



# EMI TEST REPORT

**Test Report No. : 25GE0132-HO-1**

**Applicant** : DENSO CORPORATION  
**Type of Equipment** : BLUETOOTH ASSY  
**Model No.** : BT0501A  
**Test standard** : FCC Part 15 Subpart C  
Section 15.207, Section 15.247 : 2004  
**FCC ID** : HYQBT0501A  
**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:**

March 3 to 28, 2005

**Tested by:**

Keiichi Aoki  
EMC Service

Makoto Kosaka  
EMC Service

Hiroka Umeyama  
EMC Service

**Approved by :**

Naoki Sakamoto  
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)

<b>CONTENTS</b>	<b>PAGE</b>
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.....	7
SECTION 6: Spurious Emission .....	8
SECTION 7: 20dB Bandwidth .....	9
SECTION 8: Maximum Peak Output Power .....	9
SECTION 9: Carrier Frequency Separation .....	9
SECTION 10: Number of Hopping Frequency .....	9
SECTION 11: Dwell time .....	9
APPENDIX 1: Photographs of test setup .....	10
Conducted Emission.....	10
Spurious Emission (Radiated).....	11
Worst Case Position X-Axis : Horizontal, Y-Axis : Vertical).....	12
APPENDIX 2: Test instruments .....	13
APPENDIX 3: Data of EMI test.....	14
Conducted Emission.....	14
Carrier Frequency Separation .....	18
20dB Bandwidth .....	20
Number of Hopping Frequency .....	22
Dwell time .....	24
Maximum Peak Output Power .....	27
Radiated Spurious Emission.....	29
Conducted Spurious Emission .....	35
99% Occupied Bandwidth.....	39

---

**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 CORPORATION  
Address : 1-1 Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan  
Telephone Number : +81-566-25-5947  
Facsimile Number : +81-566-25-4548  
Contact Person : Toshiharu Kamiya

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

**2.1 Identification of E.U.T.**

Type of Equipment : BLUETOOTH ASSY  
Model No. : BT0501A  
Serial No. : 623  
Country of Manufacture : Japan  
Receipt Date of Sample : March 1, 2005  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

**2.2 Product Description**

Model No: BTA0501A is the BLUETOOTH ASSY.

<b>Clock frequency</b>	13MHz
<b>Feature of EUT</b>	The BT0501A is the 2.4 GHz wireless LAN transceiver module that use frequency hopping spread spectrum technology in accordance with the Bluetooth Specification version1.2. This product is installed only in some specified navigation systems. This product connects the navigation system with the cellular phone by radio. The navigation system enables the driver to call without holding the cellular phone by using speaker, microphone and touch sensitive panel installed in the system. This application is called "hands free".
<b>Equipment Type</b>	Transceiver
<b>Frequency of Operation</b>	2402 – 2480MHz
<b>Bandwidth &amp; Channel spacing</b>	79MHz (Hopping on)/1MHz (Hopping off) & 1MHz/CH
<b>Type of Modulation</b>	FHSS
<b>Duty Cycle</b>	DH1:0.5, DH3:0.75, DH5:0.78
<b>Antenna Type</b>	Board Antenna (220050-001*)
<b>Antenna Connector Type</b>	MS-156NB(Hirose)
<b>Antenna Gain</b>	0 dBi
<b>Mode of Operation</b>	Duplex
<b>Method of frequency generation</b>	Crystal, Synthesizer
<b>ITU code</b>	F1D
<b>Operating voltage (Inner)</b>	DC3.1V to 3.5V
<b>Operating temperature range</b>	-30 deg.C. to +85 deg.C.

**FCC 15.31 (e)**

This EUT provides stable voltage(DC3.3V) from Host, and it is constantly converted into and provided with DC1.8V for the Operational voltage within 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.

**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 : 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

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin*0)	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	<Tx: 2402MHz> 9.1dB, 0.3859MHz AV, L	Complied
2	Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)(iii)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(a)(1)(iii)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(b)(1)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Conducted/ Radiated	N/A		1.1dB, 4960MHz Horizontal, AV

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

\*0) The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

#### Uncertainty:

\*In case of the margin below the EMC Head Office's 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  $\pm 1.3$ dB.

#### Spurious Emission (Radiated)

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

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

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

#### Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is  $\pm 3.0$ 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.

**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)

### 3.3 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 + Amendment4: 2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	Conducted	N/A	N/A	N/A

### 3.4 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)	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.

### 3.5 Test set up, Test instruments and Data of EMI

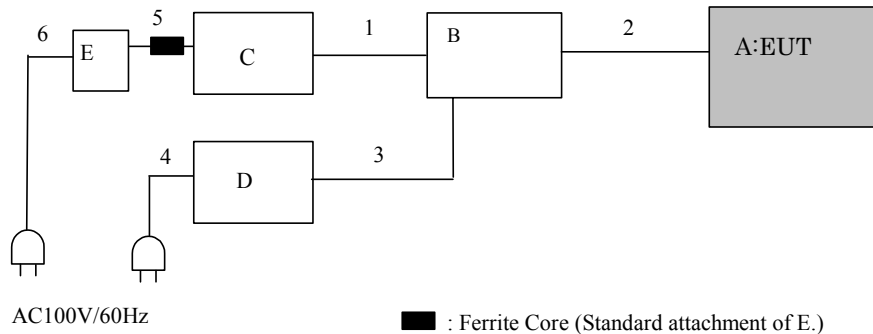
Refer to APPENDIX 1 to 3.

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

### 4.1 Operating Modes

The mode is used : Transmitting mode ( Packet : DH5) \*Dwell Time test : DH1,DH3,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 ASSY	BT0501A	623	DENSO	HYQBT0501A
B	SETTING TOOL	-	-	DENSO	-
C	PC	PCNP2-UDC8H1110	T212-006142	HITACHI	DOC
D	DC POWER SUPPLY	PW18-1.3AT	08016530	KENWOOD	-
E	AC Adapter	PC-AP6400	01Z06271	HITACHI	-

#### List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	RS232C Cable	1.0	Y	Polyvinyl chloride
2	Power and Control Cable	0.1	N	Polyvinyl chloride
3	DC Power Cable	0.6	N	Polyvinyl chloride
4	AC Power Cable	2.0	N	Polyvinyl chloride
5	DC Power Cable	1.9	N	Polyvinyl chloride
6	AC Power Cable	2.0	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**

### **Test Procedure and conditions**

EUT was placed on a platform of nominal size, 0.5m by 1.0m, 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) and excess AC cable was bundled in center.

#### 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 resistivity 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.

**Detector** : CISPR quasi-peak detector (IF BW 9 kHz)  
**Measurement range** : 0.15-30MHz  
**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 6: Spurious Emission**

**[Conducted]**

**Test Procedure**

The Out of Band 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, 0.5m by 1.0m, 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 linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

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.

**20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.**

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz(T/R)	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth	20dBc : RBW: 100kHz VBW: 300kHz (S/A)	AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

**Test data : APPENDIX 3**

**Test result : Pass**

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.



## **SECTION 7: 20dB Bandwidth**

### **Test Procedure**

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

Test data : APPENDIX 3  
Test result : Pass

## **SECTION 8: Maximum Peak Output Power**

### **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 9: Carrier Frequency Separation**

### **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 10: Number of Hopping Frequency**

### **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 11: Dwell time**

### **Test Procedure**

The Dwell time 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

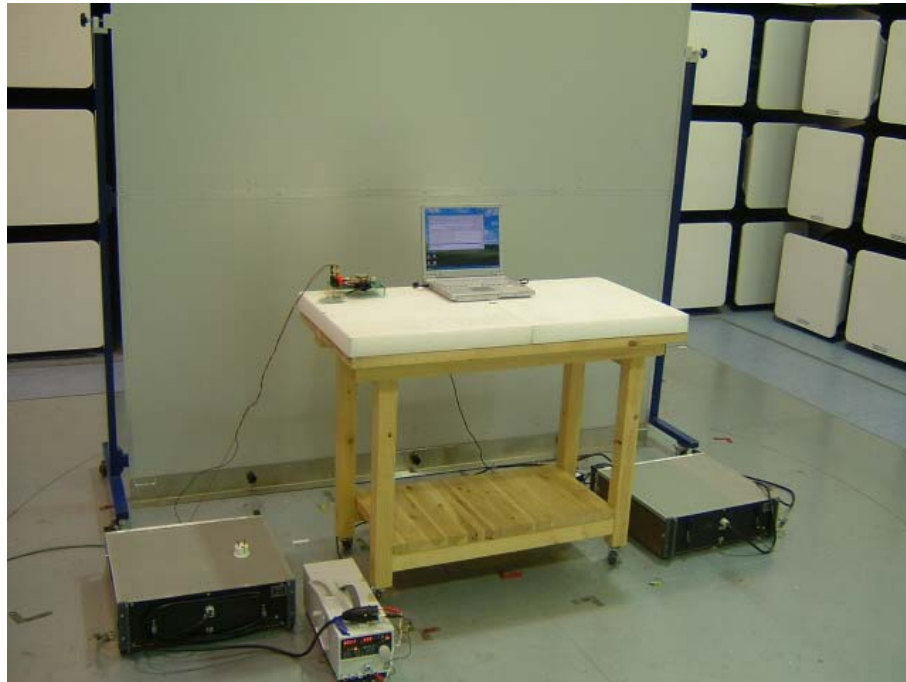
Facsimile : +81 596 24 8124

MF060b(10.04.03)

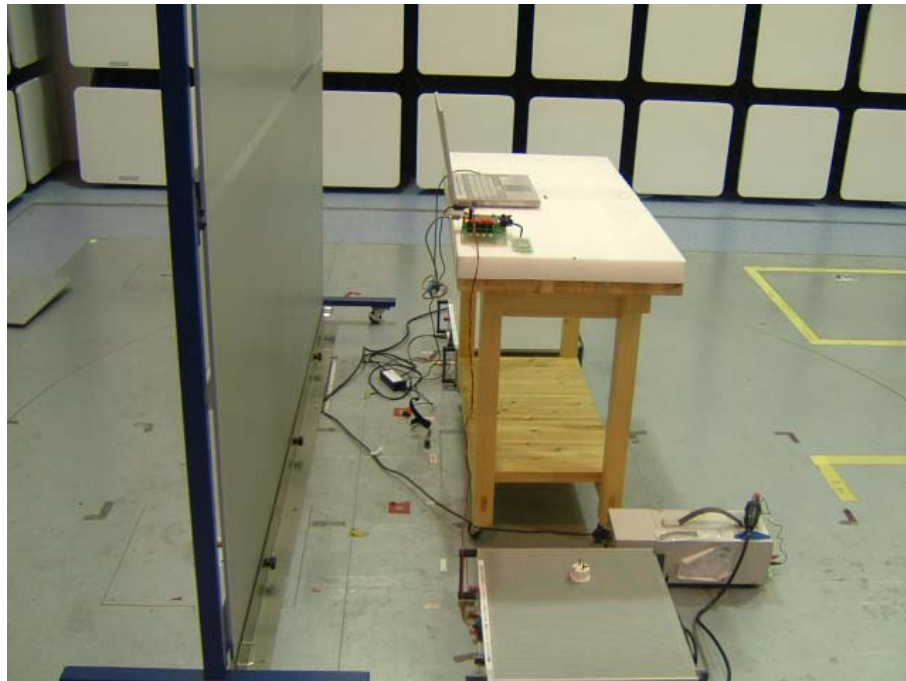
## APPENDIX 1: Photographs of test setup

### Conducted Emission

Front



Rear

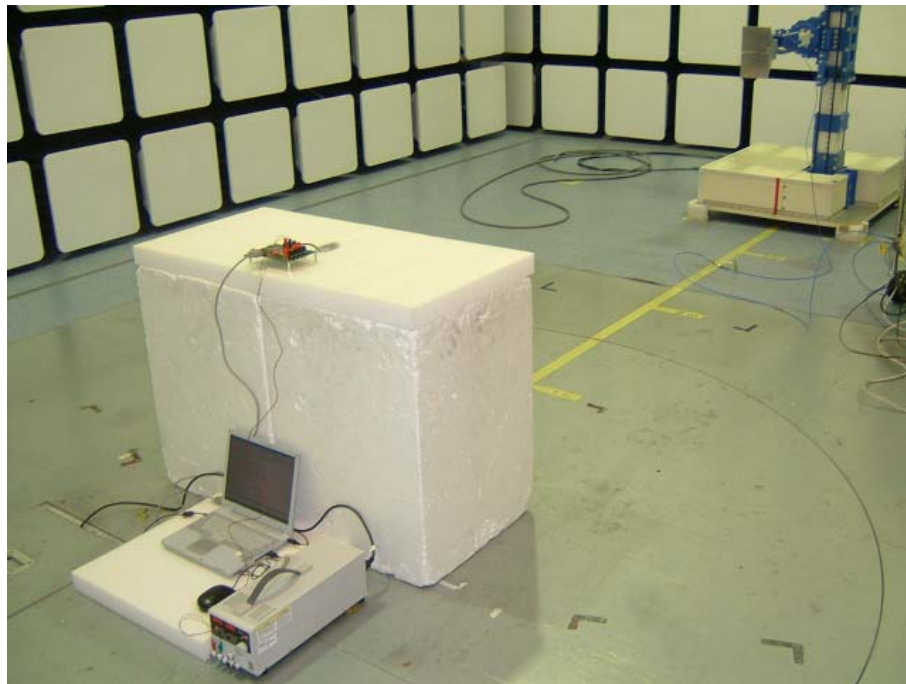


**Spurious Emission (Radiated)**

**Front**

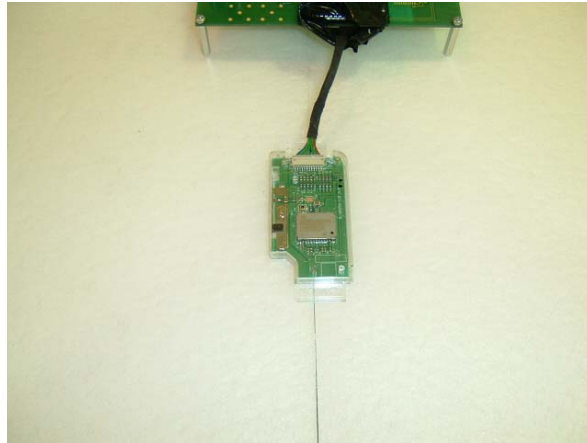


**Rear**



**Worst Case Position X-Axis : Horizontal, Y-Axis : Vertical**

**X-axis**



**Y-axis**



**Z-axis**



---

**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 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/CE	2004/04/12 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE/CE	2005/02/02 * 12
MRENT-14	Spectrum Analyzer	Advantest	R3273	RE/AT/CE	2005/02/21 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2005/02/24 * 12
MPA-06	Pre Amplifier	Hewlett Packard	8447D	RE	2004/08/29 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MCC-04	Microwave Cable 1-40G	Storm	421-011	RE	2005/01/05 * 12
MCC-21	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MCC-22	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2005/02/05 * 12
MHA-01	Horn Antenna	EMCO	3160-09	RE	2005/01/10 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	RE/AT	2005/01/11 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2005/02/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2005/02/04 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE	2005/02/04 * 12
MTA-04	Termination	MCL	NTRM-50	CE	2005/02/03 * 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 Spurious Emission**
- AT: Antenna Terminal Conducted Spurious Emission**
- Maximum Peak Output Power**
- Carrier Frequency Separation[FHSS]**
- 20dB Bandwidth[FHSS] / 99% Occupied Bandwidth**
- Number of Hopping Frequency[FHSS]**
- Dwell time[FHSS]**

**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**

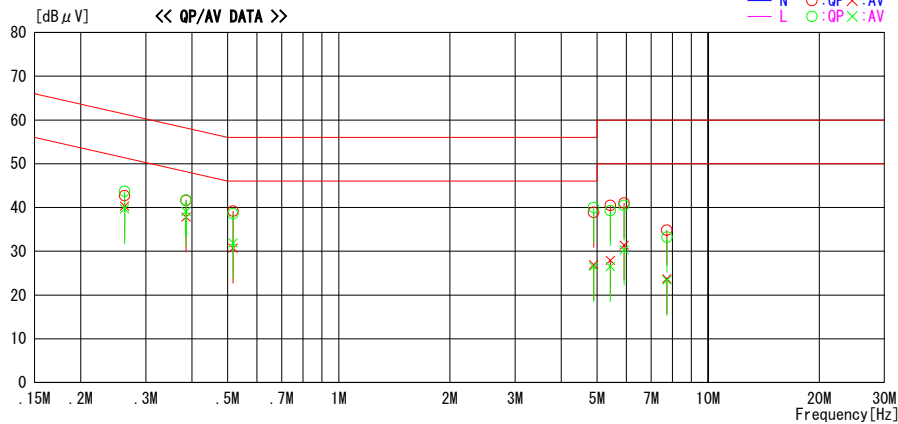
**DATA OF CONDUCTED EMISSION TEST**

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber  
Date : 2005/03/28 08:12:37

Applicant : DENSO CORPORATION  
Kind of EUT : BLUETOOTH ASSY  
Model No. : BT0501A  
Serial No. : 623  
Report No. : 25GE0132-HO  
Power : DC3.3V  
Temp°C/Humi% : 18deg. C / 60%  
Operator : Hiroka Umeyama

Mode / Remarks : Bluetooth Tx 2402MHz

LIMIT : FCC15C § 15.207 (QP)  
FCC15C § 15.207 (AV)



NO	FREQ [MHz]	READING		C. F [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dB μV]	AV [dB μV]		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]	
1	0.2630	42.6	40.2	0.1	42.7	40.3	61.3	51.3	18.6	11.0	N
2	0.3859	41.5	37.7	0.1	41.6	37.8	58.2	48.2	16.6	10.4	N
3	0.5175	39.0	30.5	0.2	39.2	30.7	56.0	46.0	16.8	15.3	N
4	4.8930	38.1	26.1	0.8	38.9	26.9	56.0	46.0	17.1	19.1	N
5	5.4350	39.7	27.1	0.8	40.5	27.9	60.0	50.0	19.5	22.1	N
6	5.9230	40.2	30.6	0.8	41.0	31.4	60.0	50.0	19.0	18.6	N
7	7.7230	33.8	22.7	1.0	34.8	23.7	60.0	50.0	25.2	26.3	N
8	0.2630	43.6	39.6	0.1	43.7	39.7	61.3	51.3	17.6	11.6	L
9	0.3859	41.6	39.0	0.1	41.7	39.1	58.2	48.2	16.5	9.1	L
10	0.5175	38.4	31.7	0.2	38.6	31.9	56.0	46.0	17.4	14.1	L
11	4.8930	39.2	25.7	0.8	40.0	26.5	56.0	46.0	16.0	19.5	L
12	5.4350	38.5	25.7	0.8	39.3	26.5	60.0	50.0	20.7	23.5	L
13	5.9230	39.7	29.5	0.8	40.5	30.3	60.0	50.0	19.5	19.7	L
14	7.7320	32.2	22.4	1.0	33.2	23.4	60.0	50.0	26.8	26.6	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 : 2005/03/28 08:38:13

Applicant : DENSO CORPORATION  
 Kind of EUT : BLUETOOTH ASSY  
 Model No. : BT0501A  
 Serial No. : 623

Report No. : 25GE0132-HO  
 Power : DC3.3V  
 Temp°C/Humi% : 18deg.C / 60%  
 Operator : Hiroka Umeyama

Mode / Remarks : Bluetooth Tx 2402MHz

LIMIT : FCC15C § 15.207 (QP)  
 FCC15C § 15.207 (AV)

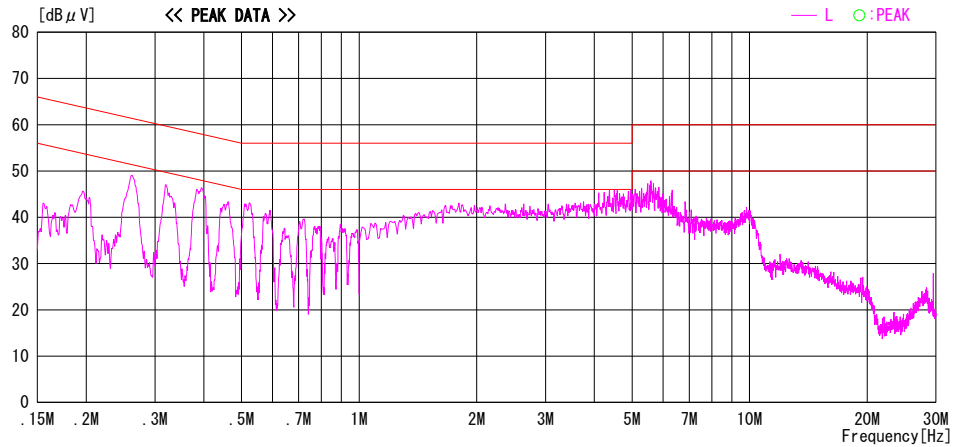
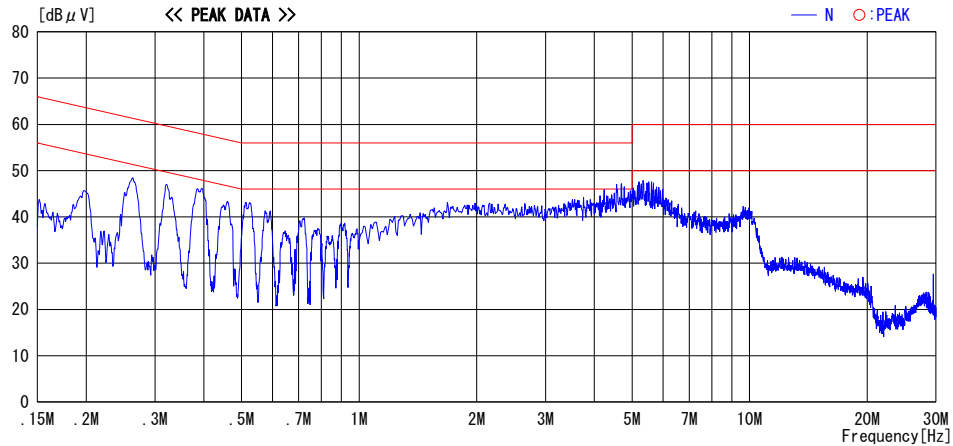


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCURATION: RESULT=READING+C.F (LISN LOSS+CABLE LOSS)  
 Except for the above table : adequate margin data below the limits.

## DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber  
 Date : 2005/03/28 08:30:28

Applicant : DENSO CORPORATION  
 Kind of EUT : BLUETOOTH ASSY  
 Model No. : BT0501A  
 Serial No. : 623

Report No. : 256E0132-H0  
 Power : DC3.3V  
 Temp°C/Humi% : 18deg.C / 60%  
 Operator : Hiroka Umeyama

Mode / Remarks : Bluetooth Tx 2441MHz

LIMIT : FCC15C § 15.207 (QP)  
 FCC15C § 15.207 (AV)

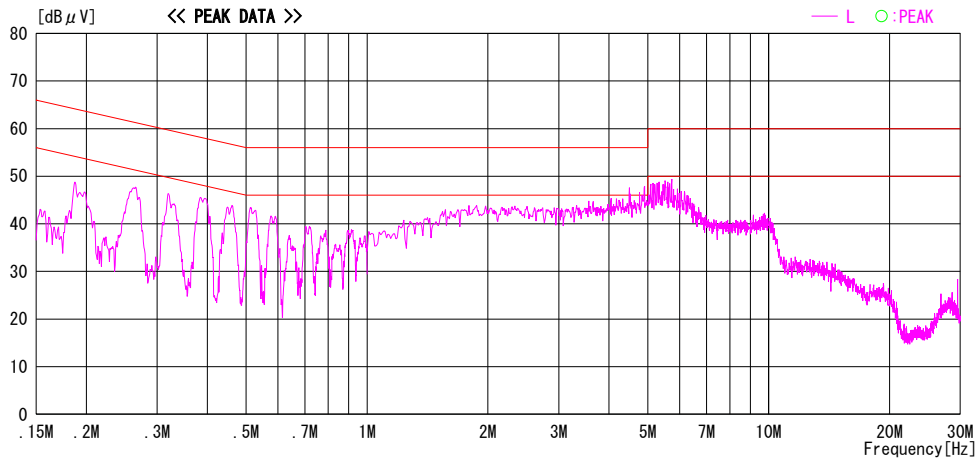
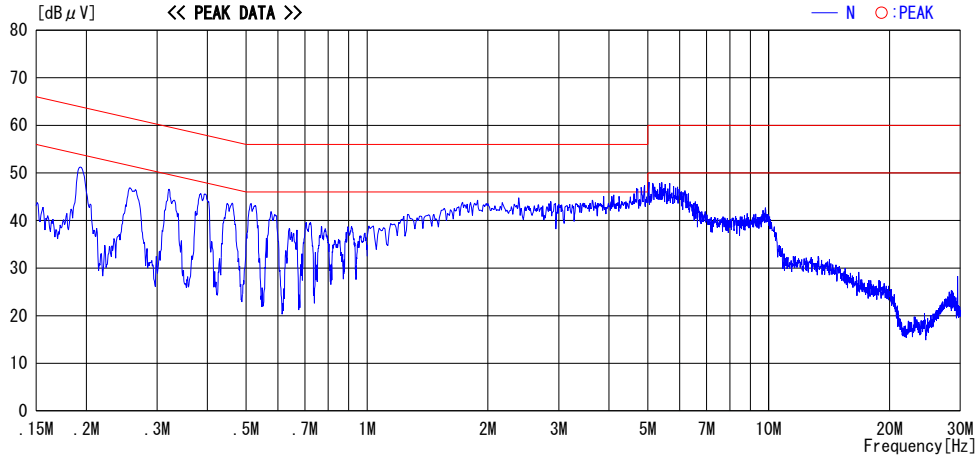


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C. F(L1SN LOSS+CABLE LOSS)  
 Except for the above table : adequate margin data below the limits.



## DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber  
 Date : 2005/03/28 08:34:21

Applicant : DENSO CORPORATION  
 Kind of EUT : BLUETOOTH ASSY  
 Model No. : BT0501A  
 Serial No. : 623

Report No. : 256E0132-H0  
 Power : DC3.3V  
 Temp°C/Humi% : 18deg.C / 60%  
 Operator : Hiroka Umeyama

Mode / Remarks : Bluetooth Tx 2480MHz

LIMIT : FCC15C § 15.207 (QP)  
 FCC15C § 15.207 (AV)

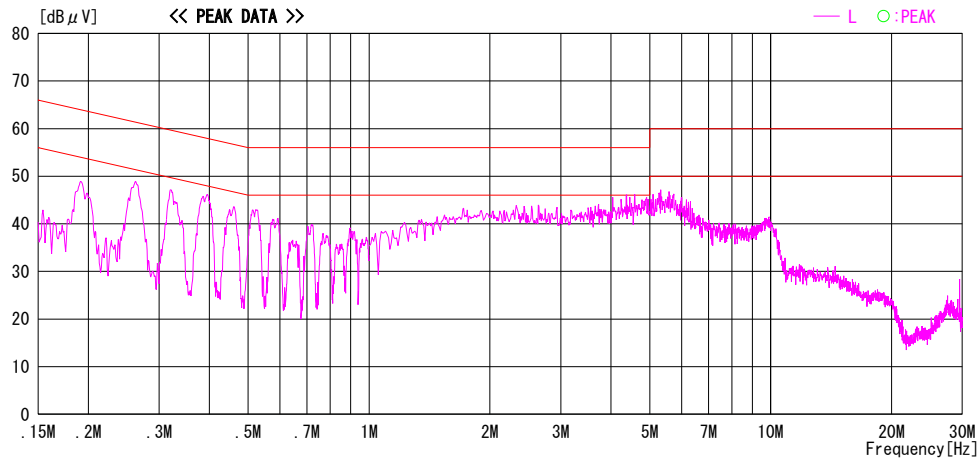
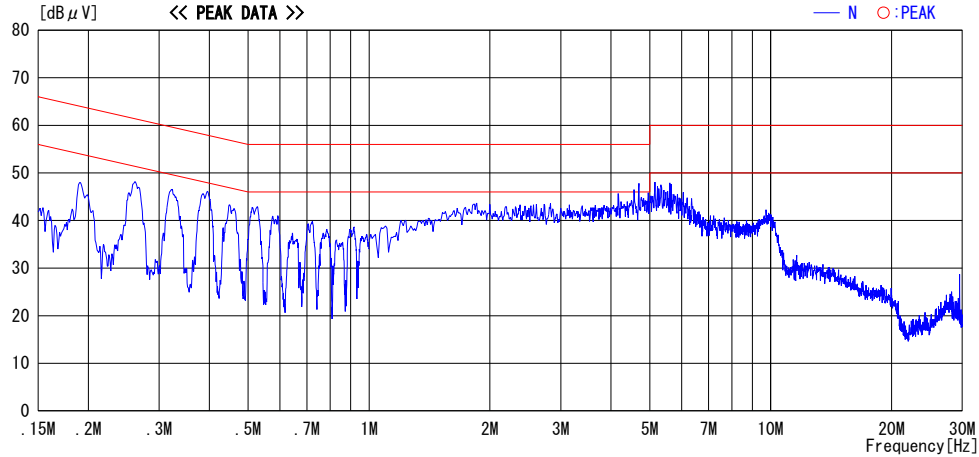


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C. F(L1SN LOSS+CABLE LOSS)  
 Except for the above table : adequate margin data below the limits.

## Carrier Frequency Separation

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

COMPANY	: DENSO CORPORATION	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Assy	TEST DISTANCE	: -
MODEL	: BT0501A	DATE	: 03/08/2005
S/ N	: 623	TEMPERATURE	: 20deg.C
POWER	: DC 3.3 V	HUMIDITY	: 38%
MODE	: Tx(Hopping on) / Inquiry	ENGINEER	: Makoto Kosaka

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	0.996	>20dB Bandwidth and 25[kHz]
Mid	2441.0	0.996	>20dB Bandwidth and 25[kHz]
High	2480.0	0.996	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	1.995	>20dB Bandwidth and 25[kHz]

---

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

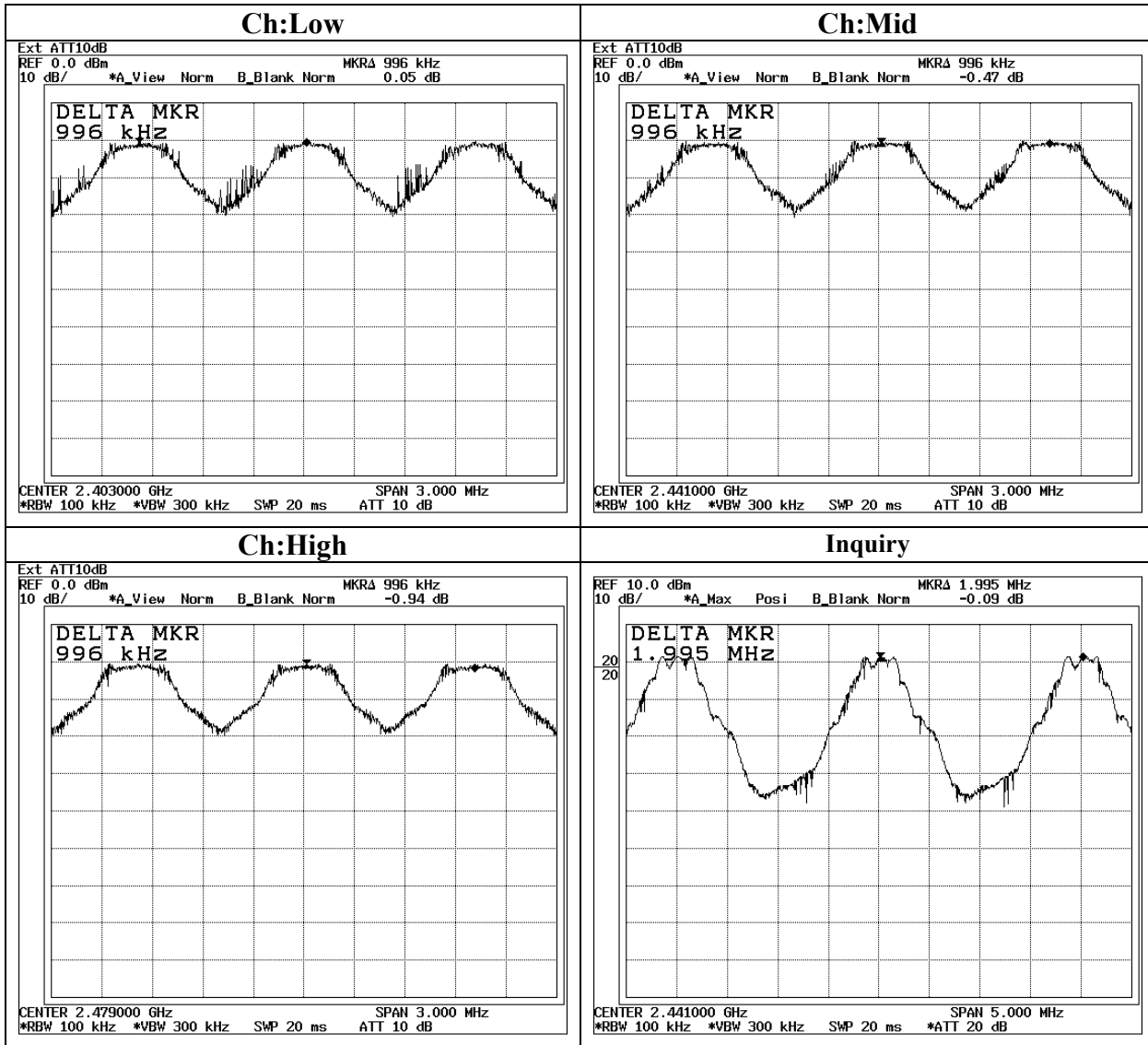
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

**Carrier Frequency Separation**



## 20dB Bandwidth

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

COMPANY : DENSO CORPORATION      REGULATION : Fcc Part15 Subpart C 15.247(a)(1)  
EQUIPMENT : Bluetooth Assy      TEST DISTANCE : -  
MODEL : BT0501A      DATE : 03/08/2005  
S/N : 623      TEMPERATURE : 20deg.C  
POWER : DC 3.3 V      HUMIDITY : 38%  
MODE : Tx (Hopping off) / Inquiry      ENGINEER : Makoto Kosaka

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.834	-
Mid	2441.0	0.792	-
High	2480.0	0.795	-
Inquiry	2441.0	0.645	-

---

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

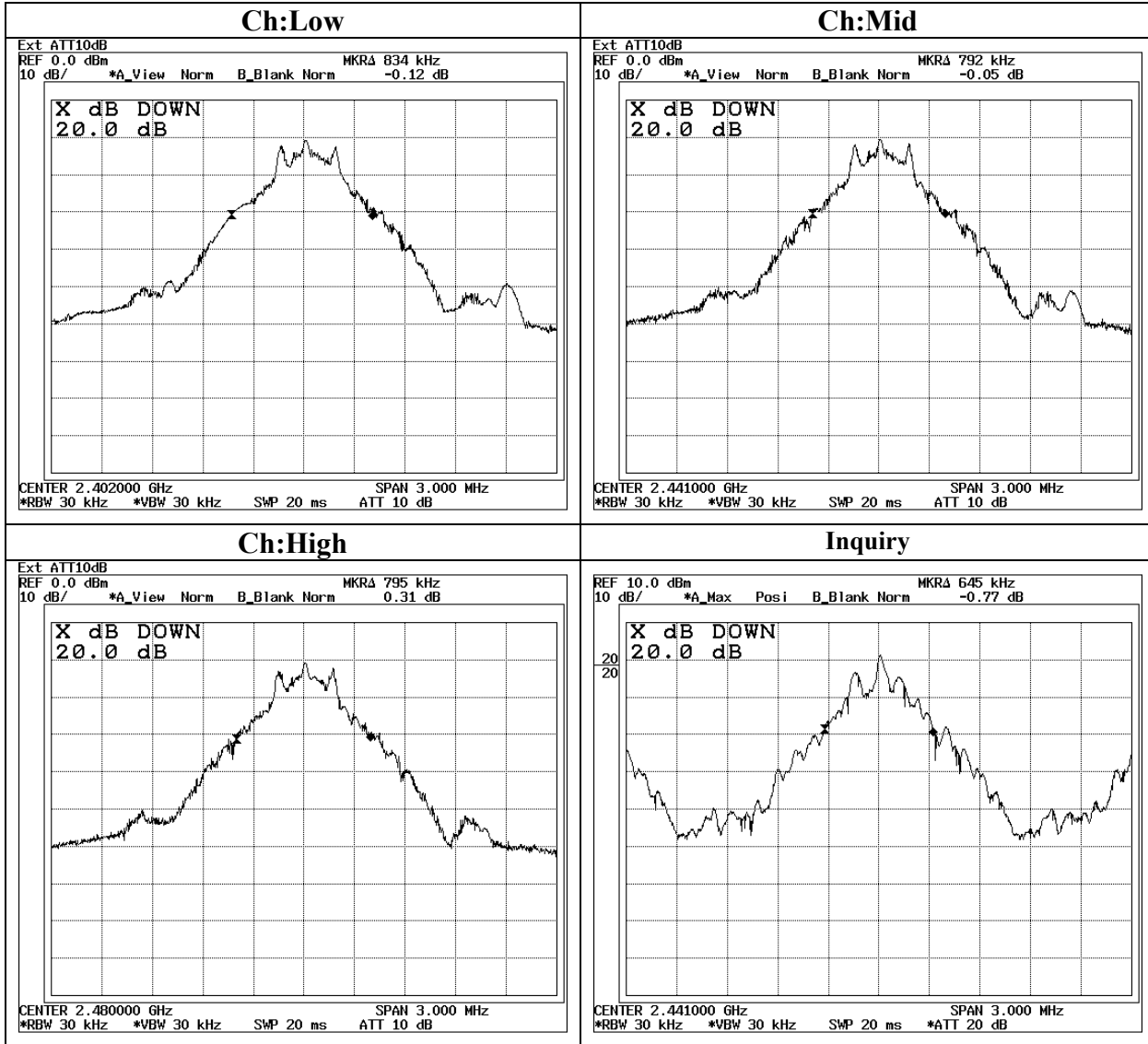
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

**20dB Bandwidth**



## Number of Hopping Frequency

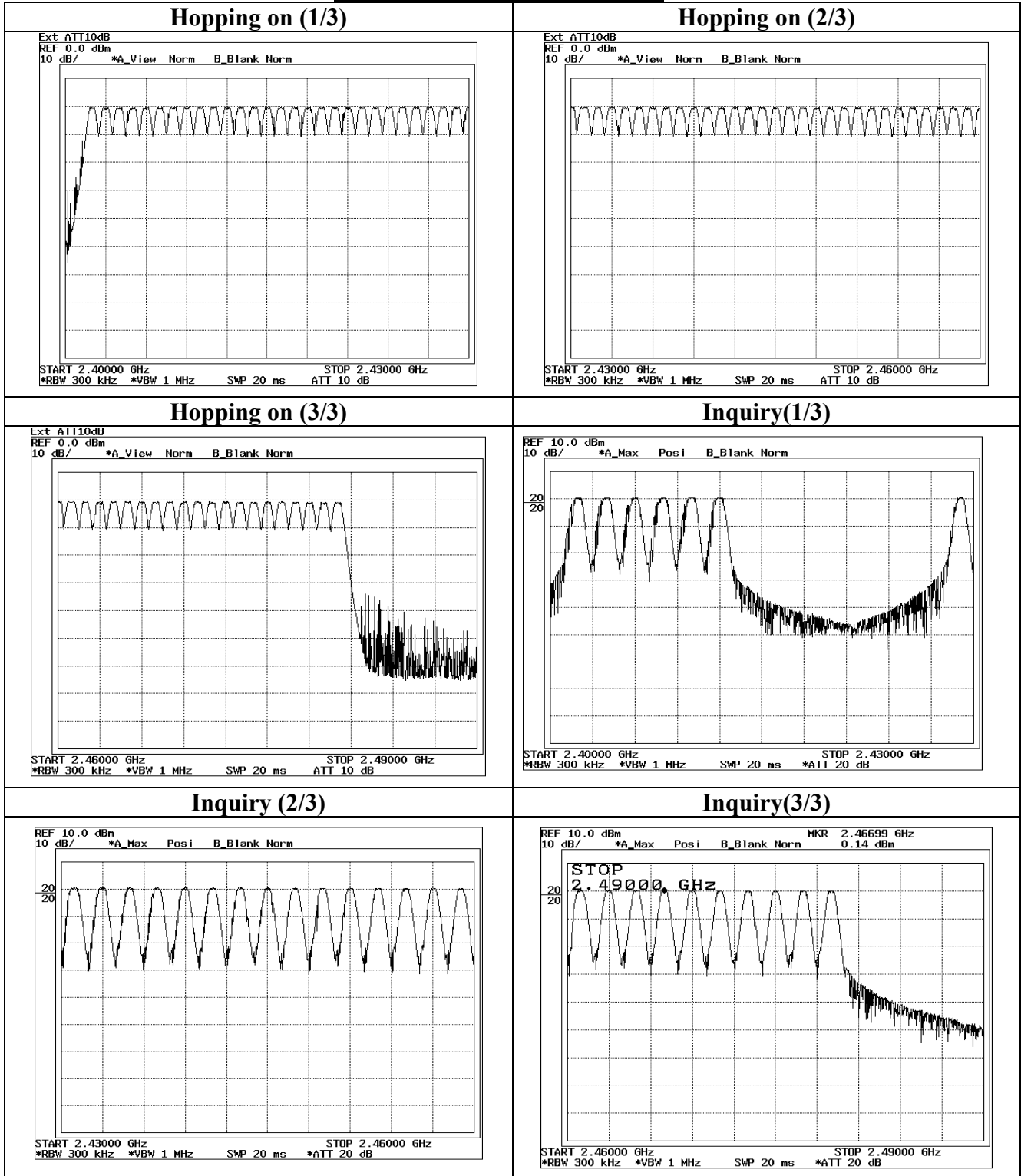
UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 Shielded Room

COMPANY	: DENSO CORPORATION	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Assy	TEST DISTANCE	: -
MODEL	: BT0501A	DATE	: 03/08/2005
S/ N	: 623	TEMPERATURE	: 20deg.C
POWER	: DC 3.3 V	HUMIDITY	: 38%
MODE	: Tx (Hopping on)/Inquiry	ENGINEER	: Makoto Kosaka

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	79	$\geq 15$

Mode	Number of channel	Limit
	[time]	[time]
Inquiry	32	$\geq 15$

### Number of Hopping Frequency



## Dwell time

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

COMPANY : DENSO CORPORATION	REGULATION : Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT : Bluetooth Assy	TEST DISTANCE : -
MODEL : BT0501A	DATE : 03/08/2005
S/N : 623	TEMPERATURE : 20deg.C
POWER : DC 3.3 V	HUMIDITY : 38%
MODE : Tx (Hopping on) / Inquiry	ENGINEER : Makoto Kosaka

(DH1) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	133	0.457	132.8 * 0.457	60.69	400
2	134				
3	131				
4	133				
5	133				
Average	132.8				

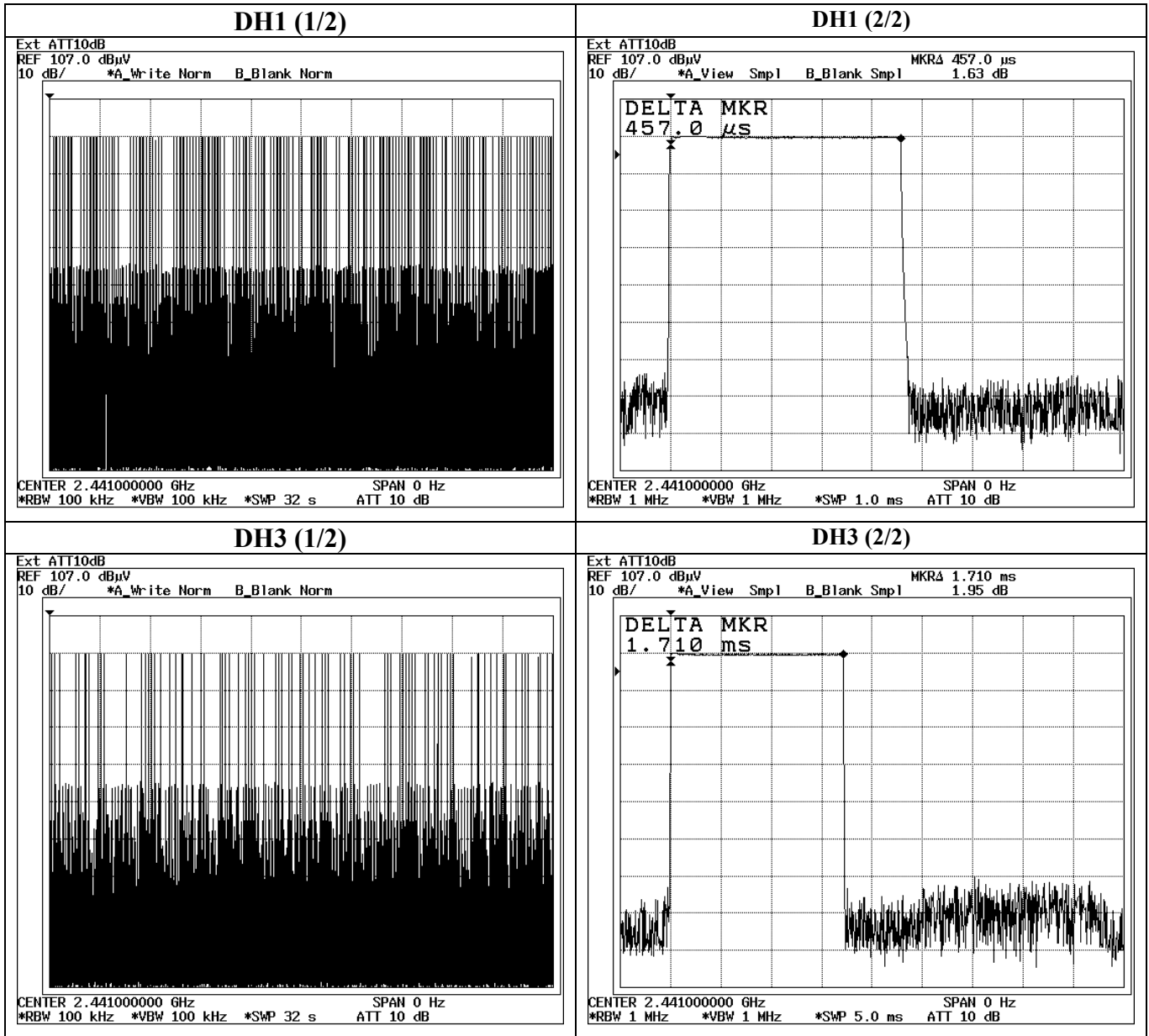
(DH3) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	79	1.710	76.6 * 1.71	130.99	400
2	75				
3	81				
4	74				
5	74				
Average	76.6				

(DH5) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	23	2.960	24 * 2.96	71.04	400
2	24				
3	27				
4	21				
5	25				
Average	24.0				

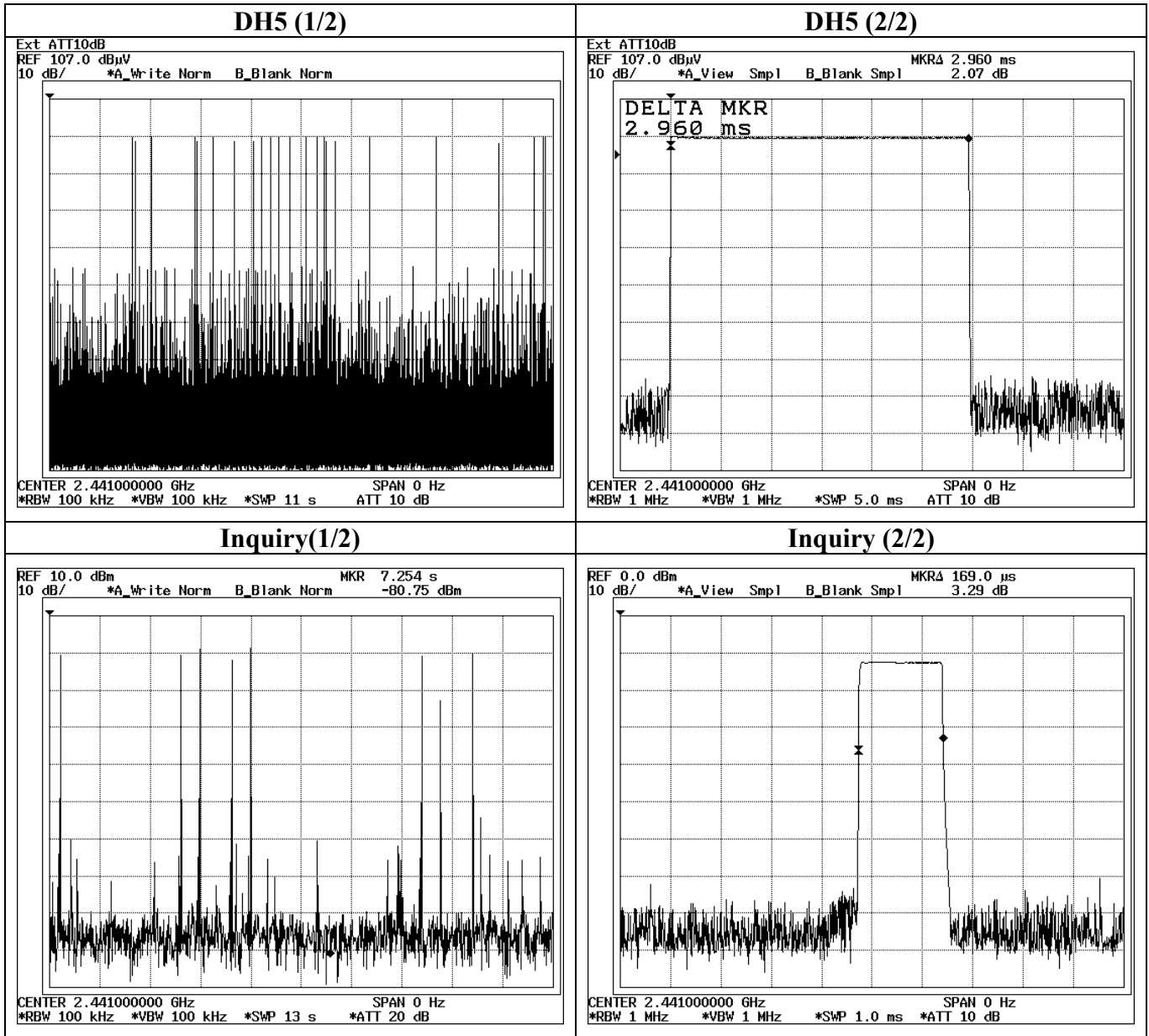
(Inquiry) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1	8	0.169	8.8 * 0.169	1.49	400
2	10				
3	8				
4	10				
5	8				
Average	8.8				



Dwell time



**Dwell time**



## Maximum Peak Output Power

UL Apex Co., Ltd.  
Head Office EMC Lab. No.3 shielded room

COMPANY : DENSO CORPORATION  
EQUIPMENT : Bluetooth Assy  
MODEL : BT0501A  
S/N : 623  
POWER : DC 3.3 V  
MODE : Tx(Hopping off) / Inquiry

REGULATION : Fcc Part15 Subpart C 15.247(b)(1)  
TEST DISTANCE : -  
DATE : 03/08/2005 and 03/15/2005  
TEMPERATURE : 20deg.C and 24deg.C  
HUMIDITY : 38% and 42%  
ENGINEER : Makoto Kosaka and Hiroka Umeyama

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-10.54	0.05	10.00	-0.49	30.00	30.49
Mid	2441.0	-10.36	0.05	10.00	-0.31	30.00	30.31
High	2480.0	-10.67	0.05	10.00	-0.62	30.00	30.62
Inquiry	2441.0	-9.16	0.05	10.00	0.89	30.00	29.11

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.

***\*This result also meets the limit 0.125W (20.97dBm) of other frequency hopping systems.***

---

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

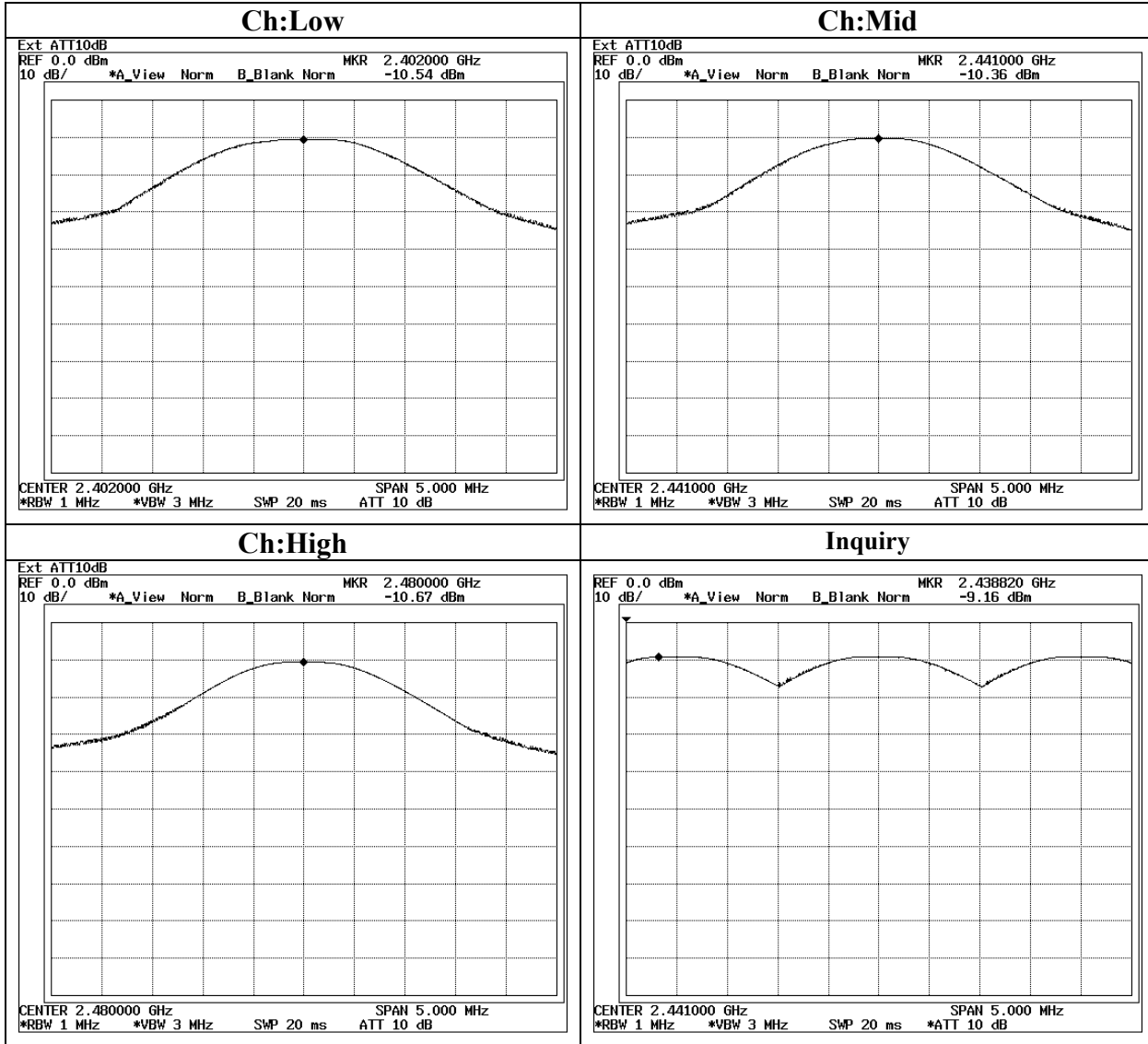
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

### Maximum Peak Output Power



## Radiated Spurious Emission

### DATA OF RADIATED EMISSION TEST

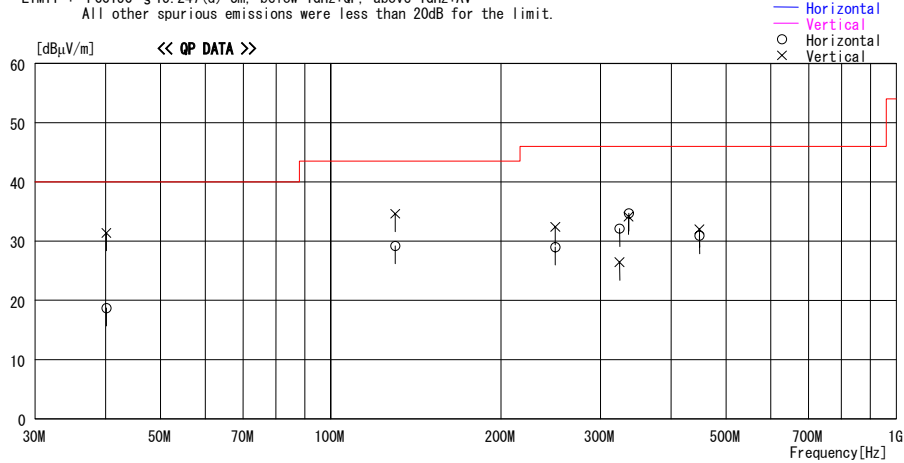
UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber

Applicant : DENSO CORPORATION  
Kind of EUT : Bluetooth Assy  
Model No. : BT0501A  
Serial No. : 623

Report No. : 25GE0132-HO  
Power : DC 3.3 V  
Temp./ Humi. : 26 / 36  
Operator : Keiichi Aoki

Mode / Remarks : Tx 2402 Max axis Hor:X Ver:Y

LIMIT : FCC15C § 15.247(d) 3m, below 1GHz:QP, above 1GHz:AV  
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	40.119	26.6	13.8	6.1	27.8	18.7	40.0	21.3	301	283
2	130.003	35.8	13.9	6.9	27.4	29.2	43.5	14.3	157	284
3	249.402	31.0	17.1	7.7	26.8	29.0	46.0	17.0	298	258
4	324.229	35.3	15.7	8.0	26.9	32.1	46.0	13.9	100	229
5	336.697	37.5	16.2	8.0	27.0	34.7	46.0	11.3	163	183
6	448.925	31.5	18.7	8.6	27.9	30.9	46.0	15.1	224	211
----- Vertical -----										
7	40.126	39.4	13.7	6.1	27.8	31.4	40.0	8.6	100	-1
8	130.005	41.2	13.9	6.9	27.4	34.6	43.5	8.9	100	354
9	249.401	34.4	17.1	7.7	26.8	32.4	46.0	13.6	100	269
10	324.227	29.6	15.7	8.0	26.9	26.4	46.0	19.6	100	305
11	336.061	36.9	16.2	8.0	27.0	34.1	46.0	11.9	100	257
12	448.933	32.6	18.7	8.6	27.9	32.0	46.0	14.0	100	360

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

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

## Radiated Spurious Emission

### DATA OF RADIATED EMISSION TEST

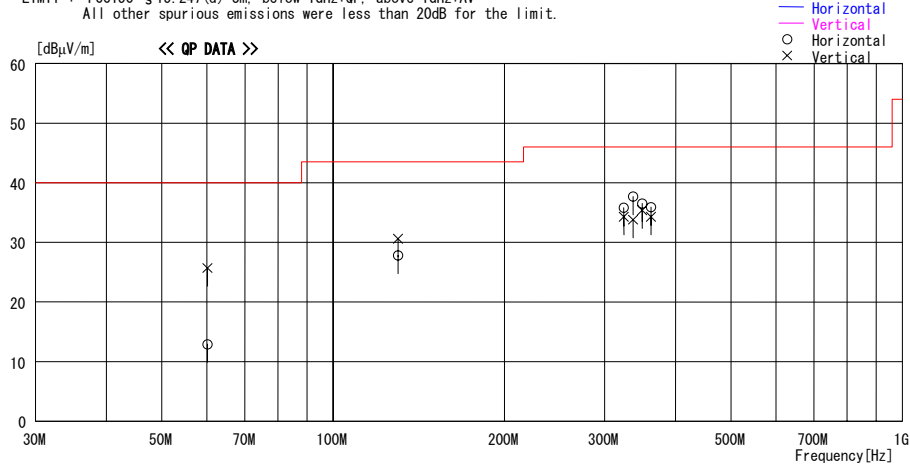
UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber

Applicant : DENSO CORPORATION  
Kind of EUT : Bluetooth Assy  
Model No. : BT0501A  
Serial No. : 623

Report No. : 25GE0132-HO  
Power : DC 3.3 V  
Temp. / Humi. : 26 / 36  
Operator : Keiichi Aoki

Mode / Remarks : Tx 2441 Max axis Hor:X Ver:Y

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV  
All other spurious emissions were less than 20dB for the limit.



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	60.185	26.2	8.2	6.3	27.8	12.9	40.0	27.1	400	89
2	130.004	34.4	13.9	6.9	27.4	27.8	43.5	15.7	176	248
3	324.231	39.0	15.7	8.0	26.9	35.8	46.0	10.2	145	127
4	336.701	40.5	16.2	8.0	27.0	37.7	46.0	8.3	145	237
5	349.172	38.8	16.7	8.1	27.1	36.5	46.0	9.5	145	227
6	361.642	37.9	17.1	8.1	27.2	35.9	46.0	10.1	148	241
----- Vertical -----										
7	60.186	39.0	8.2	6.3	27.8	25.7	40.0	14.3	100	170
8	130.003	37.2	13.9	6.9	27.4	30.6	43.5	12.9	100	360
9	324.221	37.5	15.7	8.0	26.9	34.3	46.0	11.7	170	28
10	336.690	36.6	16.2	8.0	27.0	33.8	46.0	12.2	100	289
11	349.164	37.7	16.7	8.1	27.1	35.4	46.0	10.6	100	295
12	361.633	36.3	17.1	8.1	27.2	34.3	46.0	11.7	150	327

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

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

## Radiated Spurious Emission

### DATA OF RADIATED EMISSION TEST

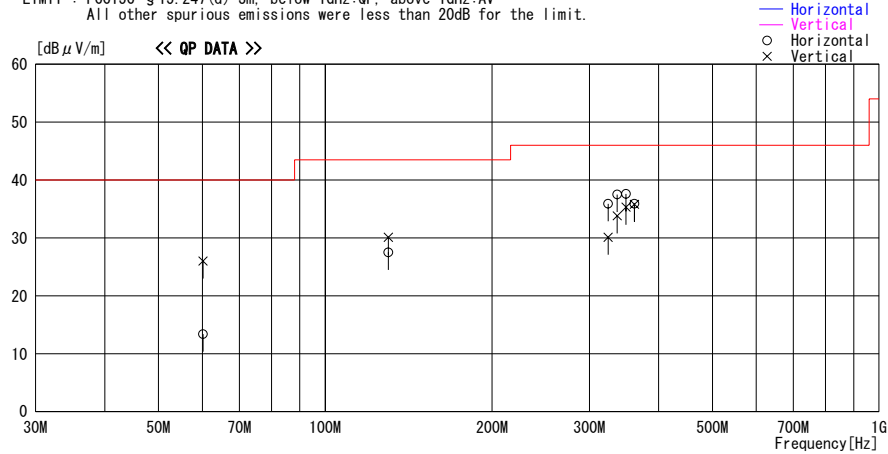
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber

Applicant : DENSO CORPORATION  
Kind of EUT : Bluetooth Assy  
Model No. : BT0501A  
Serial No. : 623

Report No. : 25GE0132-HO  
Power : DC 3.3 V  
Temp./ Humi. : 26 / 36  
Operator : Keiichi Aoki

Mode / Remarks : Tx 2480 Max axis Hor:X Ver:Y

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV  
All other spurious emissions were less than 20dB for the limit.



No.	FREQ [MHz]	READING QP [dB μV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μV/m]	LIMIT [dB μV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	60.188	26.7	8.2	6.3	27.8	13.4	40.0	26.6	400	289
2	130.004	34.1	13.9	6.9	27.4	27.5	43.5	16.0	185	90
3	324.224	39.1	15.7	8.0	26.9	35.9	46.0	10.1	100	223
4	336.695	40.3	16.2	8.0	27.0	37.5	46.0	8.5	100	254
5	349.162	39.9	16.7	8.1	27.1	37.6	46.0	8.4	100	248
6	361.633	37.9	17.1	8.1	27.2	35.9	46.0	10.1	100	257
----- Vertical -----										
7	60.188	39.3	8.2	6.3	27.8	26.0	40.0	14.0	100	205
8	130.003	36.7	13.9	6.9	27.4	30.1	43.5	13.4	100	360
9	324.224	33.3	15.7	8.0	26.9	30.1	46.0	15.9	100	12
10	336.697	36.6	16.2	8.0	27.0	33.8	46.0	12.2	100	298
11	349.170	37.6	16.7	8.1	27.1	35.3	46.0	10.7	100	289
12	361.635	37.8	17.1	8.1	27.2	35.8	46.0	10.2	100	143

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

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

## Radiated Spurious Emission

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

Company : DENSO CORPORATION	REPORT NO : 25GE0132-HO
Equipment : Bluetooth Assy	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : BT0501A	TEST DISTANCE : 3/1m
Sample No. : 623	DATE : 03/07/2005
Power : DC3.3V	TEMPERATURE : 26deg.C
Mode : Bluetooth, Tx 2402MHz	HUMIDITY : 36%
Remarks : Hor X-axis/Ver Y-axis	ENGINEER : Keiichi Aoki

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1293.1	57.5	57.8	23.6	37.0	4.1	0.0	48.2	48.5	74.0	25.8	25.5
2	2390.0	64.2	62.3	30.5	36.4	5.7	0.0	64.0	62.1	74.0	10.0	11.9
3	4804.0	51.6	47.7	35.1	36.0	8.3	0.0	59.0	55.1	74.0	15.0	18.9
4	7206.0	43.4	43.2	37.7	36.1	10.1	0.0	55.1	54.9	74.0	18.9	19.1
5	9608.0	44.3	44.4	37.0	36.4	12.2	0.0	57.1	57.2	74.0	16.9	16.8
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
6	12010.0	42.4	42.6	41.6	36.1	14.3	0.0	52.7	52.9	74.0	21.3	21.1
7	14412.0	41.6	41.6	41.7	34.6	15.2	0.0	54.4	54.4	74.0	19.6	19.6
8	16814.0	44.6	44.2	45.1	35.1	16.5	0.0	61.6	61.2	74.0	12.4	12.8
9	19216.0	44.3	43.6	41.7	34.1	18.9	0.0	61.3	60.6	74.0	12.7	13.4
10	21618.0	44.6	44.7	40.4	34.8	19.4	0.0	60.1	60.2	74.0	13.9	13.8
11	24020.0	45.2	45.0	41.0	35.5	21.6	0.0	62.8	62.6	74.0	11.2	11.4

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1293.1	39.6	39.5	23.6	37.0	4.1	0.0	30.3	30.2	54.0	23.7	23.8
2	2390.0	33.8	34.2	30.5	36.4	5.7	0.0	33.6	34.0	54.0	20.4	20.0
3	4804.0	45.2	43.3	35.1	36.0	8.3	0.0	52.6	50.7	54.0	1.4	3.3
4	7206.0	30.9	30.8	37.7	36.1	10.1	0.0	42.6	42.5	54.0	11.4	11.5
5	9608.0	32.3	32.3	37.0	36.4	12.2	0.0	45.1	45.1	54.0	8.9	8.9
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
6	12010.0	29.4	29.5	41.6	36.1	14.3	0.0	39.7	39.8	54.0	14.3	14.2
7	14412.0	29.1	29.1	41.7	34.6	15.2	0.0	41.9	41.9	54.0	12.1	12.1
8	16814.0	31.8	31.8	45.1	35.1	16.5	0.0	48.8	48.8	54.0	5.2	5.2
9	19216.0	31.0	31.0	41.7	34.1	18.9	0.0	48.0	48.0	54.0	6.0	6.0
10	21618.0	32.2	32.2	40.4	34.8	19.4	0.0	47.7	47.7	54.0	6.3	6.3
11	24020.0	32.4	32.4	41.0	35.5	21.6	0.0	50.0	50.0	54.0	4.0	4.0

**20dBc(Fundamental 2402MHz) (RBW: 100kHz, VBW: 300kHz)**

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
0	2402.0	105.1	101.5	30.5	36.4	5.7	0.0	104.9	101.3	-	-	-
3	2400.0	61.0	58.2	30.5	36.4	5.7	0.0	60.8	58.0	Funda-20dB	24.1	23.3

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.  
\*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.  
\*Hi-Pass Filter was not used for factor 0.0dB of the above table.



## Radiated Spurious Emission

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

Company : DENSO CORPORATION	REPORT NO : 25GE0132-HO
Equipment : Bluetooth Assy	REGULATION : Fcc Part15 Subpart C 15.247(d)
Model : BT0501A	TEST DISTANCE : 3/1m
Sample No. : 623	DATE : 03/07/2005
Power : DC3.3V	TEMPERATURE : 26deg.C
Mode : Bluetooth, Tx 2441MHz	HUMIDITY : 36%
Remarks : Hor X-axis/Ver Y-axis	ENGINEER : Keiichi Aoki

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]		[dB]		
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1295.9	61.8	62.0	23.6	37.0	4.1	0.0	52.5	52.7	74.0	21.5	21.3
2	4882.0	50.2	48.6	35.6	36.0	8.4	0.0	58.2	56.6	74.0	15.8	17.4
3	7323.0	41.9	42.8	37.9	36.0	10.2	0.0	54.0	54.9	74.0	20.0	19.1
4	9764.0	43.7	43.3	36.8	36.4	12.4	0.0	56.5	56.1	74.0	17.5	17.9
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
5	12205.0	41.8	42.0	41.6	36.0	14.4	0.0	52.3	52.5	74.0	21.7	21.5
6	14646.0	41.5	42.0	42.2	35.2	15.3	0.0	54.3	54.8	74.0	19.7	19.2
7	17087.0	44.2	44.6	45.2	34.9	16.7	0.0	61.7	62.1	74.0	12.3	11.9
8	19528.0	43.7	44.1	41.4	34.3	18.9	0.0	60.2	60.6	74.0	13.8	13.4
9	21969.0	44.6	44.7	40.5	34.2	19.4	0.0	60.8	60.9	74.0	13.2	13.1
10	24410.0	43.8	43.8	41.1	35.8	21.6	0.0	61.2	61.2	74.0	12.8	12.8

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]		[dB]		
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1295.9	46.8	46.7	23.6	37.0	4.1	0.0	37.5	37.4	54.0	16.5	16.6
2	4882.0	44.4	43.0	35.6	36.0	8.4	0.0	52.4	51.0	54.0	1.6	3.0
3	7323.0	30.2	30.2	37.9	36.0	10.2	0.0	42.3	42.3	54.0	11.7	11.7
4	9764.0	32.2	32.1	36.8	36.4	12.4	0.0	45.0	44.9	54.0	9.0	9.1
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
5	12205.0	29.4	29.4	41.6	36.0	14.4	0.0	39.9	39.9	54.0	14.1	14.1
6	14646.0	29.3	29.4	42.2	35.2	15.3	0.0	42.1	42.2	54.0	11.9	11.8
7	17087.0	31.8	31.9	45.2	34.9	16.7	0.0	49.3	49.4	54.0	4.7	4.6
8	19528.0	31.3	31.3	41.4	34.3	18.9	0.0	47.8	47.8	54.0	6.2	6.2
9	21969.0	32.2	32.1	40.5	34.2	19.4	0.0	48.4	48.3	54.0	5.6	5.7
10	24410.0	31.4	31.4	41.1	35.8	21.6	0.0	48.8	48.8	54.0	5.2	5.2

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.

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

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

**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)

## Radiated Spurious Emission

Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company		REPORT NO	: 25GE0132-HO
Equipment	: DENSO CORPORATION	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: Bluetooth Assy	TEST DISTANCE	: 3/1m
Sample No.	: BT0501A	DATE	: 03/07/2005
Power	: 623	TEMPERATURE	: 26deg.C
Mode	: DC3.3V	HUMIDITY	: 36%
Remarks	: Bluetooth, Tx 2480MHz	ENGINEER	: Keiichi Aoki
	: Hor X-axis/Ver Y-axis		

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1295.9	61.5	62.0	23.6	37.0	4.1	0.0	52.2	52.7	74.0	21.8	21.3
2	2483.5	66.8	64.6	30.5	36.4	5.8	0.0	66.7	64.5	74.0	7.3	9.5
3	4960.0	49.9	47.2	36.1	35.9	8.4	0.0	58.5	55.8	74.0	15.5	18.2
4	7440.0	43.1	43.0	38.1	35.9	10.2	0.0	55.5	55.4	74.0	18.5	18.6
5	9920.0	44.8	44.6	36.7	36.5	12.6	0.0	57.6	57.4	74.0	16.4	16.6
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
6	12400.0	41.8	41.8	41.7	35.9	14.5	0.0	52.6	52.6	74.0	21.4	21.4
7	14880.0	41.8	41.4	42.7	36.0	15.5	0.0	54.5	54.1	74.0	19.5	19.9
8	17360.0	44.5	43.4	44.7	35.1	16.9	0.0	61.5	60.4	74.0	12.5	13.6
9	19840.0	44.2	44.0	41.1	34.8	19.2	0.0	60.2	60.0	74.0	13.8	14.0
10	22320.0	44.7	43.8	40.4	34.1	19.8	0.0	61.3	60.4	74.0	12.7	13.6
11	24800.0	43.6	43.6	41.1	35.1	21.6	0.0	61.7	61.7	74.0	12.3	12.3

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
<b>Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss</b>												
1	1295.9	46.5	47.1	23.6	37.0	4.1	0.0	37.2	37.8	54.0	16.8	16.2
2	2483.5	48.2	45.9	30.5	36.4	5.8	0.0	48.1	45.8	54.0	5.9	8.2
3	4960.0	44.3	41.9	36.1	35.9	8.4	0.0	52.9	50.5	54.0	1.1	3.5
4	7440.0	30.7	30.5	38.1	35.9	10.2	0.0	43.1	42.9	54.0	10.9	11.1
5	9920.0	32.5	32.3	36.7	36.5	12.6	0.0	45.3	45.1	54.0	8.7	8.9
<b>Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac</b>												
6	12400.0	29.7	29.7	41.7	35.9	14.5	0.0	40.5	40.5	54.0	13.5	13.5
7	14880.0	29.2	29.3	42.7	36.0	15.5	0.0	41.9	42.0	54.0	12.1	12.0
8	17360.0	31.6	31.5	44.7	35.1	16.9	0.0	48.6	48.5	54.0	5.4	5.5
9	19840.0	31.5	31.5	41.1	34.8	19.2	0.0	47.5	47.5	54.0	6.5	6.5
10	22320.0	32.0	32.0	40.4	34.1	19.8	0.0	48.6	48.6	54.0	5.4	5.4
11	24800.0	31.3	31.3	41.1	35.1	21.6	0.0	49.4	49.4	54.0	4.6	4.6

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.

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

\*Hi-Pass Fiter was not used for factor 0.0dB of the above table.

**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

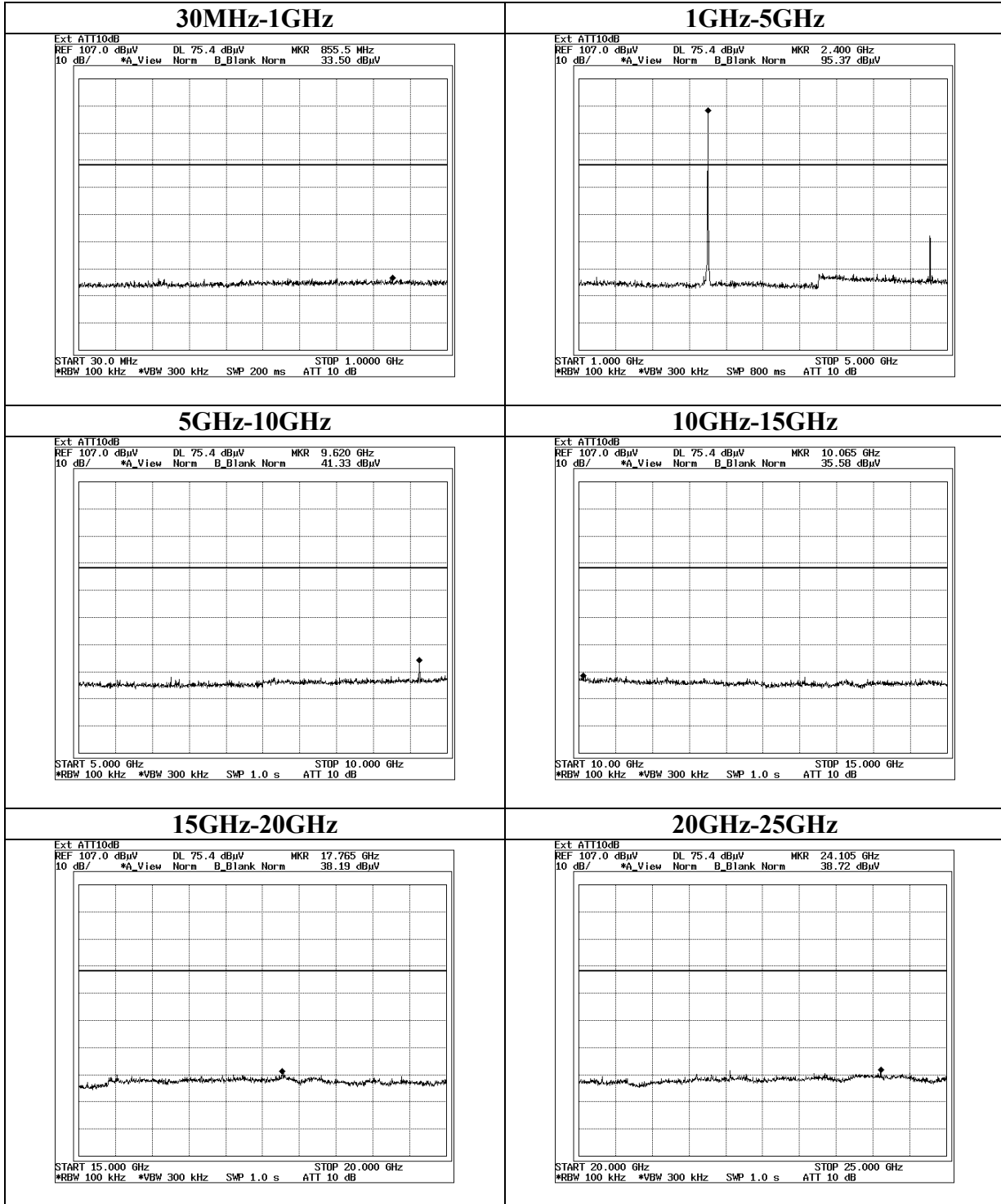
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

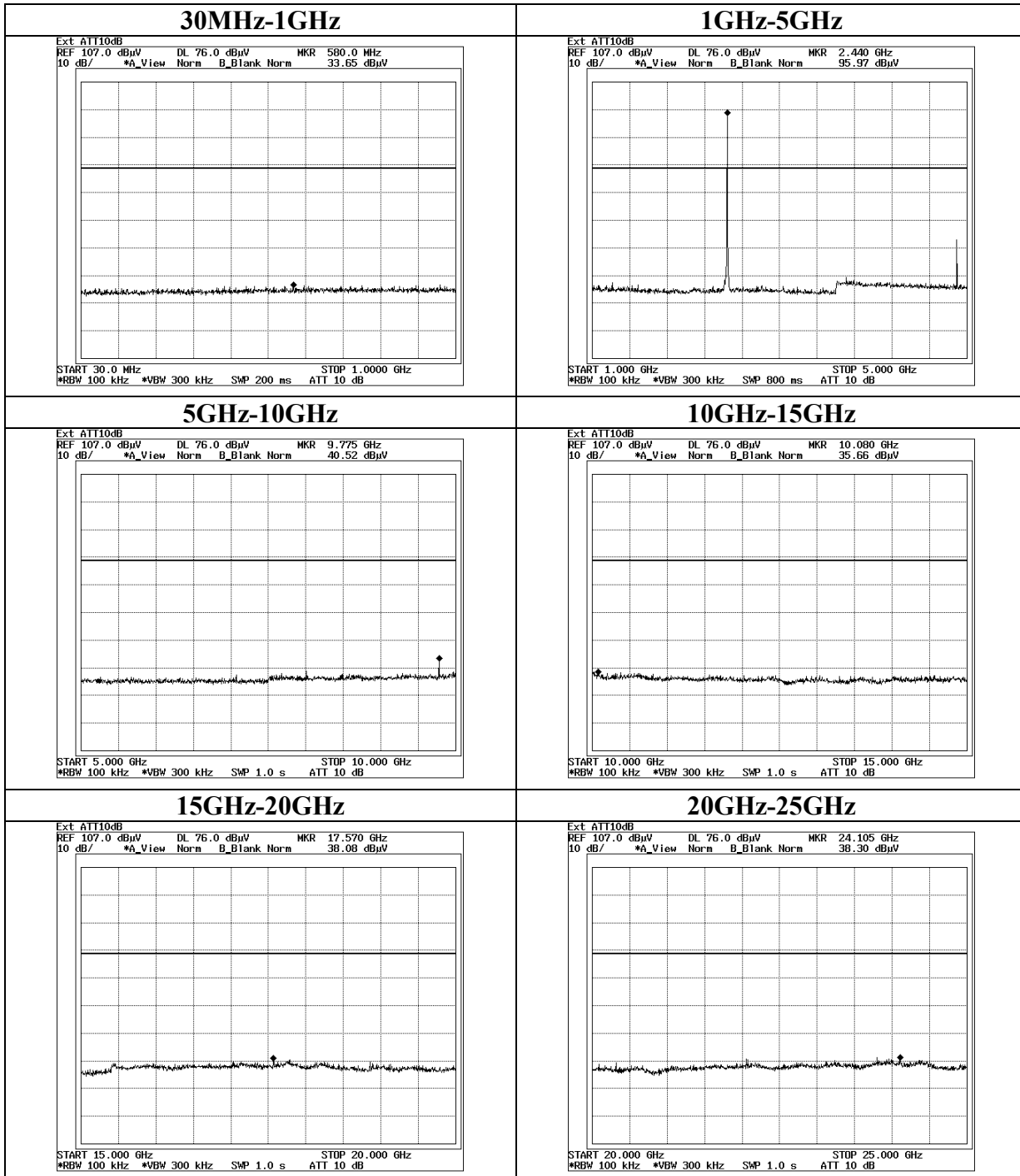
Facsimile : +81 596 24 8124

MF060b(10.04.03)

**Conducted Spurious Emission**  
**Ch:Low**

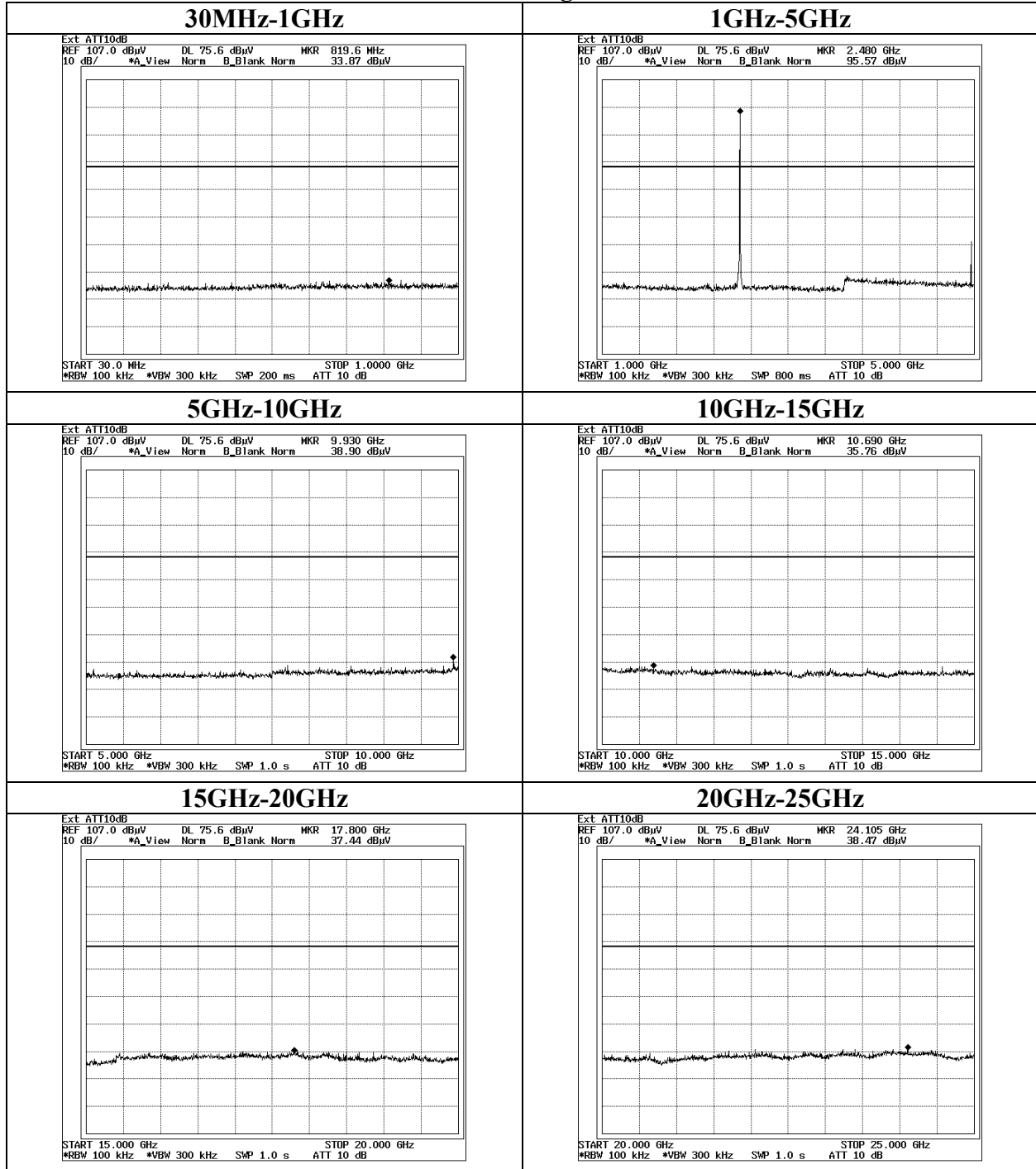


**Conducted Spurious Emission**  
**Ch:Mid**



**Conducted Spurious Emission**

Ch:High



**UL Apex Co., Ltd.**

**Head Office EMC Lab.**

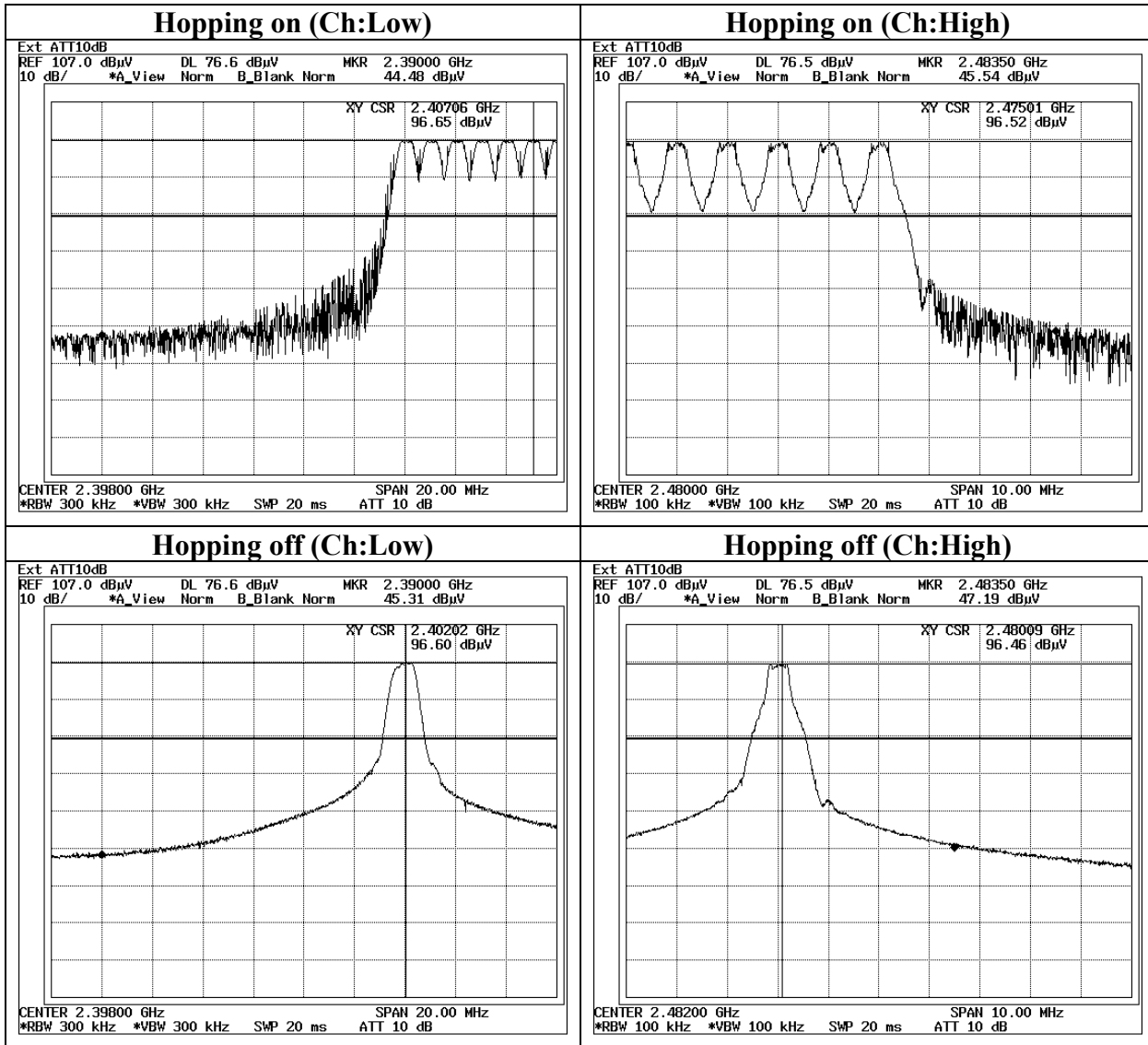
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

**Conducted Spurious Emission**  
**Band Edge compliance**



### 99% Occupied Bandwidth

