



EMI TEST REPORT

Test Report No. : 24GE0020-HO-1

Applicant : DENSO WAVE INCORPORATED
Type of Equipment : Bluetooth Board
Model No. : DWBT002
Test standard : FCC Part 15 Subpart C 2003
Section 15.207, Section 15.247
FCC ID : PZWDWBT002
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:

April 23 – May 27, 2004

Tested by:

Naoki Sakamoto
EMC Service

Hiroka Umeyama
EMC Service

Approved by :

Hironobu Shimoji
Group Leader of
EMC Service

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)

CONTENTS	PAGE
SECTION 1: Client information.....	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	4
SECTION 4: Operation of E.U.T. during testing.....	6
SECTION 5: Conducted Emission, Section 15.207	8
SECTION 6: Carrier Frequency Separation, Section15.247(a)(1).....	8
SECTION 7: 20dB Bandwidth, Section 15.247(a)(1)	8
SECTION 8: Number of Hopping Frequency, Section 15.247(a)(1)(iii)	9
SECTION 9: Dwell time, Section 15.247(a)(1)(iii)	9
SECTION 10: Maximum Peak Output Power, Section 15.247(b)(1)	9
SECTION 11: Band Edge Compliance, Section 15.247(c)	9
SECTION 12: Spurious Emission, Section 15.247(c).....	10
APPENDIX 1: Photographs of test setup.....	11
Conducted Emission.....	11
Spurious Emission (Radiated).....	12
Worst Case Position (X-axis:Horizontal / X-axis:Vertical)	13
APPENDIX 2:Test instruments	14
APPENDIX 3: Data of EMI test	15
Conducted emission.....	15
Carrier Frequency Separation	17
20dB Bandwidth	19
Number of Hopping Frequency	21
Dwell time.....	23
Maximum Peak Output Power	26
Band Edge compliance.....	27
Spurious Emission(Radiated).....	28
Spurious Emission(Conducted).....	34
99% Occupied Bandwidth.....	37

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)

SECTION 1: Client information

Company Name : DENSO WAVE INCORPORATED
Brand name : DENSO
Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan
Telephone Number : +81-566-25-9802
Facsimile Number : +81-566-25-4780
Contact Person : Takayoshi Arakawa

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

2.1 Identification of E.U.T.

Type of Equipment : Bluetooth Board
Model No. : DWBT002
Serial No. : No.1 (for the AC Main Conducted emission test)
No.3 (for the Radiated emission test)
No.4 & 10 (for the Antenna terminal conducted test)
Country of Manufacture : Japan
Rating : DC3.3V/0.12A
Receipt Date of Sample : February 3, 2004
Condition of EUT : Production Prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: DWBT002 is the Bluetooth Board. It is the communication equipment according to the radio standard of Bluetooth. It builds in a bar code scanner and a communication unit.

Equipment Type : Transceiver
Frequency of operation : 2402-2480MHz
Type of modulation : FSK(FHSS)
Bandwidth & Channel spacing : 79MHz & 1MHz
Antenna Type : AH122F245001
Antenna connector Type : N/A
Antenna Gain : 1dBi
Power Supply : DC3.3V
Temperature of operation : 0 deg. C. to +40 deg. C.

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 and 204 Antenna requirement

Since the antenna used is a type of chip component and is permanently mounted by soldering on a printed circuit board in DWBT002, It is impossible for end users to replace it without assistance of professionals. Therefore, this EUT complies with the requirement.

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)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C 2003

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

3.2 Procedures and results

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003	Section 15.207	-	N/A	9.8dB 0.2466MHz AV, L	Complied
2	Carrier Frequency Separation	ANSI C63.4:2003	Section15.247(a)(1)	Conducted	N/A	-	Complied
3	20dB Bandwidth	ANSI C63.4:2003	Section15.247(a)(1)	Conducted	N/A	-	Complied
4	Number of Hopping Frequency	ANSI C63.4:2003	Section15.247(a)(1)(iii)	Conducted	N/A	-	Complied
5	Dwell time	ANSI C63.4:2003	Section15.247(a)(1)(iii)	Conducted	N/A	-	Complied
6	Maximum Peak Output Power	ANSI C63.4:2003	Section15.247(b)(1)	Conducted	N/A	22.54dB Inquiry	Complied
7	Band Edge Compliance	ANSI C63.4:2003	Section15.247(c)	Conducted	N/A	-	Complied
8	Spurious Emission	ANSI C63.4:2003	Section15.247(c)	Conducted/ Radiated	N/A	1.1dB 17087MHz AV Vertical	Complied

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

*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.

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	Conducted	N/A	N/A	N/A

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)

3.4 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C 2003 Section 15.207 and 15.247.

3.5 Uncertainty

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 1.3\text{dB}$.
The data listed in this test report has enough margin.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}(3\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}(3\text{m})$.
The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is $\pm 6.6\text{dB}$.
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is $\pm 3.0\text{dB}$.
The data listed in this test report has enough margin.

3.6 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	Listed date (for FCC)	Registration Number (for FCC)	IC 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 measurement room.

3.7 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

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)

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

4.1 Operating modes

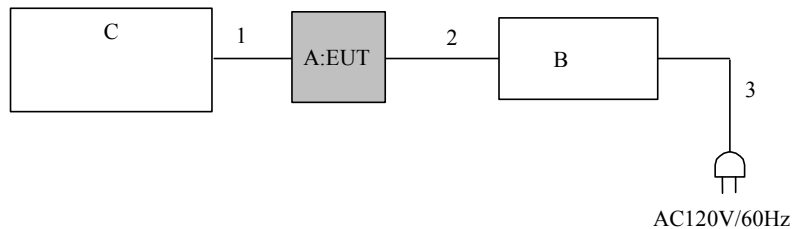
The EUT was operated in a manner similar to typical use during the tests.

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

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals

Other tests except for the AC Conducted emission test.



* 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 Board	DWBT002	No.3 (for the Radiated emission test) No.4(for the Antenna terminal conducted test *L/M/H channel) No.10(for the Antenna terminal conducted test *Inquiry)	DENSO	PZWDWBT002
B	DC power supply	PMC35-2A	13090501	Kikusui	-
C	Personal computer	PP05L	CN-04Y212-48643-39M-2489	DELL	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	RS-232C Cable	1.0	N	Polyvinyl chloride
2	AC power cable	1.5	N	Polyvinyl chloride
3	DC power cable	1.5	N	Polyvinyl chloride

UL Apex Co., Ltd.

Head Office EMC Lab.

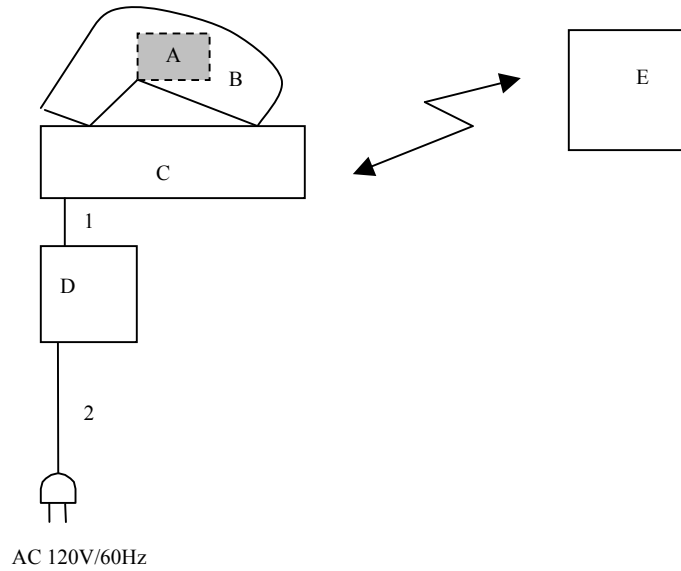
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

AC Conducted emission test



* 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 Board	DWBT002	No.1	DENSO	PZWDWBT002
B	Barcode Scanner	GT10B-SB	-	DENSO	-
C	Charger	CH-10	-	DENSO	-
D	AC ADAPTOR	454865-340	2152864	DENSO	-
E	Barcode Scanner	BHT-8000	5496310204300053	DENSO	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC cable	1.8	N	Polyvinyl chloride
2	AC cable	1.8	N	Polyvinyl chloride

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)

SECTION 5: Conducted Emission, Section 15.207

Test Procedure

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN).

1) For the tests on EUT with other peripherals (as a whole system)

I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

2) For the tests on EUT itself (as a stand alone equipment)

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN /(AMN) to the input power source. All unused 50ohm connectors of the LISN(AMN) were resistively terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

The measurements have been performed with CISPR quasi-peak and Average detector (IF BW 9 kHz).

Measurement range: 0.15-30MHz

Test data : APPENDIX 3

Test result : Pass

SECTION 6: Carrier Frequency Separation, Section15.247(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 7: 20dB Bandwidth, Section 15.247(a)(1)

Test Procedure

The 20dB bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

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)

SECTION 8: 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 9: 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

SECTION 10: Maximum Peak Output Power, Section 15.247(b)(1)

Test Procedure

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

Test data : APPENDIX 3
Test result : Pass

SECTION 11: Band Edge Compliance, Section 15.247(c)

Test Procedure

The Band Edge Compliance was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3
Test result : Pass

SECTION 12: Spurious Emission, Section 15.247(c)

[Conducted]

Test Procedure

The Spurious Emission (Conducted) 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, 1m by 1.5m, raised 80cm above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength intensity has been measured in the semi anechoic chamber with a ground plane at a distance of 3m.

The measuring antenna height 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.

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

(Use the Spectrum Analyzer)

Frequency	Below 1GHz	Above 1GHz
Detector Type	Quasi-peak	Peak and Average
IF Bandwidth	120kHz	Peak: RBW:1MHz/VBW: 1MHz Average: RBW:1MHz/VBW:10Hz

Test data : APPENDIX 3
Test result : Pass

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)

APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Rear

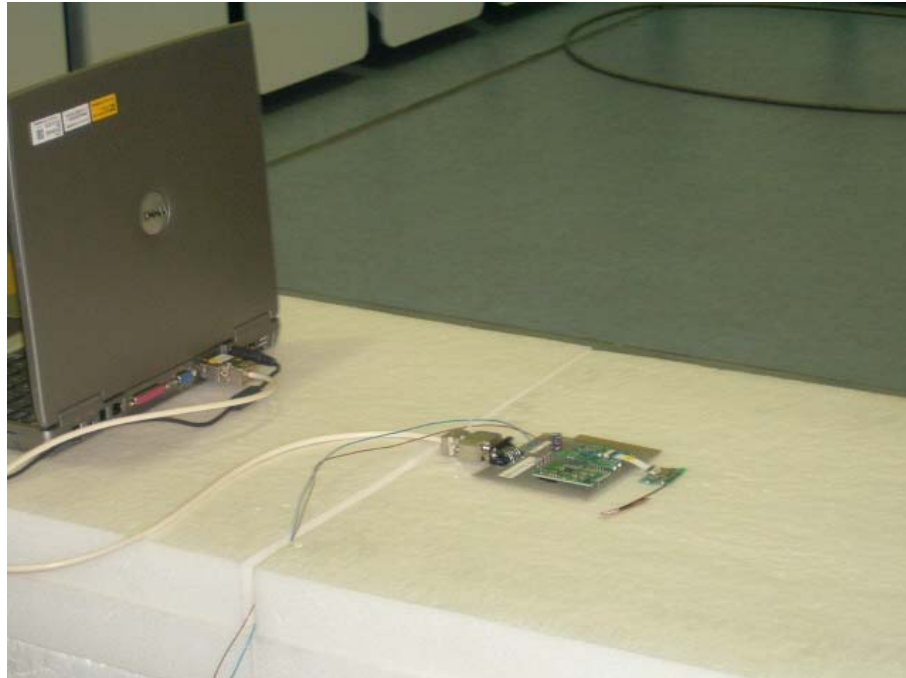


Spurious Emission (Radiated)

Front



Rear

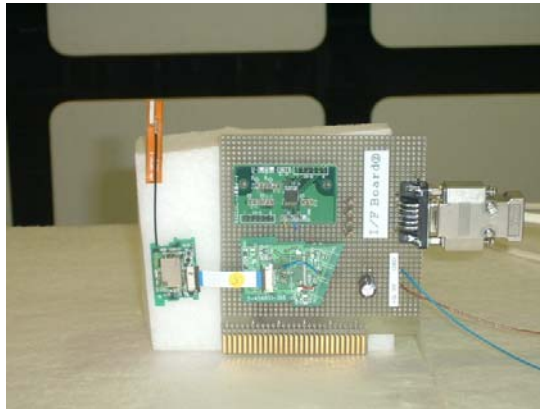


Worst Case Position (X-axis:Horizontal / X-axis:Vertical)

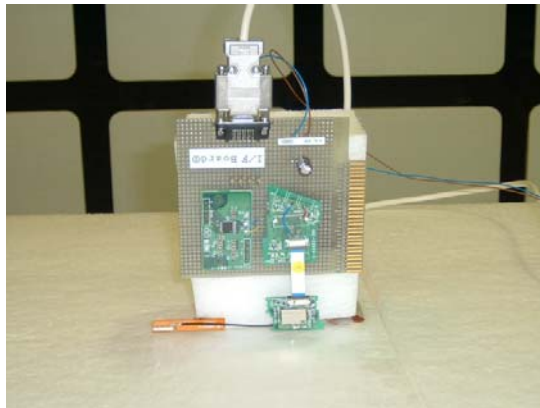
X-axis



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	CE	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE/CE	2004/02/03 * 12
MRENT-06	Spectrum Analyzer	Advantest	R3273	CE/RE/AT	2003/10/31 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2004/02/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2004/02/17 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/10/15 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/10/15 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2004/01/10 * 12
MAT-22	Attenuator (10dB)	Orient Microwave	BX10-0476-00	AT	2004/03/30 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2004/02/06 * 12
MPA-02	Pre Amplifier	Agilent	87405A	RE	2004/04/16 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2003/12/27 * 12
MPM-04	Power Meter	Agilent	E4416A	AT	2004/03/03 * 12
MPSE-03	Power sensor	Agilent	E9327A	AT	2003/11/03 * 12

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

Test Item :

CE: Conducted emission, RE: Radiated emission, AT: Antenna Terminal Conducted Emissions

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)

APPENDIX 3: Data of EMI test

Conducted emission

DATA OF CONDUCTED EMISSION TEST

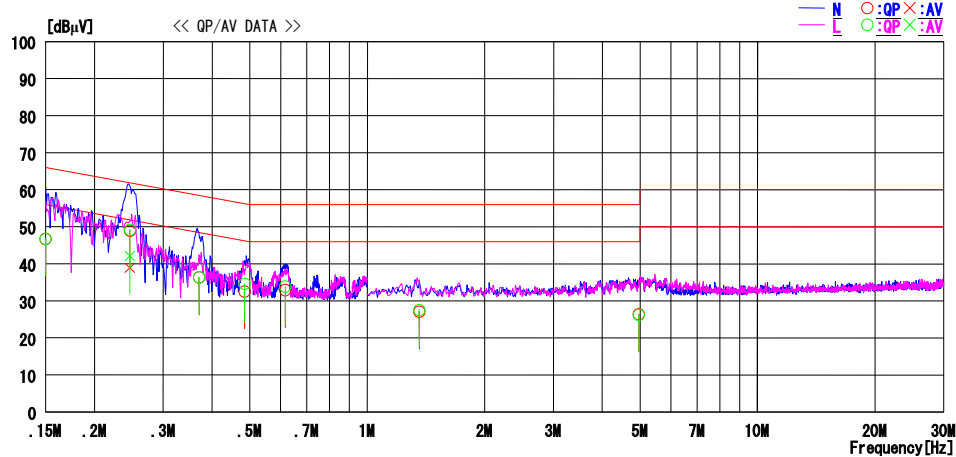
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/05/27 11:21:13

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT002
Serial No. : 01

Report No. : 24GE0020-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 25 deg.C / 54 %
Operator : Hiroka Umeyama

Mode / Remarks : Transmitting

LIMIT : FCC15C 15.207 (QP) (0.15-30MHz)
FCC15C 15.207 (AV) (0.15-30MHz)



NO	FREQ [MHz]	READING		C. F [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dB]	QP [dB]	AV [dB]	
1	0.1500	46.7	—	0.0	46.7	—	66.0	—	19.3	—	N
2	0.2466	48.9	38.8	0.1	49.0	38.9	61.9	51.9	12.9	13.0	N
3	0.3707	36.2	—	0.1	36.3	—	58.5	—	22.2	—	N
4	0.4848	32.4	—	0.1	32.5	—	56.3	—	23.8	—	N
5	0.6169	32.7	—	0.2	32.9	—	56.0	—	23.1	—	N
6	1.3590	26.9	—	0.2	27.1	—	56.0	—	28.9	—	N
7	4.9700	25.8	—	0.6	26.4	—	56.0	—	29.6	—	N
8	0.1500	46.8	—	0.0	46.8	—	66.0	—	19.2	—	L
9	0.2466	49.1	42.0	0.1	49.2	42.1	61.9	51.9	12.7	9.8	L
10	0.3707	36.3	—	0.1	36.4	—	58.5	—	22.1	—	L
11	0.4848	34.5	—	0.1	34.6	—	56.3	—	21.7	—	L
12	0.6169	33.7	—	0.2	33.9	—	56.0	—	22.1	—	L
13	1.3590	27.3	—	0.2	27.5	—	56.0	—	28.5	—	L
14	4.9700	25.6	—	0.6	26.2	—	56.0	—	29.8	—	L

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C. F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/05/27 11:33:19

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT002
Serial No. : 01

Report No. : 24GE0020-HO
Power : AC120V / 60Hz
Temp°C/Humi% : 25 deg.C / 54 %
Operator : Hiroka Umeyama

Mode / Remarks: Stdnby

LIMIT : FCC15C 15.207 (QP) (0.15-30MHz)
FCC15C 15.207 (AV) (0.15-30MHz)

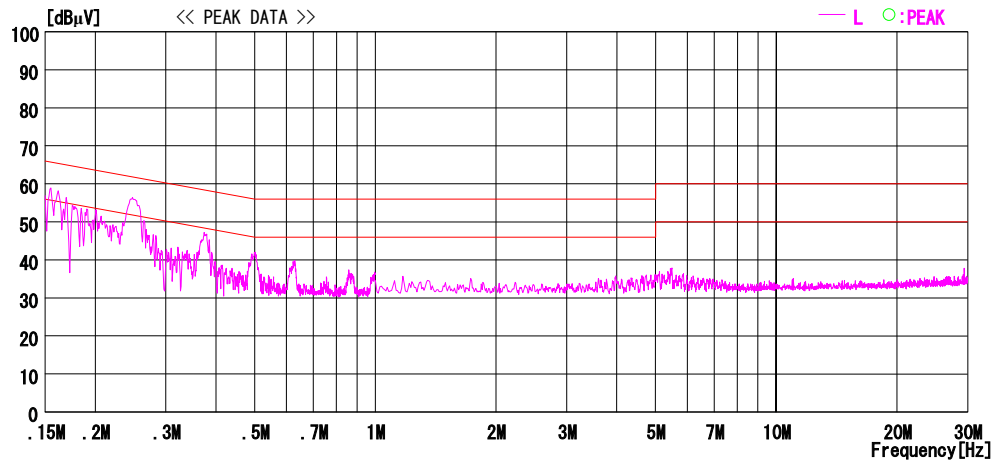
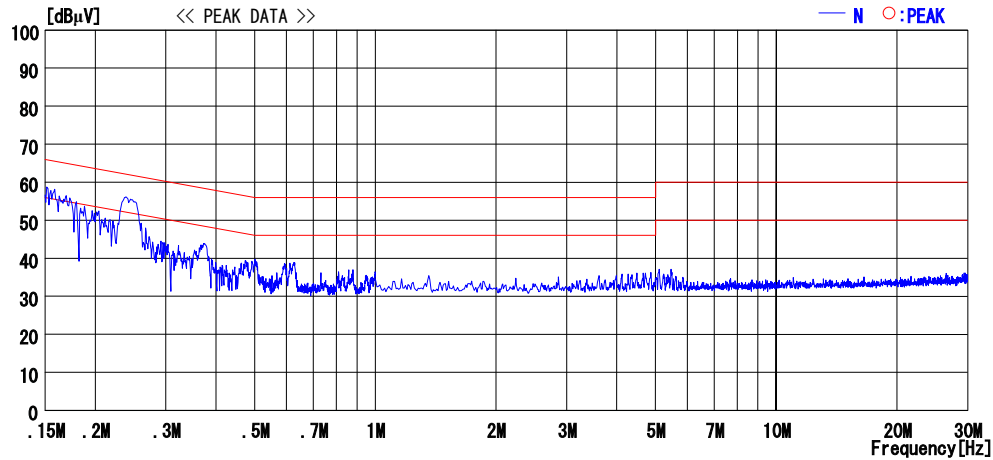


CHART:WITH FACTOR, Peak hold data. Data is uncorrected. CALCURATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

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)

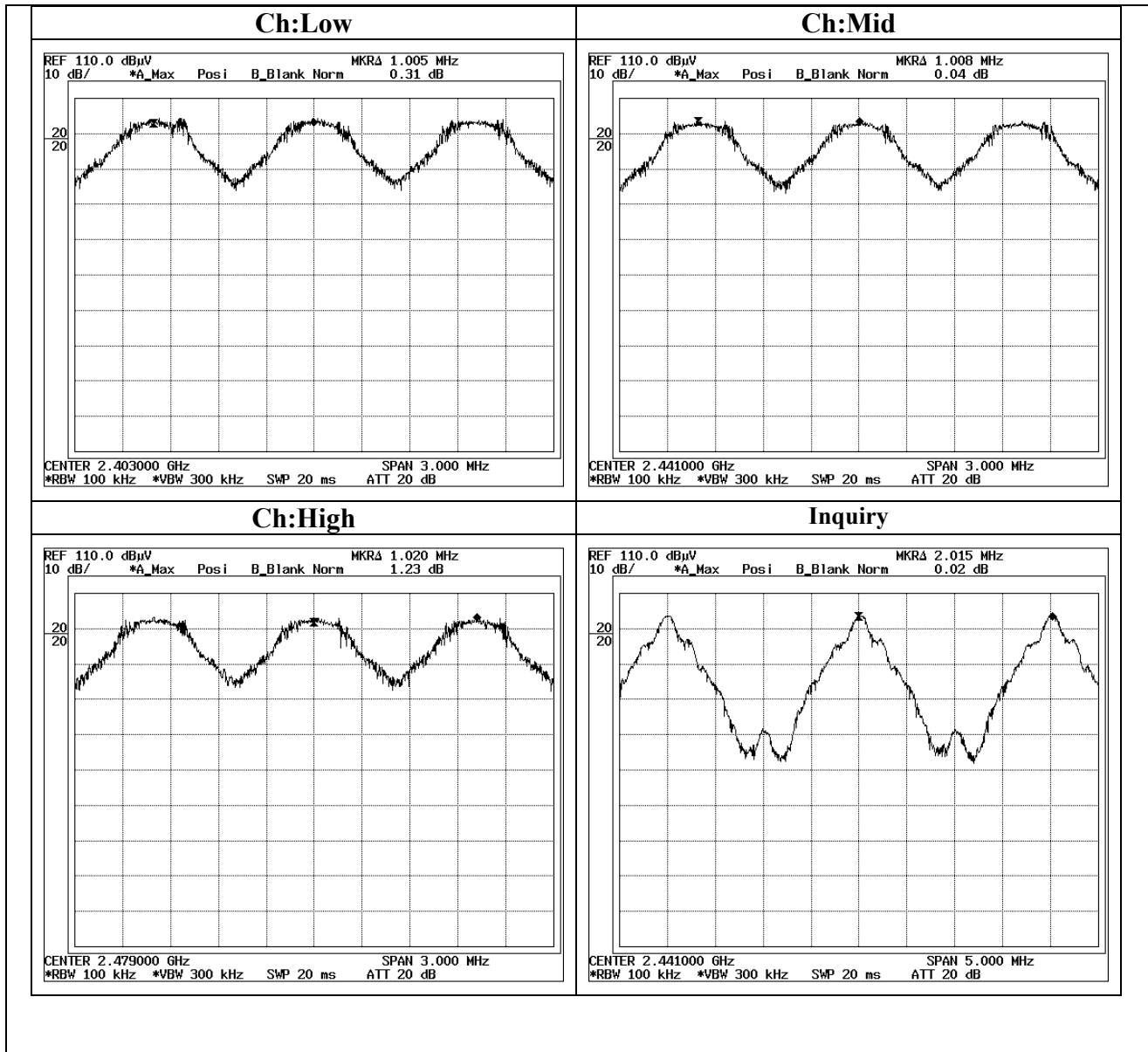
Carrier Frequency Separation

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

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT002	DATE	: 04/23/2003
S/ N	: No.4/10	TEMPERATURE	: 24 deg.C
POWER	: DC 3.3 V	HUMIDITY	: 43 %
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Naoki Sakamoto

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.005	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.008	>20dB Bandwidth and 25[kHz]
High	2480.0	1.020	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	2.015	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation



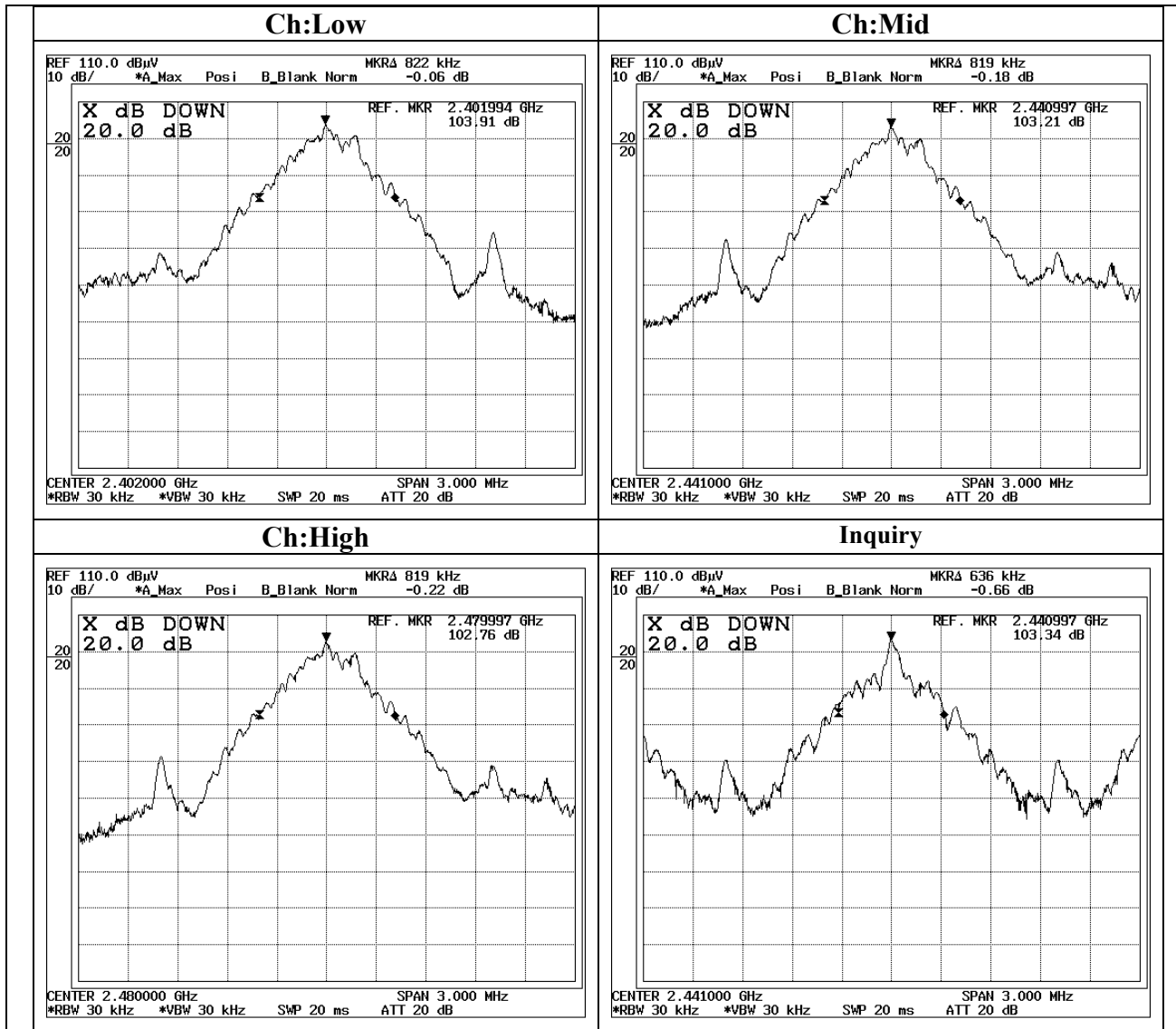
20dB Bandwidth

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

COMPANY : DENSO WAVE INCORPORATED REGULATION : Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT : Bluetooth Board TEST DISTANCE : -
MODEL : DWBT002 DATE : 04/23/2003
S/ N : No.4/10 TEMPERATURE : 24 deg.C
POWER : DC 3.3 V HUMIDITY : 43 %
MODE : Tx (Hopping off) /Inquiry ENGINEER : Naoki Sakamoto

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.822	-
Mid	2441.0	0.819	-
High	2480.0	0.819	-
Inquiry	2441.0	0.636	-

20dB Bandwidth



Number of Hopping Frequency

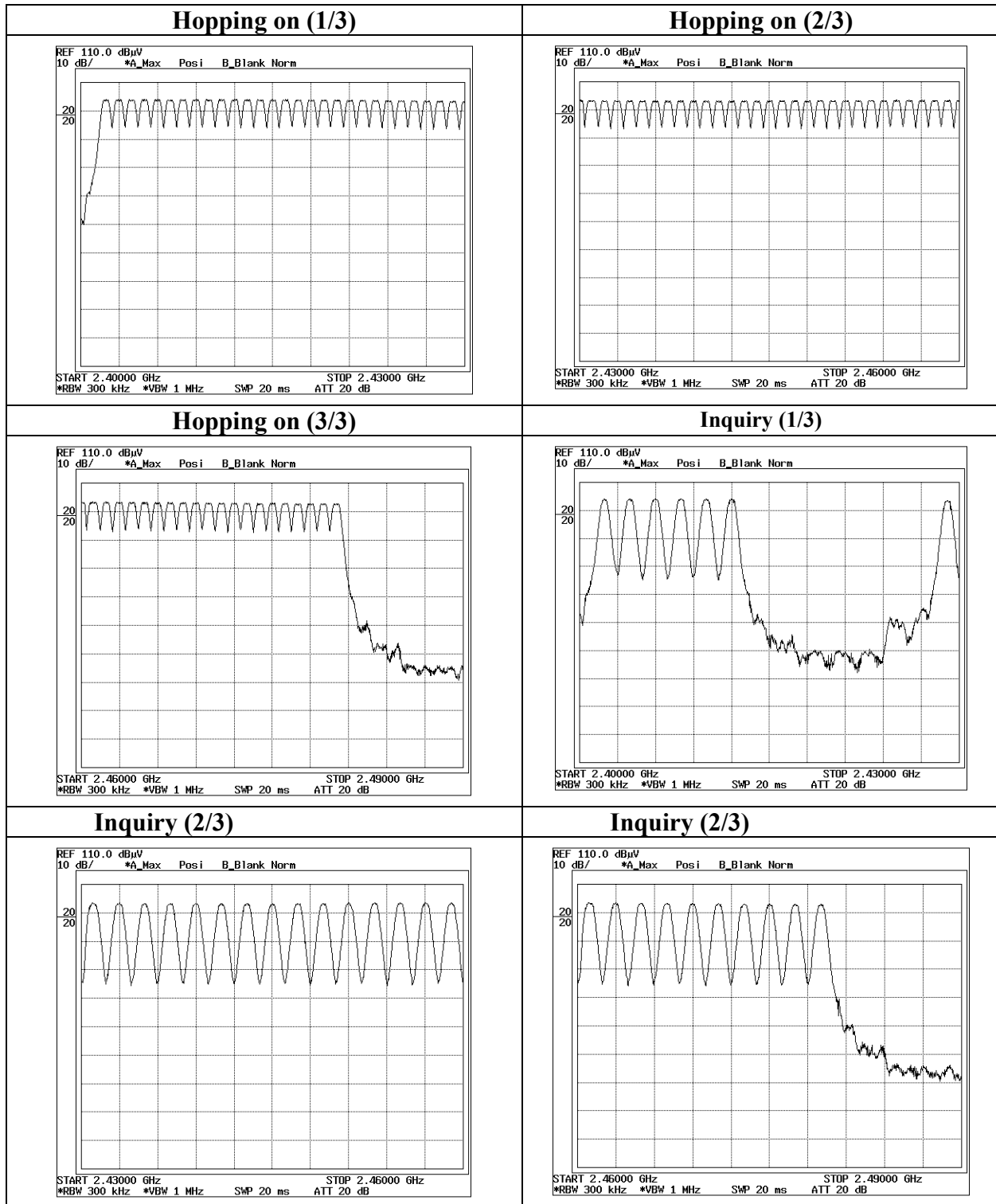
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT002	DATE	: 04/23/2003
S/N	: No.4/10	TEMPERATURE	: 24 deg.C
POWER	: DC 3.3 V	HUMIDITY	: 43 %
MODE	: Tx (Hoppng on) /Inquiry	ENGINEER	: Naoki Sakamoto

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



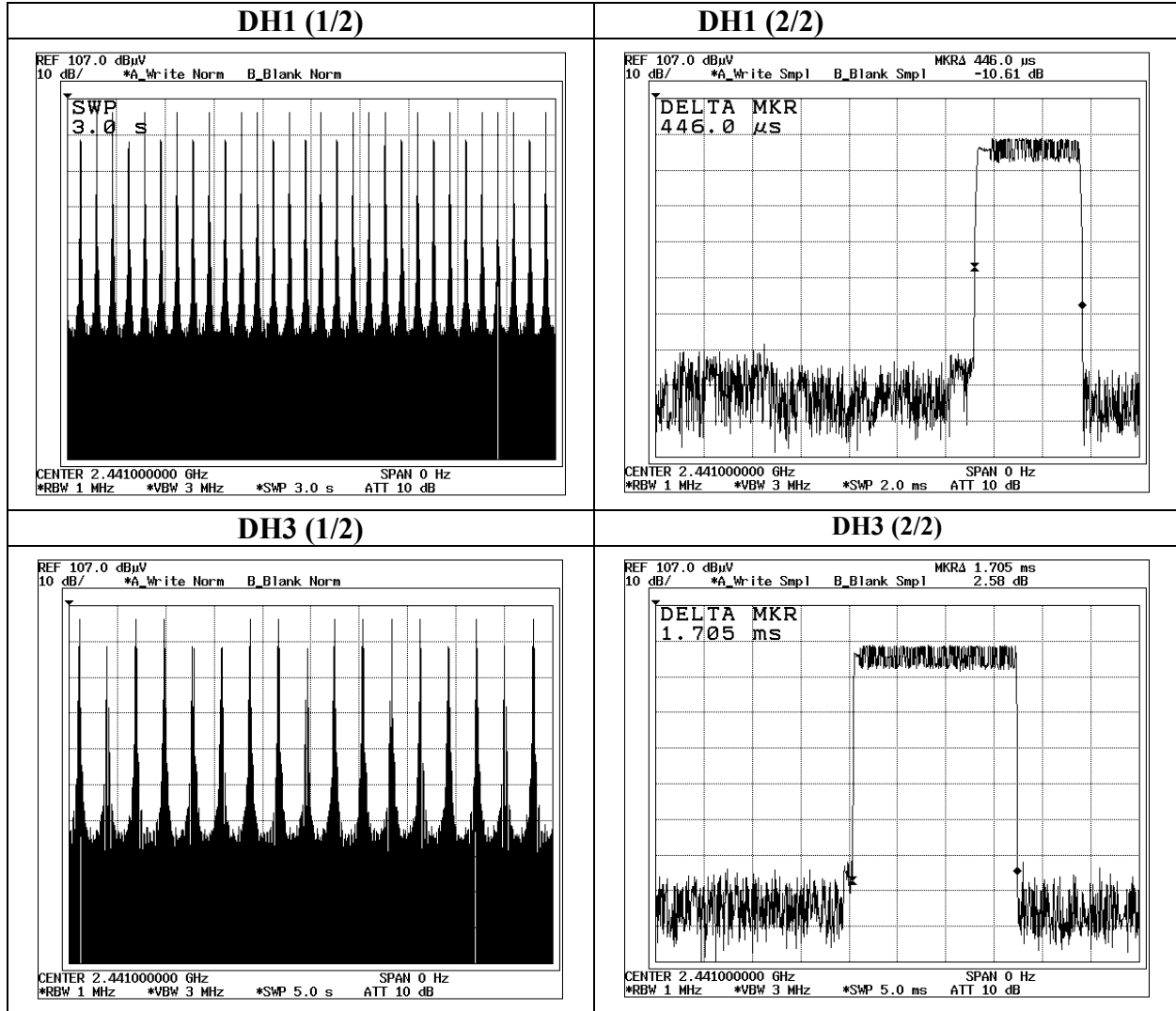
Dwell time

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

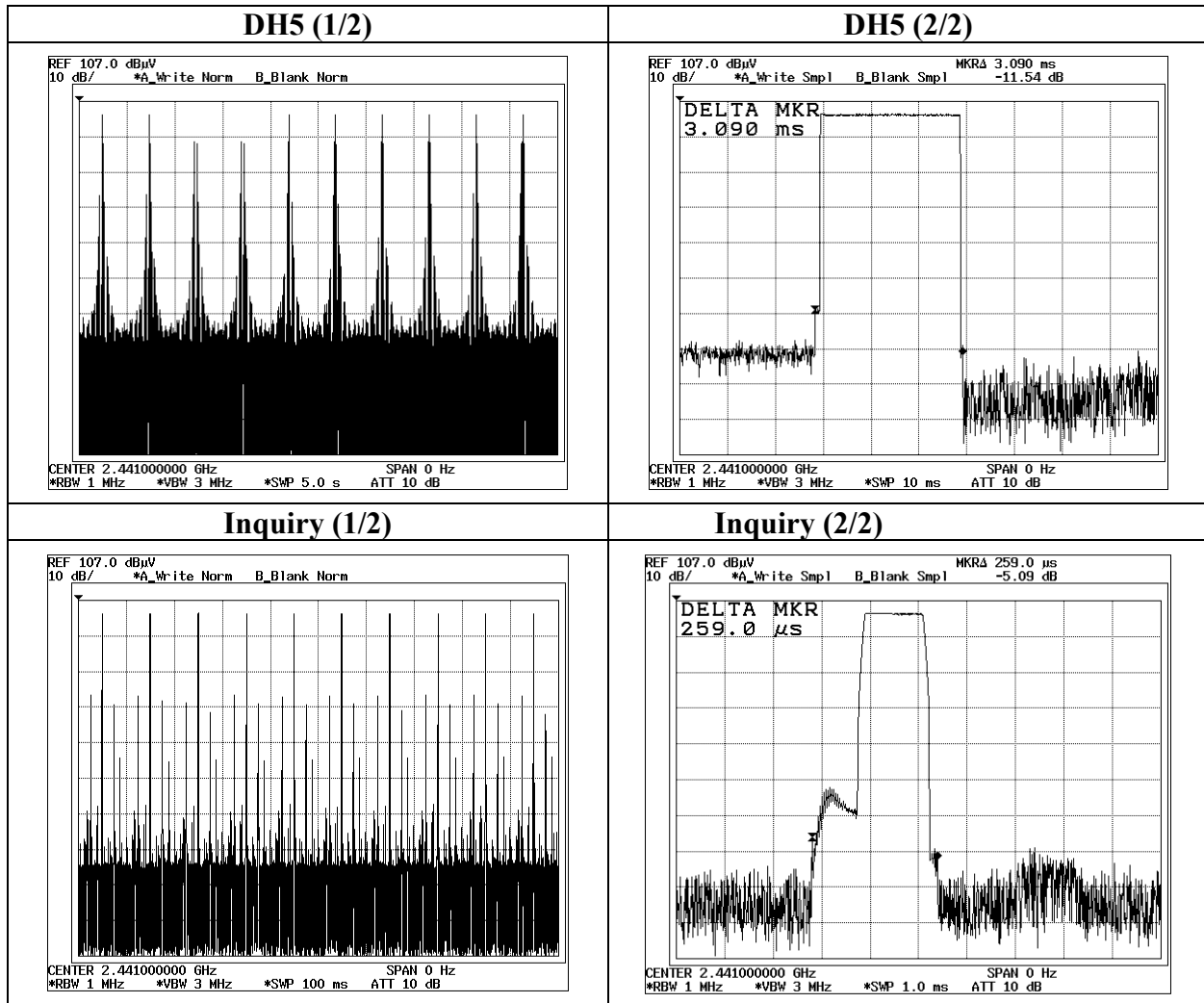
COMPANY : DENSO WAVE INCORPORATED REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT : Bluetooth Board TEST DISTANCE : -
MODEL : DWBT002 DATE : 04/23/2003
S/ N : No.4/10 TEMPERATURE : 24 deg.C
POWER : DC 3.3 V HUMIDITY : 43 %
MODE : Tx (Hopping on) /Inquiry ENGINEER : Naoki Sakamoto

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	30 times /3sec. x 31.6 = 316 times	0.446	141	400
DH3	17 times / 5sec. x 31.6 = 107 times	1.705	182	400
DH5	10 times / 5 sec. x 31.6 = 63 times	3.090	195	400
Inquiry	10 times / 0.1sec. x 12.8 = 1280 times	0.259	332	400

Dwell time(FHSS)



Dwell time(FHSS)



Maximum Peak Output Power

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

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT002	DATE	: 04/23/2003
S/ N	: No.4/10	TEMPERATURE	: 24 deg.C
POWER	: DC 3.3 V	HUMIDITY	: 43 %
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Naoki Sakamoto

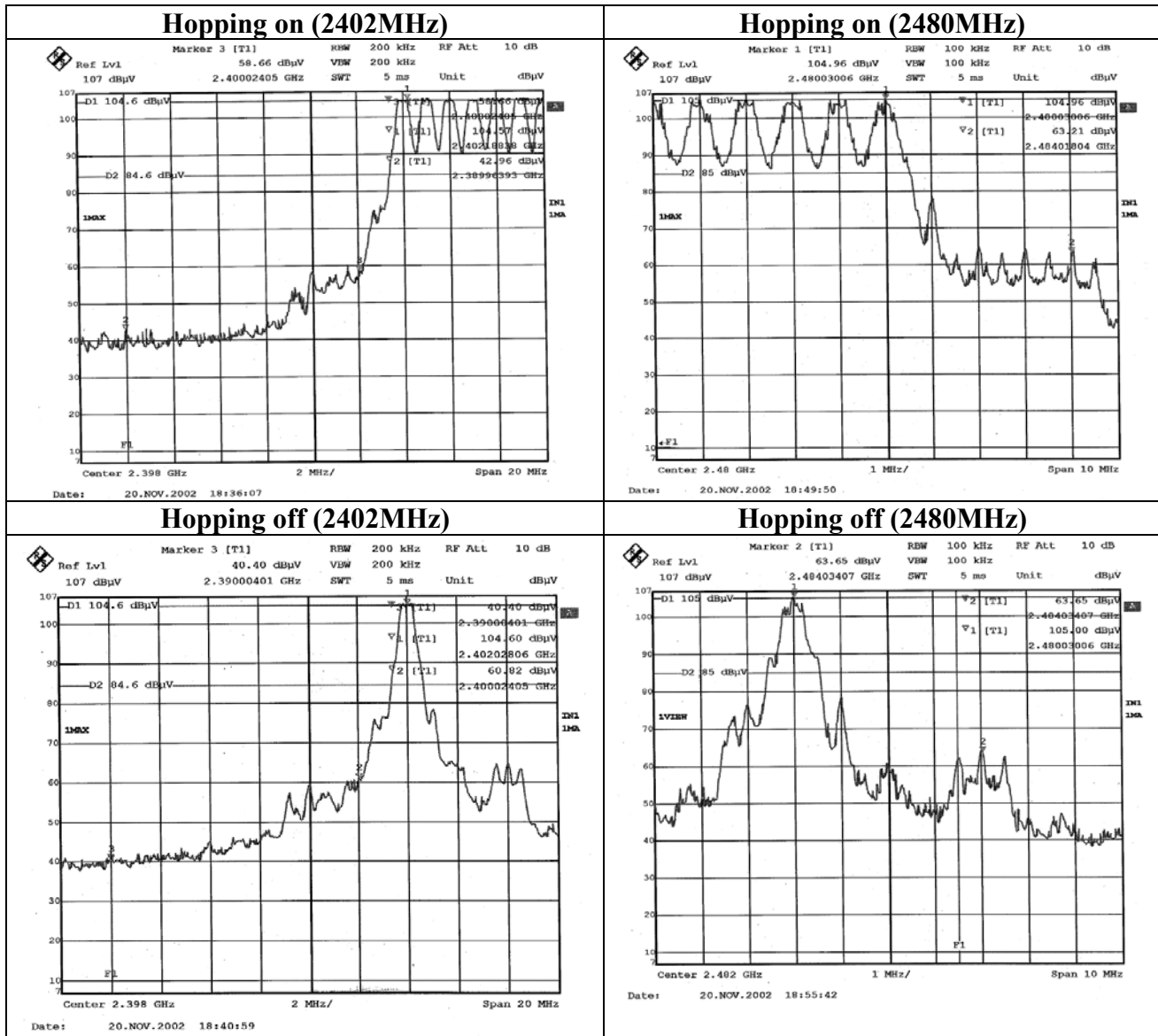
Ch	Freq. [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-12.75	1.88	9.90	-0.97	30.00	30.97
Mid	2441.0	-13.33	1.86	9.90	-1.57	30.00	31.57
High	2480.0	-13.77	1.86	9.90	-2.01	30.00	32.01
Inquiry	2441.0	-13.30	1.86	9.90	-1.54	21.00	22.54

Sample Calculation:

Result = P/M Reading + Cable Loss + Attenuator

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

Band Edge compliance



Spurious Emission(Radiated) 2402MHz

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/05/24 10:35:39

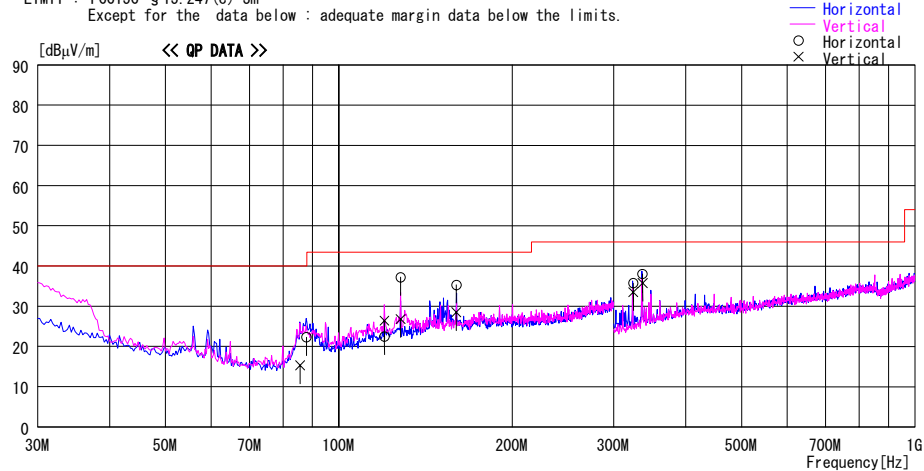
Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT002
Serial No. : 03

Report No. : 24GE0020-HO
Power : DC 3.3V
Temp°C/Humi% : 25 / 52
Operator : Naoki Sakamoto

Mode / Remarks : TX Mode(2402MHz) X Data

LIMIT : FCC15C §15.247(c) 3m

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	87.841	30.6	7.5	7.1	22.9	22.3	40.0	17.7	248	86
2	120.000	24.9	13.0	7.4	22.8	22.5	43.5	21.0	100	306
3	128.001	39.3	13.4	7.4	22.9	37.2	43.5	6.3	155	55
4	160.000	35.5	15.2	7.6	23.0	35.3	43.5	8.2	100	162
5	324.357	35.2	15.0	8.4	22.9	35.7	46.0	10.3	100	130
6	336.835	36.8	15.6	8.4	22.8	38.0	46.0	8.0	100	138
----- Vertical -----										
7	85.718	24.2	7.1	7.0	23.0	15.3	40.0	24.7	198	87
8	120.004	28.8	13.0	7.4	22.8	26.4	43.5	17.1	100	360
9	128.009	28.9	13.4	7.4	22.9	26.8	43.5	16.7	100	7
10	160.000	28.7	15.2	7.6	23.0	28.5	43.5	15.0	155	125
11	324.357	33.0	15.0	8.4	22.9	33.5	46.0	12.5	100	0
12	336.845	34.6	15.6	8.4	22.8	35.8	46.0	10.2	100	0

CHART: WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN
Page:

Spurious Emission(Radiated) 2441MHz

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 1 Semi Anechoic Chamber
Date : 2004/05/24 11:51:33

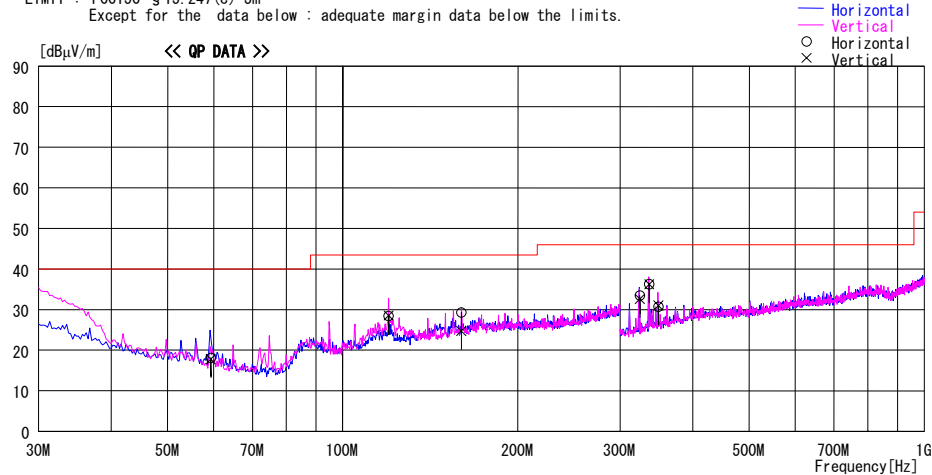
Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT002
Serial No. : 03

Report No. : 24GE0020-HO
Power : DC 3.3V
Temp°C/Humi% : 25 / 52
Operator : Naoki Sakamoto

Mode / Remarks : TX Mode(2441MHz) X

LIMIT : FCC15C §15.247(c) 3m

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	59.307	26.0	8.3	6.8	23.0	18.1	40.0	21.9	100	183
2	120.000	30.8	13.0	7.4	22.8	28.4	43.5	15.1	168	39
3	160.002	29.5	15.2	7.6	23.0	29.3	43.5	14.2	145	183
4	324.313	33.0	15.0	8.4	22.9	33.5	46.0	12.5	240	117
5	336.813	35.1	15.6	8.4	22.8	36.3	46.0	9.7	100	127
6	349.288	28.8	16.1	8.5	22.7	30.7	46.0	15.3	100	0
----- Vertical -----										
7	59.307	25.7	8.3	6.8	23.0	17.8	40.0	22.2	161	0
8	120.000	30.9	13.0	7.4	22.8	28.5	43.5	15.0	164	0
9	160.002	24.9	15.2	7.6	23.0	24.7	43.5	18.8	171	0
10	324.323	32.1	15.0	8.4	22.9	32.6	46.0	13.4	100	0
11	336.803	35.0	15.6	8.4	22.8	36.2	46.0	9.8	100	0
12	349.288	29.1	16.1	8.5	22.7	31.0	46.0	15.0	100	151

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP. GAIN

Page:

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)

Spurious Emission(Radiated) 2480MHz

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/05/24 13:22:32

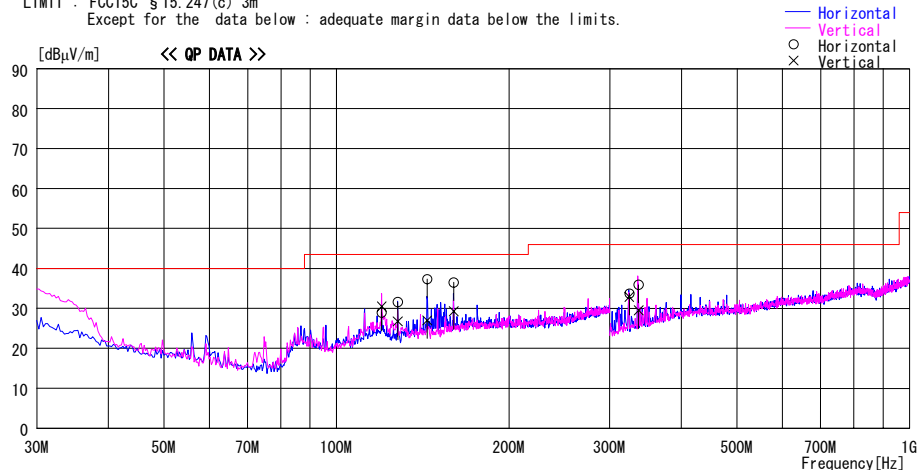
Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT002
Serial No. : 03

Report No. : 24GE0020-HO
Power : DC 3.3V
Temp°C/Humi% : 25 / 52
Operator : Naoki Sakamoto

Mode / Remarks : TX Mode(2480MHz) X Data

LIMIT : FCC15C §15.247(c) 3m

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	120.000	31.3	13.0	7.4	22.8	28.9	43.5	14.6	212	56
2	128.009	33.7	13.4	7.4	22.9	31.6	43.5	11.9	100	0
3	144.000	38.6	14.3	7.5	23.1	37.3	43.5	6.2	202	0
4	160.140	36.7	15.2	7.6	23.0	36.5	43.5	7.0	100	0
5	324.337	33.2	15.0	8.4	22.9	33.7	46.0	12.3	187	110
6	336.802	34.7	15.6	8.4	22.8	35.9	46.0	10.1	100	114
----- Vertical -----										
7	120.000	32.9	13.0	7.4	22.8	30.5	43.5	13.0	157	0
8	128.009	28.8	13.4	7.4	22.9	26.7	43.5	16.8	100	0
9	144.000	28.3	14.3	7.5	23.1	27.0	43.5	16.5	244	296
10	160.140	29.5	15.2	7.6	23.0	29.3	43.5	14.2	100	96
11	324.327	32.4	15.0	8.4	22.9	32.9	46.0	13.1	100	3
12	336.802	28.3	15.6	8.4	22.8	29.5	46.0	16.5	259	5

CHART: WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

Spurious Emission(Radiated) 2402MHz

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company : DENSO WAVE INCORPORATED
Equipment : Bluetooth Board
Model : DWBT002
Sample No. : 03
Power : DC3.3V(PC:AC120V/60Hz)
Mode : Continuous Tx(2402MHz) mode
FCC ID : PZWDWBT002
IC No. : 1551C-DWBT002

REPORT NO : 24GE0020-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE : 3/1m
DATE : May 24,2004
TEMPERATURE : 25deg.C
HUMIDITY : 52%
ENGINEER : Naoki Sakamoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Band-Pass	RESULT		Limit	MARGIN	
	[MHz]	HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
		[dBuV/m]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1201.0	48.6	47.3	23.0	36.9	4.0	0.0	38.7	37.4	74.0	35.3	36.6
2	2400.0	42.3	41.8	30.8	36.3	5.9	0.0	42.7	42.2	74.0	31.3	31.8
3	4804.0	41.3	41.4	35.3	36.1	8.4	0.0	48.9	49.0	74.0	25.1	25.0
4	7206.0	40.6	39.5	37.9	35.6	11.0	0.0	53.9	52.8	74.0	20.1	21.2
5	9608.0	40.5	42.0	37.6	36.3	12.9	0.0	54.7	56.2	74.0	19.3	17.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12010.0	39.7	38.6	41.0	35.7	14.6	0.0	50.1	49.0	74.0	23.9	25.0
6	14412.0	39.7	38.3	41.1	34.6	16.2	0.0	52.9	51.5	74.0	21.1	22.5
7	16814.0	42.2	42.5	45.9	35.6	19.0	0.0	62.0	62.3	74.0	12.0	11.7
8	19216.0	42.7	44.8	39.7	34.9	21.1	0.0	59.1	61.2	74.0	14.9	12.8
9	21618.0	42.8	42.7	40.8	35.4	22.6	0.0	61.3	61.2	74.0	12.7	12.8
10	24020.0	42.3	42.6	39.9	35.8	23.8	0.0	60.7	61.0	74.0	13.3	13.0

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR [dBuV/m]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1201.0	44.1	40.7	23.0	36.9	4.0	0.0	34.2	30.8	54.0	19.8	23.2
2	2400.0	32.1	33.3	30.8	36.3	5.9	0.0	32.5	33.7	54.0	21.5	20.3
3	4804.0	30.7	30.8	35.3	36.1	8.4	0.0	38.3	38.4	54.0	15.7	15.6
4	7206.0	30.2	30.2	37.9	35.6	11.0	0.0	43.5	43.5	54.0	10.5	10.5
5	9608.0	31.0	31.0	37.6	36.3	12.9	0.0	45.2	45.2	54.0	8.8	8.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12010.0	29.1	29.2	41.0	35.7	14.6	0.0	39.5	39.6	54.0	14.5	14.4
6	14412.0	28.7	28.5	41.1	34.6	16.2	0.0	41.9	41.7	54.0	12.1	12.3
7	16814.0	32.2	32.1	45.9	35.6	19.0	0.0	52.0	51.9	54.0	2.0	2.1
8	19216.0	32.8	33.3	39.7	34.9	21.1	0.0	49.2	49.7	54.0	4.8	4.3
9	21618.0	31.6	31.5	40.8	35.4	22.6	0.0	50.1	50.0	54.0	3.9	4.0
10	24020.0	31.8	31.8	39.9	35.8	23.8	0.0	50.2	50.2	54.0	3.8	3.8

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

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

*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

*In the above table, factor 0.0dB represents no use of Band-Pass Filter.

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)

Spurious Emission(Radiated)2441MHz

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

Company : DENSO WAVE INCORPORATED
Equipment : Bluetooth Board
Model : DWBT002
Sample No. : 03
Power : DC3.3V(PC:AC120V/60Hz)
Mode : Continuous Tx(2441MHz) mode
FCC ID : PZWDWBT002
IC No. : 1551C-DWBT002

REPORT NO : 24GE0020-HO
REGULATION : Fcc Part15 Subpart C 15.247(b)(3)
TEST DISTANCE: 3/1m
DATE : May 24,2004
TEMPERATURE : 25deg.C
HUMIDITY : 52%
ENGINEER : Naoki Sakamoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Band-Pass	RESULT		Limit	MARGIN	
	[MHz]	HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
		[dBuV/m]	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dBuV/m]	[dB]	[dB]		
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1220.0	47.3	47.6	23.1	36.9	4.0	0.0	37.5	37.8	74.0	36.5	36.2
2	4882.0	41.0	40.2	35.5	36.1	8.4	0.0	48.8	48.0	74.0	25.2	26.0
3	7323.0	42.2	40.3	37.9	35.7	11.0	0.0	55.4	53.5	74.0	18.6	20.5
4	9764.0	40.6	40.4	37.0	36.3	12.9	0.0	54.2	54.0	74.0	19.8	20.0
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12205.0	39.4	39.6	41.4	35.6	14.6	0.0	50.3	50.5	74.0	23.7	23.5
6	14646.0	38.9	38.9	42.6	34.8	16.2	0.0	53.4	53.4	74.0	20.6	20.6
7	17087.0	43.0	41.7	46.5	35.4	19.0	0.0	63.6	62.3	74.0	10.4	11.7
8	19528.0	32.1	42.7	39.3	35.5	21.1	0.0	47.5	58.1	74.0	26.5	15.9
9	21969.0	41.4	41.8	40.4	35.0	22.6	0.0	59.9	60.3	74.0	14.1	13.7
10	24410.0	42.8	42.5	40.1	36.6	23.8	0.0	60.6	60.3	74.0	13.4	13.7

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Band-Pass	RESULT		Limit	MARGIN	
	[MHz]	HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
		[dBuV/m]	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1220.0	39.6	41.6	23.1	36.9	4.0	0.0	29.8	31.8	54.0	24.2	22.2
2	4882.0	31.2	30.7	35.5	36.1	8.4	0.0	39.0	38.5	54.0	15.0	15.5
3	7323.0	30.3	30.3	37.9	35.7	11.0	0.0	43.5	43.5	54.0	10.5	10.5
4	9764.0	30.8	30.8	37.0	36.3	12.9	0.0	44.4	44.4	54.0	9.6	9.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
5	12205.0	28.8	28.7	41.4	35.6	14.6	0.0	39.7	39.6	54.0	14.3	14.4
6	14646.0	28.8	28.8	42.6	34.8	16.2	0.0	43.3	43.3	54.0	10.7	10.7
7	17087.0	32.2	32.3	46.5	35.4	19.0	0.0	52.8	52.9	54.0	1.2	1.1
8	19528.0	32.1	32.1	39.3	35.5	21.1	0.0	47.5	47.5	54.0	6.5	6.5
9	21969.0	31.7	31.7	40.4	35.0	22.6	0.0	50.2	50.2	54.0	3.8	3.8
10	24410.0	32.7	32.7	40.1	36.6	23.8	0.0	50.5	50.5	54.0	3.5	3.5

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

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

*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

*In the above table, factor 0.0dB represents no use of Band-Pass Filter.

Spurious Emission (Radiated) 2480MHz

Company : DENSO WAVE INCORPORATED Equipment : Bluetooth Board Model : DWBT002 Sample No. : 03 Power : DC3.3V(PC:AC120V/60Hz) Mode : Continuous Tx(2480MHz) mode FCC ID : PZWDWBT002 IC No. : 1551C-DWBT002	UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber REPORT NO : 24GE0020-HO REGULATION : Fcc Part15 Subpart C 15.247(b)(3) TEST DISTANCE : 3/1m DATE : May 24,2004 TEMPERATURE : 25deg.C HUMIDITY : 52% ENGINEER : Naoki Sakamoto
--	--

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Band-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV/m]	[dBuV/m]					[dB]	[dB]		[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1239.5	47.9	48.7	23.2	36.9	4.0	0.0	38.2	39.0	74.0	35.8	35.0
2	2483.5	43.2	43.1	30.8	36.2	5.9	0.0	43.7	43.6	74.0	30.3	30.4
3	4960.0	39.6	41.7	35.8	36.1	8.6	0.0	47.9	50.0	74.0	26.1	24.0
4	7440.0	40.2	39.8	38.2	35.7	11.1	0.0	53.8	53.4	74.0	20.2	20.6
5	9920.0	41.3	42.1	37.0	36.3	13.0	0.0	55.0	55.8	74.0	19.0	18.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
6	12400.0	41.0	40.6	42.3	35.5	14.6	0.0	52.9	52.5	74.0	21.1	21.5
7	14880.0	39.1	39.7	43.0	35.0	16.6	0.0	54.2	54.8	74.0	19.8	19.2
8	17360.0	42.5	42.6	45.4	35.2	19.2	0.0	62.4	62.5	74.0	11.6	11.5
9	19840.0	41.8	41.9	39.9	35.8	21.5	0.0	57.9	58.0	74.0	16.1	16.0
10	22320.0	42.4	43.7	40.7	35.1	22.8	0.0	61.3	62.6	74.0	12.7	11.4
11	24800.0	43.2	44.3	40.2	36.7	24.0	0.0	61.2	62.3	74.0	12.8	11.7

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Band-Pass	RESULT		Limit	MARGIN	
	[MHz]	HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
		[dBuV/m]	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass												
1	1239.5	42.1	43.3	23.2	36.9	4.0	0.0	32.4	33.6	54.0	21.6	20.4
2	2483.5	34.5	33.5	30.8	36.2	5.9	0.0	35.0	34.0	54.0	19.0	20.0
3	4960.0	30.2	30.6	35.8	36.1	8.6	0.0	38.5	38.9	54.0	15.5	15.1
4	7440.0	30.2	30.3	38.2	35.7	11.1	0.0	43.8	43.9	54.0	10.2	10.1
5	9920.0	31.2	31.4	37.0	36.3	13.0	0.0	44.9	45.1	54.0	9.1	8.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Band Pass - Dfac												
6	12400.0	29.5	29.6	42.3	35.5	14.6	0.0	41.4	41.5	54.0	12.6	12.5
7	14880.0	28.9	28.8	43.0	35.0	16.6	0.0	44.0	43.9	54.0	10.0	10.1
8	17360.0	31.8	31.8	45.4	35.2	19.2	0.0	51.7	51.7	54.0	2.3	2.3
9	19840.0	31.4	31.4	39.9	35.8	21.5	0.0	47.5	47.5	54.0	6.5	6.5
10	22320.0	32.0	32.0	40.7	35.1	22.8	0.0	50.9	50.9	54.0	3.1	3.1
11	24800.0	33.3	33.4	40.2	36.7	24.0	0.0	51.3	51.4	54.0	2.7	2.6

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

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

*In the frequency over the fifth harmonic, the noise from the EUT was not seen. The data above is its base noise.

*In the above table, factor 0.0dB represents no use of Band-Pass Filter.

UL Apex Co., Ltd.

Head Office EMC Lab.

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

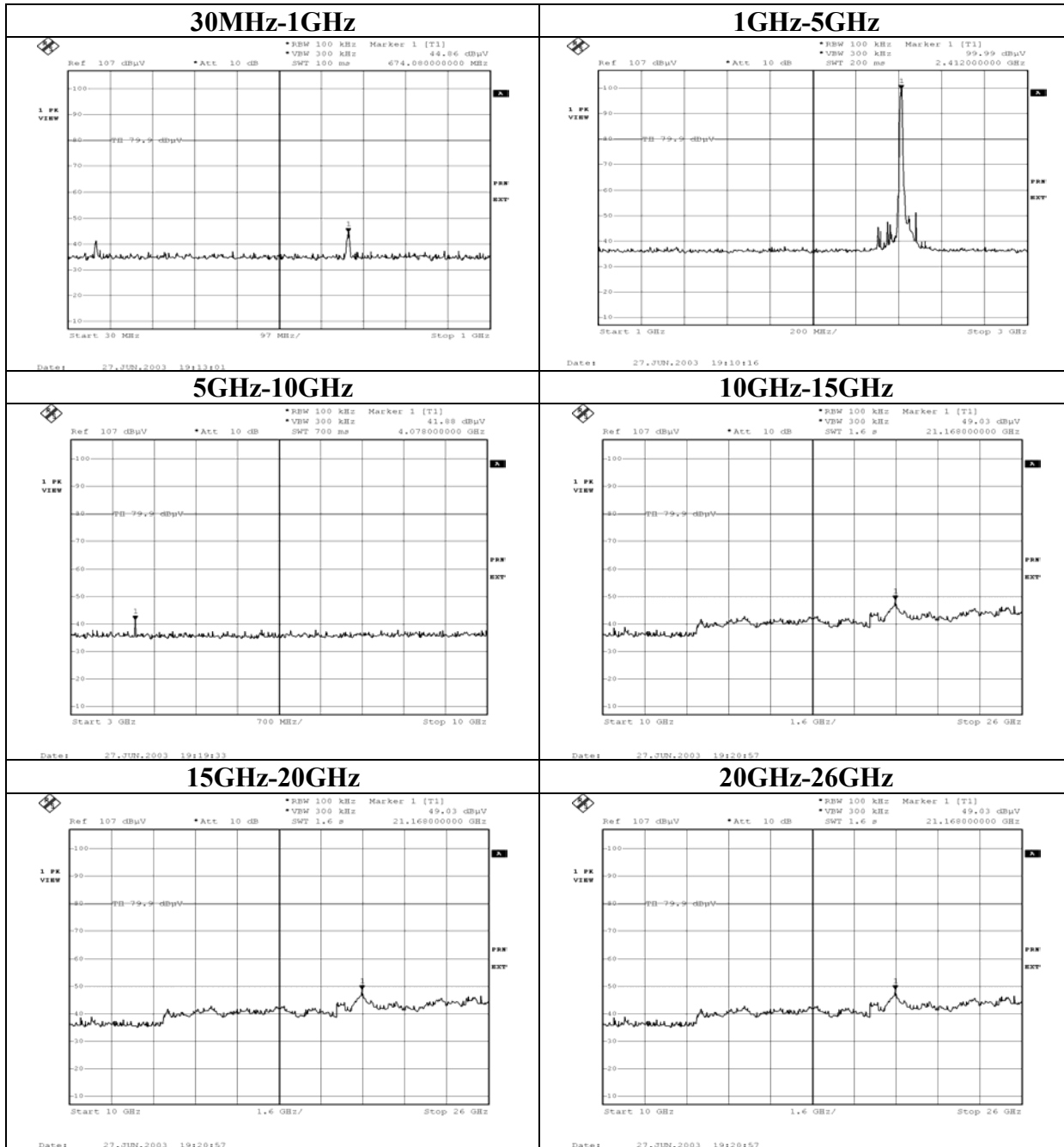
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

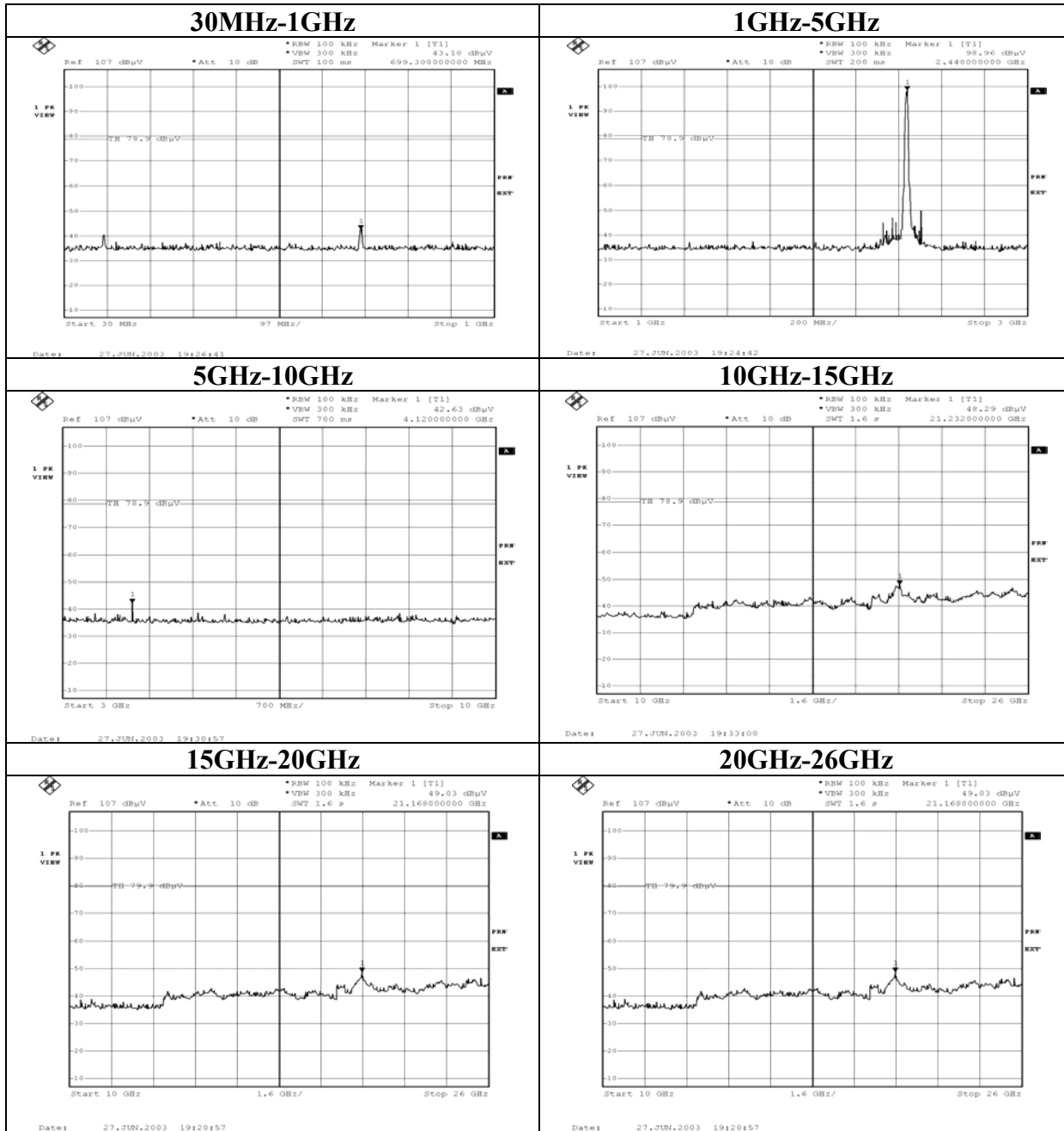
Spurious Emission(Conducted)

2402MHz



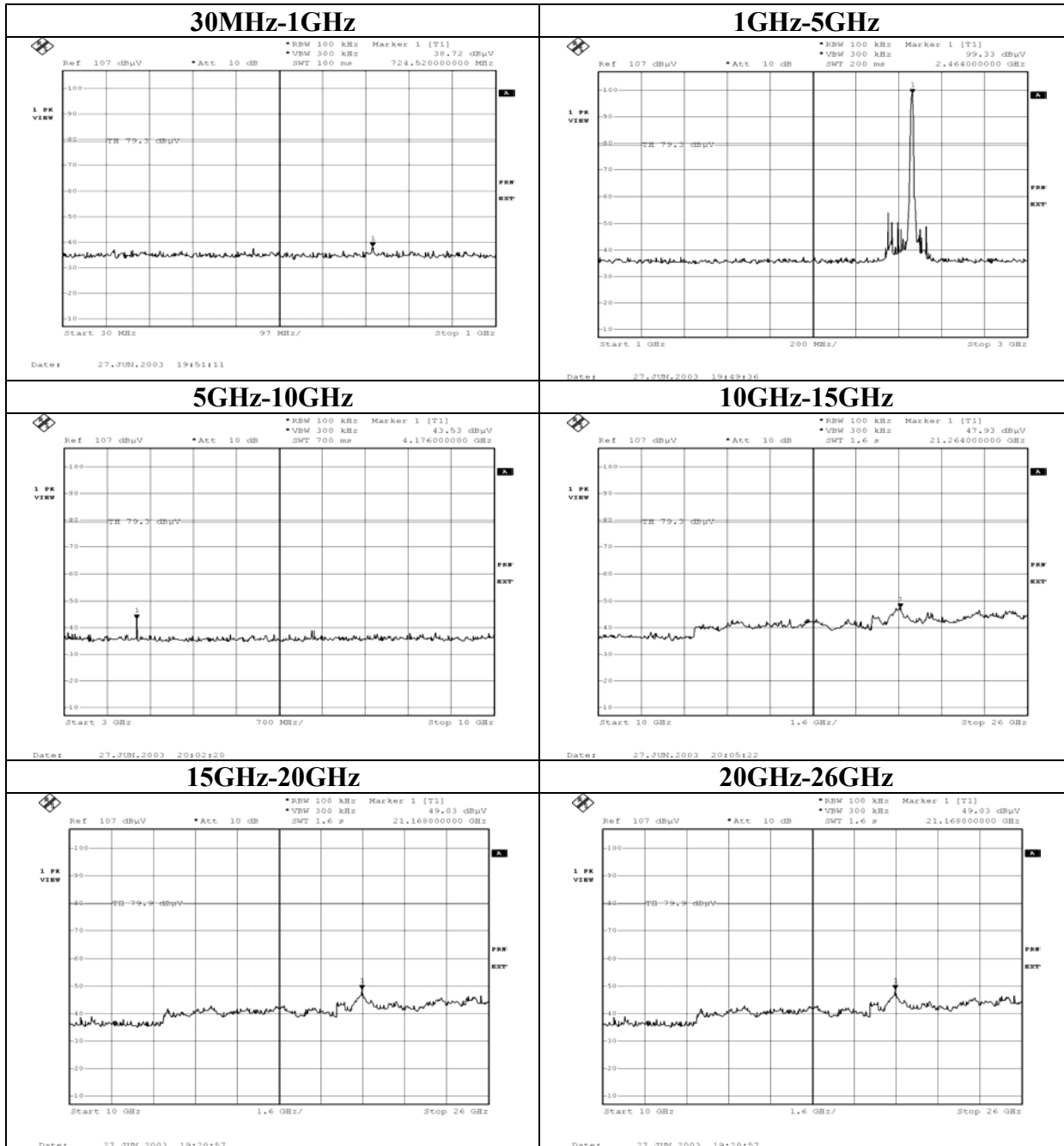
Spurious Emission(Conducted)

2441MHz



Spurious Emission(Conducted)

2480MHz



99% Occupied Bandwidth

