EMI TEST REPORT

Test Report No. : 25GE0283-HO-1

Applicant	:	**DENSO CORPORATION**
Type of Equipment	:	**Audio Bluetooth Hands Free Unit**
Model No.	:	**BTAU01A, BTAU02A**
Test standard	:	**FCC Part 15 Subpart C** **Section 15.207, Section 15.247 : 2005**
FCC ID	:	**HYQBTAU01A**
Test Result	:	**Complied**

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

Date of test:

April 19 to 21, 2005

Tested by:

Kenichi Adachi
EMC Service

Makoto Kosaka
EMC Service

Approved by :

Naoki Sakamoto
Group Leader of
EMC Service

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SECTION 1: Client information

Company Name	:	DENSO CORPORATION
Address	:	1-1,Showa-cho,Kariya-shi,Aichi-ken, 448-8661 Japan
Telephone Number	:	+81-566-26-5879
Facsimile Number	:	+81-566-25-4751
Contact Person	:	Takehio Abeta

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

2.1 Identification of E.U.T.

Type of Equipment	:	Audio Bluetooth Hands Free Unit
Model No.	:	BTAU01A (for All tests), BTAU02A (for only Spurious emissions)
Serial No.	:	5S-029 (BTAU01A), 5S-033 (BTAU02A)
Rating	:	12VDC (Vehicle Battery) 3.3±0.2VDC(Bluetooth Module IC)
Country of Manufacture	:	Japan
Receipt Date of Sample	:	April 18, 2005
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model No: BTAU01A (referred to as the EUT in this report) are the Audio Bluetooth Hands Free Unit.

Clock frequency in the system	BT 13MHz, CPU 264.18MHz (25.16MHz x 10.5)
The difference between BTAU01A and BTAU02A	BTAU01A (Type A): Antenna is fixed on the Bluetooth part BTAU02A (Type B): Antenna is connected with anntena cable from the Bluetooth part.
Feature of EUT	The BTAU01A and BTAU02A are 2.4 GHz wireless LAN transceiver module that use frequency hopping spread spectrum technology in accordance with the Bluetooth Specification version 1.2. This product connects the audio system with the cellular phone by radio. The audio system enables the driver to call without holding the cellular phone by using speaker, microphone and audio panel installed in the system. This application is called "hands free".

Equipment Type	Transceiver
Frequency of Operation	2402 - 2480 MHz(Bluetooth Mode)
Bandwidth & Channel spacing	1MHz & 1MHz/ch
Type of Modulation	FHSS
Antenna Type	INVERTED F ANTENNA
Antenna Connector Type	U.FL Coaxial Connector
Antenna Gain	2.1dBi
Mode of Operation	Duplex
Method of Frequency Generation	Crystal
ITU Code	F1D

FCC 15.31 (e)
Regulator regulates DC3.3V from power supply of Audio Bluetooth Hands Free Unit to DC 1.8V for supplying RFIC.
Therefore, the equipment complies with this requirement.

FCC Part 15.203 Antenna requirement
The specific antenna connector is used for the EUT. Therefore, this 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	16.8dB 0.1573MHz 0.1557MHz QP, N,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 *3)	ANSI C63.4:2003 13. Measurement of intentional radiators	Section15.247(d)	Conducted/ Radiated	N/A	<BTAU01A> 1.9dB 2483.52MHz PK, Horizontal (ch79) <BTAU02A> 4.1dB 2483.53MHz PK, Vertical (ch79)	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.

*1) These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".
*2) These tests were performed without any deviations from test procedure except for additions or exclusions.
*3) The comparison test on two models (BTAU01A and BTAU02A) was made only for Air Spurious emission item which may have the electromagnetic effect on EMC tests.
As a result, the two models was equivalent in the test level.
The only difference in these two models is the installation place of the antenna (BTAU01A has a short antenna cable./ BTAU02A has a long antenna cable.).
The test for Antenna Terminal is made with BTAU01A as the representative model.

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

	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

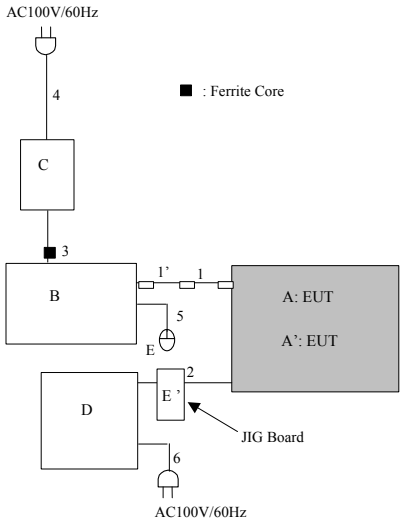
Refer to APPENDIX 1 to 3.

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

4.1 Operating Modes

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

4.2 Configuration and peripherals



A: BTAU01A :
All tests

A': BTAU02A :
1GHz to 10GHz
Spurious emissions

* 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 Type A (EUT)	BTAU01A	5S-029	DENSO	HYQBTAU01A
A'	Bluetooth Assy Type B (EUT)	BTAU02A	5S-033	DENSO	HYQBTAU01A
B	Note PC	PC7NP2-UDC8H1110	4330ZU0T212 006142	HITACHI	-
C	AC Adapter	PC-AP6400	01Z06271	HITACHI	-
D	DC Power Supply	PW8-3ATP	09067054	KENWOOD	-
E	Mouse	-	-	DENSO	-
E'	JIG	599996-0034	-	DENSO	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	RS232C Cable	1.5	Y	Polyvinyl chloride
1'	RS232C Cable PC Card Cable	0.45	Y	Polyvinyl chloride
2	DC Cable	0.9	N	Polyvinyl chloride
3	DC Cable	1.8	N	Polyvinyl chloride
4	AC Cable	1.9	N	Polyvinyl chloride
5	Mouse Cable	1.2	N	Polyvinyl chloride
6	AC Cable	1.9	N	Polyvinyl chloride

SECTION 5: Conducted Emission

Test Procedure and conditions

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

APPENDIX 1: Photographs of test setup

Conducted Emission

Front

Rear

Spurious Emission (Radiated)

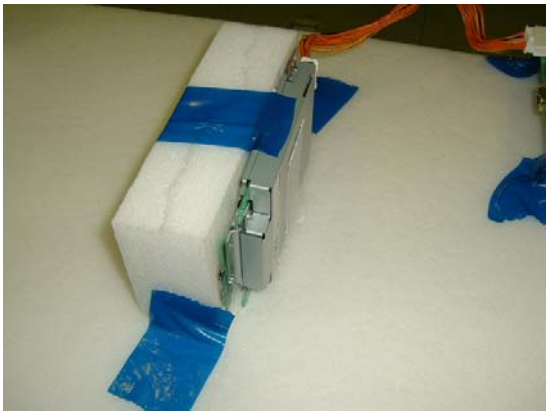
Front

Rear

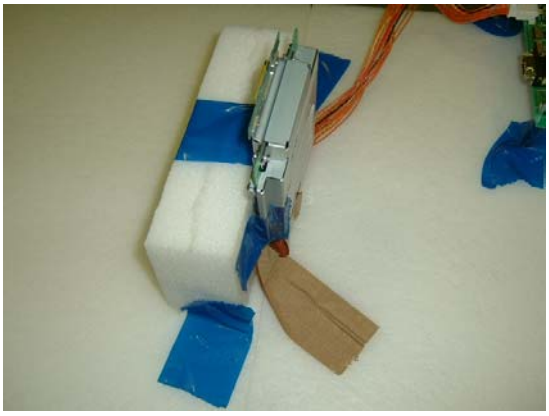
Worst Case Position , Type A (X-axis:Horizontal / Y-axis:Vertical)

X-axis

Y-axis

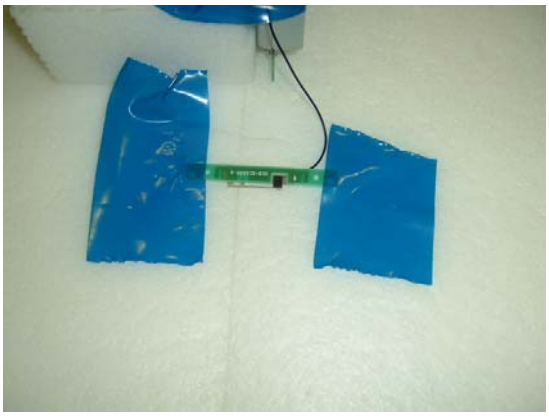


Z-axis



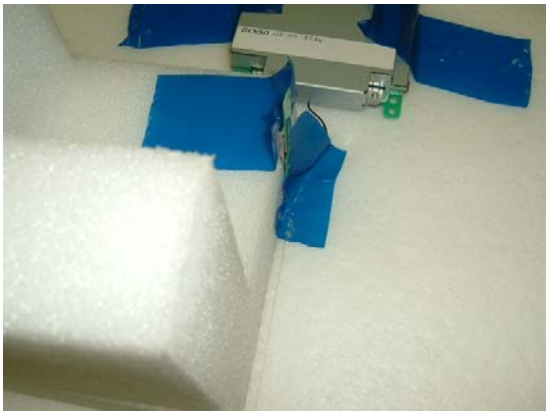
Worst Case Position , Type B's Antenna (X-axis:Horizontal / Z-axis:Vertical)

X-axis



Y-axis

Z-axis



APPENDIX 2:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	1,2	2004/11/13 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	1,2	2004/11/12 * 12
MCC-05	Microwave Cable	Storm	421-011	2	2005/01/05 * 12
MPA-05	Pre Amplifier	TSJ	TSJ 1-26.5GHz PreAmp	2	2004/06/12 * 12
MCC-23	Microwave Cable	Storm	-	2	2004/05/01 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	2	2005/01/10 * 12
MHA-01	Horn Antenna	EMCO	3160-09	2	2005/01/10 * 12
MHF-02	High Pass Filter	Tokimec	TF323DCA	2	2004/09/18 * 12
MDPS-04	DC Power Supply	KENWOOD TMI	PW18-1.3AT	1 to 9	Pre Check
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	2	2004/10/14 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	2	2004/10/14 * 12
MCC-01	Coaxial Cable 0.1-3000MHz	Suhner/storm/Agilent/TSJ	-	2	2004/12/19 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	2	2004/12/16 * 12
MPA-04	Pre Amplifier	Agilent	8447D	2	2004/05/25 * 12
MAT-20	Attenuator(10dB)(above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	3 to 9	2005/01/11 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	3 to 9	2004/06/12 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agilent/TSJ	-	1	2004/12/24 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	1	2004/11/10 * 12
MPL-01	Pulse Limiter	Rohde & Schwarz	ESH3Z2	1	2005/01/11 * 12

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

1: AC Main Conducted Emission
2: Radiated Spurious Emission
3: Antenna Terminal Conducted Spurious Emission
4: Maximum Peak Output Power
5: Carrier Frequency Separation
6: 20dB Bandwidth[FHSS]
7: Number of Hopping Frequency
8: Dwell time
9: 99% OBW

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

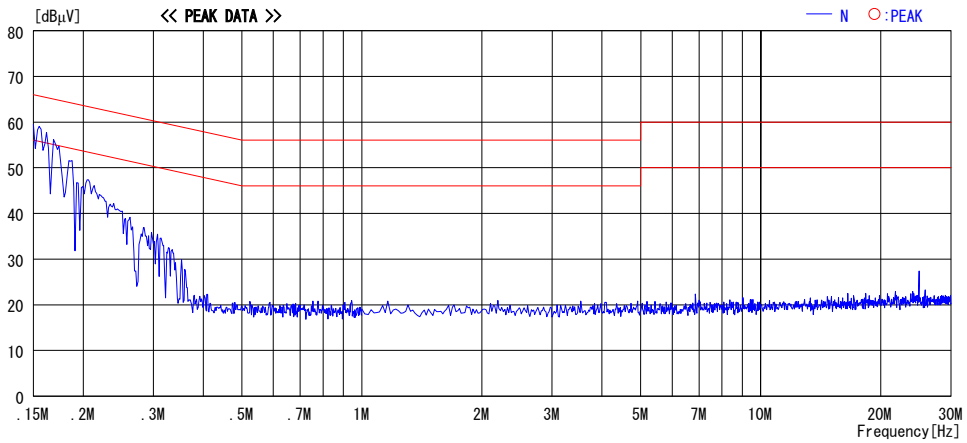
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/20 23:00:08

Applicant : DENSO CORPORATION
Kind of EUT : Audio Bluetooth Hands Free Unit
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12V(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 45%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2402MHz

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



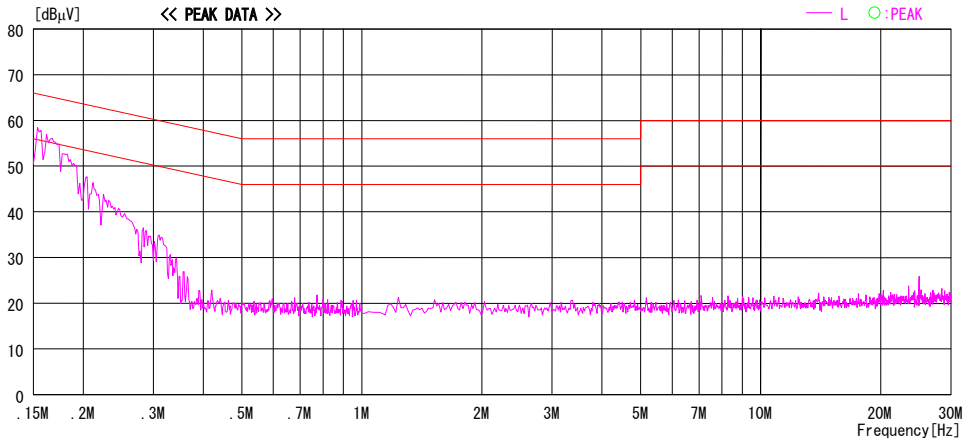


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

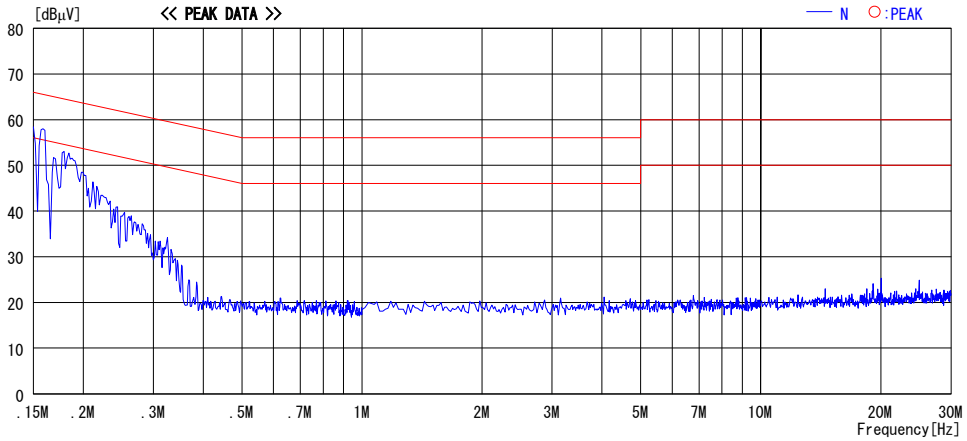
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/20 23:08:31

Applicant	: DENSO CORPORATION	Report No.	: 25GE0283-HO
Kind of EUT	: Audio Bluetooth Hands Free Unit	Power	: DC12V(BT DC3.3V)
Model No.	: BTAU01A:TYPE A	Temp℃/Humi%	: 24deg.C / 45%
Serial No.	: No.5S-029	Operator	: Kenichi Adachi

Mode / Remarks : Tx 2441MHz

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



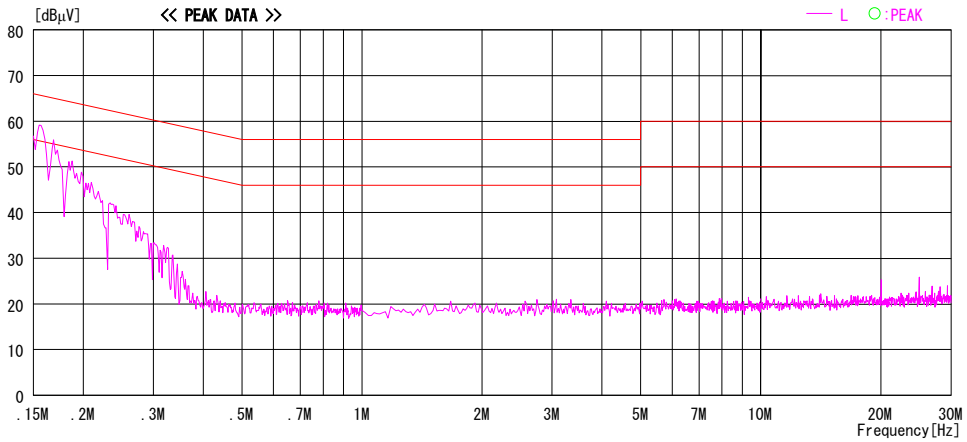


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

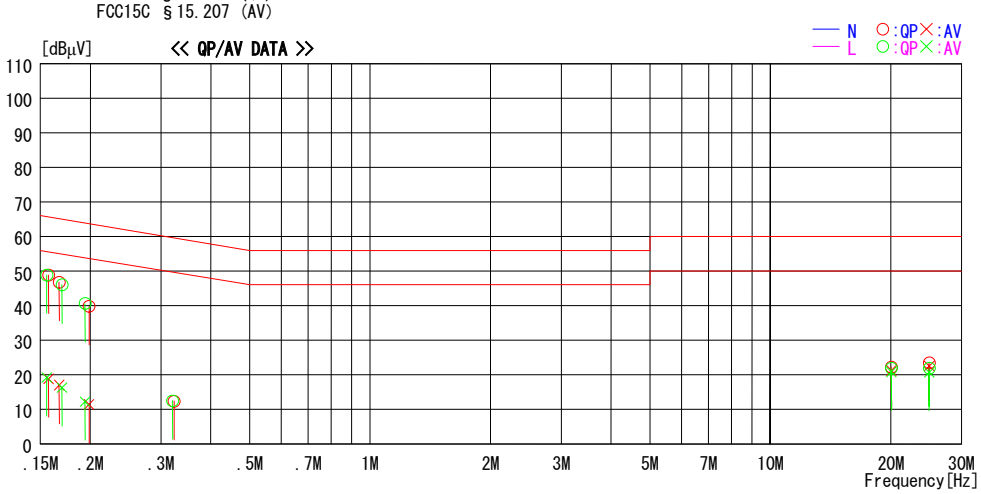
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/20 23:08:31

Applicant : DENSO CORPORATION
Kind of EUT : Bluetooth Assy
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12V(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 45%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2441MHz

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	0.1573	38.8	8.8	10.0	48.8	18.8	65.6	55.6	16.8	36.8	N
2	0.1672	36.7	6.9	10.1	46.8	17.0	65.1	55.1	18.3	38.1	N
3	0.1984	29.5	1.1	10.3	39.8	11.4	63.7	53.7	23.9	42.3	N
4	0.3238	12.1	----	0.2	12.3	----	59.6	----	47.3	----	N
5	20.0616	9.9	8.9	12.3	22.2	21.2	60.0	50.0	37.8	28.8	N
6	24.9319	10.9	9.9	12.6	23.5	22.5	60.0	50.0	36.5	27.5	N
7	0.1557	38.9	9.2	10.0	48.9	19.2	65.7	55.7	16.8	36.5	L
8	0.1699	35.9	6.2	10.1	46.0	16.3	65.0	55.0	19.0	38.7	L
9	0.1942	30.3	1.9	10.3	40.6	12.2	63.9	53.9	23.3	41.7	L
10	0.3212	12.3	----	0.2	12.5	----	59.7	----	47.2	----	L
11	20.0612	9.6	8.5	12.3	21.9	20.8	60.0	50.0	38.1	29.2	L
12	24.9314	9.3	8.1	12.6	21.9	20.7	60.0	50.0	38.1	29.3	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.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

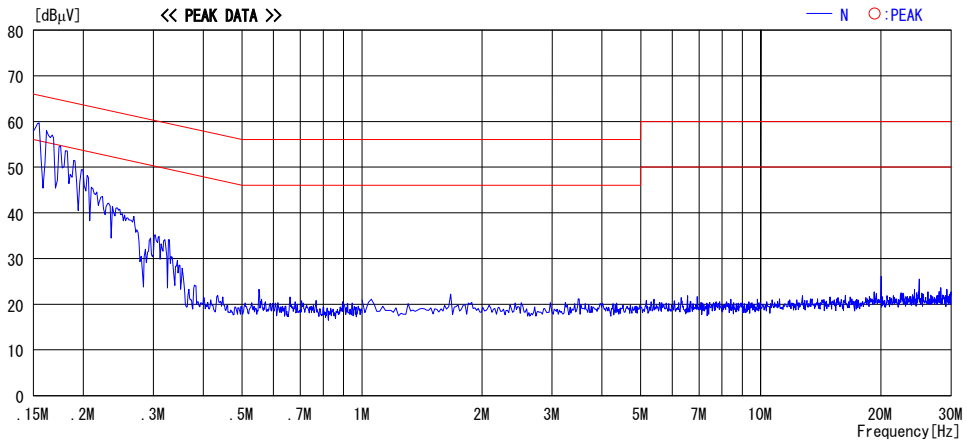
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/20 23:15:35

Applicant : DENSO CORPORATION
Kind of EUT : Audio Bluetooth Hands Free Unit
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 45%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2480MHz

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



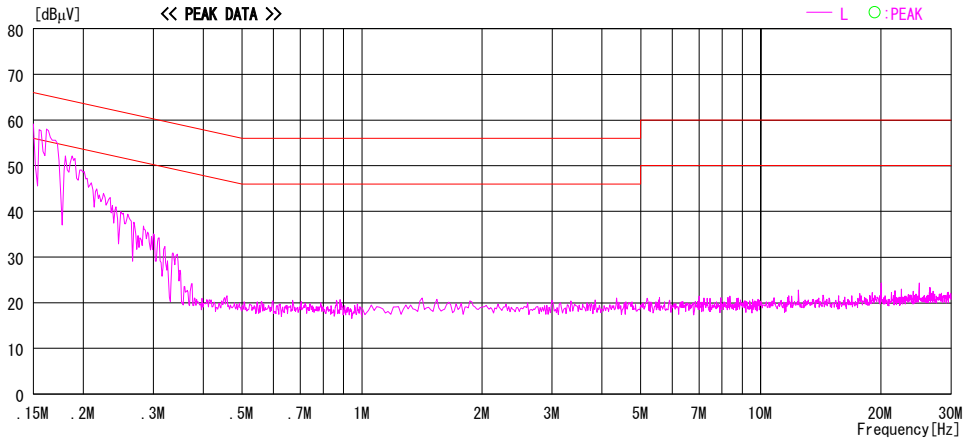


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

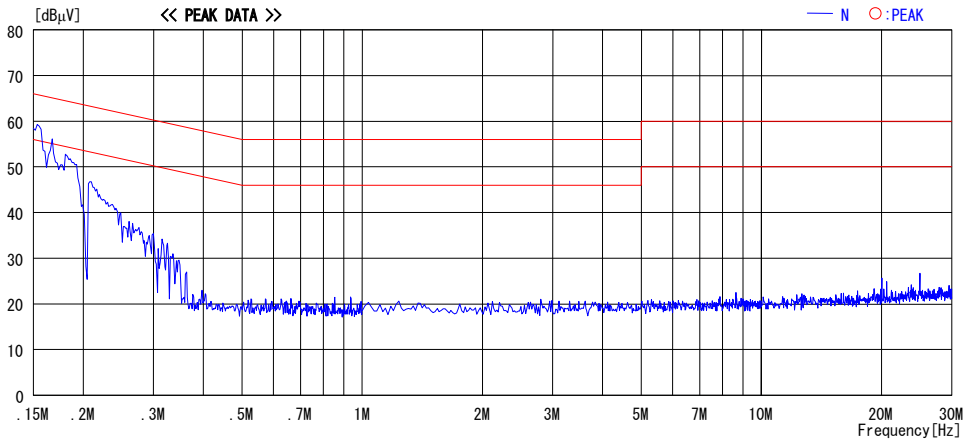
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2005/04/21 00:29:24

Applicant : DENSO CORPORATION
Kind of EUT : Audio Bluetooth Hands Free Unit
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12V(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 45%
Operator : Kenichi Adachi

Mode / Remarks : Standby

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



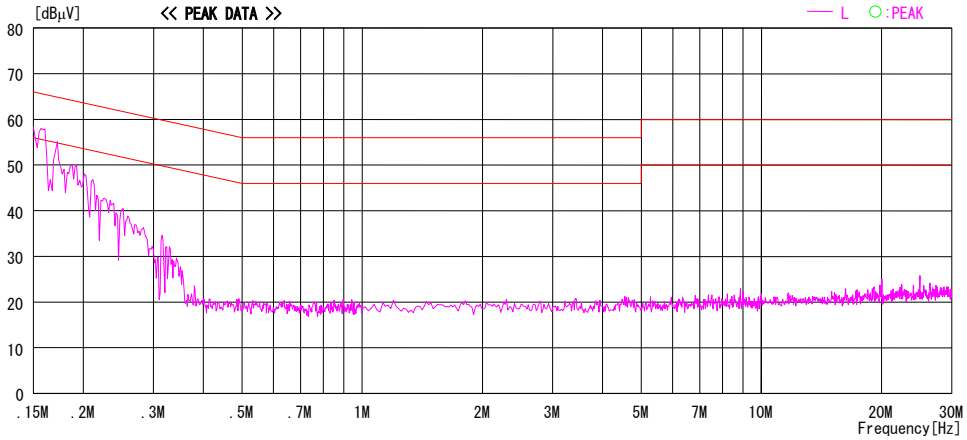


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Carrier Frequency Separation

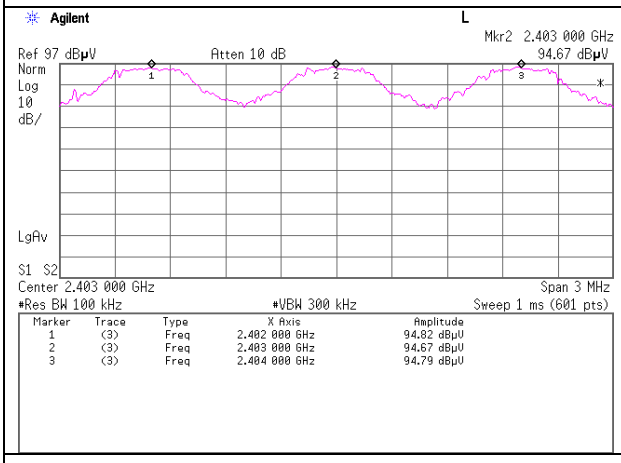
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Audio Bluetooth Hands Free Unit	TEST DISTANCE	: -
MODEL	: BTAU01A(Type A)	DATE	: 04/20/2005
S/ N	: 5S-029	TEMPERATURE	: 25deg.C
POWER	: DC12V(BT DC3.3V)	HUMIDITY	: 48%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Makoto Kosaka

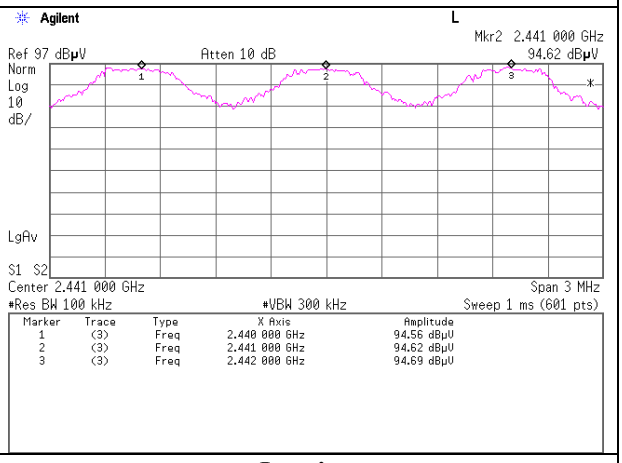
Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.000	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.000	>20dB Bandwidth and 25[kHz]
High	2480.0	1.000	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	2.000	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation

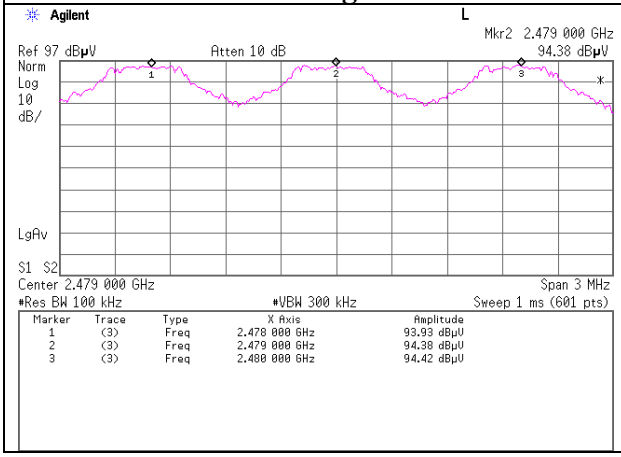
Ch:Low



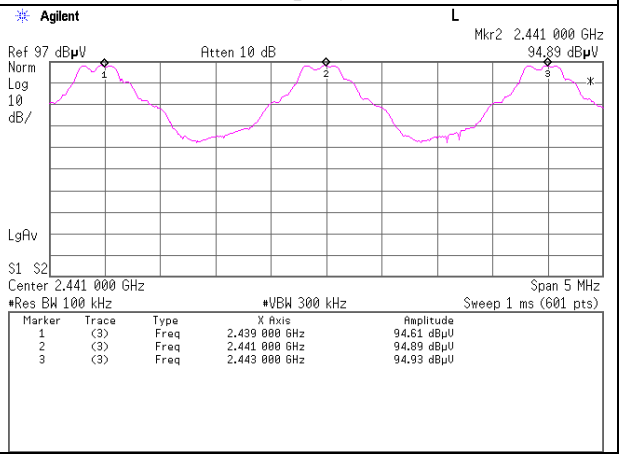
Ch:Mid



Ch:High



Inquiry



20dB Bandwidth

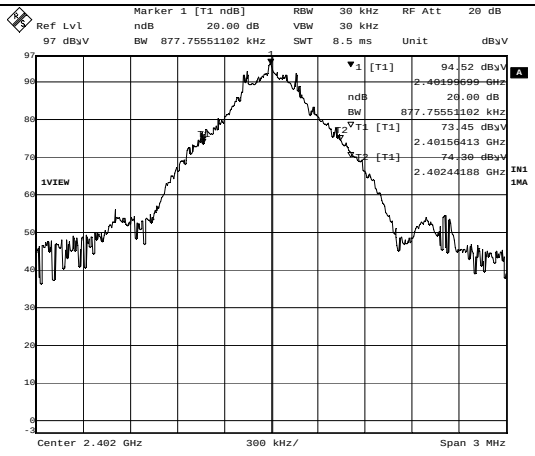
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Audio Bluetooth Hands Free Unit	TEST DISTANCE	: -
MODEL	: BTAU01A(Type A)	DATE	: 04/20/2005
S/ N	: 5S-029	TEMPERATURE	: 25deg.C
POWER	: DC12V(BT DC3.3V)	HUMIDITY	: 48%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Makoto Kosaka

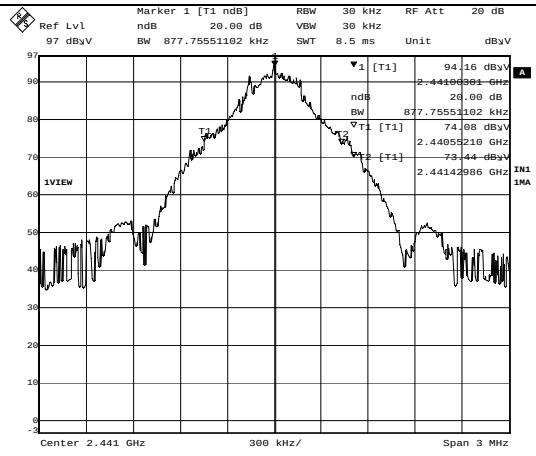
Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.877	-
Mid	2441.0	0.877	-
High	2480.0	0.877	-
Inquiry	2441.0	0.661	-

20dB Bandwidth

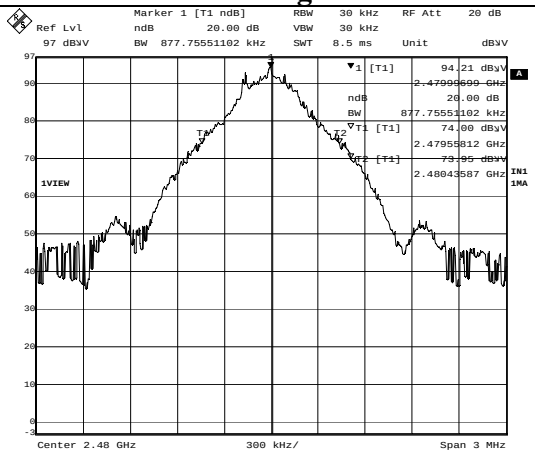
Ch:Low



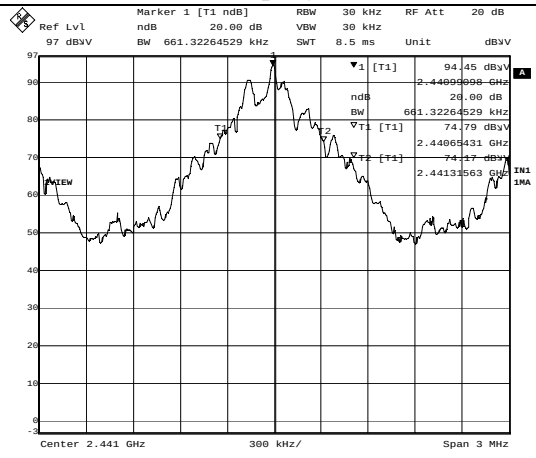
Ch:Mid



Ch:High



Inquiry



Number of Hopping Frequency

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

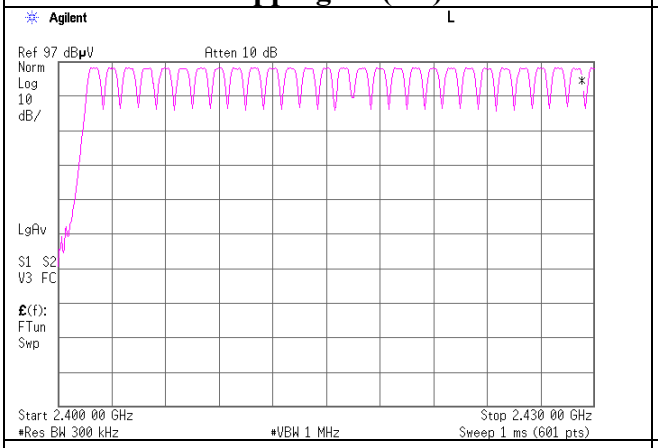
COMPANY	: DENSO Corporation	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Audio Bluetooth Hands Free Unit	TEST DISTANCE	: -
MODEL	: BTAU01A(Type A)	DATE	: 04/20/2005
S/ N	: 5S-029	TEMPERATURE	: 25deg.C
POWER	: DC12V(BT DC3.3V)	HUMIDITY	: 48%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Makoto Kosaka

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

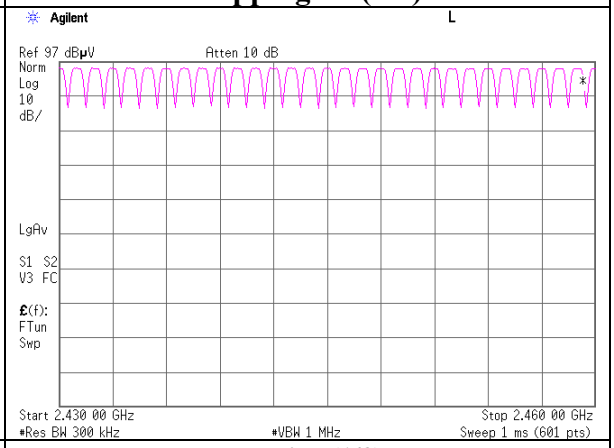
Mode	Number of channel [time]	Limit [time]
Inquiry	32	≧15

Number of Hopping Frequency

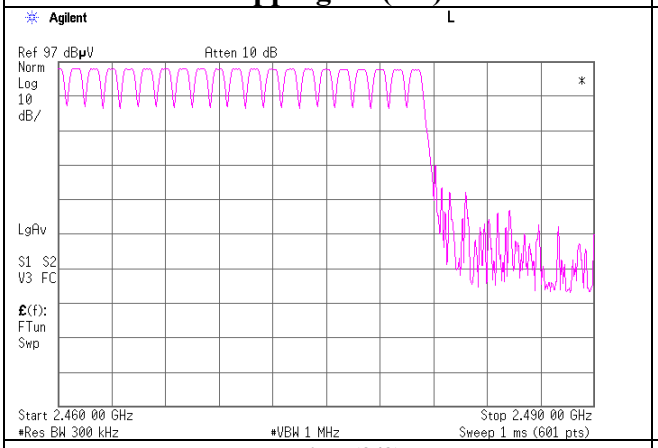
Hopping on (1/3)



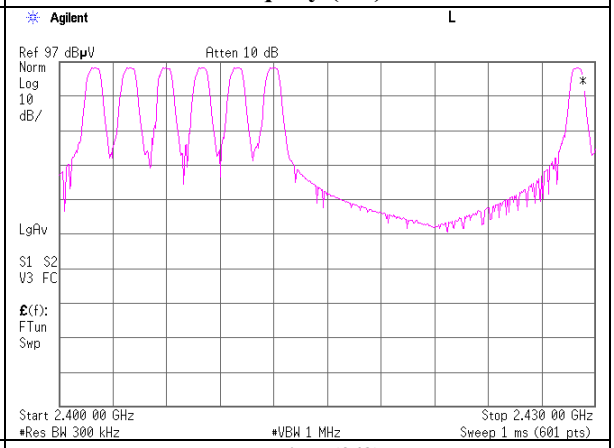
Hopping on (2/3)



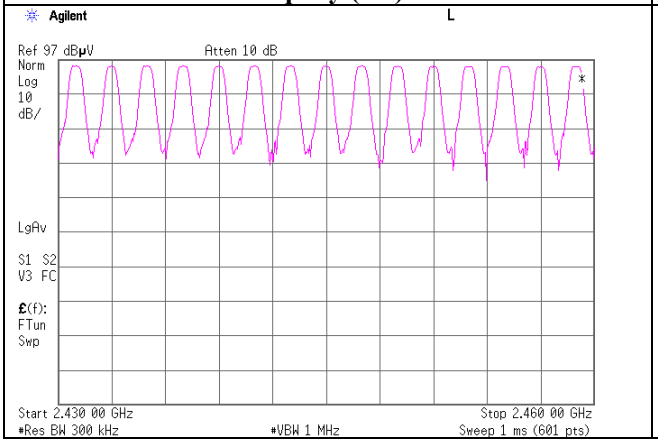
Hopping on (3/3)



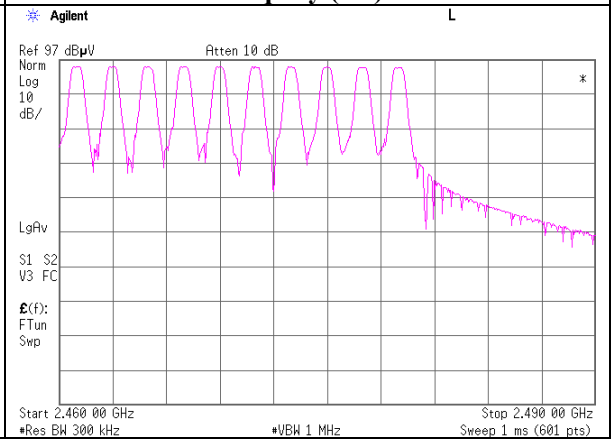
Inquiry (1/3)



Inquiry (2/3)



Inquiry (2/3)



Dwell time

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

COMPANY	:	DENSO Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	:	Audio Bluetooth Hands Free Unit	TEST DISTANCE	:	-
MODEL	:	BTAU01A(Type A)	DATE	:	04/20/2005
S/ N	:	5S-029	TEMPERATURE	:	25deg.C
POWER	:	DC12V(BT DC3.3V)	HUMIDITY	:	48%
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 to 5	223, 222, 214, 216, 216	0.487	218.2 * 0.487	106.20	400
Averege	218.2				

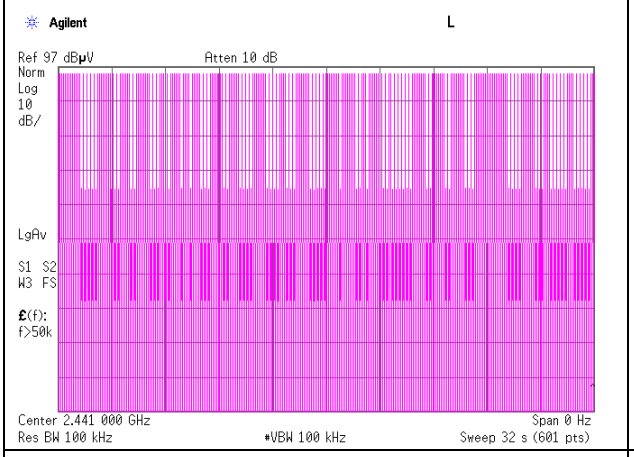
(DH3) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1 to 5	140, 137, 137, 144, 136	1.730	138.8 * 1.73	240.12	400
Averege	138.8				

(DH5) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1 to 5	114, 97, 92, 99, 89	2.975	98.2 * 2.975	292.15	400
Averege	98.2				

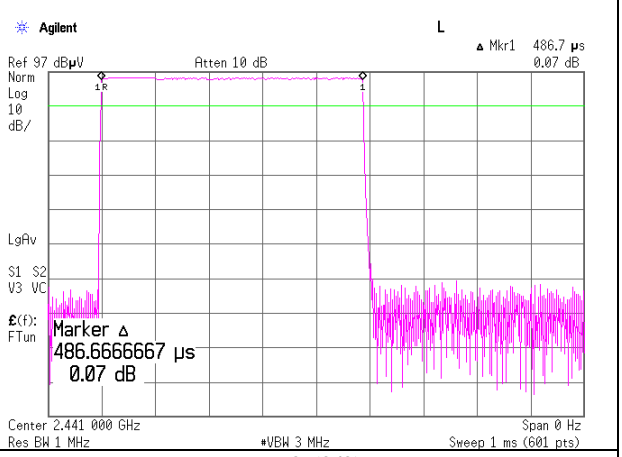
(Inquiry) times	Number of Hoppings	Length of transmission time [msec]	Dwell time [msec]	Result [msec]	Limit [msec]
1 to 5	170, 153, 154, 133, 150	0.193	152 * 0.193	29.38	400
Averege	152.0				

Dwell time

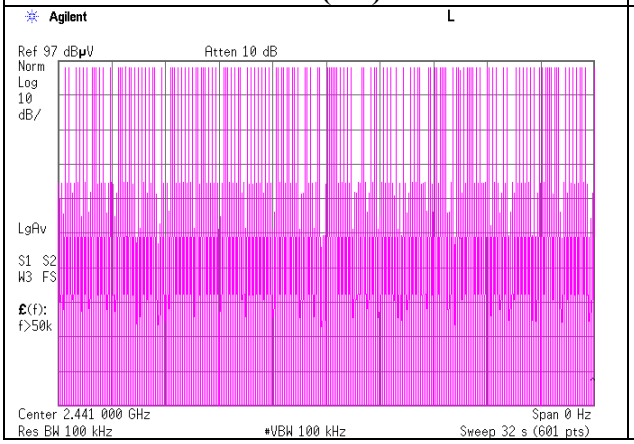
DH1 (1/2)



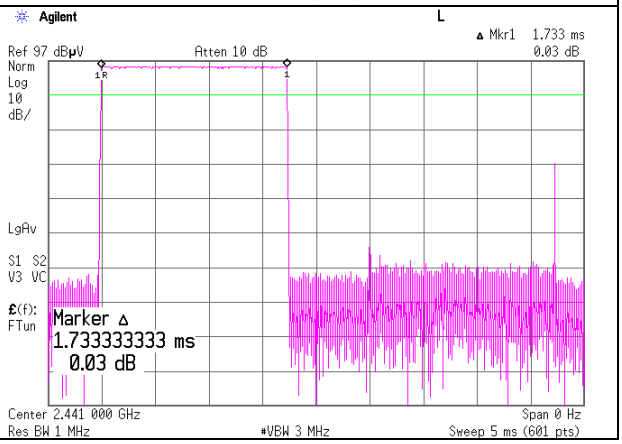
DH1 (2/2)



DH3 (1/2)

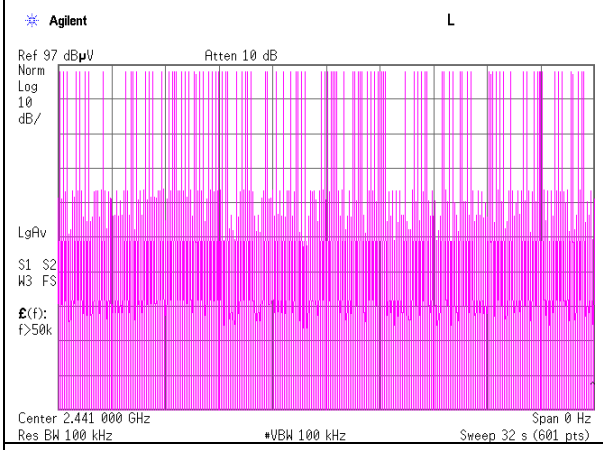


DH3 (2/2)

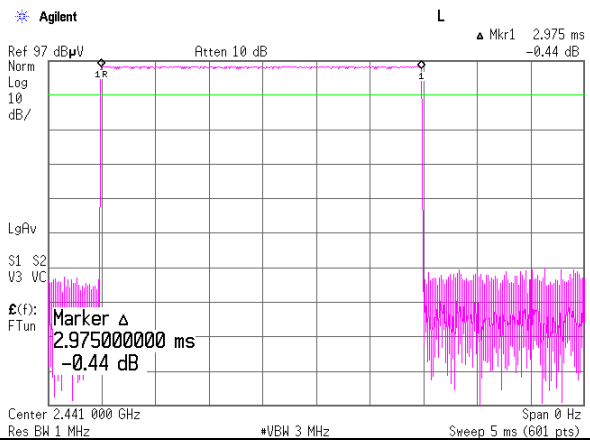


Dwell time

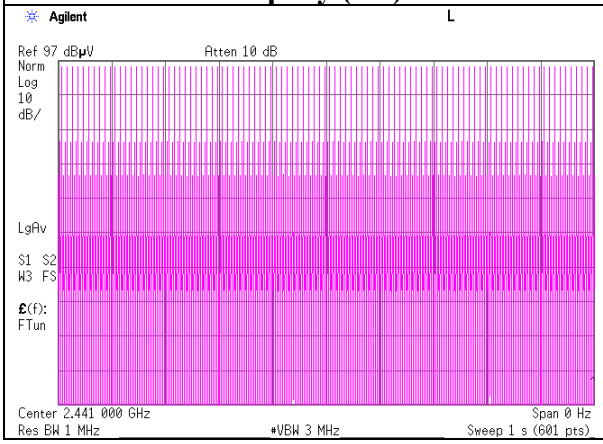
DH5 (1/2)



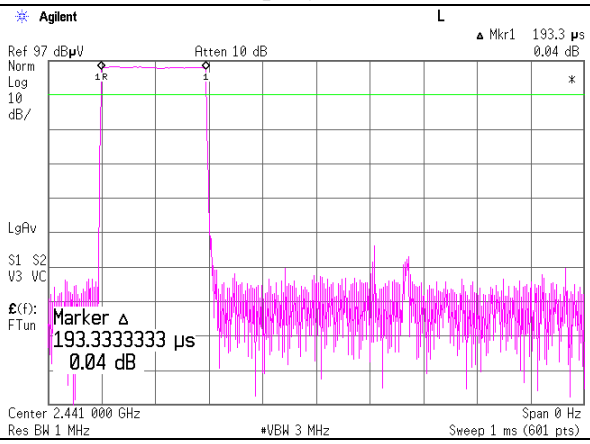
DH5 (2/2)



Inquiry (1/2)



Inquiry (2/2)



Maximum Peak Output Power

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

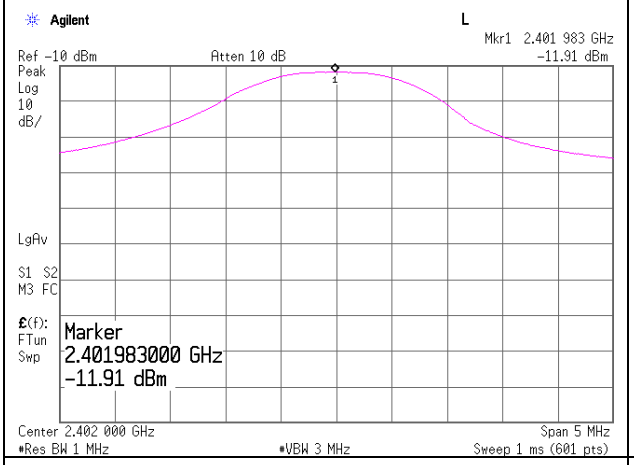
COMPANY	:	DENSO Corporation	REGULATION	:	Fcc Part15 Subpart C 15.247(b)(1)
EQUIPMENT	:	Audio Bluetooth Hands Free Unit	TEST DISTANCE	:	-
MODEL	:	BTAU01A(Type A)	DATE	:	04/20/2005
S/ N	:	5S-029	TEMPERATURE	:	25deg.C
POWER	:	DC12V(BT DC3.3V)	HUMIDITY	:	48%
MODE	:	Tx(Hopping off)/Inquiry	ENGINEER	:	Makoto Kosaka

Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2402.0	-11.91	0.68	10.00	-1.23	30.00	31.23
Mid	2441.0	-11.94	0.68	10.00	-1.26	30.00	31.26
High	2480.0	-12.34	0.68	10.00	-1.66	30.00	31.66
Inquiry	2441.0	-11.88	0.68	10.00	-1.20	20.96	22.16

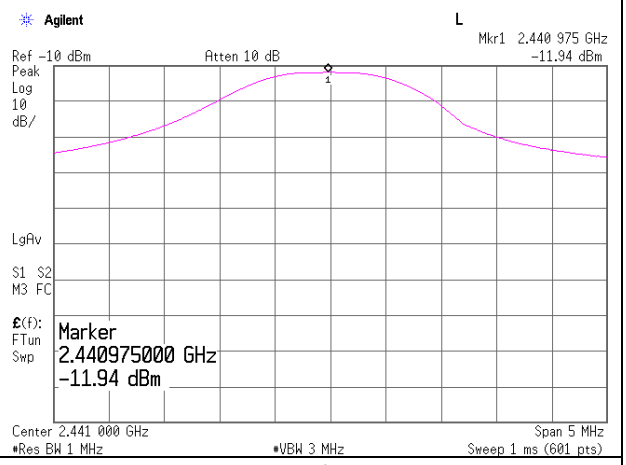
Sample Calculation:
Result = Reading + Cable Loss (supplied by customer)+ Attenuator
* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.
*The test result applied to the most strictest limit of 0.125W.

Maximum Peak Output Power(FHSS)

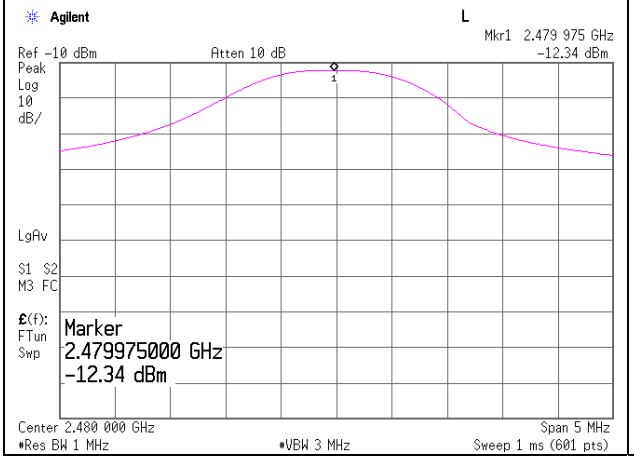
Ch:Low



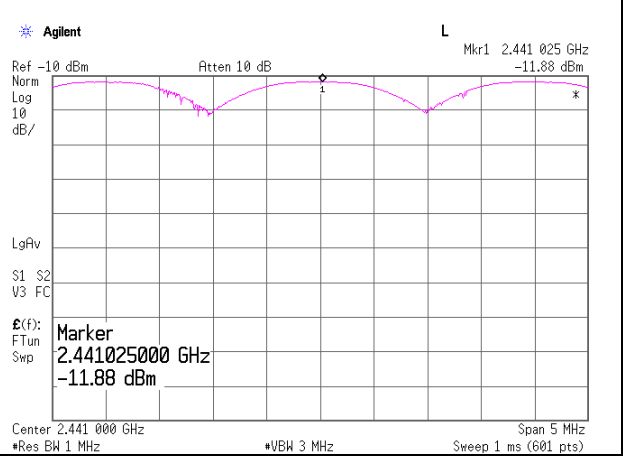
Ch:Mid



Ch:High



Inquiry



Radiated Spurious Emission (Type A)

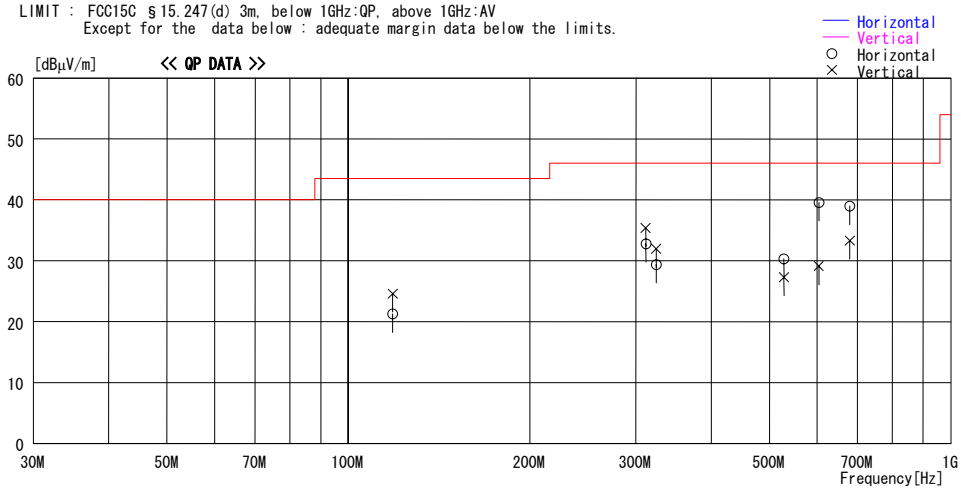
DATA OF RADIATED EMISSION TEST

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

Applicant	: DENSO CORPORATION	Report No.	: 25GE0283-HO
Kind of EUT	: Bluetooth Assy	Power	: DC12V(BT DC3.3V)
Model No.	: BTAU01A:TYPE A	Temp°C/Humi%	: 24deg.C / 21%
Serial No.	: No.5S-029	Operator	: Kenichi Adachi

Mode / Remarks : Tx 2402MHz EUT MAX (H:X , V:Y)

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	118.411	27.6	12.8	8.4	27.5	21.3	43.5	22.2	282	76
2	311.613	35.1	15.0	10.0	27.3	32.8	46.0	13.2	195	40
3	324.075	31.3	15.4	10.2	27.5	29.4	46.0	16.6	150	-1
4	528.356	28.6	19.0	11.3	28.6	30.3	46.0	15.7	153	143
5	603.835	36.7	19.9	11.8	28.8	39.6	46.0	6.4	142	111
6	679.314	35.0	20.6	12.2	28.8	39.0	46.0	7.0	126	95
----- Vertical ------										
7	118.412	30.9	12.8	8.4	27.5	24.6	43.5	18.9	100	160
8	311.612	37.7	15.0	10.0	27.3	35.4	46.0	10.6	100	165
9	324.077	33.9	15.4	10.2	27.5	32.0	46.0	14.0	100	133
10	528.355	25.6	19.0	11.3	28.6	27.3	46.0	18.7	100	-1
11	603.834	26.2	19.9	11.8	28.8	29.1	46.0	16.9	100	360
12	679.313	29.3	20.6	12.2	28.8	33.3	46.0	12.7	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)

Radiated Spurious Emission (Type A)

DATA OF RADIATED EMISSION TEST

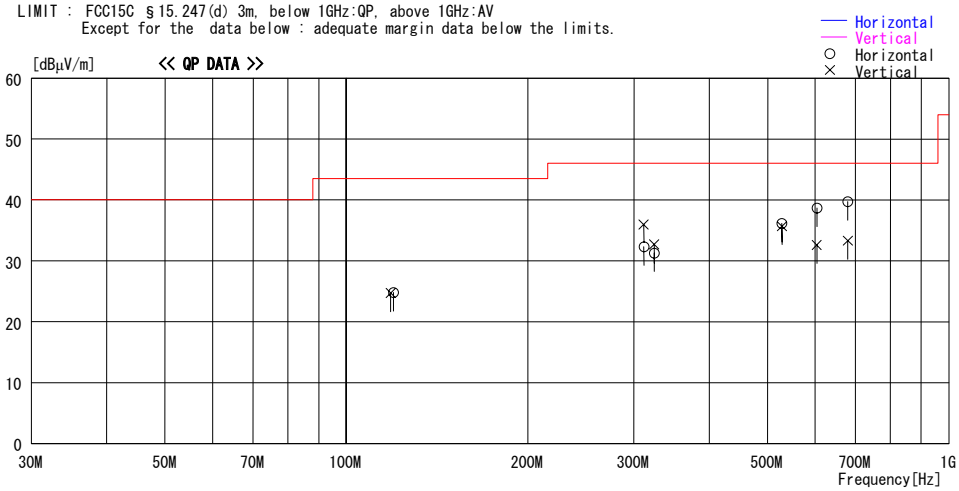
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber

Applicant : DENSO CORPORATION
Kind of EUT : Bluetooth Assy
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12V(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 21%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2441MHz EUT MAX (H:X , V:Y)

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	119.791	30.8	13.0	8.4	27.4	24.8	43.5	18.7	278	75
2	311.615	34.6	15.0	10.0	27.3	32.3	46.0	13.7	153	254
3	324.078	33.2	15.4	10.2	27.5	31.3	46.0	14.7	148	181
4	528.355	34.4	19.0	11.3	28.6	36.1	46.0	9.9	148	139
5	603.834	35.8	19.9	11.8	28.8	38.7	46.0	7.3	143	111
6	679.314	35.7	20.6	12.2	28.8	39.7	46.0	6.3	123	116
----- Vertical ------										
7	118.414	31.0	12.8	8.4	27.5	24.7	43.5	18.8	100	148
8	311.615	38.3	15.0	10.0	27.3	36.0	46.0	10.0	100	156
9	324.080	34.6	15.4	10.2	27.5	32.7	46.0	13.3	100	166
10	528.355	34.0	19.0	11.3	28.6	35.7	46.0	10.3	100	178
11	603.835	29.7	19.9	11.8	28.8	32.6	46.0	13.4	100	182
12	679.314	29.3	20.6	12.2	28.8	33.3	46.0	12.7	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)

Radiated Spurious Emission (Type A)

DATA OF RADIATED EMISSION TEST

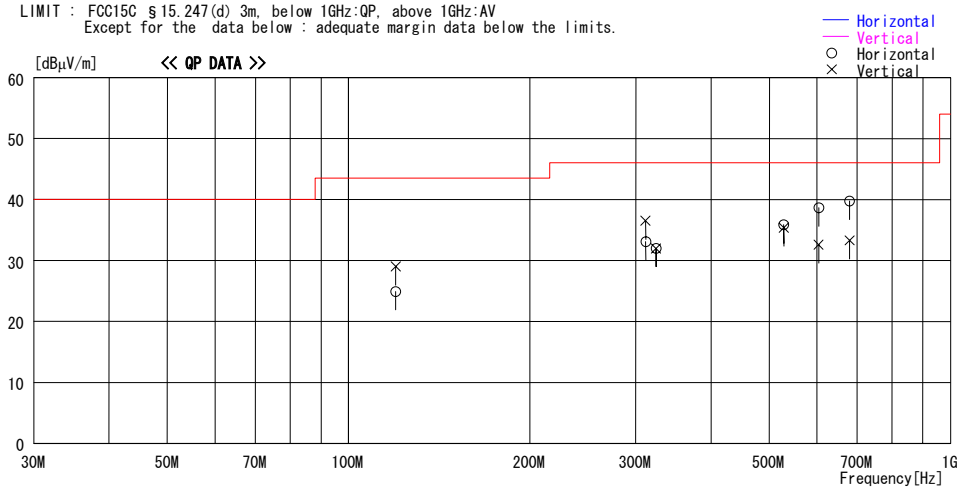
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber

Applicant : DENSO CORPORATION
Kind of EUT : Bluetooth Assy
Model No. : BTAU01A:TYPE A
Serial No. : No.5S-029

Report No. : 25GE0283-HO
Power : DC12V(BT DC3.3V)
Temp℃/Humi% : 24deg.C / 21%
Operator : Kenichi Adachi

Mode / Remarks : Tx 2480MHz EUT MAX (H:X , V:Y)

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



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	119.791	30.9	13.0	8.4	27.4	24.9	43.5	18.6	286	67
2	311.619	35.4	15.0	10.0	27.3	33.1	46.0	12.9	190	228
3	324.082	33.9	15.4	10.2	27.5	32.0	46.0	14.0	236	205
4	528.355	34.2	19.0	11.3	28.6	35.9	46.0	10.1	148	130
5	603.834	35.8	19.9	11.8	28.8	38.7	46.0	7.3	148	112
6	679.314	35.8	20.6	12.2	28.8	39.8	46.0	6.3	126	117
----- Vertical ------										
7	119.790	35.0	13.0	8.4	27.4	29.0	43.5	14.5	100	149
8	311.616	38.8	15.0	10.0	27.3	36.5	46.0	9.5	100	159
9	324.082	33.9	15.4	10.2	27.5	32.0	46.0	14.0	100	165
10	528.355	33.7	19.0	11.3	28.6	35.4	46.0	10.6	100	165
11	603.834	29.7	19.9	11.8	28.8	32.6	46.0	13.4	100	185
12	679.314	29.3	20.6	12.2	28.8	33.3	46.0	12.7	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)

Radiated Spurious Emission (Type A)

UL Apex Co., Ltd.	Head Office EMC Lab. No.1 Semi Anechoic Chamber		
COMPANY	DENSO CORPORATION	REPORT NO.	25GE0283-HO
EQUIPMENT	Bluetooth Assy	REGULATION	Fcc Part15 Subpart C 15.247(d)
MODEL	BTAU01A:TYPE A	TEST DISTANCE	3m (1GHz to 10GHz) / 1m (10GHz to 26.5GHz)
S/ N	No.5S-029	DATE	04/19/2005
POWER	DC 12V(BT DC3.3V)	TEMP /HUMIDITY	24 deg.C / 30 %
MODE	Bluetooth Tx 2402MHz		
AXIS	H: X-axis / V: Y-axis	ENGINEER	Kenichi Adachi

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

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.		Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]		HOR	VER	[dBuV/m	[dB]	
1	1660.05	54.2	54.8	26.08	-39.52	1.64	2.96				45.4	46.0	74.0	28.0	
2	1962.60	55.6	55.6	30.93	-39.30	1.79	3.25				52.3	52.3	74.0	21.7	
4	2389.86	67.1	56.0	30.98	-39.90	1.93	3.60				63.7	52.6	74.0	10.3	
5	2566.27	55.4	56.3	31.01	-40.18	1.97	3.74				51.9	52.8	74.0	21.2	
6	4804.28	57.7	56.8	34.92	-41.22	2.79	5.20	0.98			60.4	59.5	74.0	13.6	
7	7206.00	47.4	46.7	37.57	-40.45	3.47	6.48	0.36			54.8	54.1	74.0	19.2	
8	9608.00	44.8	45.7	36.27	-39.49	4.21	7.61	0.15			53.5	54.4	74.0	19.6	
9	12008.95	47.2	46.1	41.35	-39.58	5.05	8.59	0.14	-9.54		53.2	52.1	74.0	20.8	
10	14412.00	45.7	46.0	41.68	-41.01	5.99	9.60		-9.54		52.4	52.7	74.0	21.3	
11	16814.00	45.6	45.5	44.67	-41.69	6.66	10.35		-9.54		56.1	56.0	74.0	17.9	
13	19216.00	43.3	43.4	42.04	-40.27	7.67	11.02		-9.54		54.2	54.3	74.0	19.7	
14	21618.00	44.1	44.1	40.82	-35.37	7.29	12.00		-9.54		59.3	59.3	74.0	14.7	
15	24020.00	43.1	43.2	41.04	-32.89	9.15	12.41		-9.54		63.3	63.4	74.0	10.6	

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

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.	Dwell fac.	Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	HOR	VER	[dBuV/m]	[dB]	
1	1660.05	47.6	49.5	26.08	-39.52	1.64	2.96				38.8	40.7	54.0	13.3	
2	1962.60	50.3	51.5	30.93	-39.30	1.79	3.25				47.0	48.2	54.0	5.8	
4	2389.86	38.6	35.3	30.98	-39.90	1.93	3.60				35.2	31.9	54.0	18.8	
5	2566.27	49.4	50.6	31.01	-40.18	1.97	3.74				45.9	47.1	54.0	6.9	
6	4804.28	50.4	48.8	34.92	-41.22	2.79	5.20	0.98		-40.23	12.9	11.2	54.0	41.1	
7	7206.00	33.5	33.3	37.57	-40.45	3.47	6.48	0.36			40.9	40.7	54.0	13.1	
8	9608.00	31.3	31.6	36.27	-39.49	4.21	7.61	0.15			40.0	40.3	54.0	13.7	
9	12008.95	33.0	32.8	41.35	-39.58	5.05	8.59	0.14	-9.54		39.0	38.8	54.0	15.0	
10	14412.00	32.7	32.0	41.68	-41.01	5.99	9.60		-9.54		39.4	38.7	54.0	14.6	
11	16814.00	31.5	31.5	44.67	-41.69	6.66	10.35		-9.54		42.0	42.0	54.0	12.0	
13	19216.00	29.6	29.6	42.04	-40.27	7.67	11.02		-9.54		40.5	40.5	54.0	13.5	
14	21618.00	30.3	30.4	40.82	-35.37	7.29	12.00		-9.54		45.5	45.6	54.0	8.4	
15	24020.00	29.2	29.1	41.04	-32.89	9.15	12.41		-9.54		49.4	49.3	54.0	4.6	

AV. MEASUREMENTS (RBW: 100kHz , VBW:300kHz)

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	ATT.			Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]			HOR	VER	[dBuV/m]	[dB]	
0	2401.96	106.5	95.0	30.96	-39.92	1.71	3.61				102.9	91.4	-	-	carrier
3	2400.00	67.1	55.6	30.96	-39.91	1.93	3.61				63.7	52.2	82.9	19.2	

Ant F.=Antenna Factor // Amp G.=PreAmp Gain // Cable L.=Cable Loss // ATT.=Attenuator Loss (or Filter Loss)
Filter L.=Filter Loss // D.fac. = Distance Factor // Dwell fac. = Dwell Factor
CALCULATION RESULT = Reading + Ant.F. + Amp.G. + Cable L. + Cable L. + ATT + Other
ANT Type below 30MHz=Loop // 30-300MHz=Biconical // 300-1000MHz=Logperiodic // above 1000MHz=Horn
D.fac. Distance Factor(D.fac) = 20log(3/1.0) = 9.5dB // In the case of 1m of distance of an antenna and a sample
Dwell Fac. (DH5) Dwell Factor = 20 * LOG (((2.975 [ms] * (98.2 [times / 30s] /300)) / 100 [ms])) = -40.2305 dB (* [ ] : unit)
* Except for the above table : All other spurious emissions were less than 20dB for the limit.
* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
* In the frequency over the 5th harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

Radiated Spurious Emission (Type A)

UL Apex Co., Ltd.	Head Office EMC Lab. No.1 Semi Anechoic Chamber		
COMPANY	DENSO CORPORATION	REPORT NO.	25GE0283-HO
EQUIPMENT	Bluetooth Assy	REGULATION	Fcc Part15 Subpart C 15.247(d)
MODEL	BTAU01A:TYPE A	TEST DISTANCE	3m (1GHz to 10GHz) / 1m (10GHz to 26.5GHz)
S/ N	No.5S-029	DATE	04/19/2005
POWER	DC 12V(BT DC3.3V)	TEMP /HUMIDITY	24 deg.C / 30 %
MODE	Bluetooth Tx 2441MHz		
AXIS	H: X-axis / V: Y-axis	ENGINEER	Kenichi Adachi

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

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.		Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]		HOR	VER	[dBuV/m	[dB]	
1	1660.56	53.9	55.9	26.09	-39.52	1.64	2.96				45.1	47.1	74.0	26.9	
2	1962.50	54.3	55.4	30.93	-39.30	1.79	3.25				51.0	52.1	74.0	21.9	
3	2383.91	57.2	49.6	30.98	-39.89	1.92	3.60				53.8	46.2	74.0	20.2	
4	2566.08	54.6	55.9	31.01	-40.18	1.97	3.74				51.1	52.4	74.0	21.6	
5	4881.87	60.4	62.8	35.35	-41.25	2.81	5.24	1.02			63.6	66.0	74.0	8.0	
6	7323.00	52.4	47.6	37.74	-40.36	3.51	6.54	0.53			60.4	55.6	74.0	13.6	
7	9764.00	47.4	45.7	36.26	-39.56	4.25	7.68	0.22			56.3	54.6	74.0	17.7	
8	12204.58	47.0	47.1	41.45	-39.78	5.13	8.68	0.29	-9.54		53.2	53.3	74.0	20.7	
9	14646.00	46.3	46.3	42.13	-40.93	6.05	9.70		-9.54		53.7	53.7	74.0	20.3	
10	17087.00	45.3	44.6	44.53	-41.84	6.75	10.39		-9.54		55.6	54.9	74.0	18.4	
11	19528.00	42.6	42.5	41.15	-39.84	7.84	11.15		-9.54		53.4	53.3	74.0	20.6	
12	21969.00	45.5	45.5	41.07	-35.90	7.12	12.15		-9.54		60.4	60.4	74.0	13.6	
13	24410.00	42.1	42.2	41.24	-33.76	9.08	12.47		-9.54		61.6	61.7	74.0	12.3	

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

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.	Dwell Fac.	Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	HOR	VER	[dBuV/m	[dB]	
1	1660.56	47.80	47.40	26.09	-39.52	1.64	2.96				39.0	38.6	54.0	15.0	
2	1962.50	49.90	50.70	30.93	-39.30	1.79	3.25				46.6	47.4	54.0	6.6	
3	2383.91	38.10	35.70	30.98	-39.89	1.92	3.60				34.7	32.3	54.0	19.3	
4	2566.08	44.10	51.40	31.01	-40.18	1.97	3.74				40.6	47.9	54.0	6.1	
5	4881.87	52.61	55.70	35.35	-41.25	2.81	5.24	1.02		-40.23	15.6	18.6	54.0	35.4	
6	7323.00	38.30	34.10	37.74	-40.36	3.51	6.54	0.53			46.3	42.1	54.0	7.7	
7	9764.00	35.30	33.80	36.26	-39.56	4.25	7.68	0.22			44.2	42.7	54.0	9.8	
8	12204.58	33.20	33.20	41.45	-39.78	5.13	8.68	0.29	-9.54		39.4	39.4	54.0	14.6	
9	14646.00	33.00	32.00	42.13	-40.93	6.05	9.70		-9.54		40.4	39.4	54.0	13.6	
10	17087.00	31.20	31.30	44.53	-41.84	6.75	10.39		-9.54		41.5	41.6	54.0	12.4	
11	19528.00	29.10	32.10	41.15	-39.84	7.84	11.15		-9.54		39.9	42.9	54.0	11.1	
12	21969.00	32.00	29.10	41.07	-35.90	7.12	12.15		-9.54		46.9	44.0	54.0	7.1	
13	24410.00	29.20	29.10	41.24	-33.76	9.08	12.47		-9.54		48.7	48.6	54.0	5.3	

Ant F.=Antenna Factor // Amp G.=PreAmp Gain // Cable L.=Cable Loss // ATT.=Attenuator Loss (or Filter Loss)
Filter L.=Filter Loss // D.fac. = Distance Factor // Dwell fac. = Dwell Factor
CALCULATION RESULT = Reading + Ant.F. + Amp.G. + Cable L. + Cable L. + ATT + Other
ANT Type below 30MHz=Loop // 30-300MHz=Biconical // 300-1000MHz=Logperiodic // above 1000MHz=Horn
D.fac. Distance Factor(D.fac) = 20log(3/1.0) = 9.5dB // In the case of 1m of distance of an antenna and a sample
Dwell Fac. (DH5) Dwell Factor = 20 * LOG (((2.975 [ms] * (98.2 [times / 30s] /300)) / 100 [ms])) = -40.2305 dB (* [ ] : unit)
* Except for the above table : All other spurious emissions were less than 20dB for the limit.
* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
* In the frequency over the 5th harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

Radiated Spurious Emission (Type A)

	UL Apex Co., Ltd.		Head Office EMC Lab. No.1 Semi Anechoic Chamber												
	COMPANY		DENSO CORPORATION						REPORT NO.		25GE0283-HO				
	EQUIPMENT		Bluetooth Assy						REGULATION		Fcc Part15 Subpart C 15.247(d)				
	MODEL		BTAU01A:TYPE A						TEST DISTANCE		3m (1GHz to 10GHz) / 1m (10GHz to 26.5GHz)				
	S/ N		No.5S-029						DATE		04/19/2005				
	POWER		DC 12V(BT DC3.3V)						TEMP /HUMIDITY		24 deg.C / 30 %				
	MODE		Bluetooth Tx 2480MHz												
	AXIS		H: X-axis / V: Y-axis						ENGINEER		Kenichi Adachi				

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

No.	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.		Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]		HOR	VER	[dBuV/m]	[dB]	
1	1660.64	54.5	56.8	26.09	-39.52	1.64	2.96				45.7	48.0	74.0	26.0	
2	1811.28	54.2	53.7	28.51	-39.41	1.71	3.11				48.1	47.6	74.0	25.9	
3	1962.51	55.1	55.3	30.93	-39.30	1.79	3.25				51.8	52.0	74.0	22.0	
4	2483.52	75.7	74.4	30.84	-40.05	1.93	3.68				72.1	70.8	74.0	1.9	
5	4959.97	60.5	55.6	35.78	-41.27	2.83	5.29	1.05			64.2	59.3	74.0	9.8	
6	7437.82	52.1	48.9	37.92	-40.28	3.55	6.60	0.68			60.6	57.4	74.0	13.4	
7	9917.50	50.5	44.7	36.25	-39.62	4.30	7.75	0.28			59.5	53.7	74.0	14.5	
8	12399.96	47.3	47.3	41.54	-39.98	5.22	8.76	0.43	-9.54		53.7	53.7	74.0	20.3	
9	14880.00	45.9	46.0	42.56	-40.86	6.11	9.79		-9.54		54.0	54.1	74.0	19.9	
10	17360.00	46.4	46.5	44.39	-41.62	6.83	10.43		-9.54		56.9	57.0	74.0	17.0	
11	19840.00	42.4	42.5	41.19	-39.40	8.01	11.27		-9.54		53.9	54.0	74.0	20.0	
12	22320.00	45.5	45.6	41.36	-35.26	7.43	12.20		-9.54		61.7	61.8	74.0	12.2	
13	24800.00	43.4	43.4	41.22	-34.62	9.02	12.53		-9.54		62.0	62.0	74.0	12.0	

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

No.	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.	Dwell fac.	Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	HOR	VER	[dBuV/m]	[dB]	
1	1660.64	47.60	52.30	26.09	-39.52	1.64	2.96				38.8	43.5	54.0	10.5	
2	1811.28	47.20	47.30	28.51	-39.41	1.71	3.11				41.1	41.2	54.0	12.8	
3	1962.51	50.80	50.40	30.93	-39.30	1.79	3.25				47.5	47.1	54.0	6.5	
4	2483.52	49.40	48.20	30.84	-40.05	1.93	3.68				45.8	44.6	54.0	8.2	
5	4959.97	53.14	48.53	35.78	-41.27	2.83	5.29	1.05		-40.23	16.6	12.0	54.0	37.4	
6	7437.82	38.70	34.00	37.92	-40.28	3.55	6.60	0.68			47.2	42.5	54.0	6.8	
7	9917.50	37.20	32.80	36.25	-39.62	4.30	7.75	0.28			46.2	41.8	54.0	7.8	
8	12399.96	33.50	33.60	41.54	-39.98	5.22	8.76	0.43	-9.54		39.9	40.0	54.0	14.0	
9	14880.00	32.20	32.30	42.56	-40.86	6.11	9.79		-9.54		40.3	40.4	54.0	13.6	
10	17360.00	32.00	32.10	44.39	-41.62	6.83	10.43		-9.54		42.5	42.6	54.0	11.4	
11	19840.00	28.80	29.00	41.19	-39.40	8.01	11.27		-9.54		40.3	40.5	54.0	13.5	
12	22320.00	31.90	32.00	41.36	-35.26	7.43	12.20		-9.54		48.1	48.2	54.0	5.8	
13	24800.00	29.90	30.00	41.22	-34.62	9.02	12.53		-9.54		48.5	48.6	54.0	5.4	

Ant F.=Antenna Factor // Amp G.=PreAmp Gain // Cable L.=Cable Loss // ATT.=Attenuator Loss (or Filter Loss)
Filter L.=Filter Loss // D.fac. = Distance Factor // Dwell fac. = Dwell Factor
CALCULATION RESULT = Reading + Ant.F. + Amp.G. + Cable L. + Cable L. + ATT + Other
ANT Type below 30MHz=Loop // 30-300MHz=Biconical // 300-1000MHz=Logperiodic // above 1000MHz=Horn
D.fac. Distance Factor(D.fac) = 20log(3/1.0) = 9.5dB // In the case of 1m of distance of an antenna and a sample
Dwell Fac. (DH5) Dwell Factor = 20 * LOG(((2.975 [ms] * (98.2 [times / 30s] /300)) / 100 [ms])) = -40.23046 dB (* [ ] : unit)
* Except for the above table : All other spurious emissions were less than 20dB for the limit.
* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
* In the frequency over the 5th harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

Radiated Spurious Emission (Type B) (Reference data)

	UL Apex Co., Ltd.		Head Office EMC Lab. No.1 Semi Anechoic Chamber													
	COMPANY		DENSO CORPORATION							REPORT NO.		25GE0283-HO				
	EQUIPMENT		Bluetooth Assy							REGULATION		Fcc Part15 Subpart C 15.247(d)				
	MODEL		BTAU02A:TYPE B							TEST DISTANCE		3m (1GHz to 10GHz) / 1m (10GHz to 26.5GHz)				
	S/N		No.5S-033							DATE		04/19/2005				
	POWER		DC 12V(BT DC3.3V)							TEMP /HUMIDITY		24 deg.C / 30 %				
	MODE		Bluetooth Tx 2402MHz													
	AXIS	EUT	H: X-axis / V: Y-axis							ENGINEER		Kenichi Adachi				
		Antenna	H: X-axis / V: Z-axis													

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

No.	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.		Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]		HOR	VER	[dBuV/m]	[dB]	
1	1660.64	50.6	51.4	26.09	-39.52	1.64	2.96				41.8	42.6	74.0	31.4	
2	1811.45	53.9	55.0	28.51	-39.41	1.71	3.11				47.8	48.9	74.0	25.1	
4	1962.50	53.5	54.2	30.93	-39.30	1.79	3.25				50.2	50.9	74.0	23.1	
5	2566.00	56.9	52.9	31.01	-40.18	1.97	3.74				53.4	49.4	74.0	20.6	
6	4807.64	53.9	58.5	34.93	-41.22	2.79	5.20	0.99			56.6	61.2	74.0	12.8	
7	7206.00	47.2	46.6	37.57	-40.45	3.47	6.48	0.36			54.6	54.0	74.0	19.4	
8	9608.00	45.7	45.3	36.27	-39.49	4.21	7.61	0.15			54.4	54.0	74.0	19.6	

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

No.	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.	Dwell fac.	Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	HOR	VER	[dBuV/m]	[dB]	
1	1660.64	40.2	39.0	26.09	-39.52	1.64	2.96				31.4	30.2	54.0	22.6	
2	1811.45	47.9	50.1	28.51	-39.41	1.71	3.11				41.8	44.0	54.0	10.0	
4	1962.50	47.6	49.0	30.93	-39.30	1.79	3.25				44.3	45.7	54.0	8.3	
5	2566.00	43.9	44.0	31.01	-40.18	1.97	3.74				40.4	40.5	54.0	13.5	
6	4807.64	45.6	50.8	34.93	-41.22	2.79	5.20	0.99		-40.23	8.1	13.3	54.0	40.7	
7	7206.00	33.9	34.0	37.57	-40.45	3.47	6.48	0.36			41.3	41.4	54.0	12.6	
8	9608.00	31.8	32.1	36.27	-39.49	4.21	7.61	0.15			40.5	40.8	54.0	13.2	

AV. MEASUREMENTS (RBW: 100kHz , VBW:300kHz)

No.	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	ATT.			Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]			HOR	VER	[dBuV/m]	[dB]	
0	2401.98	104.1	105.0	30.96	-39.92	1.71	3.61				100.5	101.4	-	-	carrier
3	2400.00	64.6	65.4	30.96	-39.91	1.93	3.61				61.2	62.0	81.4	19.4	

Ant F.=Antenna Factor // Amp G.=PreAmp Gain // Cable L.=Cable Loss // ATT.=Attenuator Loss (or Filter Loss)
Filter L.=Filter Loss // D.fac. = Distance Factor // Dwell fac. = Dwell Factor
CALCULATION RESULT = Reading + Ant.F. + Amp.G. + Cable L. + Cable L. + ATT + Other
ANT Type below 30MHz=Loop // 30-300MHz=Biconical // 300-1000MHz=Logperiodic // above 1000MHz=Horn
D.fac. Distance Factor(D.fac) = 20log(3/1.0) = 9.5dB // In the case of 1m of distance of an antenna and a sample
Dwell Fac. (DH5) Dwell Factor = 20 * LOG (((2.975 [ms] * (98.2 [times / 30s] /300)) / 100 [ms])) = -40.23046 dB (* [ ] : unit)
* Except for the above table : All other spurious emissions were less than 20dB for the limit.
* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
* In the frequency over the 5th harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

Radiated Spurious Emission (Type B) (Reference data)

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

COMPANY	DENSO CORPORATION		REPORT NO.	25GE0283-HO
EQUIPMENT	Bluetooth Assy		REGULATION	Fcc Part15 Subpart C 15.247(d)
MODEL	BTAU02A:TYPE B		TEST DISTANCE	3m (1GHz to 10GHz) / 1m (10GHz to 26.5GHz)
S/ N	No.5S-033		DATE	04/19/2005
POWER	DC 12V(BT DC3.3V)		TEMP /HUMIDITY	24 deg.C / 30 %
MODE	Bluetooth Tx 2480MHz			
AXIS	EUT	H: X-axis / V: Y-axis	ENGINEER	Kenichi Adachi
	Antenna	H: X-axis / V: Z-axis		

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

No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.		Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]		HOR	VER	[dBuV/m	[dB]	
1	1660.47	52.2	52.1	26.09	-39.52	1.64	2.96				43.4	43.3	74.0	30.6	
2	1811.47	52.8	53.7	28.51	-39.41	1.71	3.11				46.7	47.6	74.0	26.4	
3	1962.63	52.4	55.8	30.93	-39.30	1.79	3.25				49.1	52.5	74.0	21.5	
4	2483.53	72.6	73.5	30.84	-40.05	1.93	3.68				69.0	69.9	74.0	4.1	
5	4959.98	58.3	55.9	35.78	-41.27	2.83	5.29	1.05			62.0	59.6	74.0	12.0	
6	7440.09	46.1	46.5	37.92	-40.27	3.55	6.60	0.69			54.6	55.0	74.0	19.0	
7	9919.95	45.9	45.6	36.25	-39.62	4.30	7.75	0.28			54.9	54.6	74.0	19.1	

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

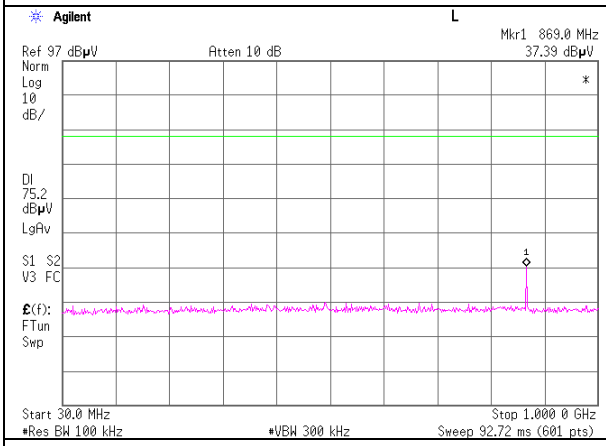
No	Freq.	Reading		Ant F.	Amp G.	Cable L.	Cable L.	Filter L.	D.fac.	Dwell fac.	Result [dBuV/m]		Limit	Margin	Remark
	[MHz]	HOR	VER	[dB/m]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	HOR	VER	[dBuV/m	[dB]	
1	1660.47	43.70	44.60	26.09	-39.52	1.64	2.96				34.9	35.8	54.0	18.2	
2	1811.47	46.20	48.10	28.51	-39.41	1.71	3.11				40.1	42.0	54.0	12.0	
3	1962.63	45.90	51.70	30.93	-39.30	1.79	3.25				42.6	48.4	54.0	5.6	
4	2483.53	45.90	46.60	30.84	-40.05	1.93	3.68				42.3	43.0	54.0	11.0	
5	4959.98	50.40	47.50	35.78	-41.27	2.83	5.29	1.05		-40.23	13.8	10.9	54.0	40.2	
6	7440.09	33.70	33.80	37.92	-40.27	3.55	6.60	0.69			42.2	42.3	54.0	11.7	
7	9919.95	32.3	32.6	36.25	-39.62	4.30	7.75	0.28			41.3	41.6	54.0	12.4	

Ant F.=Antenna Factor // Amp G.=PreAmp Gain // Cable L.=Cable Loss // ATT.=Attenuator Loss (or Filter Loss)
Filter L.=Filter Loss // D.fac. = Distance Factor // Dwell fac. = Dwell Factor
CALCULATION RESULT = Reading + Ant.F. + Amp.G. + Cable L. + Cable L. + ATT + Other
ANT Type below 30MHz=Loop // 30-300MHz=Biconical // 300-1000MHz=Logperiodic // above 1000MHz=Horn
D.fac. Distance Factor(D.fac) = 20log(3/1.0) = 9.5dB // In the case of 1m of distance of an antenna and a sample
Dwell Fac. (DH5) Dwell Factor = 20 * LOG (((2.975 [ms] * (98.2 [times / 30s] /300)) / 100 [ms])) = -40.2305 dB (* [ ] : unit)
* Except for the above table : All other spurious emissions were less than 20dB for the limit.
* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.
* In the frequency over the 5th harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

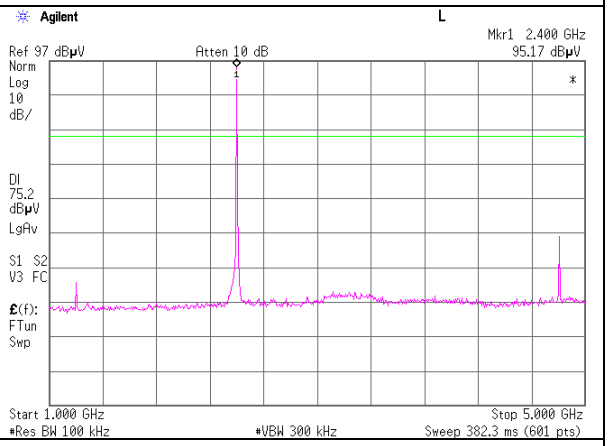
Conducted Spurious Emission (FHSS)

Ch:Low

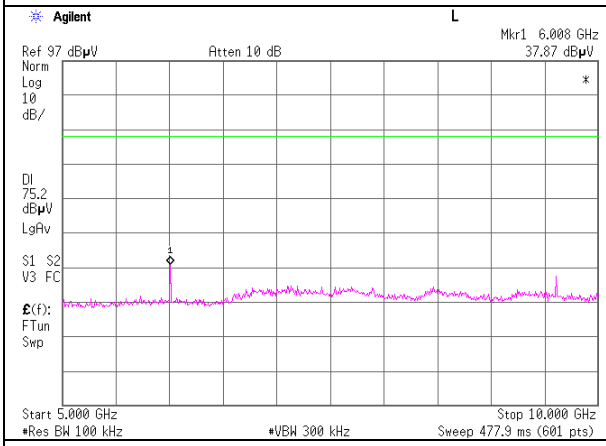
30MHz-1GHz



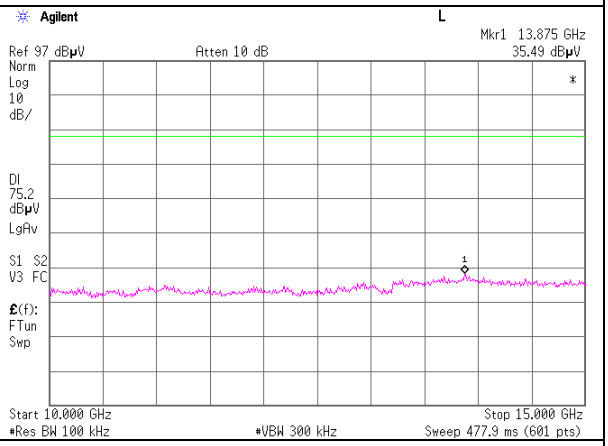
1GHz-5GHz



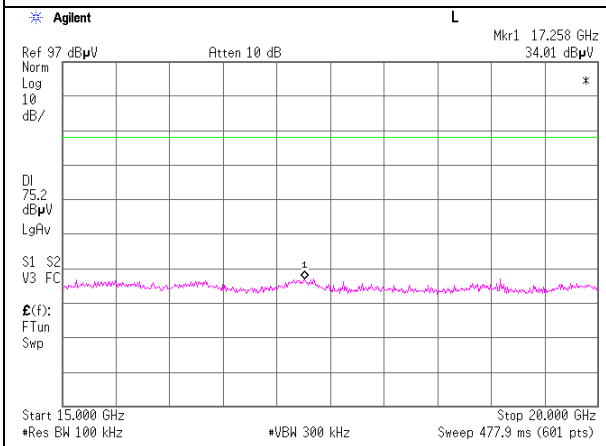
5GHz-10GHz



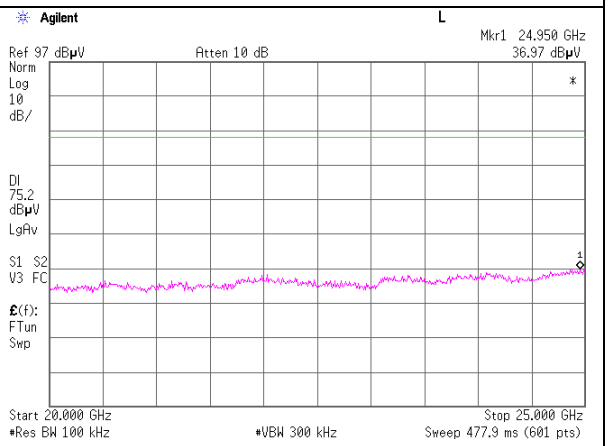
10GHz-15GHz



15GHz-20GHz



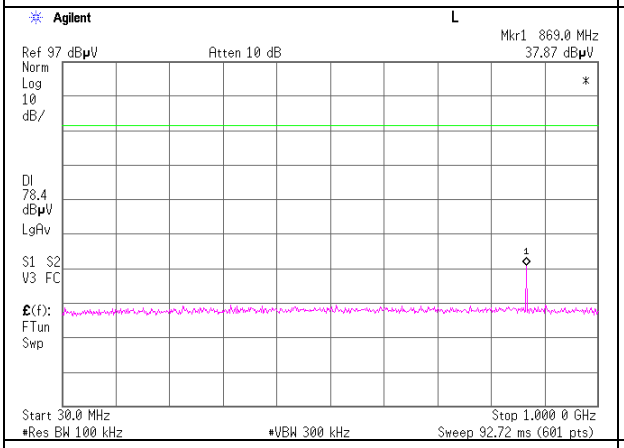
20GHz-25GHz



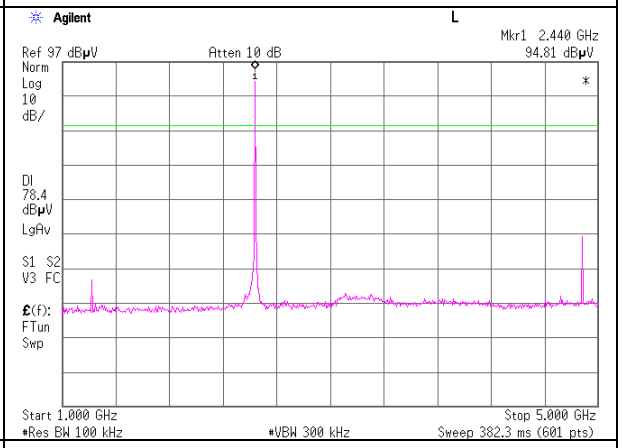
Conducted Spurious Emission (FHSS)

Ch:Mid

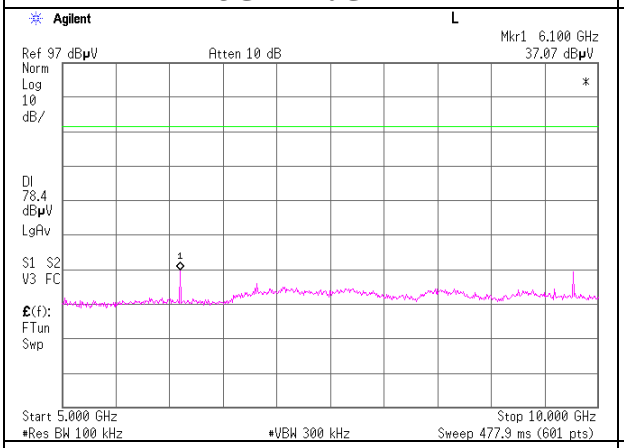
30MHz-1GHz



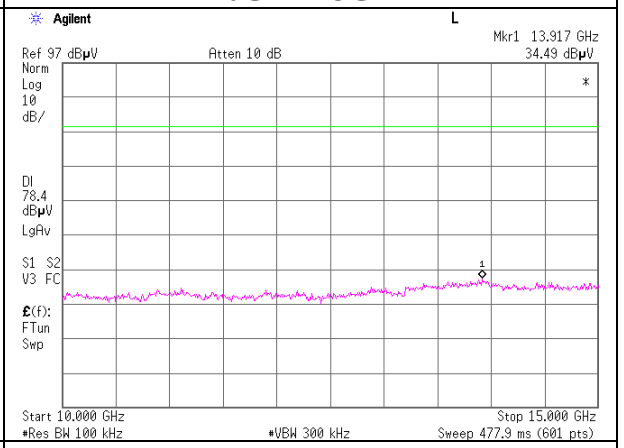
1GHz-5GHz



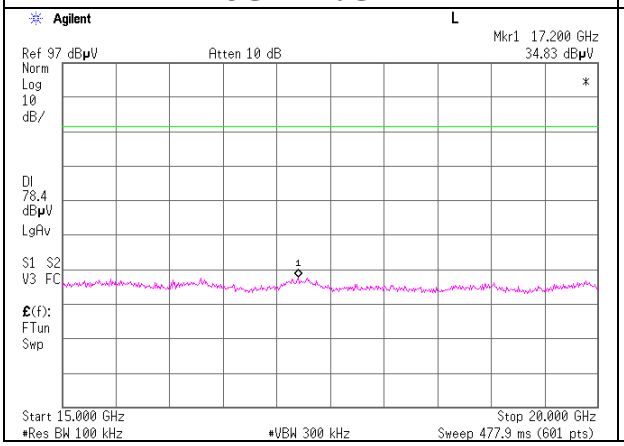
5GHz-10GHz



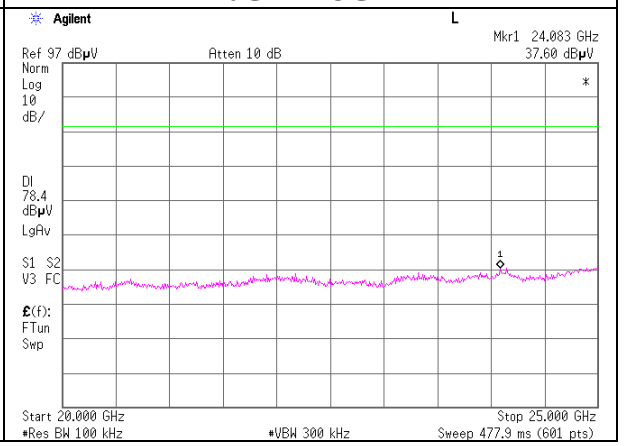
10GHz-15GHz



15GHz-20GHz



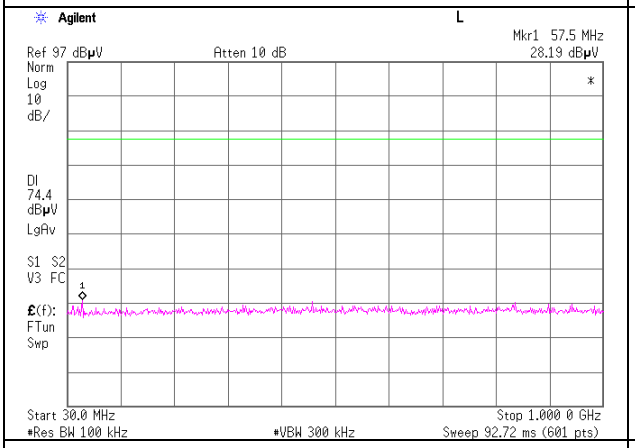
20GHz-25GHz



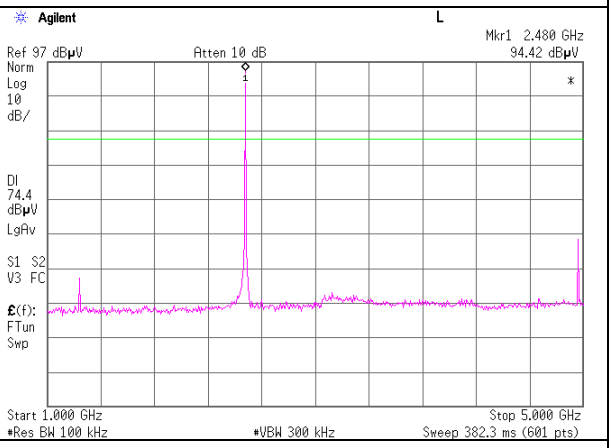
Conducted Spurious Emission (FHSS)

Ch:High

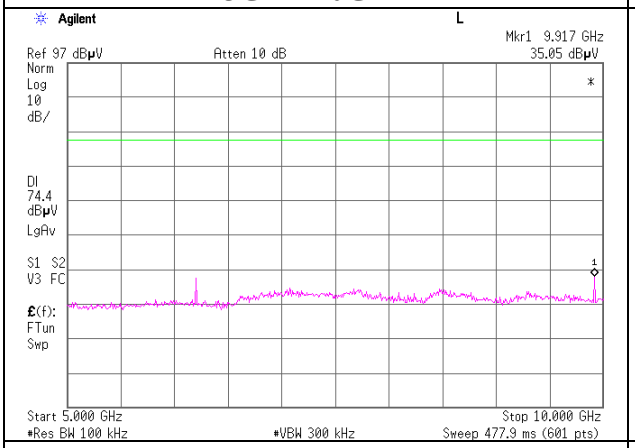
30MHz-1GHz



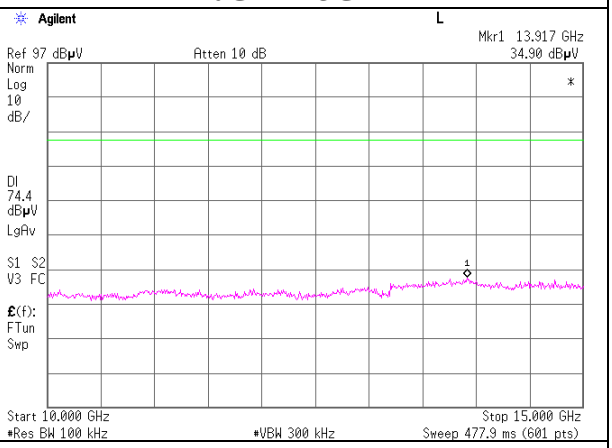
1GHz-5GHz



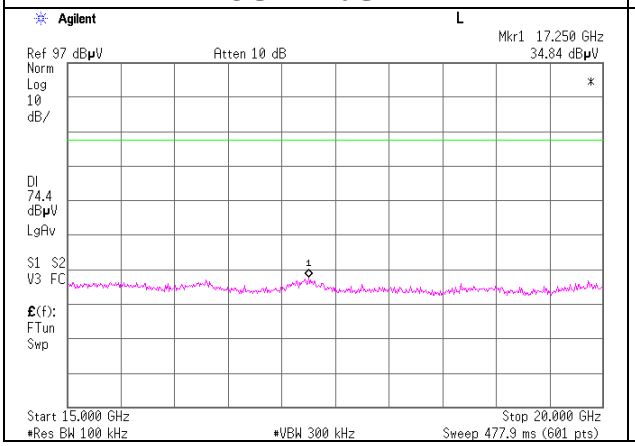
5GHz-10GHz



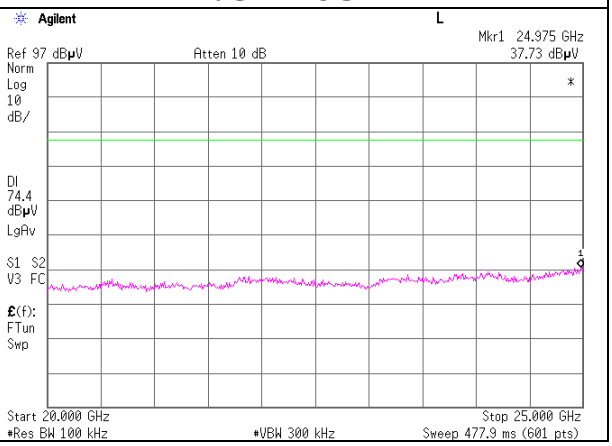
10GHz-15GHz



15GHz-20GHz



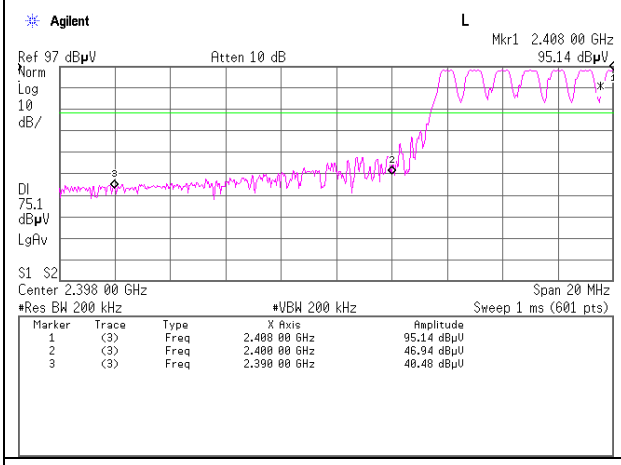
20GHz-25GHz



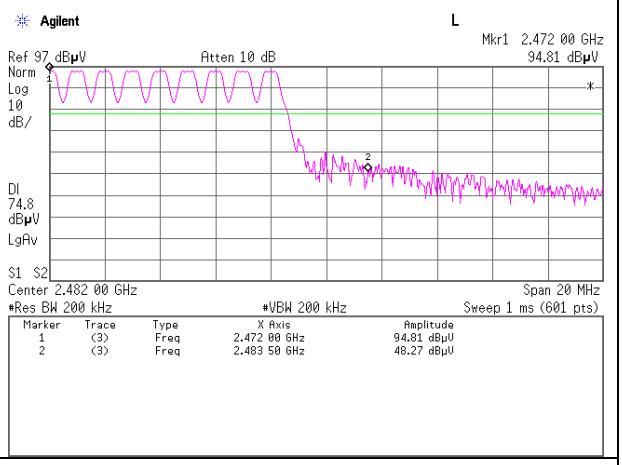
Conducted Spurious Emission (FHSS)

Band Edge compliance

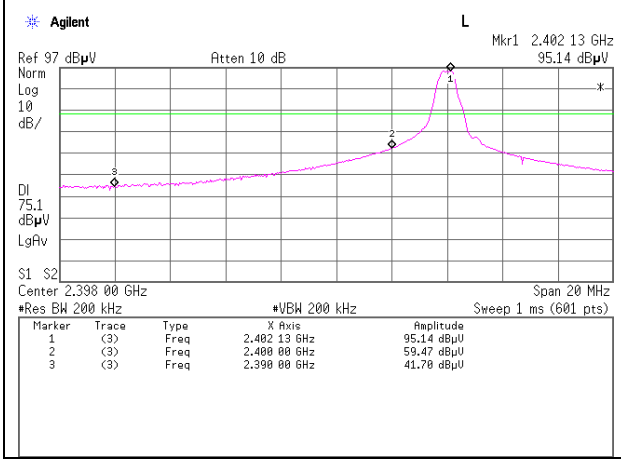
Hopping on (Ch:Low)



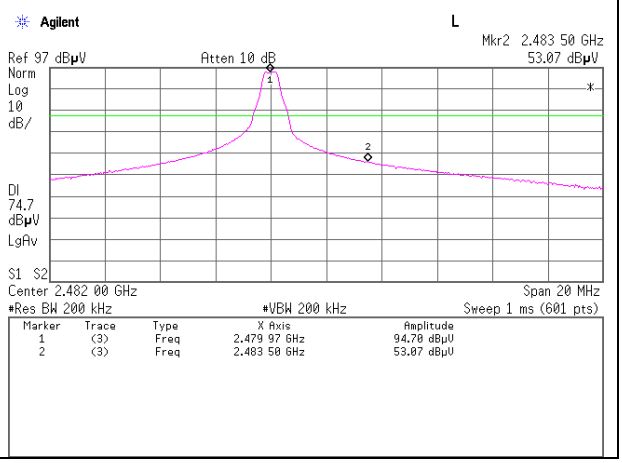
Hopping on (Ch:High)



Hopping off (Ch:Low)



Hopping off (Ch:High)



99% Occupied Bandwidth(FHSS)