



EMI TEST REPORT

Test Report No. : 24FE0298-HO-1

Applicant : Sony Corporation
Type of Equipment : Bluetooth Earset
Model No. : DR-BT1
Test standard : FCC Part 15 Subpart C
Section 15.207, Section 15.247 : 2004
FCC ID : AK8DRBT1
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test:

August 3 to 5, 2004

Tested by:

Makoto Kosaka
EMC Service

Hiroka Umeyama
EMC Service

Approved by :

Hironobu Shimoji
Group Leader of
EMC Service

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SECTION 1: Client information

Company Name : Sony EMCS Corporation
Address : Shinagawa INTERCITY C Tower 2-15-3 Konan Minato-ku, Tokyo, Japan
108-6201
Telephone Number : +81-3-5769-5640
Facsimile Number : +81-3-5769-5962
Contact Person : Kikuo Murata

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Bluetooth Earset
Model No. : DR-BT1
Serial No. : 000000
Rating : DC3.7V
Country of Manufacture : Korea
Receipt Date of Sample : July 30, 2004
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: DR-BT1 (referred to as the EUT in this report) is the Bluetooth Earset.

	The details
Clock frequency	16MHz
Feature of EUT	Headset / mobilephone Headset / adapter and mobilephone

	The details
Equipment Type	Bluetooth Earset
Frequency band	Lower limit 2400MHz Upper limit 2483.5MHz
Frequency of Operation	2402 – 2480MHz
Bandwidth & Channel spacing	79MHz(Hopping) & 1MHz
Type of Modulation	FHSS
Duty cycle	100%
Antenna Type	Chip Antenna (Murata Manufacturing Co.,Ltd. LDA31)
Antenna Gain	2400: -8.5dBi, 2442: -7.3dBi, 2484: -6.7dBi
Transmit Power	1mW
Mode of Operation	Duplex
Method of Frequency Generation	Synthesizer
ITU code	F7W
Operating voltage (Inner)	DD-con: DC2.8V, (Battery voltage: DC2.8-3.9V)
Operating Temperature	0 to +40deg.C.

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FCC 15.31 (e)

This EUT provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2004

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits : 2004
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz : 2004

3.2 Procedures and results

[FHSS]

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A *1)	N/A	N/A
2	Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)(iii)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)(iii)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(b)(1)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(c)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(c)	Conducted/ Radiated	N/A	2.3dB 17360.0MHz Horizontal/ Vertical, AV	Complied

Note: UL Apex's EMI Work Procedures No. QPM05.

*1) The test is not applicable since the EUT cannot be connected to the AC Adapter in Bluetooth mode.

Uncertainty

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ± 1.3 dB.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ± 4.5 dB(3m)/ ± 4.7 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m)/ ± 3.8 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is ± 3.0 dB.

*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

*These tests were performed without any deviations from test procedure except for additions or exclusions.

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3.3 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0

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	Listed date (for FCC)	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.4 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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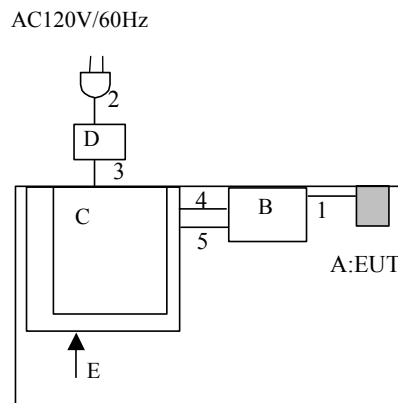
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SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The mode is used : [FHSS:Bluetooth]
Transmitting mode(Packet size DH5)
Low Channel :2402MHz
Mid Channel :2441MHz
High channel :2480MHz
Inquiry

4.2 Configuration and peripherals



* Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Bluetooth Earset	DR-BT1	000000	SONY	AK8DRBT1
B	IF Board	-	-	SONY	-
C	Personal Computer	PCG-654N	1403335	SONY	-
D	AC Adapter	PCGA-ACMV5	0132537	SONY	-
E	Docking Station	PCGA-DSM51	1017485	SONY	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	Test Control Cable	0.2	N	Polyvinyl chloride
2	AC Cable	0.8	N	Polyvinyl chloride
3	DC Cable	1.8	N	Polyvinyl chloride
4	RS232C Cable	2.0	Y	Polyvinyl chloride
5	USB Cable	1.1	Y	Polyvinyl chloride

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SECTION 5: Spurious Emission 15.247(c)

[Conducted]

Test Procedure

The Spurious Emission was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

[Radiated]

Test Procedure

EUT was placed on a platform of nominal size, 1.0m by 0.5m, raised 80cm above the conducting ground plane.

The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver or the Spectrum Analyzer.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

The result also satisfied with the general limits specified in section 15.209(a).

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
Detector	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth		AV: RBW:1MHz/VBW:10Hz

Test data : APPENDIX 3

Test result : Pass

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.

With the position, the noise levels of all the frequencies was measured.

SECTION 6: Bandwidth, Section 15.247(a)(1)

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

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SECTION 7: Maximum Peak Output Power, Section 15.247(b)(1)

Test Procedure

The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 8: Carrier Frequency Separation, Section 15.247(a)(1)

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 9: Number of Hopping Frequency, Section 15.247(a)(1)(iii)

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 10: Dwell time, Section 15.247(a)(1)(iii)

Test Procedure

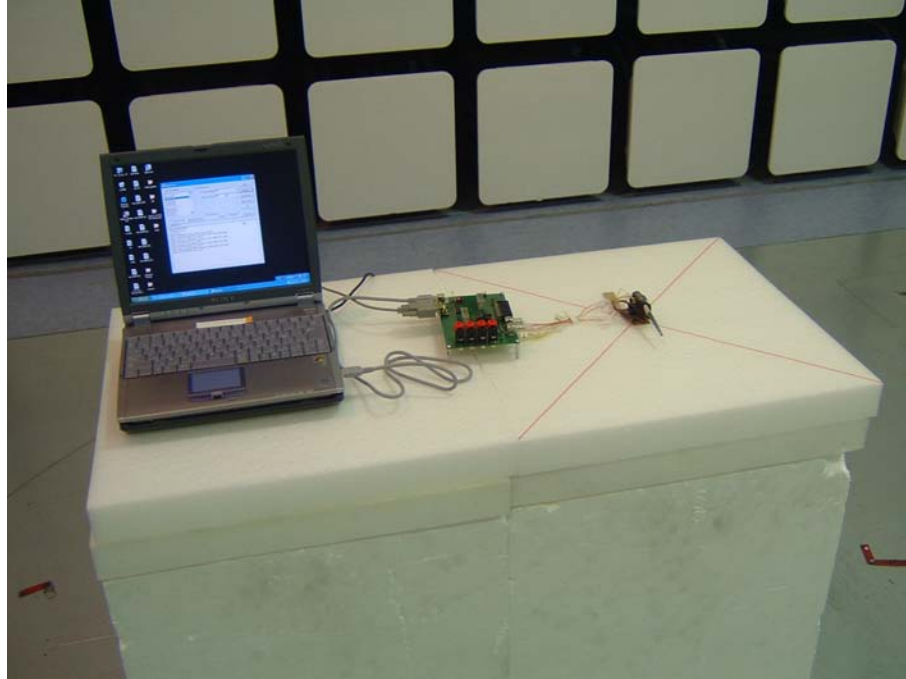
The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

APPENDIX 1: Photographs of test setup

Spurious Emission (Radiated)

Front

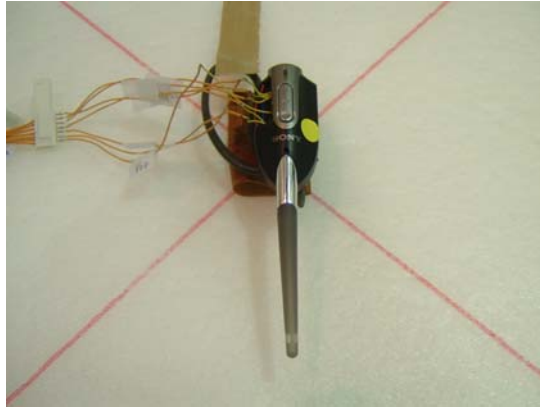


Rear

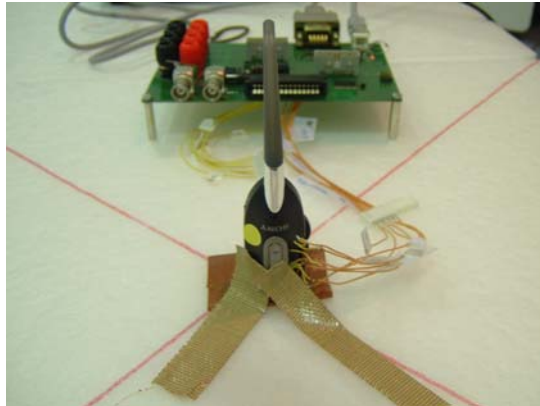


Worst Case Position (Y-axis:Horizontal / Y-axis:Vertical)

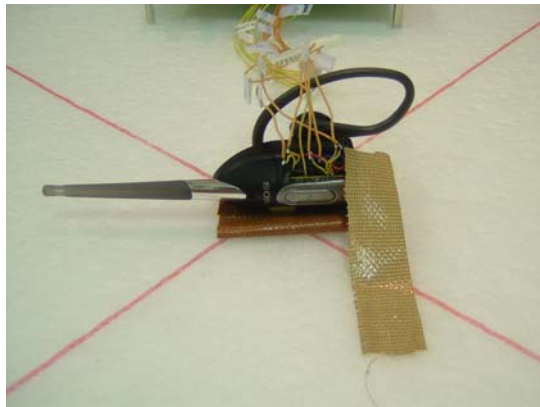
X-axis



Y-axis



Z-axis



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE /AT	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2004/02/03 * 12
MRENT-09	Spectrum Analyzer	Advantest	R3273	RE/AT	2004/02/18 * 12
MPA-02	Pre Amplifier	Agilent	87405A	RE	2004/04/16 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2004/02/06 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/10/15 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MCC-04	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MCC-24	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	AT	2004/06/12 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2004/05/25 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE(MW)	2004/01/10 * 12
MPM-04	Power Meter	Agilent	E4416A	CE	2004/03/03 * 12
MPSE-04	Power sensor	Agilent	E9327A	CE	2004/03/11 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

RE: Radiated Spurious emission Test

AT: Other Test

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APPENDIX 3: Data of EMI test

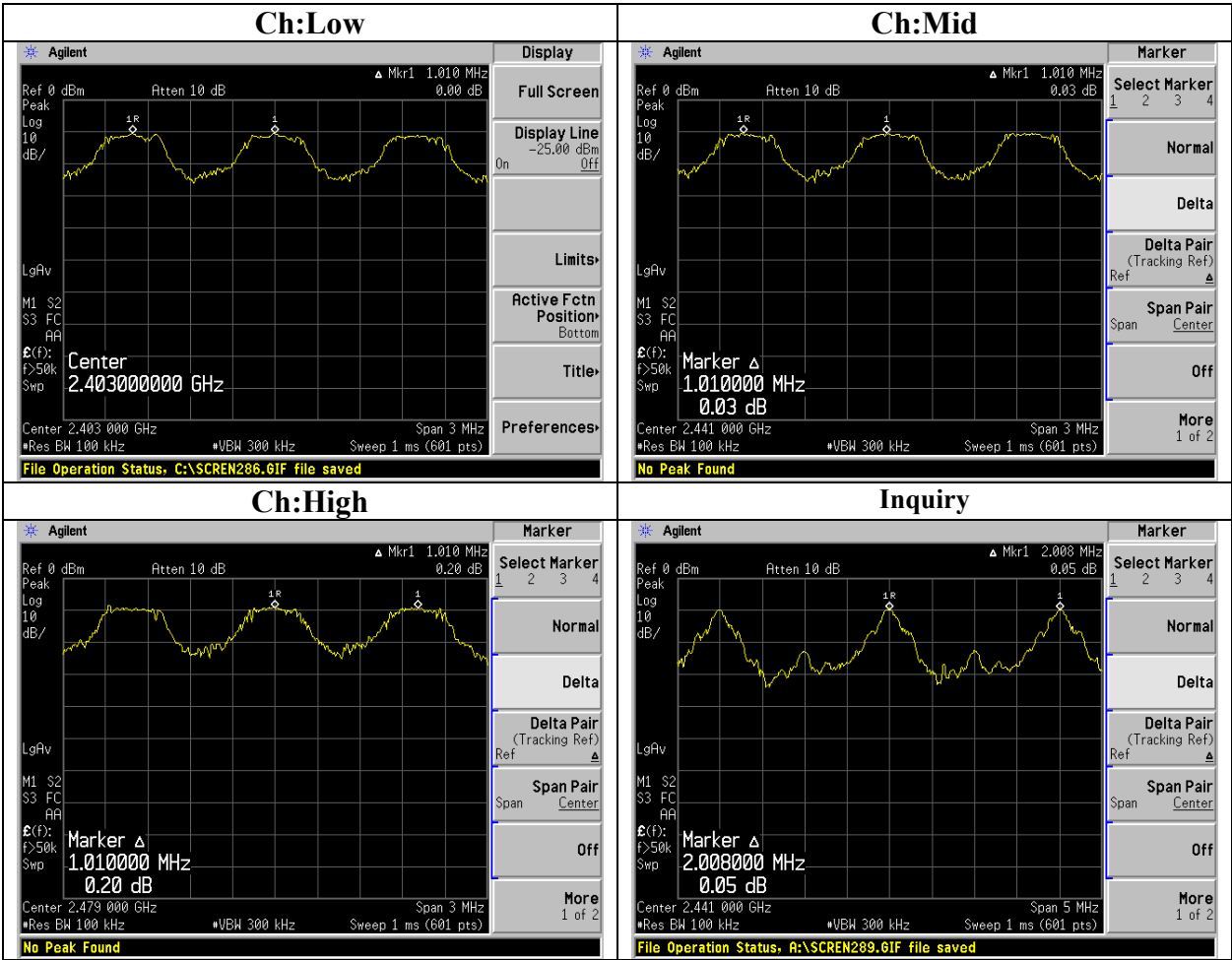
Carrier Frequency Separation(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Sony EMCS Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Earset	TEST DISTANCE	: -
MODEL	: DR-BT1	DATE	: 08/04/2004
S/ N	: 000000	TEMPERATURE	: 24deg.C
POWER	: DC 3.7 V	HUMIDITY	: 59%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.010	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.010	>20dB Bandwidth and 25[kHz]
High	2480.0	1.010	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	2.008	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation(FHSS)



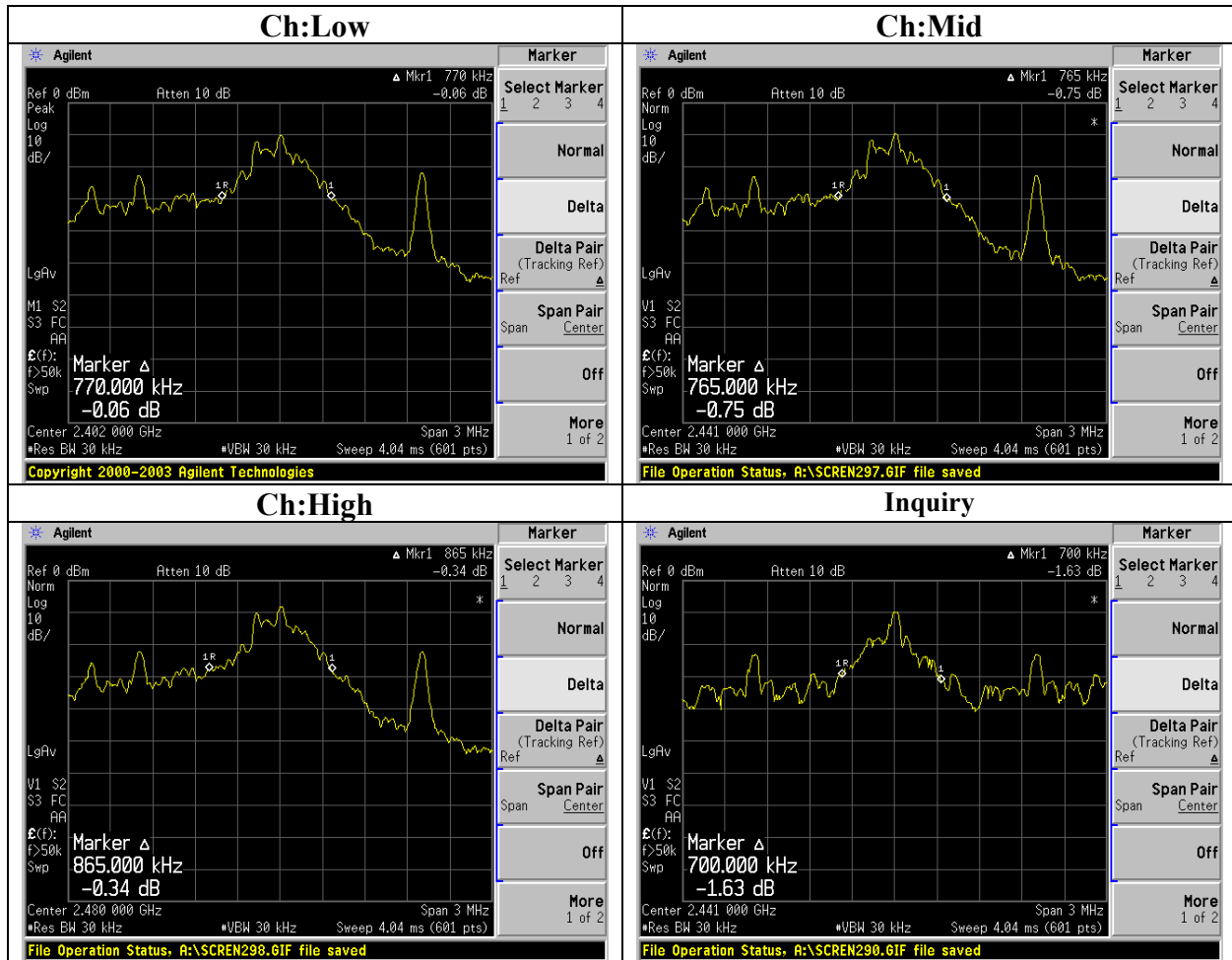
20dB Bandwidth(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: Sony EMCS Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Earset	TEST DISTANCE	: -
MODEL	: DR-BT1	DATE	: 08/04/2004
S/N	: 000000	TEMPERATURE	: 24deg.C
POWER	: DC 3.7 V	HUMIDITY	: 59%
MODE	: Tx(Hopping off)/Inquiry	ENGINEER	: Hiroka Umeyama

Ch	Freq.	20dB Bandwidth	Limit
	[MHz]	[MHz]	[MHz]
Low	2402.0	0.770	-
Mid	2441.0	0.765	-
High	2480.0	0.865	-
Inquiry	2441.0	0.700	-

20dB Bandwidth(FHSS)



Number of Hopping Frequency(FHSS)

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Head Office EMC Lab. No.3 Measurement Room

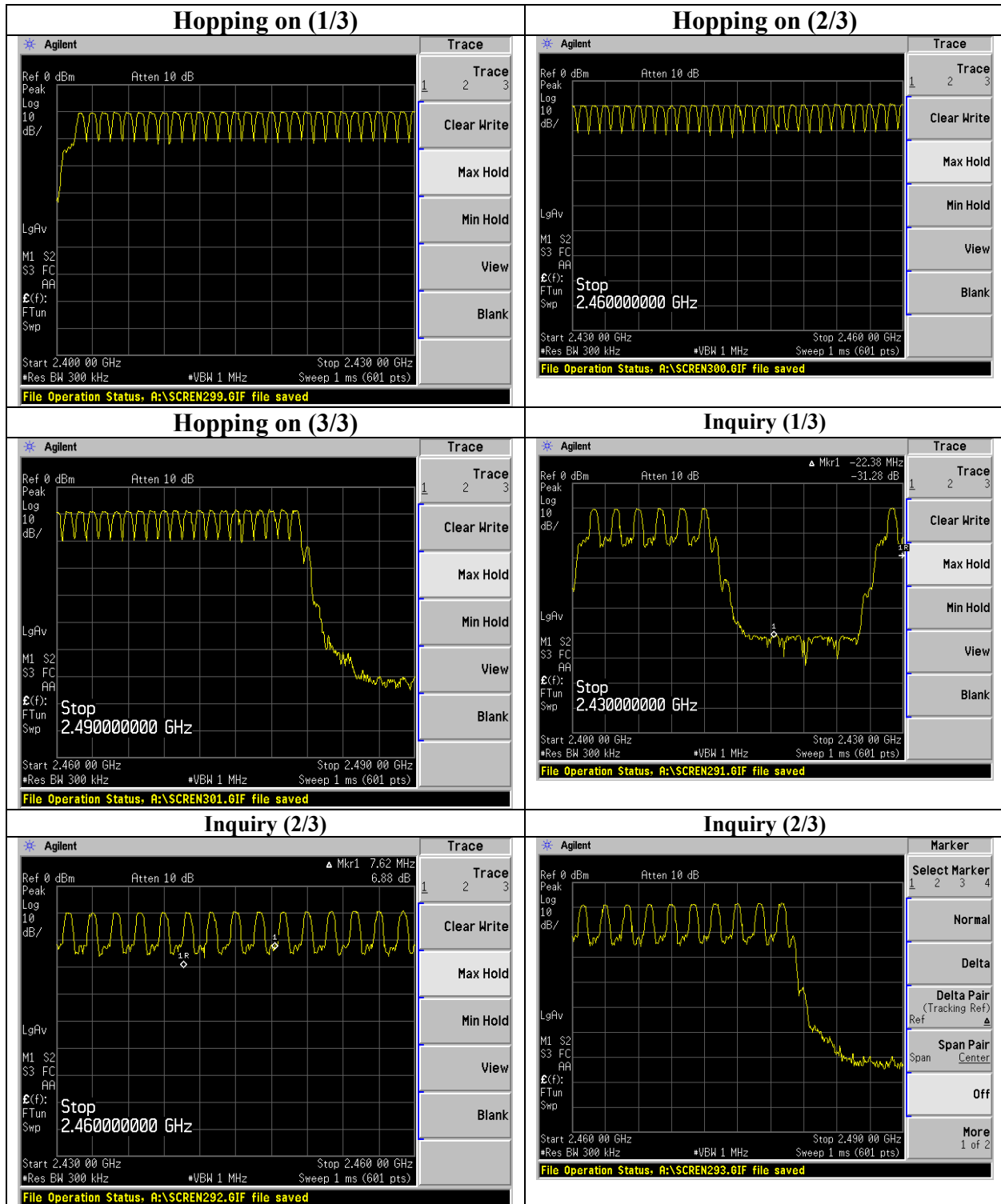
COMPANY : Sony EMCS Corporation
EQUIPMENT : Bluetooth Earset
MODEL : DR-BT1
S/ N : 000000
POWER : DC 3.7 V
MODE : Tx(Hopping on)/Inquiry

REGULATION : Fcc Part15 Subpart C 15.247(a)(1)
TEST DISTANCE : -
DATE : 08/04/2004
TEMPERATURE : 24deg.C
HUMIDITY : 59%
ENGINEER : Hiroka Umeyama

Mode	Number of channel [time]	Limit [time]
Tx(Hoppng on)	79	≥ 15

Mode	Number of channel [time]	Limit [time]
Inquiry	32	≥ 15

Number of Hopping Frequency(FHSS)



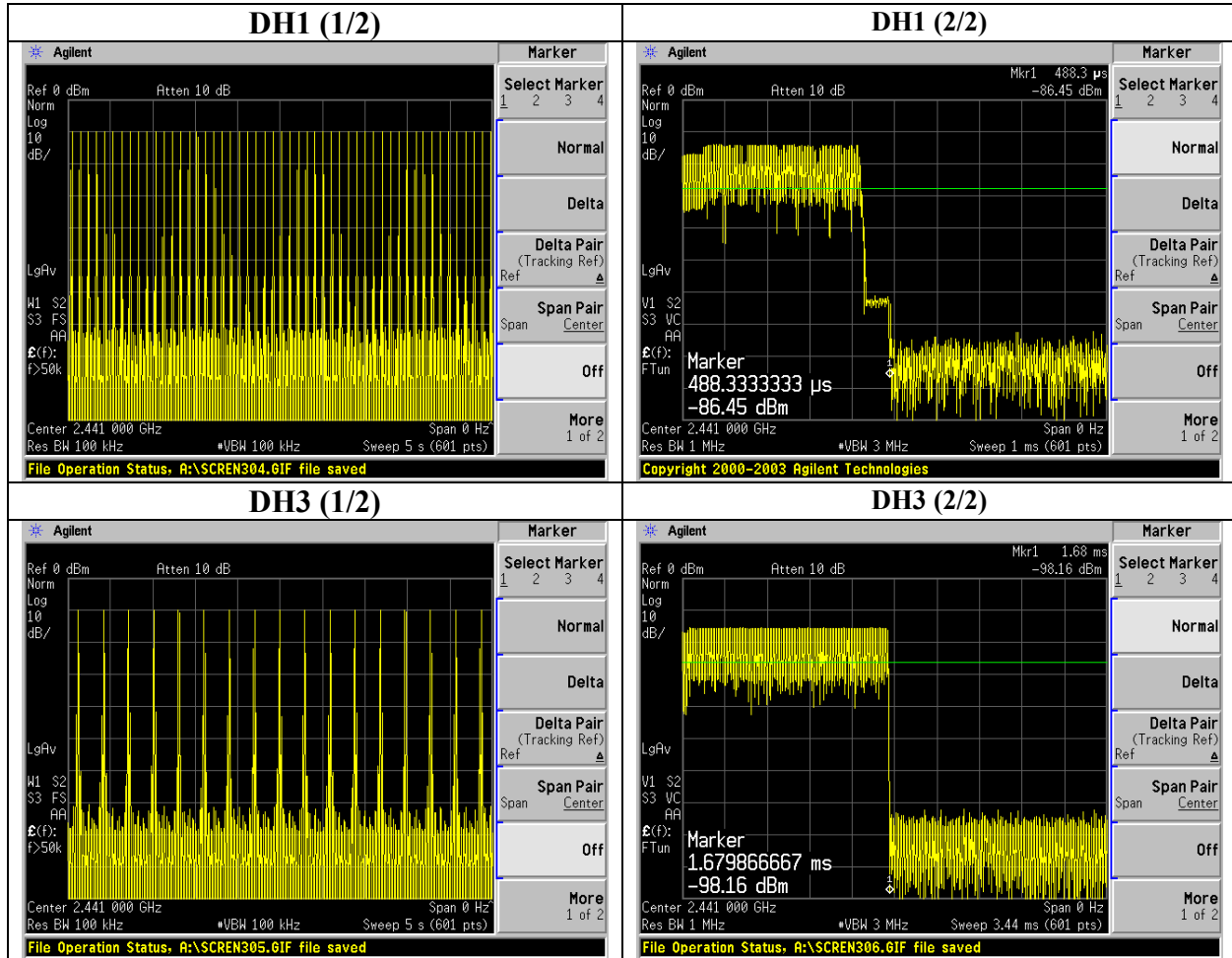
Dwell time(FHSS)

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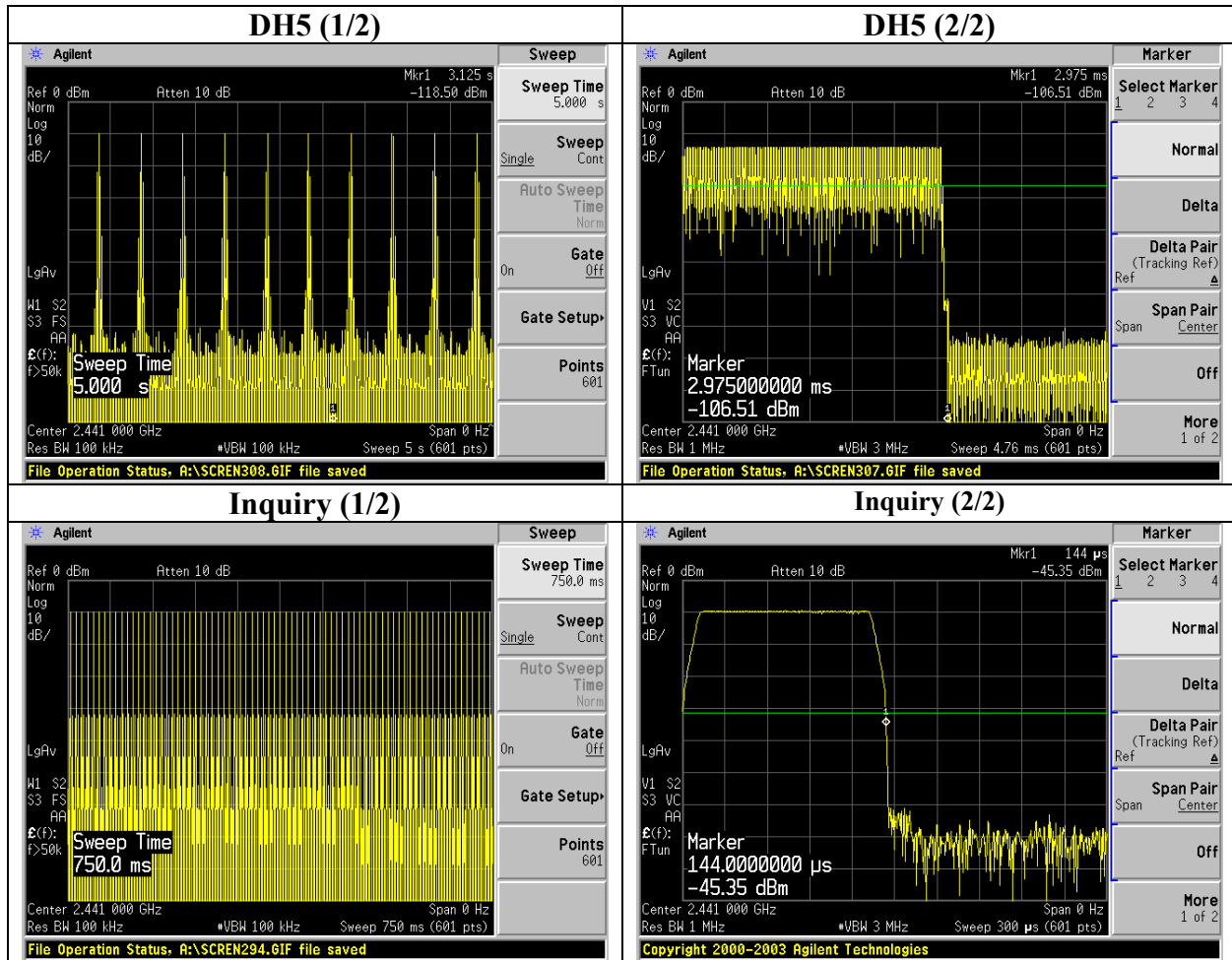
COMPANY	: Sony EMCS Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Earset	TEST DISTANCE	: -
MODEL	: DR-BT1	DATE	: 08/04/2004
S/ N	: 000000	TEMPERATURE	: 24deg.C
POWER	: DC 3.7 V	HUMIDITY	: 59%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Hiroka Umeyama

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50 times /5sec. x 31.6 = 316 times	0.488	154	400
DH3	17 times / 5sec. x 31.6 = 107 times	1.679	179	400
DH5	10 times / 5 sec. x 31.6 = 63 times	2.975	187	400
Inquiry	75 times / 0.75sec. x 12.8 = 1280 times	0.144	184	400

Dwell time(FHSS)



Dwell time(FHSS)



Maximum Peak Output Power(FHSS)

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COMPANY	: Sony EMCS Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	: Bluetooth Earset	TEST DISTANCE	: -
MODEL	: DR-BT1	DATE	: 08/04/2004
S/ N	: 000000	TEMPERATURE	: 24deg.C
POWER	: DC 3.7 V	HUMIDITY	: 59%
MODE	: Tx(Hopping off)/Inquiry	ENGINEER	: Hiroka Umeyama

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-10.37	0.00	0.00	-10.37	30.00	40.37
Mid	2441.0	-9.86	0.00	0.00	-9.86	30.00	39.86
High	2480.0	-8.43	0.00	0.00	-8.43	30.00	38.43
Inquiry	2441.0	-9.55	0.00	0.00	-9.55	30.00	39.55

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)+ Attenuator

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Test parameter : RBW 1MHz/VBW 3MHz (peak max hold)

*The tests was made with the spectrum analyzer and the power meter and there were no difference in levels.

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Radiated Spurious Emission(FHSS)

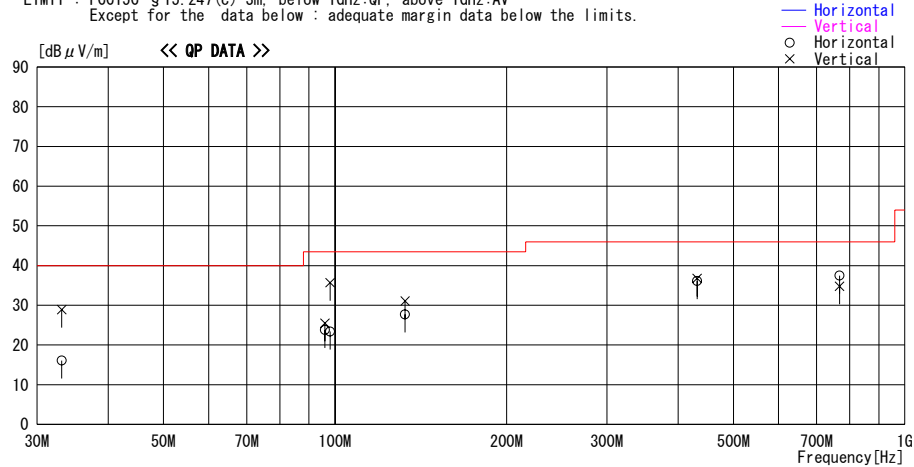
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Sony EMCS Corporation
Kind of EUT : Bluetooth Earset
Model No. : DR-BT1
Sample No. : 000000
Report No. : 24FE0298-H0
Power : DC3.7V
Temp°C/Humi% : 23deg. C / 60% 2004/08/05
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting 2402MHz X-axis(MAX)

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain					[dB μ V/m]	[dB]	
[MHz]	[dB μ V]		[dB/m]	[dB]	[dB μ V/m]	[Deg]	[cm]				
33.140	20.2	QP	17.2	-21.3	16.1	0	300	Hori.	40.0	23.9	
33.140	33.0	QP	17.2	-21.3	28.9	100	100	Vert.	40.0	11.1	
95.990	34.9	QP	9.3	-20.4	23.8	0	250	Hori.	43.5	19.7	PC
95.990	36.6	QP	9.3	-20.4	25.5	70	100	Vert.	43.5	18.0	PC
98.040	34.3	QP	9.7	-20.6	23.4	0	340	Hori.	43.5	20.1	PC
98.040	46.6	QP	9.7	-20.6	35.7	225	100	Vert.	43.5	7.8	PC
132.720	34.1	QP	13.7	-20.1	27.7	335	130	Hori.	43.5	15.8	
132.720	37.5	QP	13.7	-20.1	31.1	270	100	Vert.	43.5	12.4	
431.980	36.8	QP	18.3	-19.0	36.1	240	190	Hori.	46.0	9.9	
431.980	37.5	QP	18.3	-19.0	36.8	250	150	Vert.	46.0	9.2	
767.960	34.7	QP	21.1	-18.3	37.5	270	250	Hori.	46.0	8.5	
767.960	32.0	QP	21.1	-18.3	34.8	80	100	Vert.	46.0	11.2	

CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

Radiated Spurious Emission(FHSS)

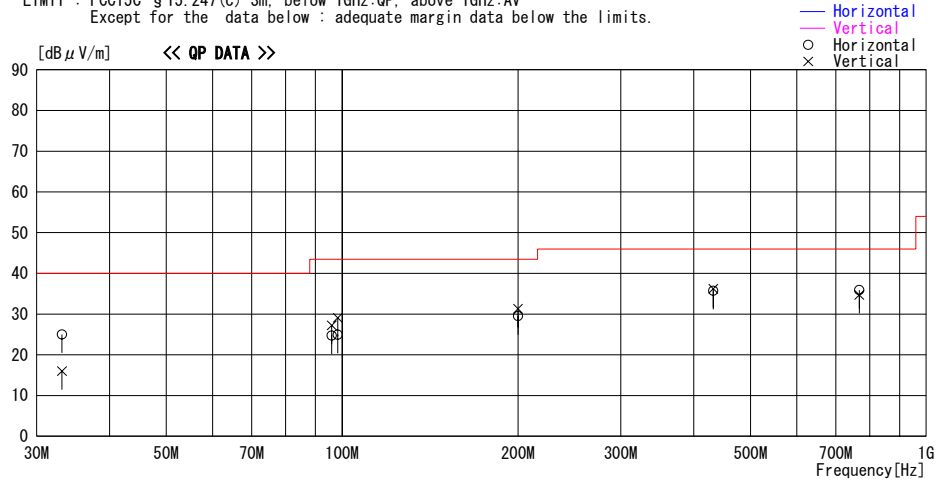
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Sony EMCS Corporation
Kind of EUT : Bluetooth Earset
Model No. : DR-BT1
Sample No. : 000000
Report No. : 24FE0298-H0
Power : DC3.7V
Temp/C/Humi% : 23deg. C / 60% 2004/08/05
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting 2441MHz X-axis(MAX)

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna		Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Loss & Gain							
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
33.140	20.1	QP	17.2	-21.3	16.0	0	100	Vert.	40.0	24.0	
33.140	29.1	QP	17.2	-21.3	25.0	0	300	Hori.	40.0	15.0	
95.990	35.8	QP	9.3	-20.4	24.7	0	100	Hori.	43.5	18.8	PC
95.990	38.3	QP	9.3	-20.4	27.2	234	100	Vert.	43.5	16.3	PC
98.300	35.7	QP	9.8	-20.6	24.9	247	300	Hori.	43.5	18.6	PC
99.300	39.9	QP	9.8	-20.6	29.1	250	100	Vert.	43.5	14.4	PC
200.000	32.0	QP	16.8	-19.3	29.5	60	235	Hori.	43.5	14.0	
200.000	33.8	QP	16.8	-19.3	31.3	359	100	Vert.	43.5	12.2	
431.980	36.9	QP	18.3	-19.0	36.2	250	150	Vert.	46.0	9.8	
431.980	36.4	QP	18.3	-19.0	35.7	240	190	Hori.	46.0	10.3	
767.960	33.1	QP	21.1	-18.3	35.9	270	250	Hori.	46.0	10.1	
767.960	31.9	QP	21.1	-18.3	34.7	80	100	Vert.	46.0	11.3	

CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

Radiated Spurious Emission(FHSS)

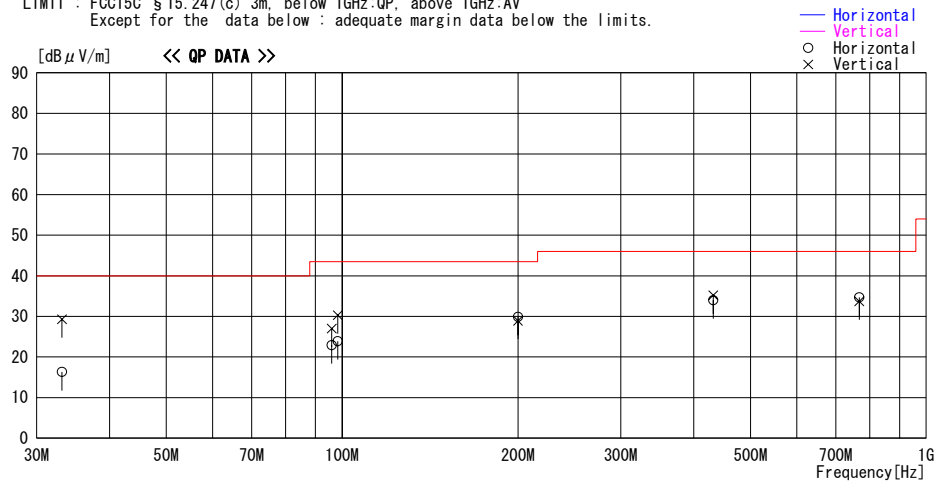
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : Sony EMCS Corporation
Kind of EUT : Bluetooth Earset
Model No. : DR-BT1
Sample No. : 000000
Report No. : 24FE0298-H0
Power : DC3.7V
Temp/C/Humi% : 23deg. C / 60% 2004/08/05
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting 2480MHz X-axis(MAX)

LIMIT : FCC15C §15.247(c) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
33.140	20.4	QP	17.2	-21.3	16.3	0	300	Hori.	40.0	23.7	PC PC PC PC
33.140	33.4	QP	17.2	-21.3	29.3	0	100	Vert.	40.0	10.7	
95.990	34.0	QP	9.3	-20.4	22.9	100	0	Hori.	43.5	20.6	
95.990	38.1	QP	9.3	-20.4	27.0	234	100	Vert.	43.5	16.5	
98.300	34.7	QP	9.8	-20.6	23.9	247	300	Hori.	43.5	19.6	
98.300	41.1	QP	9.8	-20.6	30.3	250	100	Vert.	43.5	13.2	
200.000	32.4	QP	16.8	-19.3	29.9	359	300	Hori.	43.5	13.6	
200.000	31.4	QP	16.8	-19.3	28.9	0	100	Vert.	43.5	14.6	
431.980	34.7	QP	18.3	-19.0	34.0	240	190	Hori.	46.0	12.0	
431.980	35.9	QP	18.3	-19.0	35.2	250	150	Vert.	46.0	10.8	
767.960	31.9	QP	21.1	-18.3	34.7	270	250	Hori.	46.0	11.3	
767.960	30.9	QP	21.1	-18.3	33.7	80	100	Vert.	46.0	12.3	

CHART:WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

Radiated Spurious Emission (FHSS)

DATA OF SPURIOUS EMISSIONS(1GHz to 26.5GHz)

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Sony EMCS Corporation
EQUIPMENT : Bluetooth Earsset
MODEL : DR-BT1
S/N : 000000
POWER : 3.7VDC
MODE : Tx (2402MHz)
AXIS : Hor: Y-axis , Ver: Y-axis

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 08/03/2004
TEMPERATURE : 23deg.C
HUMIDITY : 60%
ENGINEER : Makoto Kosaka

PK DETECT (RBW: 1MHz , VBW:1MHz)

No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit PK [dBuV/m]	Margin	
		HOR [dBuV]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	2390.0	42.9	42.0	30.8	36.3	6.4	0.0	43.8	42.9	74.0	30.2	31.1
2	4804.0	42.0	41.2	35.3	36.1	9.3	0.0	50.5	49.7	74.0	23.5	24.3
3	7206.0	38.8	39.4	37.9	35.6	11.8	0.0	52.9	53.5	74.0	21.1	20.5
4	9608.0	39.8	39.8	37.6	36.3	13.9	0.0	55.0	55.0	74.0	19.0	19.0
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
5	12010.0	40.0	39.6	41.0	35.7	15.5	0.0	51.3	50.9	74.0	22.7	23.1
6	14412.0	38.5	38.7	41.1	34.6	16.6	0.0	52.1	52.3	74.0	21.9	21.7
7	16814.0	40.6	40.9	45.9	35.6	18.6	0.0	60.0	60.3	74.0	14.0	13.7
8	19216.0	40.9	40.6	39.7	34.9	20.3	0.0	56.5	56.2	74.0	17.5	17.8
9	21618.0	41.1	40.6	40.8	35.4	22.1	0.0	59.1	58.6	74.0	14.9	15.4
10	24020.0	41.1	41.6	39.9	35.8	22.6	0.0	58.3	58.8	74.0	15.7	15.2

AV DETECT (RBW: 1MHz , VBW:10Hz)

No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit AV [dBuV/m]	Margin	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	2390.0	31.5	31.7	30.8	36.3	6.4	0.0	32.4	32.6	54.0	21.6	21.4
2	4804.0	30.3	30.0	35.3	36.1	9.3	0.0	38.8	38.5	54.0	15.2	15.5
3	7206.0	29.1	29.1	37.9	35.6	11.8	0.0	43.2	43.2	54.0	10.8	10.8
4	9608.0	29.5	29.5	37.6	36.3	13.9	0.0	44.7	44.7	54.0	9.3	9.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
5	12010.0	29.1	29.1	41.0	35.7	15.5	0.0	40.4	40.4	54.0	13.6	13.6
6	14412.0	27.9	27.9	41.1	34.6	16.6	0.0	41.5	41.5	54.0	12.5	12.5
7	16814.0	30.6	30.5	45.9	35.6	18.6	0.0	50.0	49.9	54.0	4.0	4.1
8	19216.0	29.5	29.5	39.7	34.9	20.3	0.0	45.1	45.1	54.0	8.9	8.9
9	21618.0	31.0	30.9	40.8	35.4	22.1	0.0	49.0	48.9	54.0	5.0	5.1
10	24020.0	31.2	31.2	39.9	35.8	22.6	0.0	48.4	48.4	54.0	5.6	5.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5 dB

* Except for the above table : All other spurious emissions were less than 20dB for the limit.

* Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

In the frequency over the fifth harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

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MF060b(10.04.03)

Radiated Spurious Emission (FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Sony EMCS Corporation
EQUIPMENT : Bluetooth Earset
MODEL : DR-BT1
S/N : 000000
POWER : 3.7VDC
MODE : Tx (2441MHz)
AXIS : Hor: Y-axis, Ver: Y-axis

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 08/03/2004
TEMPERATURE : 23deg.C
HUMIDITY : 60%
ENGINEER : Makoto Kosaka

PK DETECT (RBW: 1MHz , VBW:1MHz)													
No.	Freq.	Reading		Ant. Factor	Amp. Gain	Cable Loss	Atten. or Filter	Result		Limit PK	Margin		
		HOR	VER					HOR	VER		HOR	VER	
	[MHz]		[dBuV]		[dB]		[dB]		[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)													
1	4882.0	40.4	41.1	35.7	36.1	9.5	0.0	49.5	50.2	74.0	24.5	23.8	
2	7323.0	39.6	39.9	38.2	35.7	12.0	0.0	54.1	54.4	74.0	19.9	19.6	
3	9764.0	39.7	40.0	37.3	36.3	14.0	0.0	54.7	55.0	74.0	19.3	19.0	
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac													
5	12205.0	39.7	39.9	41.5	35.6	15.6	0.0	51.7	51.9	74.0	22.3	22.1	
6	14646.0	38.0	37.1	41.6	34.8	16.8	0.0	52.1	51.2	74.0	21.9	22.8	
7	17087.0	42.1	42.3	46.5	35.4	18.8	0.0	62.5	62.7	74.0	11.5	11.3	
8	19528.0	40.2	39.5	39.3	35.0	20.6	0.0	55.6	54.9	74.0	18.4	19.1	
9	21969.0	40.7	40.7	40.4	35.0	22.3	0.0	58.9	58.9	74.0	15.1	15.1	
10	24410.0	41.2	40.9	40.1	36.6	22.7	0.0	57.9	57.6	74.0	16.1	16.4	

AV DETECT (RBW: 1MHz, VBW:10Hz)												
No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit AV [dBuV/m]	Margin	
		HOR [dBuV]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	4882.0	30.0	30.2	35.7	36.1	9.5	0.0	39.1	39.3	54.0	14.9	14.7
2	7323.0	29.1	29.1	38.2	35.7	12.0	0.0	43.6	43.6	54.0	10.4	10.4
3	9764.0	29.7	29.7	37.3	36.3	14.0	0.0	44.7	44.7	54.0	9.3	9.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
5	12205.0	29.2	29.3	41.5	35.6	15.6	0.0	41.2	41.3	54.0	12.8	12.7
6	14646.0	27.9	27.9	41.6	34.8	16.8	0.0	42.0	42.0	54.0	12.0	12.0
7	17087.0	30.4	30.5	46.5	35.4	18.8	0.0	50.8	50.9	54.0	3.2	3.1
8	19528.0	29.7	29.7	39.3	35.0	20.6	0.0	45.1	45.1	54.0	8.9	8.9
9	21969.0	30.6	30.6	40.4	35.0	22.3	0.0	48.8	48.8	54.0	5.2	5.2
10	24410.0	31.1	31.1	40.1	36.6	22.7	0.0	47.8	47.8	54.0	6.2	6.2

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5 dB

- * Except for the above table : All other spurious emissions were less than 20dB for the limit.
- * Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz
- * In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
- * The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
- * In the frequency over the fifth harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

Radiated Spurious Emission (FHSS)

Head Office EMC Lab. No.2 Semi Anechoic Chamber

COMPANY : Sony EMCS Corporation
EQUIPMENT : Bluetooth Earset
MODEL : DR-BT1
S/ N : 000000
POWER : 3.7VDC
MODE : Tx (2480MHz)
AXIS : Hor: Y-axis , Ver: Y-axis

REGULATION : FCC Part 15 Subpart C 15.247(c)
TEST DISTANCE : 3 and 1m
DATE : 08/03/2004
TEMPERATURE : 23deg.C
HUMIDITY : 60%
ENGINEER : Makoto Kosaka

PK DETECT (RBW: 1MHz , VBW:1MHz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit PK [dBuV/m]	Margin HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	2483.5	52.2	55.6	31.0	36.2	6.5	0.0	53.5	56.9	74.0	20.5	17.1
3	4960.0	40.8	40.9	36.1	36.1	9.5	0.0	50.3	50.4	74.0	23.7	23.6
4	7440.0	40.0	40.1	38.5	35.7	12.0	0.0	54.8	54.9	74.0	19.2	19.1
5	9920.0	40.1	40.9	37.0	36.3	14.1	0.0	54.9	55.7	74.0	19.1	18.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
6	12400.0	41.1	40.1	41.9	35.5	15.7	0.0	53.7	52.7	74.0	20.3	21.3
7	14880.0	39.7	39.1	42.6	35.0	17.1	0.0	54.9	54.3	74.0	19.1	19.7
8	17360.0	40.8	39.8	46.9	35.2	19.0	0.0	62.0	61.0	74.0	12.0	13.0
9	19840.0	40.6	41.2	39.9	35.3	20.9	0.0	56.6	57.2	74.0	17.4	16.8
10	22320.0	40.6	40.9	40.7	35.1	22.4	0.0	59.1	59.4	74.0	14.9	14.6
11	24800.0	40.6	40.4	40.2	36.7	22.9	0.0	57.5	57.3	74.0	16.5	16.7

AV DETECT (RBW: 1MHz , VBW:10Hz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit AV [dBuV/m]	Margin HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	2483.5	39.4	40.8	31.0	36.2	6.5	0.0	40.7	42.1	54.0	13.3	11.9
3	4960.0	29.8	29.8	36.1	36.1	9.5	0.0	39.3	39.3	54.0	14.7	14.7
4	7440.0	29.3	29.3	38.5	35.7	12.0	0.0	44.1	44.1	54.0	9.9	9.9
5	9920.0	30.0	30.0	37.0	36.3	14.1	0.0	44.8	44.8	54.0	9.2	9.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
6	12400.0	30.0	30.0	41.9	35.5	15.7	0.0	42.6	42.6	54.0	11.4	11.4
7	14880.0	29.0	29.0	42.6	35.0	17.1	0.0	44.2	44.2	54.0	9.8	9.8
8	17360.0	30.5	30.5	46.9	35.2	19.0	0.0	51.7	51.7	54.0	2.3	2.3
9	19840.0	30.1	30.0	39.9	35.3	20.9	0.0	46.1	46.0	54.0	7.9	8.0
10	22320.0	30.8	30.8	40.7	35.1	22.4	0.0	49.3	49.3	54.0	4.7	4.7
11	24800.0	30.7	30.7	40.2	36.7	22.9	0.0	47.6	47.6	54.0	6.4	6.4

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5 dB

* Except for the above table : All other spurious emissions were less than 20dB for the limit.

* Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

In the frequency over the fifth harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

UL Apex Co., Ltd.

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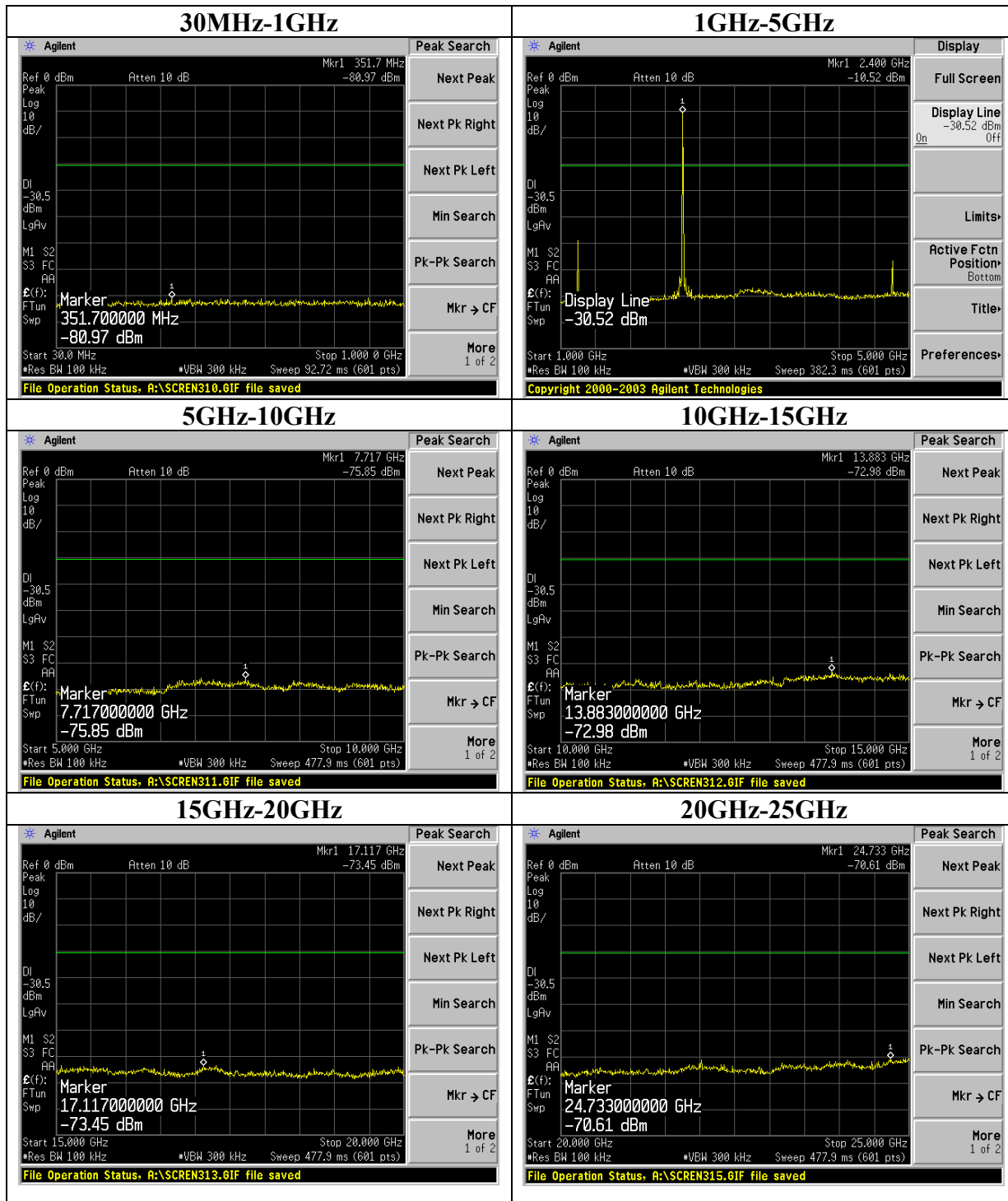
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MF060b(10.04.03)

Conducted Spurious Emission (FHSS)

Ch:Low



UL Apex Co., Ltd.

Head Office EMC Lab.

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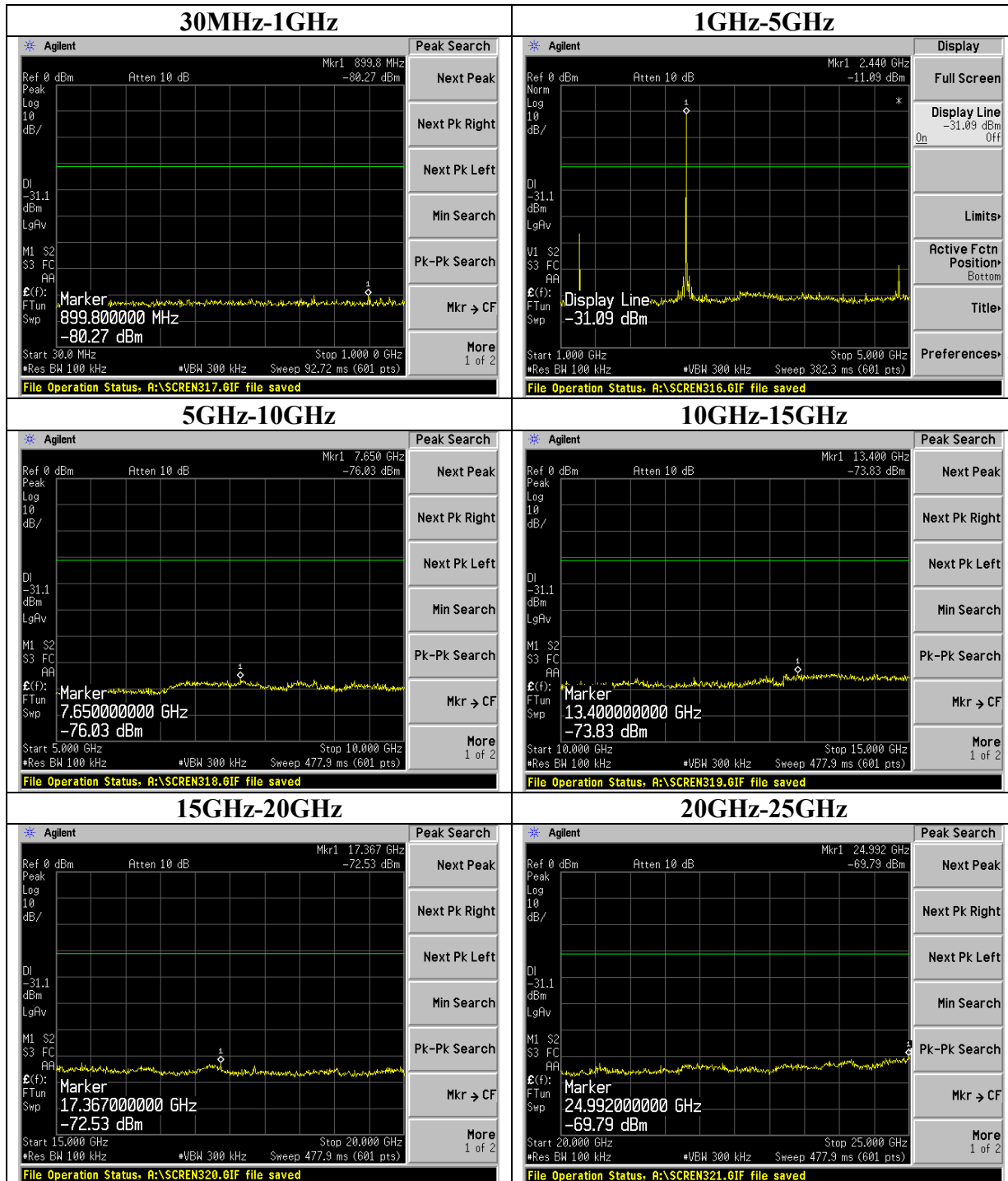
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

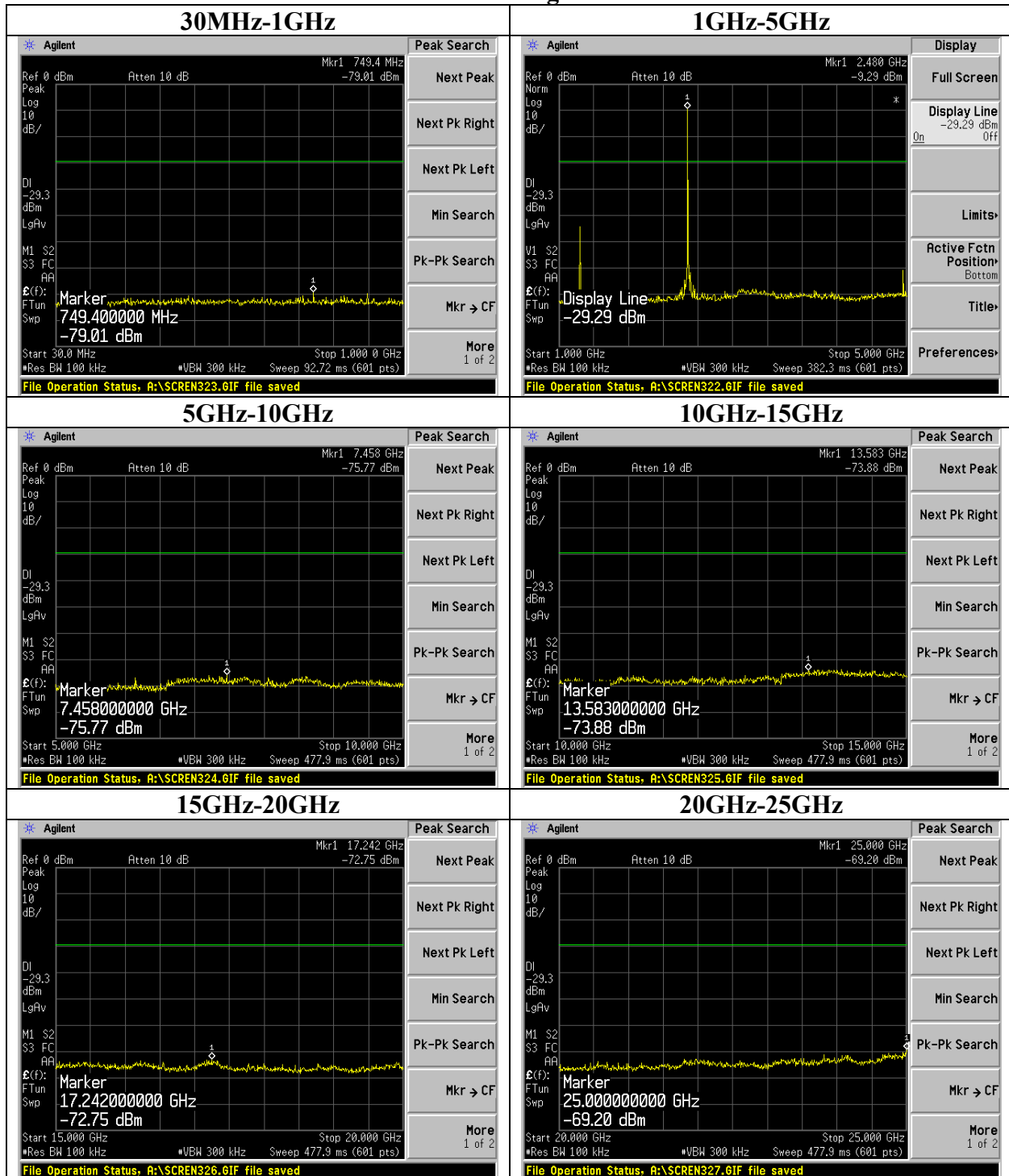
Conducted Spurious Emission (FHSS)

Ch:Mid



Conducted Spurious Emission (FHSS)

Ch:High



UL Apex Co., Ltd.

Head Office EMC Lab.

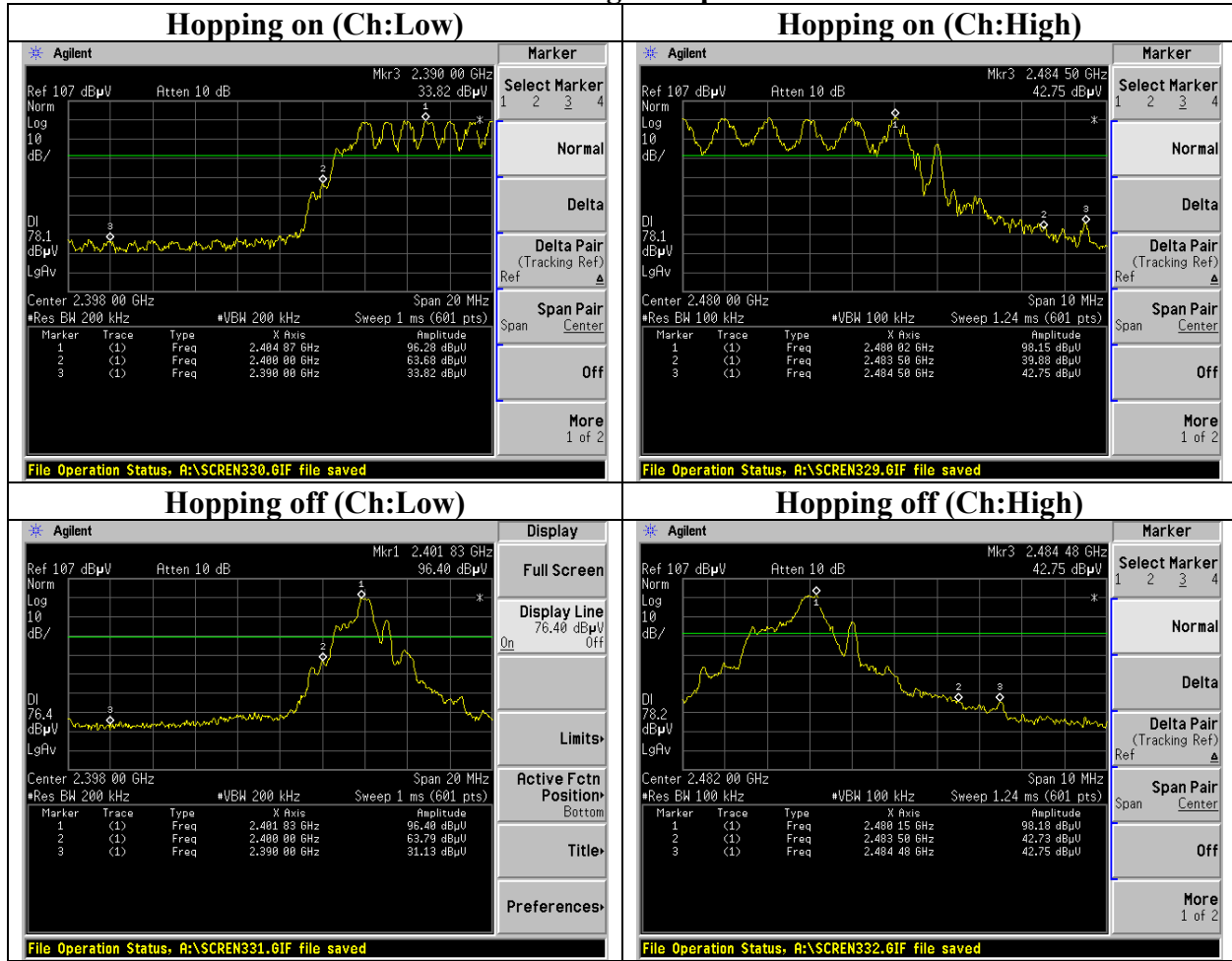
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

Conducted Spurious Emission (FHSS) Band Edge compliance



99% Occupied Bandwidth(FHSS)

