EMI TEST REPORT

Test Report No. : 25HE0109-HO-3

Applicant	:	**DENSO WAVE INCORPORATED**
Type of Equipment	:	**Bluetooth Board**
Model No.	:	**DWBT005**
Test standard	:	**FCC Part 15 Subpart C Section 15.207, Section 15.247 : 2005**
FCC ID	:	**PZWDWBT005**
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 31 to April 13, 2005

Tested by:

Makoto Kosaka
EMC Service

Yutaka Yoshida
EMC Service

Norihisa Hashimoto
EMC Service

Approved by :

Naoki Sakamoto
Group Leader of
EMC Service

UL Apex Co., Ltd.
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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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CONTENTS **PAGE**

SECTION 1: Client information

Company Name	:	DENSO WAVE INCORPORATED
Address	:	1-1, Showa-cho, Kariya-shi, Aichi-ken 448-8661 Japan
Telephone Number	:	+81-566-61-3816
Facsimile Number	:	+81-566-25-4741
Contact Person	:	Hiroshi Hayami

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth Board
Model No.	:	DWBT005
Serial No.	:	00037A2287D4 00037A2287AE
Country of Manufacture	:	Japan
Receipt Date of Sample	:	March 22,2005
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: DWBT005 is the Bluetooth Board based on Bluetooth Specification 1.2.
This EUT is installed in barcode scanner with IEEE802.11b Wireless LAN function made of DENSO WAVE INCORPORATED (M/N: KCS).
RF specification is accordance with Bluetooth.
The clock frequency of EUT is 16MHz.
Series model: DWBT004 , the difference between DWBT004 and DWBT005 is the length of antenna cable.
The test result has no difference in electromagnetic factor.

Equipment Type	:	Transceiver
Frequency operation	:	2402-2480MHz
Type of modulation	:	FHSS
Channel spacing	:	1MHz
Mode of operation	:	Duplex
Antenna Type	:	Inverted-F type multi layer antenna
Antenna Gain	:	2.02dBi
Antenna connector Type	:	Coaxial Connector with Switch SWD Type
Method of Frequency Generation	:	Crystal
Power Supply	:	DC3.0-3.6V

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
EUT has a particular antenna connector. 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 : 2005
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits : 2005 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz : 2005

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	21.0dB 0.5785MHz, QP,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	5.6dB 9920.0MHz Horizontal, AV	Complied

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 ±1.3dB.

Spurious Emission (Radiated)

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

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

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

Other test except Conducted Emission and Spurious Emission (Radiated)

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

*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 + Amendment4: 2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004 + Amendment4: 2004	Conducted	N/A	N/A	N/A
2	Co-location & Co-operation (Confirmation testing for Radiated Spurious Emission at simultaneous transmission)	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Radiated Bluetooth and IEEE802.11b mode	N/A	9.6dB 17059MHz Horizontal, AV	Complied

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

	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	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	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.

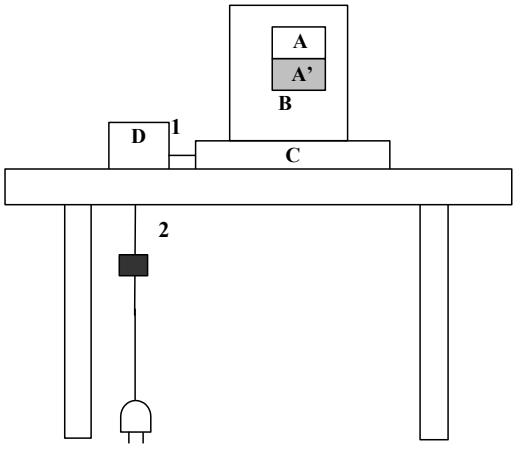
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

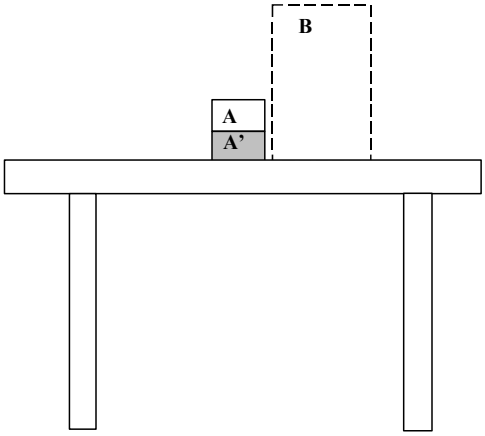
The mode is used : [FHSS:Bluetooth]
1. Transmitting mode (Packet size DH5)
Low Channel :2402MHz
Mid Channel :2441MHz
High channel :2480MHz
2. Inquiry mode
3. Hopping mode
[Simultaneous transmission]
1. Bluetooth Hopping + Wireless LAN mode

4.2 Configuration and peripherals

AC Conducted emission test



Other tests
EUT is outside of Barcode Handy Terminal
(Stand alone)



: Ferrite core (supplied by the client as the standard attachment)

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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Wireless LAN adapter	KCS	000B6B19DCED *1) 000B6B19A828 *2)	DENSO WAVE	PZWKCS
A'	Bluetooth Board	DWBT005	00037A2287D4*1) 00037A2287AE *2)	DENSO WAVE	PZWDWBT005 (EUT)
B	Barcode Handy Terminal	BHT-300QWB	549690004450027 *1) 549690004450025 *2)	DENSO WAVE	-
C	Communication Unit	CU-321	5496320078300015	DENSO WAVE	-
D	AC Adaptor	454865-0340	S3423823	DENSO WAVE	

**1) Used for AC Conducted emission test*
**2) Used for other tests*

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC Power Cable	2.0	N	Polyvinyl chloride
2	DC Power Cable	1.8	N	Polyvinyl chloride
3	AC Power Cable	1.8	N	Polyvinyl chloride

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 and average detector (IF BW 9 kHz)
Measurement range : 0.15-30MHz
Test data : APPENDIX 3
Test result : Pass

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.

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 IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz

Test data : APPENDIX 3
Test result : Pass

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 IF Bandwidth	QP: BW 120kHz(T/R) 20dBc : RBW: 100kHz VBW: 300kHz (S/A)	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

- 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: 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 8: 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 9: 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

APPENDIX 1: Photographs of test setup

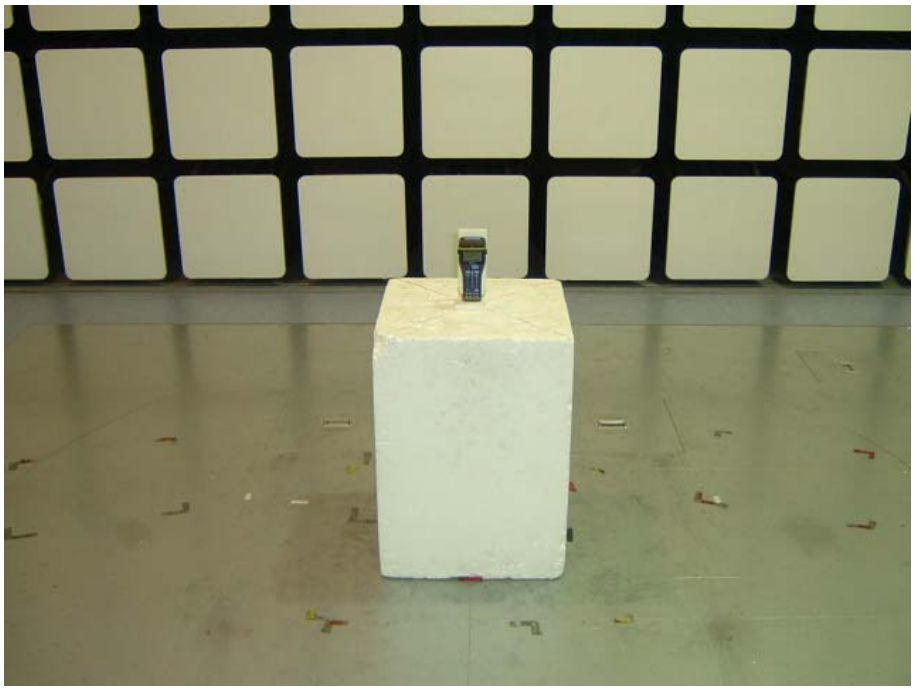
Conducted Emission

Front

Rear

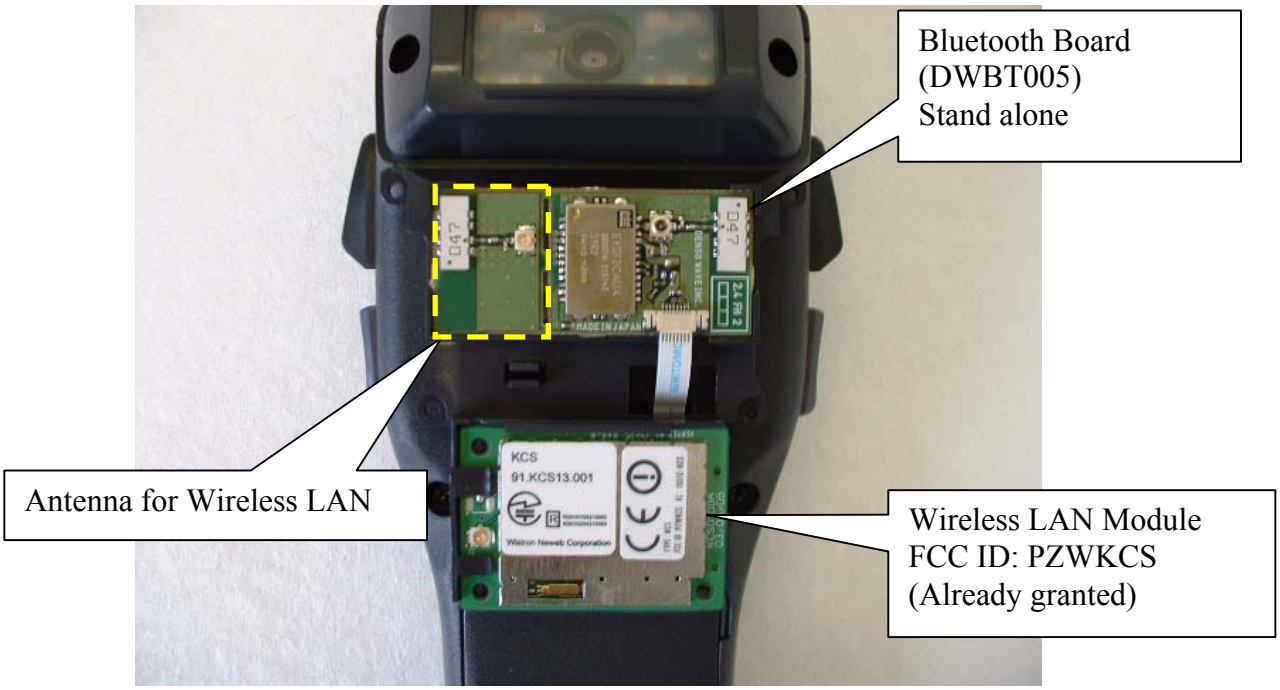
Spurious Emission (Radiated)

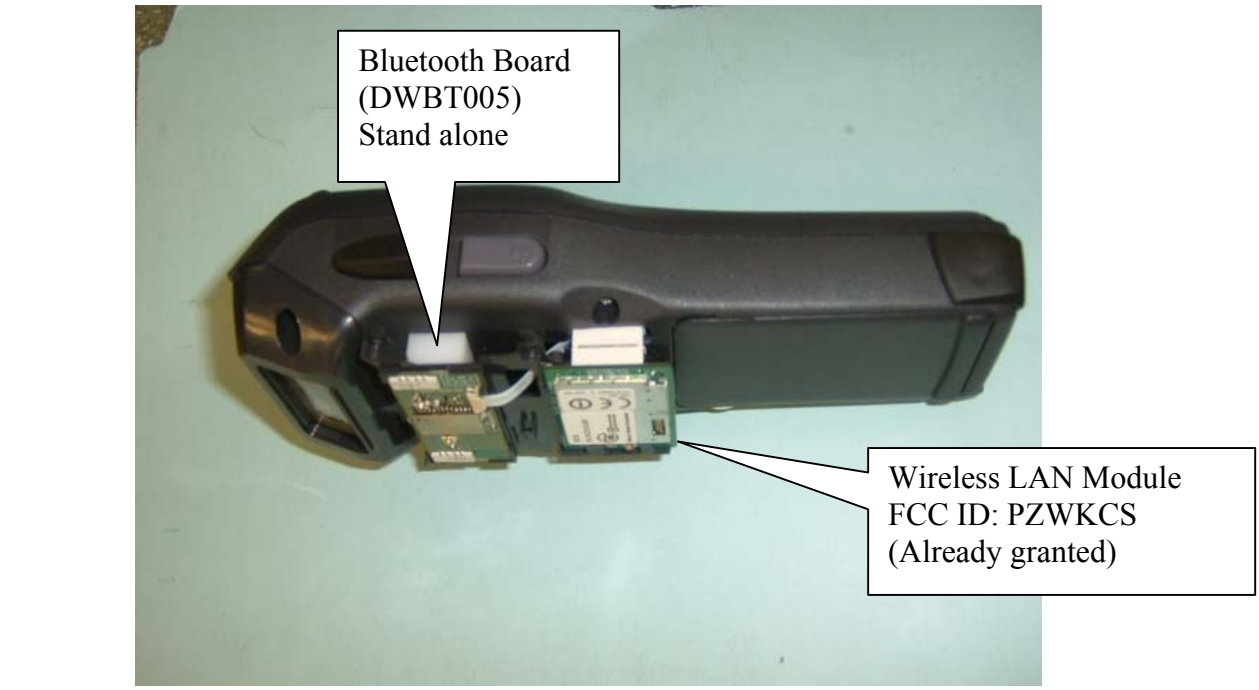
Front



Rear

Wireless LAN Adapter and Bluetooth Board





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

X-axis

Y-axis

Z-axis

APPENDIX 2:Test instruments

EMI Test Instrument

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAT-19	Attenuator(6dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-106	CFS, 20BW, NHF, DT, MPOP, CSE, BE, 99%	2005/01/11 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	CFS, 20BW, NHF, DT, MPOP, CSE, BE, 99%	2004/06/12 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/CE	2005/04/11 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2005/01/10 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2005/01/10 * 12
MRENT-14	Spectrum Analyzer	Advantest	R3273	RE	2005/02/21 * 12
MPA-05	Pre Amplifier	TSJ	TSJ 1-26.5GHz PreAmp	RE	2004/06/12 * 12
MCC-21	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MCC-04	Microwave Cable 1-40G	Storm	421-011	RE	2005/01/05 * 12
MCC-22	Microwave Cable	Storm	-	RE	2004/05/01 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	RE	2004/09/18 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	RE	2004/10/14 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2004/10/14 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	RE	2004/12/16 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2004/05/25 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/ TSJ	-	RE	2004/12/19 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE/CE	2004/11/12 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE/CE	2004/11/13 * 12

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

Test Item:

CE : AC Main Conducted Emission **CFS: Carrier Frequency Separation**
20BW: 20dB Bandwidth **NHF: Number of Hopping Frequency**
DT: Dwell time **MPOP: Maximum Peak Output Power**
BE: Band Edge Compliance **CSE: Antenna Terminal Conducted Spurious Emission**
RE: Radiated Spurious Emission **99%: 99% Occupied Bandwidth (RSS-210 Canada)**

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

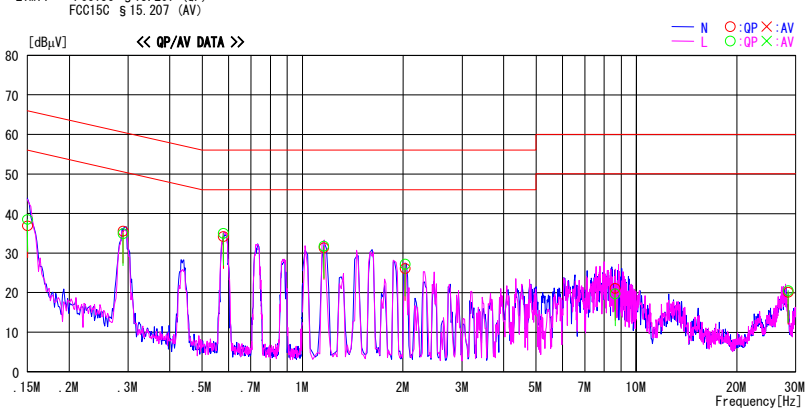
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/12 20:40:55

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT005
Serial No. : 00037A2287D4

Report No. : 25HE0109-HO
Power : AC120V / 60Hz(CU-321 AC LINE)
Temp℃/Humi% : 22deg.C / 46%
Operator : Makoto Kosaka

Mode / Remarks : Tx BT DH5 2402MHz

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



NO	FREQ	READING QP	READING AV	C.F	RESULT QP	RESULT AV	LIMIT QP	LIMIT AV	MARGIN QP	MARGIN AV	PHASE
	[MHz]	[dBμV]	[dBμV]	[dB]	[dBμV]	[dBμV]	[dBμV]	[dBμV]	[dB]	[dB]	
1	0.1500	36.7	-----	0.2	36.9	-----	66.0	-----	29.1	-----	N
2	0.2896	35.3	-----	0.3	35.6	-----	60.5	-----	24.9	-----	N
3	0.5785	33.7	-----	0.5	34.2	-----	56.0	-----	21.8	-----	N
4	1.1583	31.0	-----	0.4	31.4	-----	56.0	-----	24.6	-----	N
5	2.0245	25.6	-----	0.5	26.1	-----	56.0	-----	29.9	-----	N
6	8.6290	20.0	-----	1.1	21.1	-----	60.0	-----	38.9	-----	N
7	28.4419	18.1	-----	2.0	20.1	-----	60.0	-----	39.9	-----	N
8	0.1500	38.3	-----	0.2	38.5	-----	66.0	-----	27.5	-----	L
9	0.2896	34.6	-----	0.3	34.9	-----	60.5	-----	25.6	-----	L
10	0.5785	34.5	-----	0.5	35.0	-----	56.0	-----	21.0	-----	L
11	1.1583	31.3	-----	0.4	31.7	-----	56.0	-----	24.3	-----	L
12	2.0246	26.7	-----	0.5	27.2	-----	56.0	-----	28.8	-----	L
13	8.6290	18.6	-----	1.1	19.7	-----	60.0	-----	40.3	-----	L
14	28.4419	18.5	-----	2.0	20.5	-----	60.0	-----	39.5	-----	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.

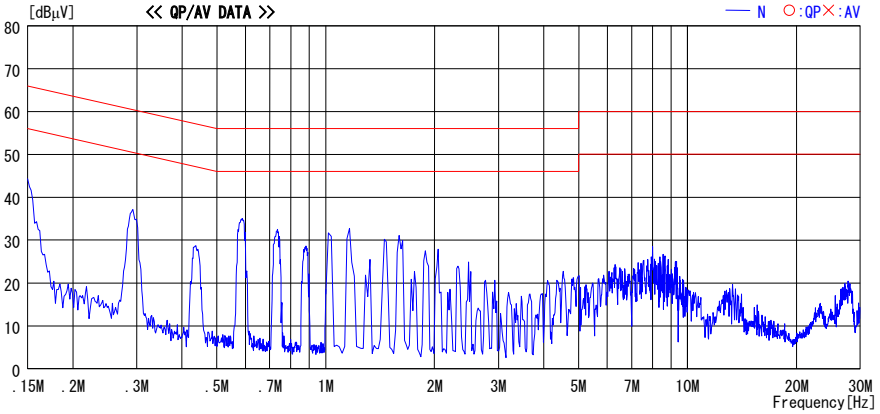
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/12 20:49:36

Applicant	: DENSO WAVE INCORPORATED	Report No.	: 25HE0109-HO
Kind of EUT	: Bluetooth Board	Power	: AC120V / 60Hz(CU-321 AC LINE)
Model No.	: DWBT005	Temp℃/Humi%	: 22deg.C / 46%
Serial No.	: 00037A2287D4	Operator	: Makoto Kosaka

Mode / Remarks : Tx BT DH5 2441MHz

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



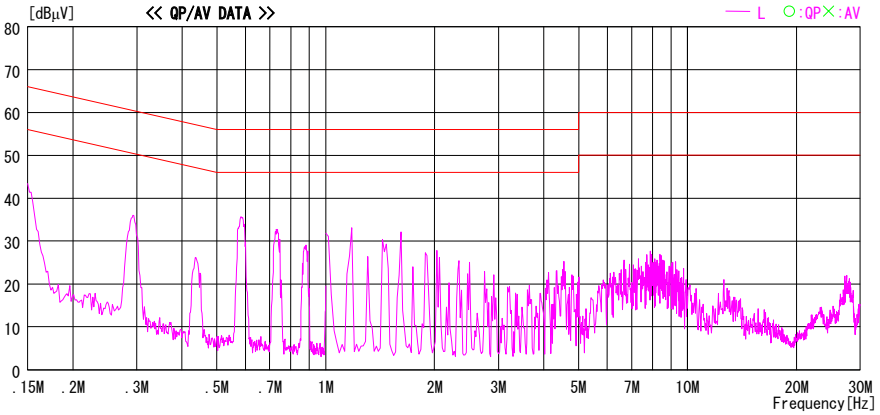


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

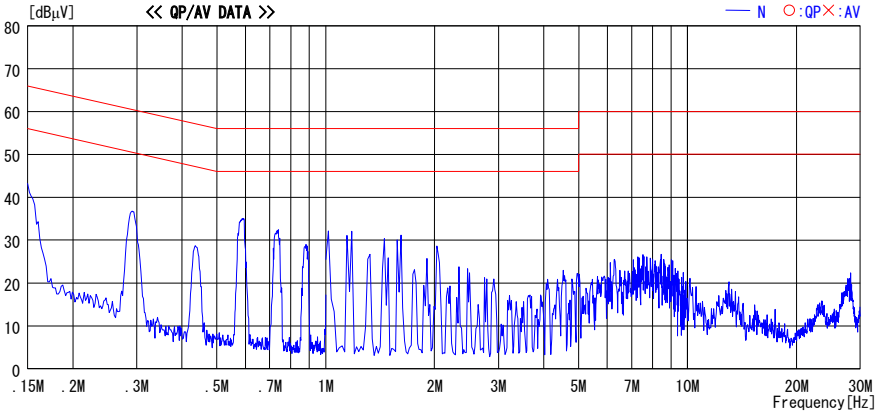
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/12 20:57:07

Applicant	: DENSO WAVE INCORPORATED	Report No.	: 25HE0109-HO
Kind of EUT	: Bluetooth Board	Power	: AC120V / 60Hz(CU-321 AC LINE)
Model No.	: DWBT005	Temp℃/Humi%	: 22deg.C / 46%
Serial No.	: 00037A2287D4	Operator	: Makoto Kosaka

Mode / Remarks : Tx BT DH5 2480MHz

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



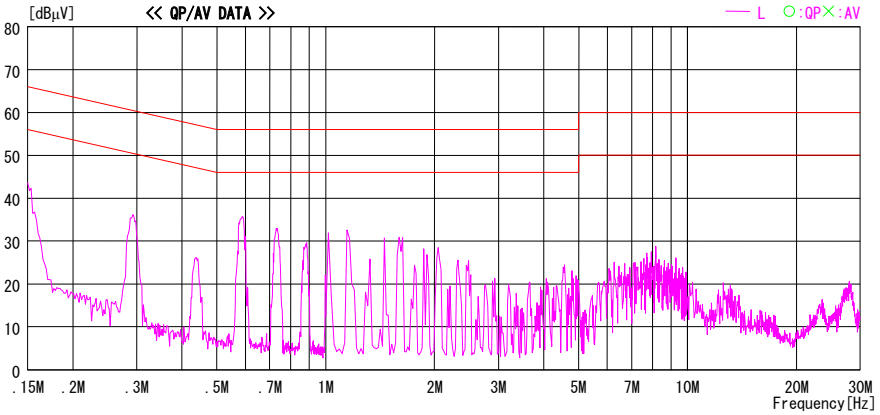


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

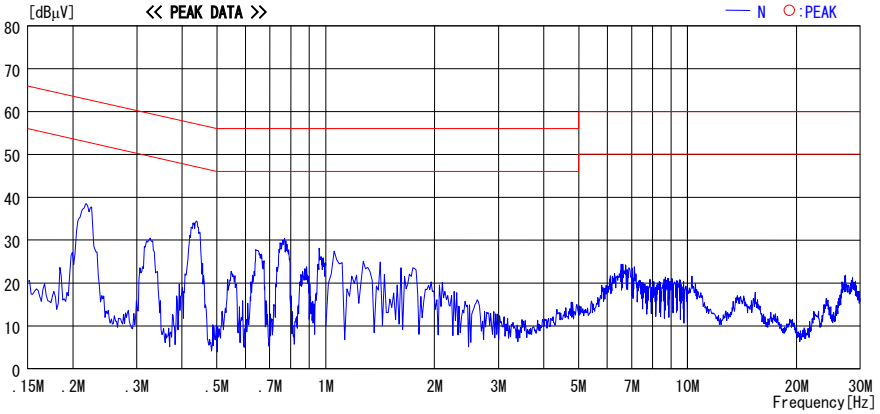
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/12 22:24:59

Applicant	: DENSO WAVE INCORPORATED	Report No.	: 25HE0109-HO
Kind of EUT	: Bluetooth Board	Power	: AC120V /60Hz(CU-321 AC LINE)
Model No.	: DWBT005	Temp℃/Humi%	: 22deg.C / 46%
Serial No.	: 00037A2287D4	Operator	: Makoto Kosaka

Mode / Remarks : Tx BT Hopping and 11b 11Mbps 2437MHz

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



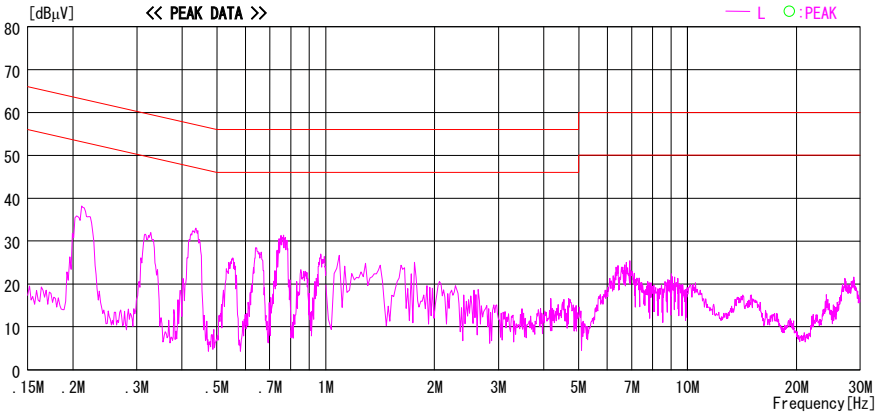


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Carrier Frequency Separation

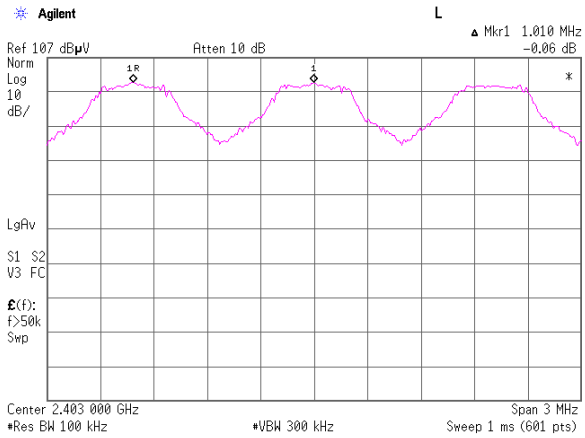
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shield Room

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT005	DATE	: 03/31/2005
S/ N	: 00037A2287AE	TEMPERATURE	: 26deg.C
POWER	: DC3.3V	HUMIDITY	: 24%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Yutaka Yoshida

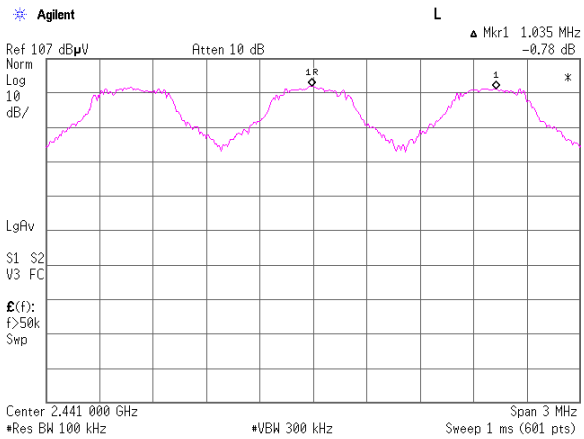
Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.010	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.035	>20dB Bandwidth and 25[kHz]
High	2480.0	1.165	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	2.000	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation

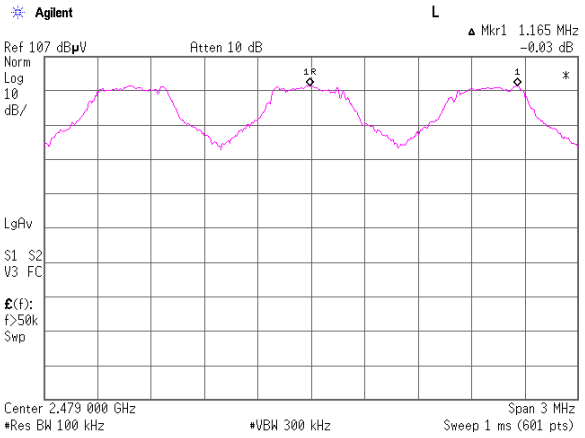
Ch:Low



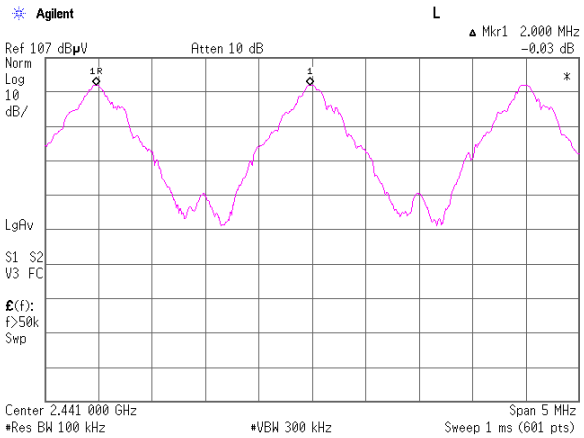
Ch:Mid



Ch:High



Inquiry



20dB Bandwidth

DATA OF 20dB BANDWIDTH

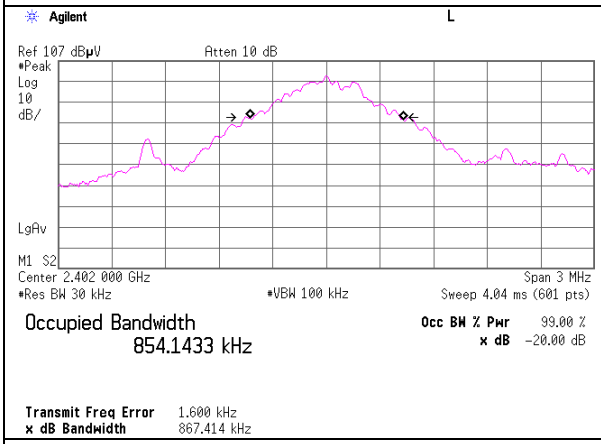
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shield Room

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT005	DATE	: 03/31/2005
S/ N	: 00037A2287AE	TEMPERATURE	: 26deg.C
POWER	: DC3.3V	HUMIDITY	: 24%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Yutaka Yoshida

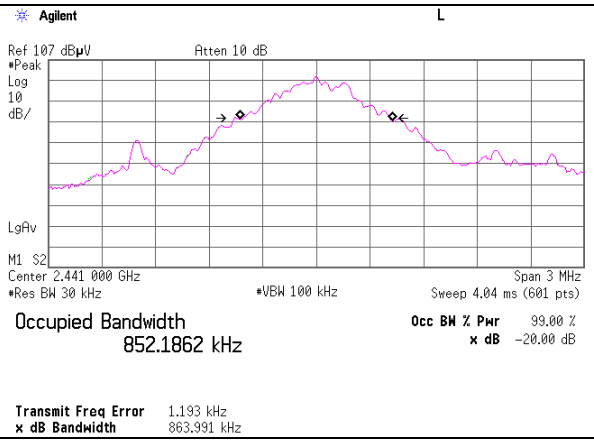
Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.867	-
Mid	2441.0	0.864	-
High	2480.0	0.815	-
Inquiry	2441.0	0.817	-

20dB Bandwidth

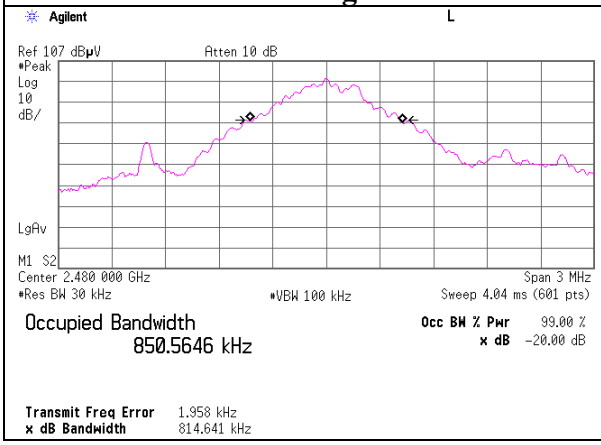
Ch:Low



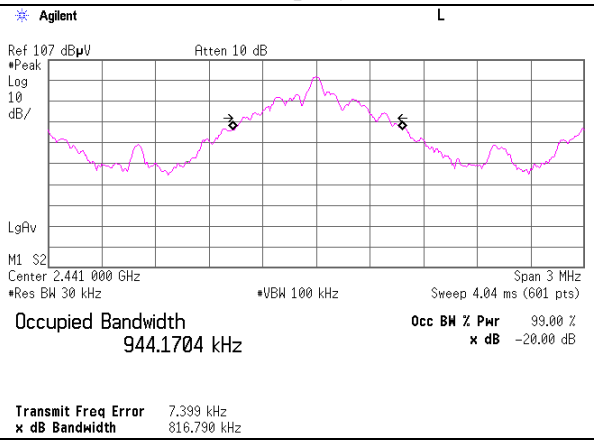
Ch:Mid



Ch:High



Inquiry



Number of Hopping Frequency

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

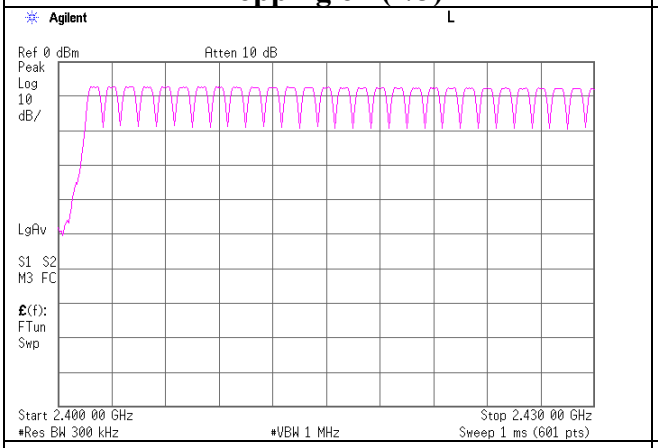
COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT005	DATE	: 03/31/2005
S/ N	: 00037A2287AE	TEMPERATURE	: 26deg.C
POWER	: DC3.3V	HUMIDITY	: 24%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Yutaka Yoshida

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

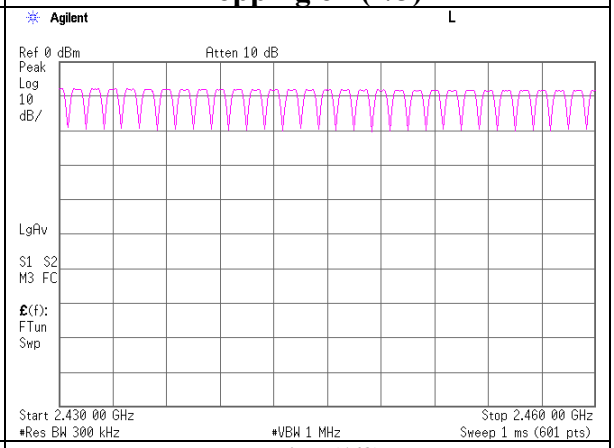
Mode	Number of channel [time]	Limit [time]
Inquiry	32	≧15

Number of Hopping Frequency

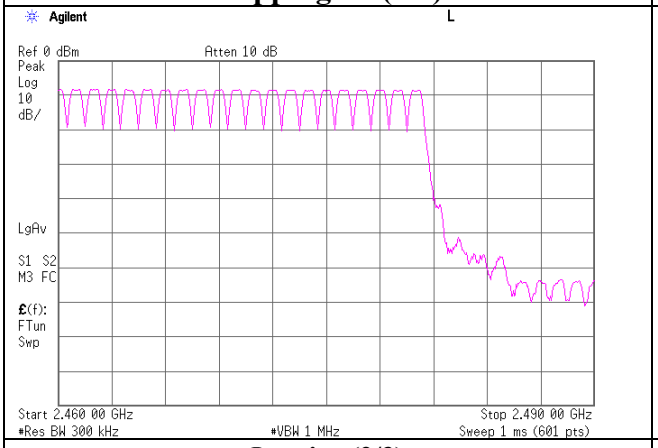
Hopping on (1/3)



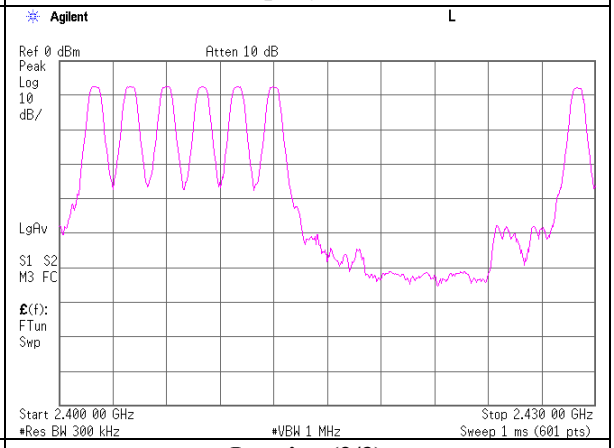
Hopping on (2/3)



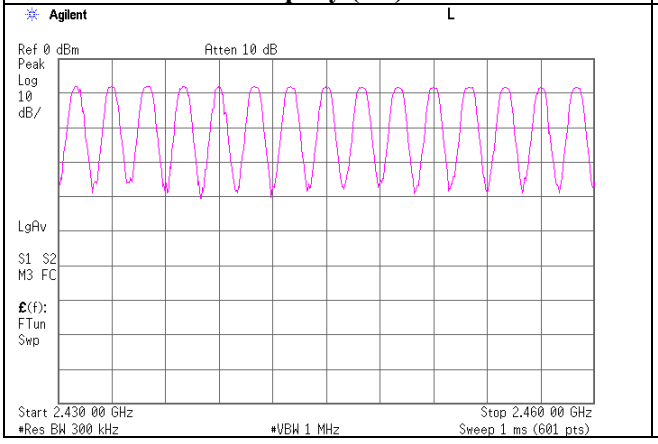
Hopping on (3/3)



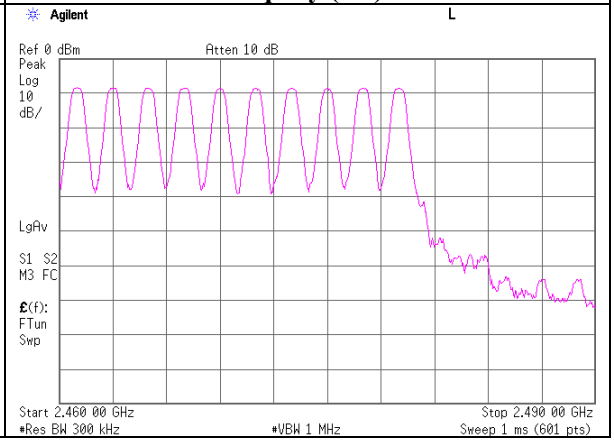
Inquiry (1/3)



Inquiry (2/3)



Inquiry (2/3)



Dwell time

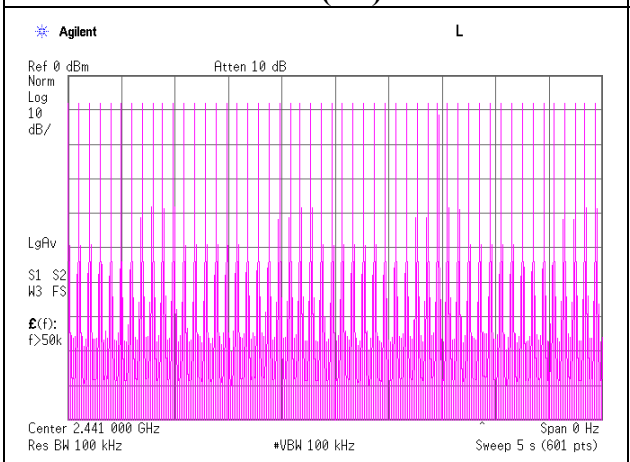
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Shield Room

COMPANY	: DENSO WAVE INCORPORATED	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT005	DATE	: 03/31/2005
S/ N	: 00037A2287AE	TEMPERATURE	: 26deg.C
POWER	: DC3.3V	HUMIDITY	: 24%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Yutaka Yoshida

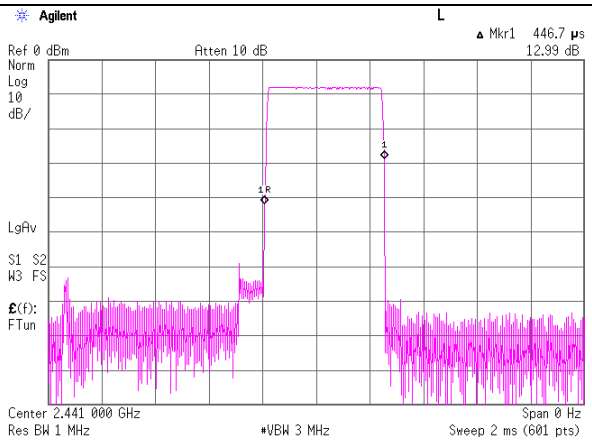
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51 times /5sec. x 31.6 = 323 times	0.447	144	400
DH3	26 times / 5sec. x 31.6 = 165 times	1.700	281	400
DH5	17 times / 5 sec. x 31.6 = 108 times	3.000	324	400
Inquiry	100 times / 1sec. x 12.8 = 1280 times	0.243	311	400

Dwell time

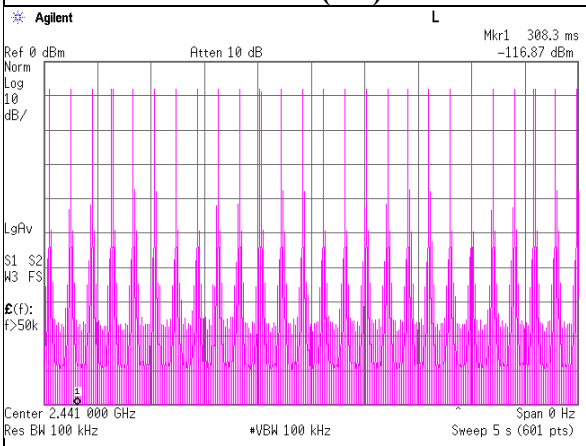
DH1 (1/2)



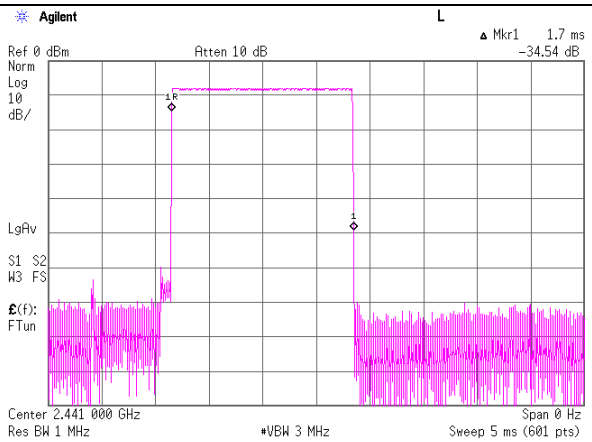
DH1 (2/2)



DH3 (1/2)

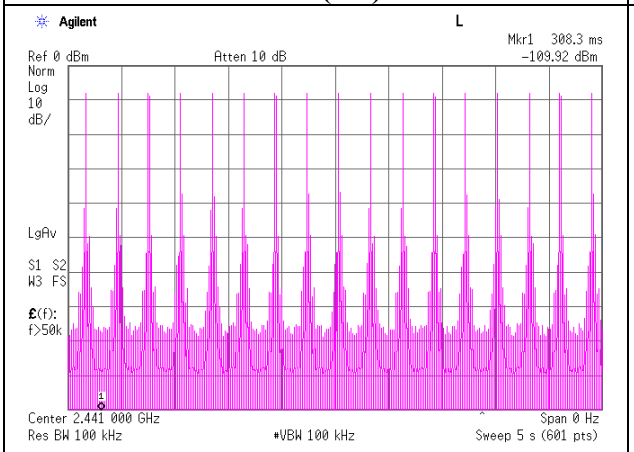


DH3 (2/2)

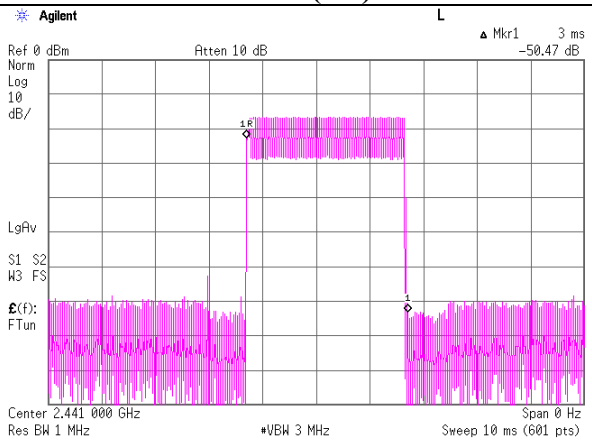


Dwell time

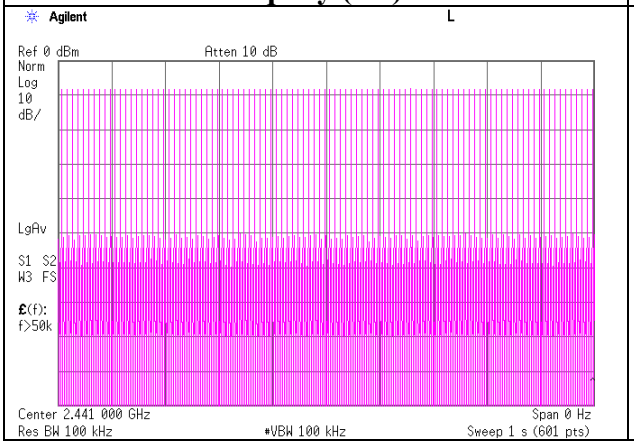
DH5 (1/2)



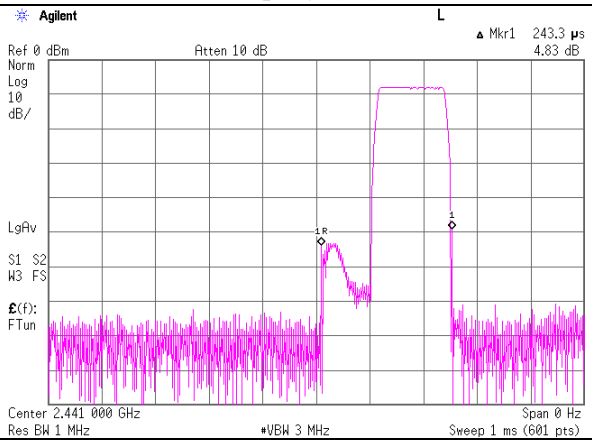
DH5 (2/2)



Inquiry (1/2)



Inquiry (2/2)



Maximum Peak Output Power

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

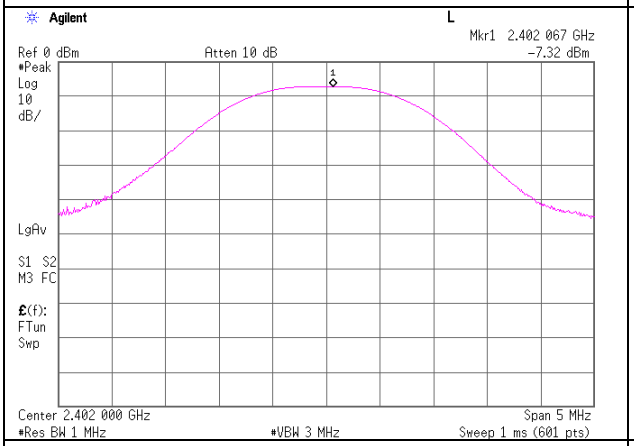
COMPANY	:	DENSO WAVE INCORPORATED	REGULATION	:	Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	:	Bluetooth Board	TEST DISTANCE	:	-
MODEL	:	DWBT005	DATE	:	03/31/2005
S/ N	:	00037A2287AE	TEMPERATURE	:	26deg.C
POWER	:	DC3.3V	HUMIDITY	:	24%
MODE	:	Tx(Hopping on)/Inquiry	ENGINEER	:	Yutaka Yoshida

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-7.32	0.45	6.00	-0.87	30.00	30.87
Mid	2441.0	-8.04	0.46	5.90	-1.68	30.00	31.68
High	2480.0	-8.47	0.46	5.90	-2.11	30.00	32.11
Inquiry	2441.0	-8.06	0.46	5.90	-1.70	30.00	31.70

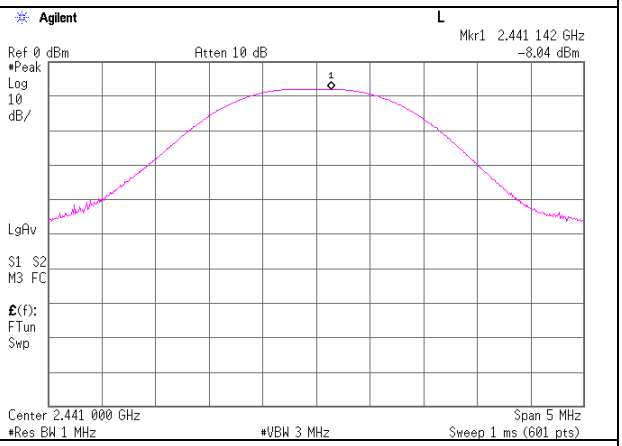
Sample Calculation:
Result = Reading + Cable Loss (supplied by customer)+ Attenuator
* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Maximum Peak Output Power

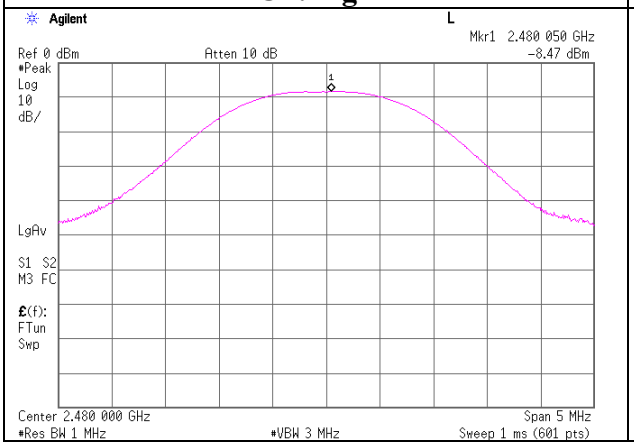
Ch:Low



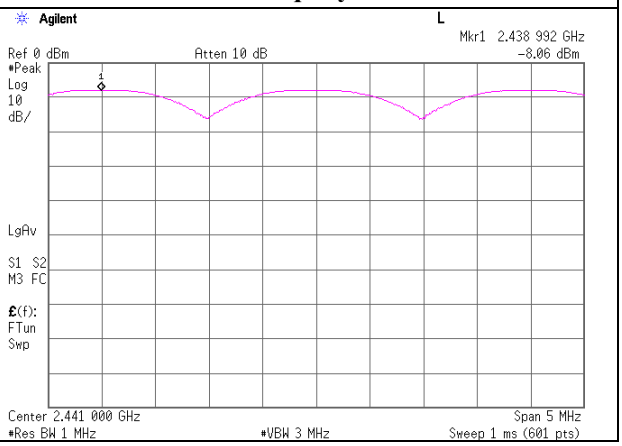
Ch:Mid



Ch:High



Inquiry



Radiated Spurious Emission

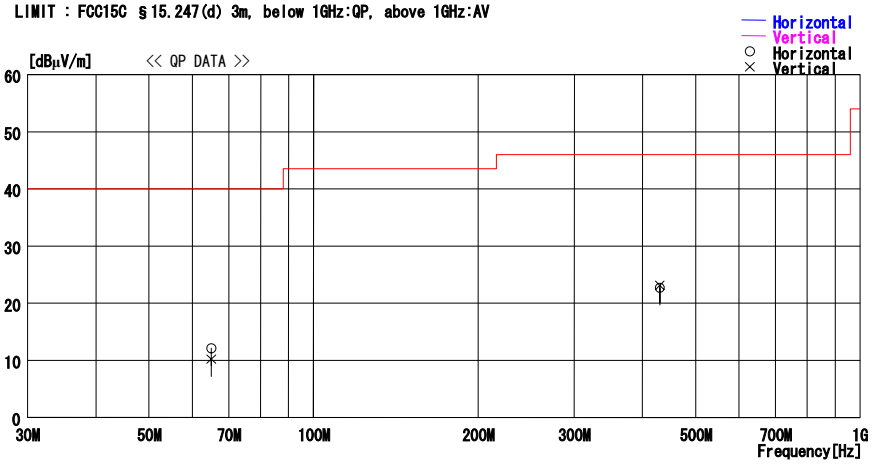
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/13 01:18:39

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT005
Serial No. : 00037A2287AE
Report No. : 25HE0109-HO
Power : DC 3.3V
Temp℃/Humi% : 25deg.C / 37%
Operator : Makoto Kosaka

Mode / Remarks : Tx BT DH5 2402MHz / Max-axis(Hor:X Ver:Y)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



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	65.000	24.5	7.7	7.5	27.6	12.1	40.0	27.9	179	359
2	430.000	21.7	18.2	10.9	28.1	22.7	46.0	23.3	199	0
——— Vertical ———										
3	65.000	22.6	7.7	7.5	27.6	10.2	40.0	29.8	157	0
4	430.000	22.1	18.2	10.9	28.1	23.1	46.0	22.9	207	359

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:

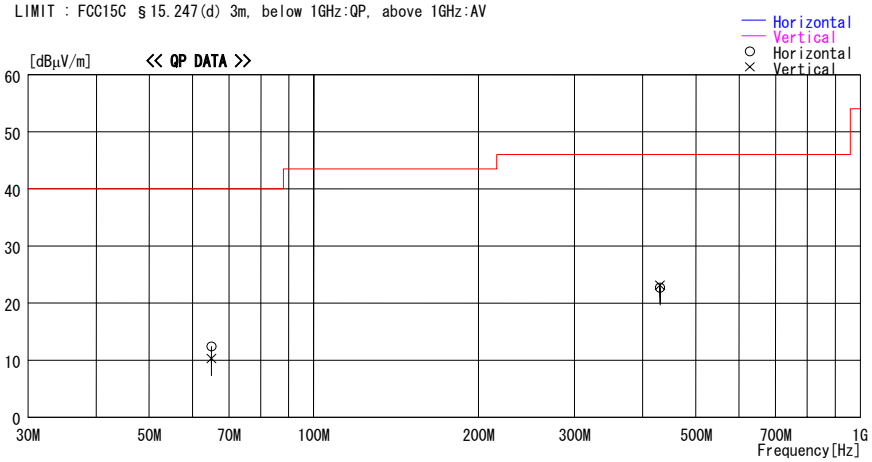
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/13 01:40:35

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT005
Serial No. : 00037A2287AE
Report No. : 25HE0109-HO
Power : DC 3.3V
Temp℃/Humi% : 25deg.C / 37%
Operator : Makoto Kosaka

Mode / Remarks : Tx BT DH5 2441MHz / Max-axis(Hor:X Ver:Y)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



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	65.000	24.8	7.7	7.5	27.6	12.4	40.0	27.6	179	359
2	430.000	21.7	18.2	10.9	28.1	22.7	46.0	23.3	199	0
----- Vertical ------										
3	65.000	22.7	7.7	7.5	27.6	10.3	40.0	29.7	157	0
4	430.000	22.1	18.2	10.9	28.1	23.1	46.0	22.9	207	359

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:

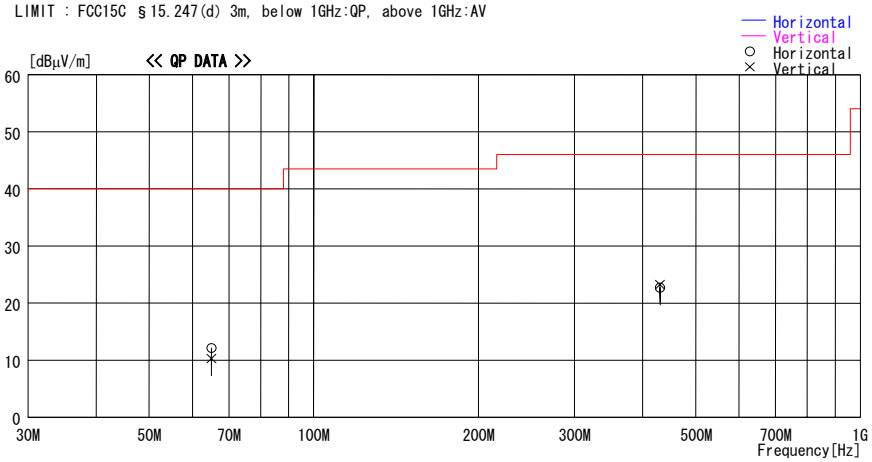
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/13 02:11:10

Applicant : DENSO WAVE INCORPORATED
Kind of EUT : Bluetooth Board
Model No. : DWBT005
Serial No. : 00037A2287AE
Report No. : 25HE0109-HO
Power : DC 3.3V
Temp℃/Humi% : 25deg.C / 37%
Operator : Makoto Kosaka

Mode / Remarks : Tx BT DH5 2480MHz / Max-axis(Hor:X Ver:Y)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



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	65.000	24.5	7.7	7.5	27.6	12.1	40.0	27.9	179	359
2	430.000	21.7	18.2	10.9	28.1	22.7	46.0	23.3	199	0
----- Vertical ------										
3	65.000	22.7	7.7	7.5	27.6	10.3	40.0	29.7	157	0
4	430.000	22.2	18.2	10.9	28.1	23.2	46.0	22.8	207	359

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:

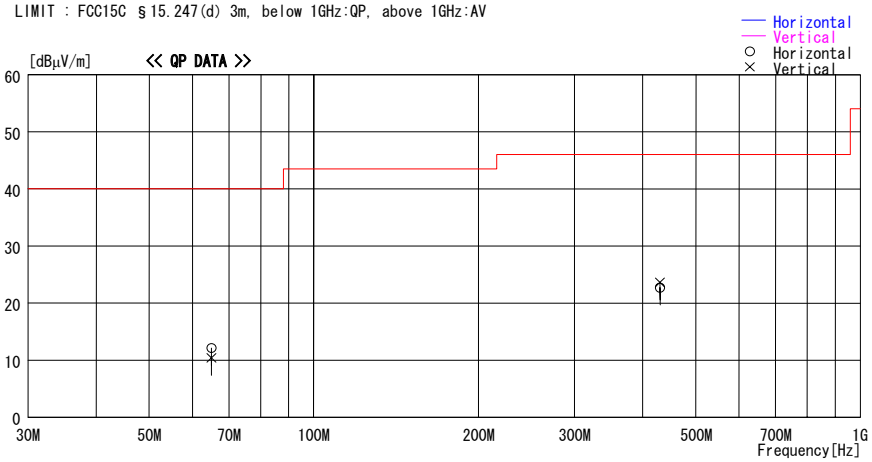
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/13 02:25:17

Applicant	: DENSO WAVE INCORPORATED	Report No.	: 25HE0109-HO
Kind of EUT	: Bluetooth Board	Power	: AC120V / 60Hz
Model No.	: DWBT005	Temp℃/Humi%	: 25deg.C / 37%
Serial No.	: 0037A2287AE	Operator	: Makoto Kosaka

Mode / Remarks : Tx BT Hopping 11b 11Mbps 2437MHz / Max-axis(Hor:X Ver:Y)

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV



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	65.000	24.5	7.7	7.5	27.6	12.1	40.0	27.9	179	359
2	430.000	21.7	18.2	10.9	28.1	22.7	46.0	23.3	199	0
----- Vertical ------										
3	65.000	22.8	7.7	7.5	27.6	10.4	40.0	29.6	157	0
4	430.000	22.6	18.2	10.9	28.1	23.6	46.0	22.4	207	359

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:

Radiated Spurious Emission

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

Company	: DENSO WAVE INCORPORATED	REPORT NO	: 25HE0109-HO
Equipment	: Bluetooth Board	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: DWBT005	TEST DISTANCE	: 3/1m
Sample No.	: 00037A2287AE	DATE	: 04/04/2005
Power	: DC3.3V	TEMPERATURE	: 23deg.C
Mode	: Tx 2402MHz DH5	HUMIDITY	: 34%
Remarks	: Hor Y , Ver Z-axis	ENGINEER	: Norihisa Hashimoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	49.4	49.1	30.5	39.9	5.7	0.0	45.7	45.4	74.0	28.3	28.6
2	4804.0	48.2	49.9	35.1	41.2	8.3	1.0	51.4	53.1	74.0	22.6	20.9
3	7206.0	48.6	48.4	37.5	40.5	10.0	0.4	56.0	55.8	74.0	18.0	18.2
4	9608.0	48.9	48.9	36.9	39.5	12.1	0.2	58.6	58.6	74.0	15.4	15.4
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12010.0	44.3	44.1	41.6	39.6	14.3	0.0	51.1	50.9	74.0	22.9	23.1
6	14412.0	41.1	43.1	41.7	41.0	15.2	0.0	47.5	49.5	74.0	26.5	24.5
7	16814.0	44.0	43.6	45.1	41.7	16.5	0.0	54.4	54.0	74.0	19.6	20.0
8	19216.0	41.8	42.0	40.0	40.3	12.6	0.0	44.6	44.8	74.0	29.4	29.2
9	21618.0	42.2	41.8	39.8	35.4	12.8	0.0	49.9	49.5	74.0	24.1	24.5
10	24020.0	41.2	41.0	40.4	33.0	14.8	0.0	53.9	53.7	74.0	20.1	20.3

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	37.0	37.1	30.5	39.9	5.7	0.0	33.3	33.4	54.0	20.7	20.6
2	4804.0	38.5	38.5	35.1	41.2	8.3	1.0	41.7	41.7	54.0	12.3	12.3
3	7206.0	37.4	37.5	37.5	40.5	10.0	0.4	44.8	44.9	54.0	9.2	9.1
4	9608.0	37.7	37.8	36.9	39.5	12.1	0.2	47.4	47.5	54.0	6.6	6.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12010.0	33.3	33.3	41.6	39.6	14.3	0.0	40.1	40.1	54.0	13.9	13.9
6	14412.0	31.9	31.9	41.7	41.0	15.2	0.0	38.3	38.3	54.0	15.7	15.7
7	16814.0	32.7	32.8	45.1	41.7	16.5	0.0	43.1	43.2	54.0	10.9	10.8
8	19216.0	30.8	30.8	40.0	40.3	12.6	0.0	33.6	33.6	54.0	20.4	20.4
9	21618.0	31.9	31.9	39.8	35.4	12.8	0.0	39.6	39.6	54.0	14.4	14.4
10	24020.0	32.0	32.1	40.4	33.0	14.8	0.0	44.7	44.8	54.0	9.3	9.2

20dBc(Fundamental 2412MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2402.0	106.5	104.8	30.5	39.9	5.7	0.0	102.8	101.1	-	-	-
2	2400.0	61.9	61.6	30.5	39.9	5.7	0.0	58.2	57.9	Funda-20dB	24.6	23.2

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.

Radiated Spurious Emission

DATA OF SPURIOUS EMISSIONS(1GHz to 26GHz)

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

Company	: DENSO WAVE INCORPORATED	REPORT NO	: 25HE0109-HO
Equipment	: Bluetooth Board	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: DWBT005	TEST DISTANCE	: 3/1m
Sample No.	: 00037A2287AE	DATE	: 04/04/2005
Power	: DC3.3V	TEMPERATURE	: 23deg.C
Mode	: Tx 2441MHz DH5	HUMIDITY	: 34%
Remarks	: Hor Y , Ver Z-axis	ENGINEER	: Norihisa Hashimoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.0	49.2	49.6	35.6	41.2	8.4	1.0	53.0	53.4	74.0	21.0	20.6
2	7323.0	47.0	46.7	37.9	40.4	10.3	0.4	55.2	54.9	74.0	18.8	19.1
3	9764.0	48.8	48.0	36.8	39.6	12.4	0.2	58.6	57.8	74.0	15.4	16.2
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.0	44.5	44.3	41.6	39.8	14.4	0.0	51.2	51.0	74.0	22.8	23.0
5	14646.0	43.5	43.4	42.2	40.9	15.3	0.0	50.6	50.5	74.0	23.4	23.5
6	17087.0	44.1	44.3	45.2	41.8	16.7	0.0	54.7	54.9	74.0	19.3	19.1
7	19528.0	42.0	41.3	40.3	39.8	12.8	0.0	45.8	45.1	74.0	28.2	28.9
8	21969.0	42.3	42.9	39.8	35.9	12.8	0.0	49.5	50.1	74.0	24.5	23.9
9	24410.0	40.5	41.0	40.4	33.8	14.7	0.0	52.3	52.8	74.0	21.7	21.2

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4882.0	37.7	37.8	35.6	41.2	8.4	1.0	41.5	41.6	54.0	12.5	12.4
2	7323.0	36.8	37.0	37.9	40.4	10.3	0.4	45.0	45.2	54.0	9.0	8.8
3	9764.0	37.7	37.9	36.8	39.6	12.4	0.2	47.5	47.7	54.0	6.5	6.3
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.0	33.2	33.2	41.6	39.8	14.4	0.0	39.9	39.9	54.0	14.1	14.1
5	14646.0	32.2	32.2	42.2	40.9	15.3	0.0	39.3	39.3	54.0	14.7	14.7
6	17087.0	33.7	33.8	45.2	41.8	16.7	0.0	44.3	44.4	54.0	9.7	9.6
7	19528.0	31.5	31.4	40.3	39.8	12.8	0.0	35.3	35.2	54.0	18.7	18.8
8	21969.0	32.0	32.0	39.8	35.9	12.8	0.0	39.2	39.2	54.0	14.8	14.8
9	24410.0	30.5	30.6	40.4	33.8	14.7	0.0	42.3	42.4	54.0	11.7	11.6

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.

Radiated Spurious Emission

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

Company	: DENSO WAVE INCORPORATED	REPORT NO	: 25HE0109-HO
Equipment	: Bluetooth Board	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: DWBT005	TEST DISTANCE	: 3/1m
Sample No.	: 00037A2287AE	DATE	: 04/04/2005
Power	: DC3.3V	TEMPERATURE	: 23deg.C
Mode	: Tx 2480MHz DH5	HUMIDITY	: 34%
Remarks	: Hor Y , Ver Z-axis	ENGINEER	: Norihisa Hashimoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.5	66.6	67.2	30.5	40.0	5.8	0.0	62.9	63.5	74.0	11.1	10.5
2	4960.0	50.3	50.5	36.1	41.3	8.5	1.0	54.6	54.8	74.0	19.4	19.2
3	7440.0	48.1	47.9	38.1	40.3	10.4	0.5	56.8	56.6	74.0	17.2	17.4
4	9920.0	49.3	48.5	36.7	39.6	12.3	0.6	59.3	58.5	74.0	14.7	15.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.0	43.1	42.9	41.7	40.0	14.5	0.0	49.8	49.6	74.0	24.2	24.4
6	14880.0	42.1	41.2	42.7	40.9	15.5	0.0	49.9	49.0	74.0	24.1	25.0
7	17360.0	42.8	42.6	44.7	41.6	16.9	0.0	53.3	53.1	74.0	20.7	20.9
8	19840.0	40.8	41.2	40.4	39.4	12.5	0.0	44.8	45.2	74.0	29.2	28.8
9	22320.0	42.8	43.1	39.8	35.3	12.6	0.0	50.4	50.7	74.0	23.6	23.3
10	24800.0	41.3	41.5	40.7	34.6	14.7	0.0	52.6	52.8	74.0	21.4	21.2

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1*	2483.5	58.5	58.9	30.5	40.0	5.8	0.0	24.3	24.7	54.0	29.7	29.3
2	4960.0	38.9	38.8	36.1	41.3	8.5	1.0	43.2	43.1	54.0	10.8	10.9
3	7440.0	37.7	37.9	38.1	40.3	10.4	0.5	46.4	46.6	54.0	7.6	7.4
4	9920.0	38.4	38.1	36.7	39.6	12.3	0.6	48.4	48.1	54.0	5.6	5.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.0	33.0	33.1	41.7	40.0	14.5	0.0	39.7	39.8	54.0	14.3	14.2
6	14880.0	32.4	32.3	42.7	40.9	15.5	0.0	40.2	40.1	54.0	13.8	13.9
7	17360.0	31.2	31.1	44.7	41.6	16.9	0.0	41.7	41.6	54.0	12.3	12.4
8	19840.0	31.1	31.0	40.4	39.4	12.5	0.0	35.1	35.0	54.0	18.9	19.0
9	22320.0	31.7	31.7	39.8	35.3	12.6	0.0	39.3	39.3	54.0	14.7	14.7
10	24800.0	30.7	30.7	40.7	34.6	14.7	0.0	42.0	42.0	54.0	12.0	12.0

<AV DETECT 2483.5MHz>
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss + Duty Cycle correction factor
Duty Cycle correction factor = -30.5dB
*Refer to the p.44 for calculation method of Duty cycle correction factor.

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 WAVE INCORPORATED	REPORT NO	: 25HE0109-HO
Equipment	: Bluetooth Board, Wireless LAN Adapter	REGULATION	: Fcc Part15 Subpart C 15.247(d)
Model	: DWBT005 , KCS	TEST DISTANCE	: 3/1m
Sample No.	: 00037A2287AE , 00B6B19A828	DATE	: 04/04/2005
Power	: DC3.3V	TEMPERATURE	: 23deg.C
Mode	: W-LAN 2437MHz + BT Hopping	HUMIDITY	: 34%
Remarks	: Hor Y , Ver Z-axis	ENGINEER	: Norihisa Hashimoto

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	51.1	47.6	30.5	39.9	5.7	0.0	47.4	43.9	74.0	26.6	30.1
2	2483.5	61.8	54.0	30.5	40.0	5.8	0.0	58.1	50.3	74.0	15.9	23.7
3	4874.0	48.2	47.6	35.5	41.2	8.4	1.0	51.9	51.3	74.0	22.1	22.7
4	7311.0	46.1	46.4	37.9	40.4	10.3	0.4	54.3	54.6	74.0	19.7	19.4
5	9748.0	43.8	44.2	36.9	39.5	12.4	0.2	53.8	54.2	74.0	20.2	19.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12185.0	43.7	43.9	41.6	39.8	14.4	0.0	50.4	50.6	74.0	23.6	23.4
7	14622.0	44.9	45.6	42.1	40.9	15.3	0.0	51.9	52.6	74.0	22.1	21.4
8	17059.0	44.2	46.2	45.3	41.9	16.6	0.0	54.7	56.7	74.0	19.3	17.3
9	19496.0	42.8	43.6	40.3	39.9	13.0	0.0	46.7	47.5	74.0	27.3	26.5
10	21933.0	44.5	43.6	39.8	35.8	12.9	0.0	51.9	51.0	74.0	22.1	23.0
11	24370.0	43.1	43.0	40.4	33.7	15.0	0.0	55.3	55.2	74.0	18.7	18.8

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

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.0	38.8	36.2	30.5	39.9	5.7	0.0	35.1	32.5	54.0	18.9	21.5
2	2483.5	42.8	40.5	30.5	40.0	5.8	0.0	39.1	36.8	54.0	14.9	17.2
3	4874.0	35.3	35.3	35.5	41.2	8.4	1.0	39.0	39.0	54.0	15.0	15.0
4	7311.0	33.4	33.4	37.9	40.4	10.3	0.4	41.6	41.6	54.0	12.4	12.4
5	9748.0	31.4	31.4	36.9	39.5	12.4	0.2	41.4	41.4	54.0	12.6	12.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12185.0	31.3	31.4	41.6	39.8	14.4	0.0	38.0	38.1	54.0	16.0	15.9
7	14622.0	32.6	32.6	42.1	40.9	15.3	0.0	39.6	39.6	54.0	14.4	14.4
8	17059.0	33.9	33.8	45.3	41.9	16.6	0.0	44.4	44.3	54.0	9.6	9.7
9	19496.0	31.1	31.0	40.3	39.9	13.0	0.0	35.0	34.9	54.0	19.0	19.1
10	21933.0	31.6	31.6	39.8	35.8	12.9	0.0	39.0	39.0	54.0	15.0	15.0
11	24370.0	30.5	30.5	40.4	33.7	15.0	0.0	42.7	42.7	54.0	11.3	11.3

20dBc(Fundamental 2412MHz) (RBW: 100kHz, VBW: 300kHz)

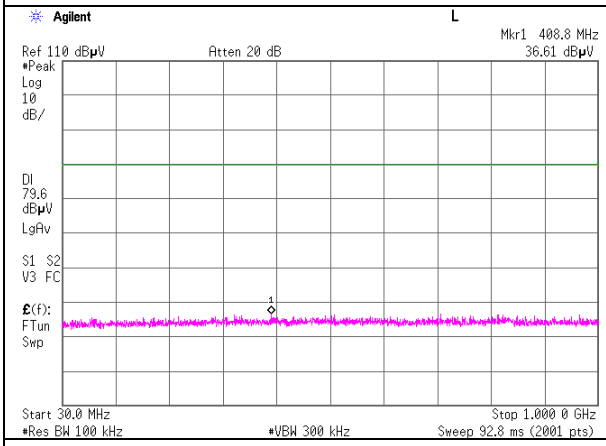
No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2412.0	105.1	87.7	30.5	39.9	5.7	0.0	101.4	84.0	-	-	-
2	2400.0	57.8	49.4	30.5	39.9	5.7	0.0	54.1	45.7	Funda-20dB	27.3	18.3

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 Fiter was not used for factor 0.0dB of the above table.

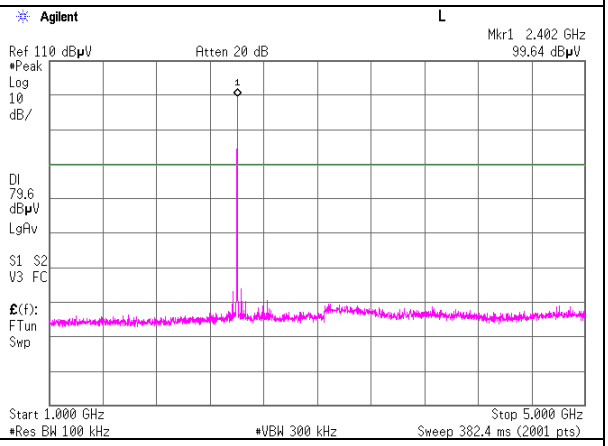
Conducted Spurious Emission

Ch:Low

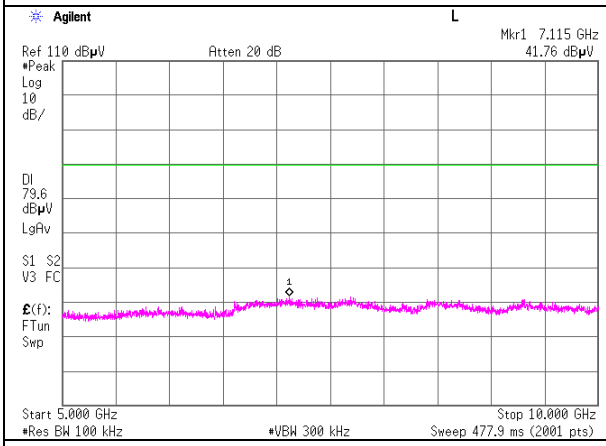
30MHz-1GHz



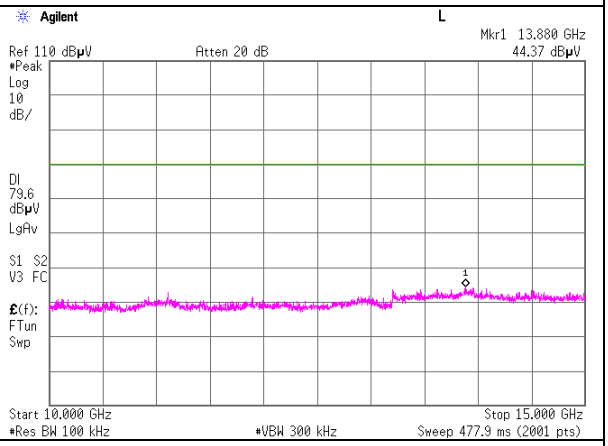
1GHz-5GHz



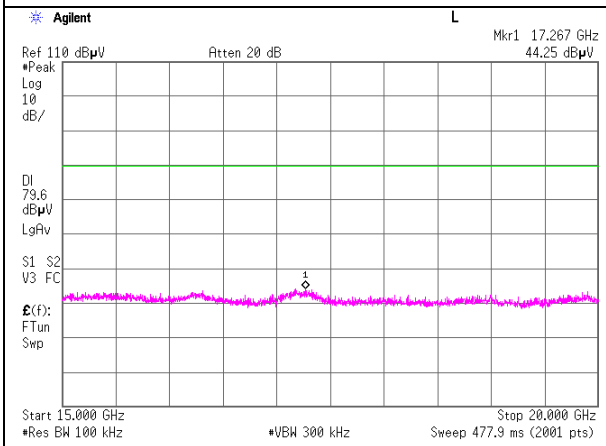
5GHz-10GHz



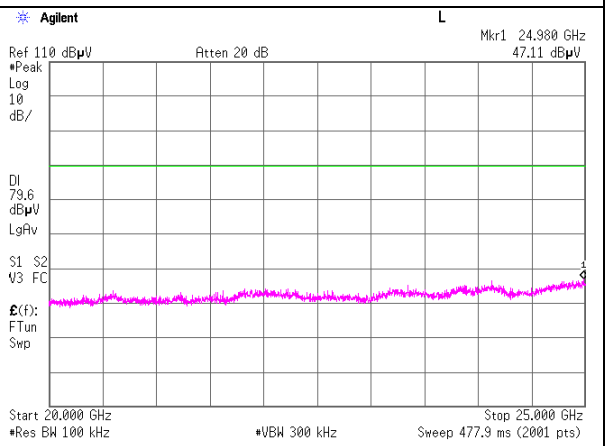
10GHz-15GHz



15GHz-20GHz



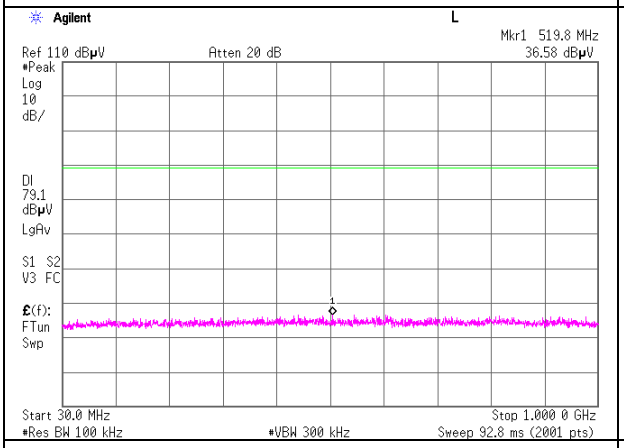
20GHz-25GHz



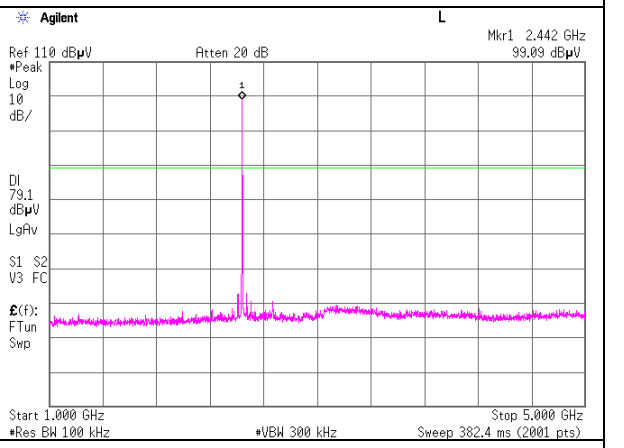
Conducted Spurious Emission

Ch:Mid

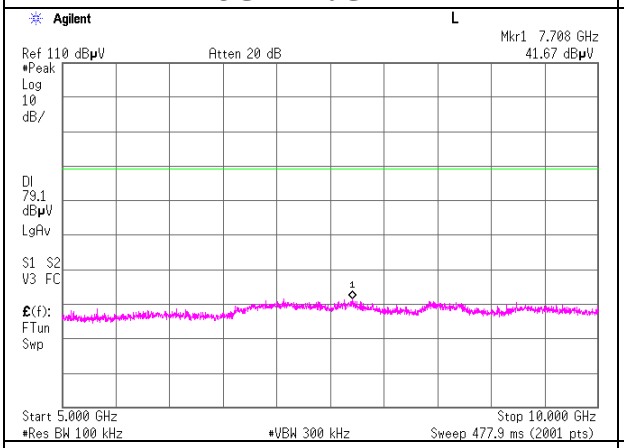
30MHz-1GHz



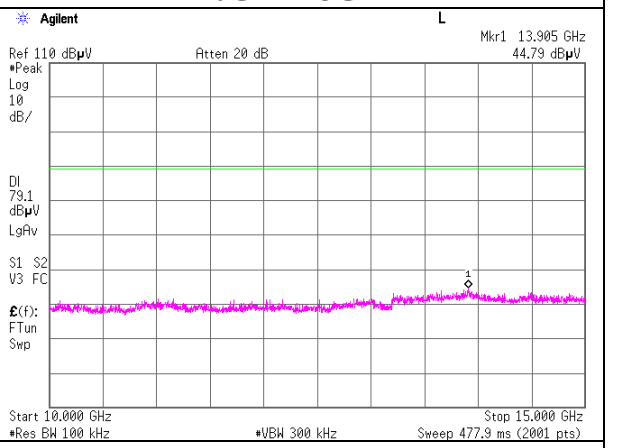
1GHz-5GHz



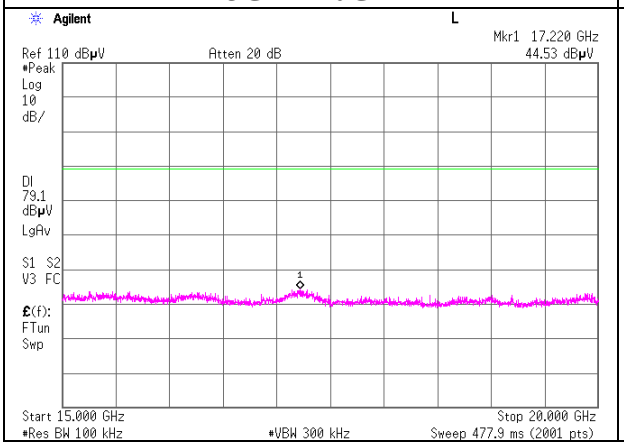
5GHz-10GHz



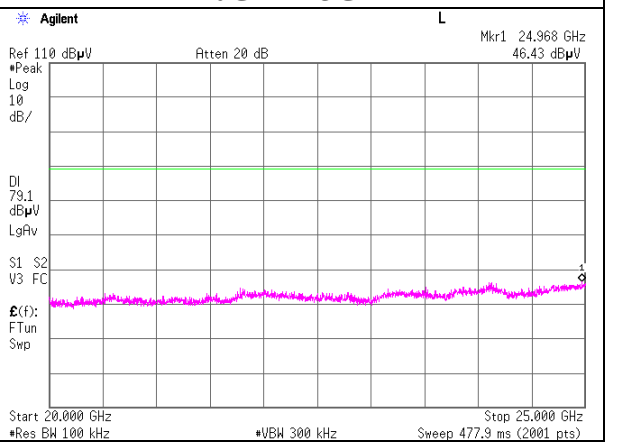
10GHz-15GHz



15GHz-20GHz



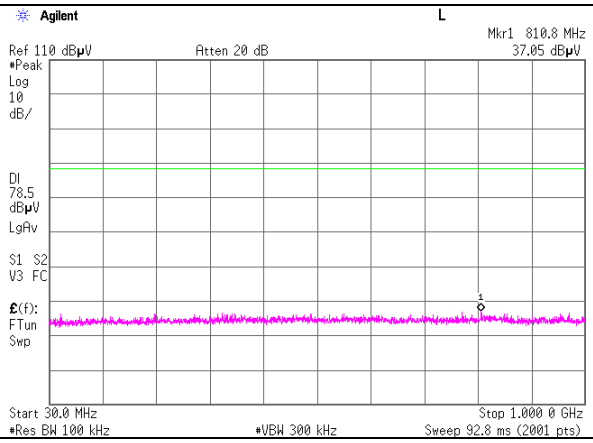
20GHz-25GHz



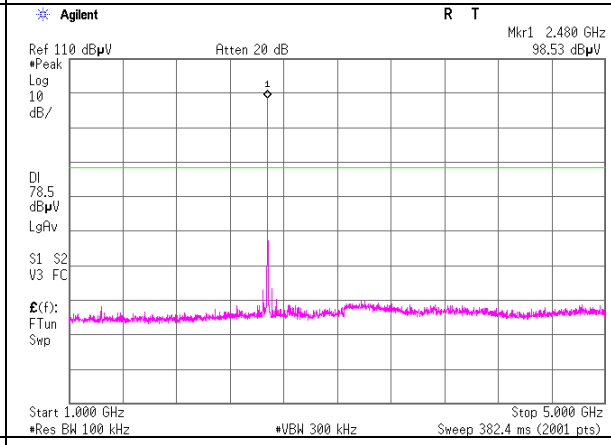
Conducted Spurious Emission

Ch:High

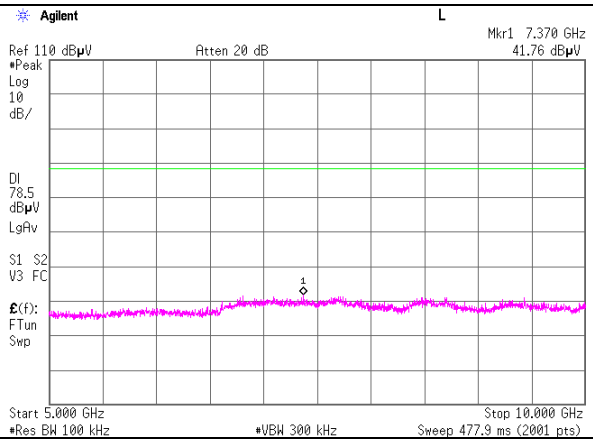
30MHz-1GHz



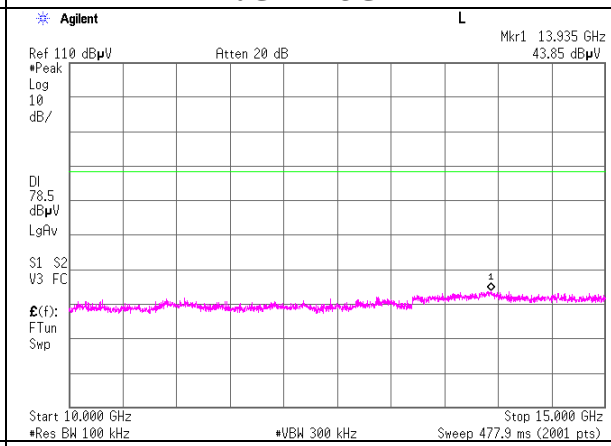
1GHz-5GHz



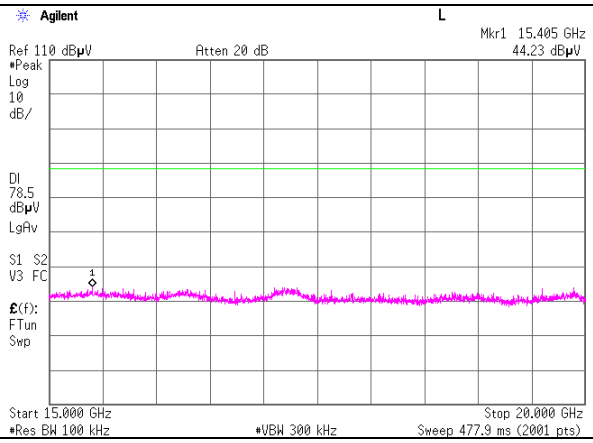
5GHz-10GHz



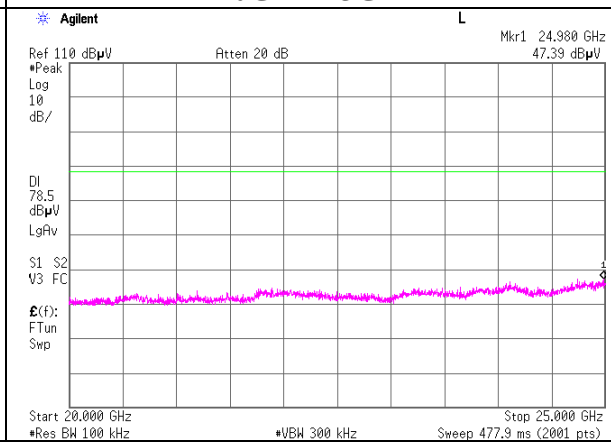
10GHz-15GHz



15GHz-20GHz



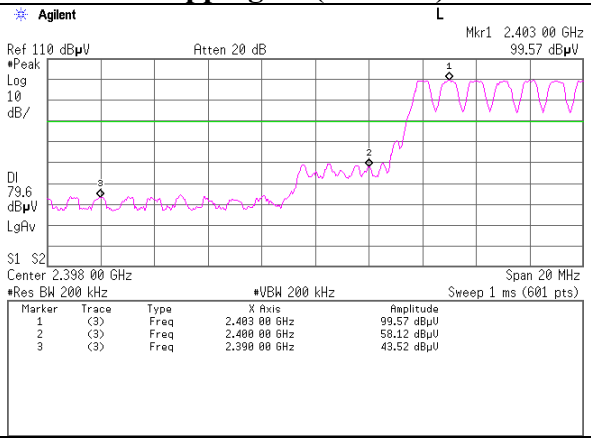
20GHz-25GHz



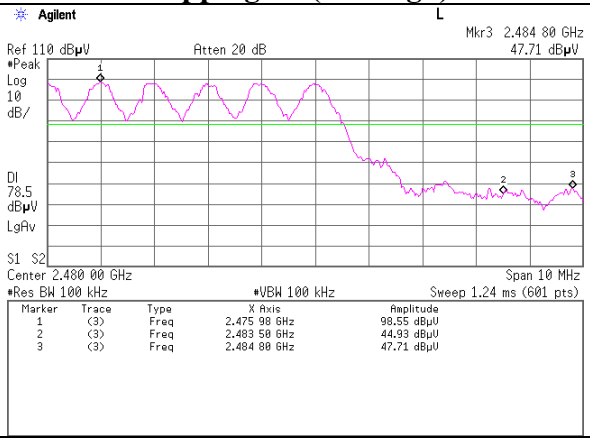
Conducted Spurious Emission

Band Edge compliance

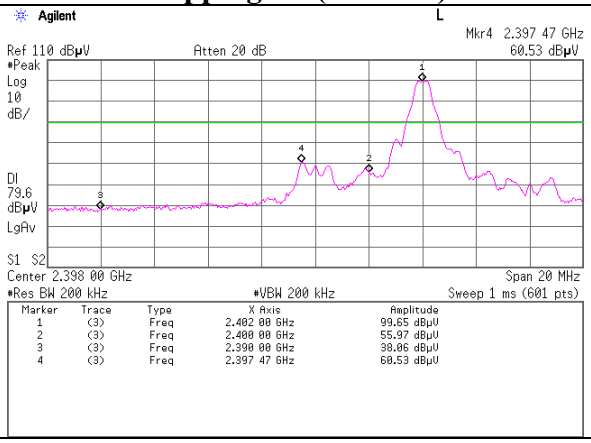
Hopping on (Ch:Low)



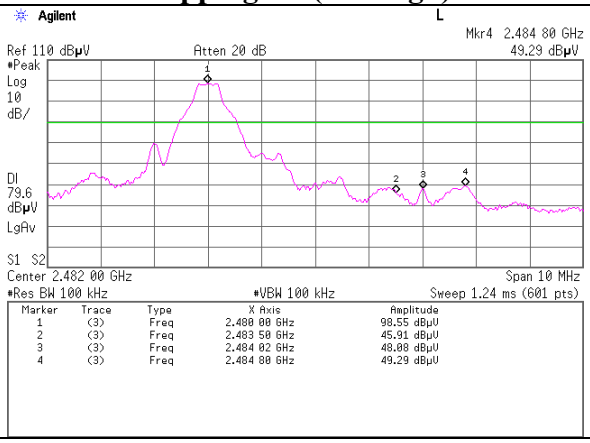
Hopping on (Ch:High)



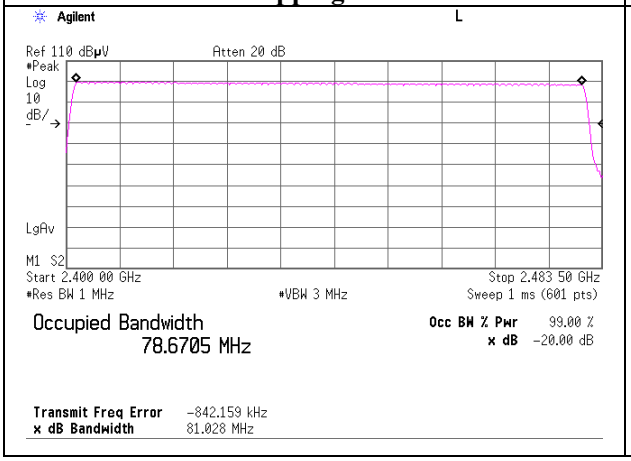
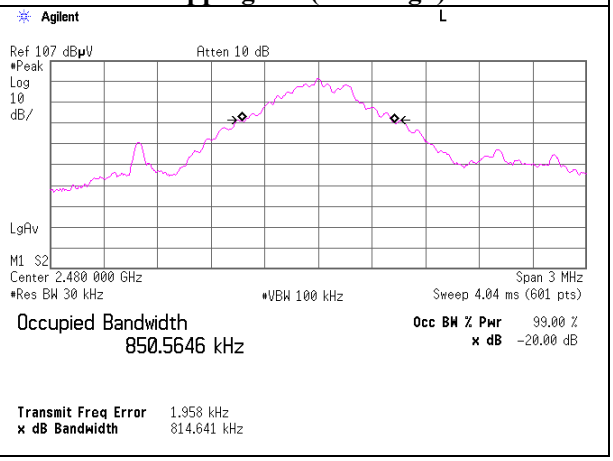
Hopping off (Ch:Low)



Hopping off (Ch:High)



99% Occupied Bandwidth

Hopping On	Hopping Off (Ch : High)
	

§ 15.35 Duty cycle correction factor

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

COMPANY	:	DENSO WAVE INCORPORATED	REGULATION	:	Fcc Part15 Subpart C 15.35
EQUIPMENT	:	Bluetooth Board	TEST DISTANCE	:	-
MODEL	:	DWBT005	DATE	:	04/04/2005
S/ N	:	00037A2287AE	TEMPERATURE	:	23deg.C
POWER	:	DC 3.3 V	HUMIDITY	:	34%
MODE	:	Tx (Hopping on) DH5	ENGINEER	:	Norihisa Hashimoto

(DH5) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [dB]	Duty Factor [dB]
1 to 5	1, 1, 1, 1, 1	100.000	3.000	-30.5	-30.5
Averege	1				

Result : 20log (Dwell Time/100ms)