	12.44		39.39				93.22	
	-	-	-		-				-	
88.00	-	-	-		-				-	100.0
88.00	-	-	-		-				-	150.0
	-	-	-		-				-	
108.58	V/X	24.69	14.22		38.91				88.21	
135.72	V/X	25.40	13.86		39.26				91.83	
162.87	V/X	21.03	15.34		36.37				65.84	
190.01	V/X	22.80	16.54		39.34				92.68	
	-	-	-		-				-	
216.00	-	-	-		-				-	150.0
216.00	-	-	-		-				-	200.0
	-	-	-		-				-	
	-	-	-		-				-	
	-	-	-		-				-	
	-	-	-		-				-	
	-	-	-		-				-	
	-	-	-		-				-	
	-	-	-		-				-	
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				
Customer:	Bose Corporation	**Test Sample:**	RF Remote Control Transceiver Console	**Job No:**	R-4265N6
Model No:	AV18	**Serial No:**	035413940890017AE	**Technician:**	T. Firkowski
Test Specification:	FCC Part 15, Subpart C	Paragraph: 15.227(b)		**Date:**	June 7, 2004
Operating Mode:	Transmitting Modulated Signal				
Notes: