RADIO TEST REPORT

Test Report No. : 11319287S-A-R2

Applicant	:	**Nintendo Co., Ltd.**
Type of Equipment	:	**Game Controller**
Model No.	:	**HAC-013**
FCC ID	:	**BKEHAC013**
Test regulation	:	**FCC Part 15 Subpart C: 2016**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11319287S-A-R1. 11319287S-A-R1 is replaced with this report.

Date of test: July 8 to 26, 2016

Representative test engineer:
Kenichi Adachi
Engineer
Consumer Technology Division

Approved by:
Akio Hayashi
Leader
Consumer Technology Division

RTL02610

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 11319287S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11319287S-A	October 24, 2016	-	-
1	11319287S-A-R1	December 26, 2016	- (full revision)	Update
2	11319287S-A-R2	January 19, 2017	4	Update reference report number

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Nintendo Co., Ltd.
Address	:	11-1 Hokotate-cho, Kamitoba, Minami-ku, Kyoto 601-8501, Japan
Telephone Number	:	+ 81 75 662 9600
Facsimile Number	:	+ 81 75 662 9624
Contact Person	:	Kazuya Kuramoto

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

2.1 Identification of E.U.T.

Type of Equipment	:	Game Controller
Model No.	:	HAC-013
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5.0 V(USB), DC 3.7 V (battery)
Receipt Date of Sample	:	July 8, 2016
Country of Mass-production	:	China
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: HAC-013 (referred to as the EUT in this report) is a Game Controller.

General Specification

Clock frequency(ies) in the system	:	Bluetooth: 24 MHz, NFC: 27.12 MHz

Radio Specification

[Bluetooth]

Radio Type	:	Transceiver
Frequency of Operation	:	2402 MHz - 2480 MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 1.8 V
Antenna type	:	Inverse-F
Antenna Gain	:	2.66 dBi
Operation temperature	:	+5 deg.C to +35 deg.C

[NFC] *1)

Radio Type	:	Transceiver
Frequency of Operation	:	13.56 MHz
Modulation	:	ASK
Power Supply (radio part input)	:	DC 1.8 V
Antenna type	:	Loop
Operation temperature	:	+5 deg.C to +35 deg.C

*1) Refer to test report no. 11319287S-B-R2.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The revision on November 14, 2016, does not affect the test specification applied to the EUT.
*The EUT has been tested for compliance with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013 6. Standard test methods **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**<Spec C>** **26.4 dB** **QP**, 0.16005 MHz, L1, DH5, Tx 2402MHz **and** **QP**, 0.16002 MHz, L1, 3-DH5, Tx 2402MHz **<Spec A>** **22.3 dB** **QP**, 0.16097 MHz, N, 3-DH5, Tx 2402MHz	Complied	-
Carrier Frequency Separation	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1) **IC:** RSS-247 5.1 (2)	See data.	Complied	Conducted
20 dB Bandwidth	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1) **IC:** RSS-247 5.1 (1)		Complied	Conducted
Number of Hopping Frequency	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1)(iii) **IC:** RSS-247 5.1 (4)		Complied	Conducted
Dwell time	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1)(iii) **IC:** RSS-247 5.1 (4)		Complied	Conducted
Maximum Peak Output Power	**FCC:** FCC Public Notice DA 00-705 **IC:** RSS-Gen 6.12	**FCC:** Section15.247(a)(b)(1) **IC:** RSS-247 5.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	**FCC:** FCC Public Notice DA 00-705 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	<Spec C> 6.0 dB 12010.00 MHz, AV, Vert., DH5, Tx 2402MHz <Spec A> 6.1 dB 12010.00 MHz, AV, Hori., 3-DH5, Tx 2402MHz	Complied	Conducted/ Radiated (above 30 MHz) *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on section 15.247(d).

* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

FCC Part 15.31 (e)

This EUT provides stable voltage (DC1.8 V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
99 % Occupied Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	N/A	-	Conducted

Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

Shonan EMC Lab.

Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.76 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	0.79 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.74 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.08 dB
Spurious emission (Conducted) below 1GHz	1.5 dB
Spurious emission (Conducted) 1 GHz-3 GHz	1.7 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.4 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.5 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.5 dB
Bandwidth Measurement	0.66 %
Duty cycle and Time Measurement	0.012 %

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

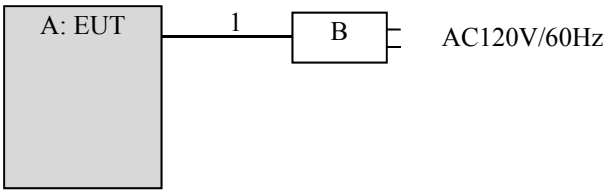
Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20 dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number of Hopping Frequency	Tx (Hopping On) DH5, 3DH5	-
Dwell time	Tx (Hopping On), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping Off) DH5, 2DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2480 MHz
99 % Occupied Bandwidth	Tx DH5, 3DH5 -Hopping On -Hopping Off	2402 MHz 2441 MHz 2480 MHz

*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)
* 2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.
* It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all the test items based on Bluetooth Core specification.

*EUT has the power settings by the software as follows;
Power settings: Fixed
Software: cmd.exe, Ver. 6.3.9600.17415,
Bluetool.exe, Ver.1.9.3.0
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Game Controller	HAC-013	A192, C338*1) A145, C278 *2)	Nintendo	EUT
B	AC Adapter	HAC-002	-	Nintendo	-

*1) Used for Antenna Terminal conducted test
*2) Used for Conducted Emission test and Radiated Emission test
*The EUT for final test was selected based on following preliminary test.
- Radiated Emission (below 1 GHz, Spec A): Worst mode of Spec C.
- Conducted Emission (Spec A): Worst mode of Spec C.
- Antenna Terminal Conducted test: Comparison of Spec A and Spec C on Output Power

Accessory and model differences
The differences between Spec A and Spec C are as following table.
These differences are compatible and are electrically identical having same radio parameters.
So, for the antenna terminal tests, the Spec C was used as a representative.

Parts	Manufacturer	
	Spec A	Spec C
Crystal Resonators for Bluetooth (X200)	Daishinku	Epson
Resistance for Bluetooth Antenna part (R203)	KAMAYA	Hokuriku
Capacitor for Bluetooth Antenna part (C205, C206)	MURATA	Taiyo
Coil for Bluetooth Antenna part (L200)	TDK	MURATA
Coil for Bluetooth Antenna part (L201)	TDK	MURATA
Crystal Resonators for NFC (X400)	Daishinku	Epson
Capacitor for NFC Antenna part (C412, C413, C414, C416, C417, C418, C419, C420, C421, C422, R400, R403)	MURATA	Taiyo
Coil for NFC Antenna part (L400, L401, L402, L403)	TDK	MURATA
Fuse (F1)	KAMAYA	SKYGATE
Fuse (F2)	KAMAYA	SKYGATE

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	AC	1.8	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.
The rear of tabletop was located 40 cm 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 80 cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via host device in a Shielded room.
The EUT via host device was connected to a LISN (AMN).
An overview sweep with peak detection has been performed.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Detector	**: QP and CISPR AV**
Measurement range	**: 0.15 MHz - 30 MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission

Test Procedure

[For below 1GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1GHz]
EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The height of the measuring antenna varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The measurements were made with the following detector function of the test receiver and 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.

Test Antennas are used as below;

Frequency	Below 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

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

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	RBW: 1 MHz VBW: 10 Hz *1)	RBW: 100 kHz VBW: 300 kHz
Test Distance	3 m	4.4 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26.5 GHz)		4.4 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26.5 GHz)

*1) Although DA 00-705 accepts VBW = 10 Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.
*2) Distance Factor: 20 x log (4.4 m/3.0 m) = 3.33 dB
*2) Distance Factor: 20 x log (1.0 m/3.0 m) = -9.5 dB

- 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.

Antenna polarization	Carrier	Spurious (Below 1 GHz)	Spurious (1 GHz - 13 GHz)	Spurious (Above 13 GHz)
Horizontal	X	X	Y	X
Vertical	Z	Y	Z	X

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 30 MHz - 26.5 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20 dB Bandwidth	3 MHz	30 kHz	100 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to Display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Sample	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 160 MHz BW)
Carrier Frequency Separation	3 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30 MHz	300 kHz	1 MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100 kHz, 1 MHz	300 kHz, 3 MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *2)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				
	30 MHz to 25 GHz	100 kHz	300 kHz				
Conducted Spurious Emission Band Edge compliance	10 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100 %.
*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.
(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)
*3) Reference data

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

<Spec C>

DATA OF CONDUCTED EMISSION TEST

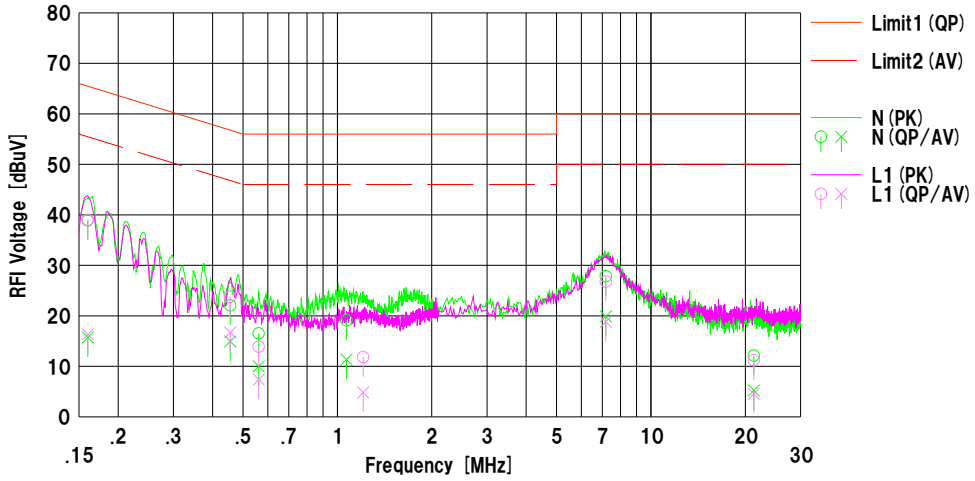
UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2016/07/26

Company : Nintendo Co., Ltd.
Kind of EUT : Full Keyboard controller
Model No. : HAC-013
Serial No. : C278
Remarks :

Mode : Tx, Bluetooth DH5 2402 MHz
Order No. : 11319287S
Power : AC 120 V / 60 Hz (AC adapter input)
Temp./Humi. : 25 deg.C / 61 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Kenichi Adachi



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		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16005	26.49	3.34	12.39	38.88	15.73	65.46	55.46	26.5	39.7	N	
2	0.45552	9.65	2.53	12.40	22.05	14.93	56.77	46.77	34.7	31.8	N	
3	0.56110	4.11	-2.42	12.41	16.52	9.99	56.00	46.00	39.4	36.0	N	
4	1.06910	6.64	-1.12	12.46	19.10	11.34	56.00	46.00	36.9	34.6	N	
5	7.18509	15.08	7.13	12.75	27.83	19.88	60.00	50.00	32.1	30.1	N	
6	21.29544	-1.21	-8.12	13.33	12.12	5.21	60.00	50.00	47.8	44.7	N	
7	0.16005	26.64	3.92	12.39	39.03	16.31	65.46	55.46	26.4	39.1	L1	
8	0.45552	11.34	4.33	12.40	23.74	16.73	56.77	46.77	33.0	30.0	L1	
9	0.56110	1.48	-5.02	12.41	13.89	7.39	56.00	46.00	42.1	38.6	L1	
10	1.20853	-0.64	-7.65	12.47	11.83	4.82	56.00	46.00	44.1	41.1	L1	
11	7.18509	14.03	6.04	12.75	26.78	18.79	60.00	50.00	33.2	31.2	L1	
12	21.29544	-2.12	-8.78	13.33	11.21	4.55	60.00	50.00	48.7	45.4	L1	

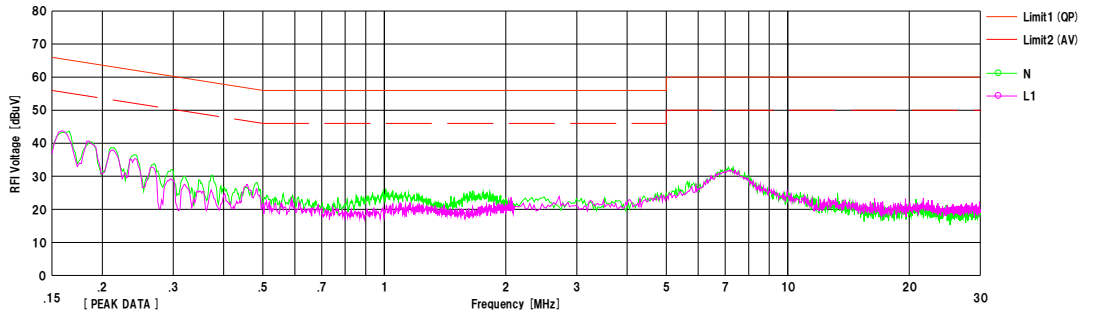
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-02 (with extended cable)

Conducted Emission

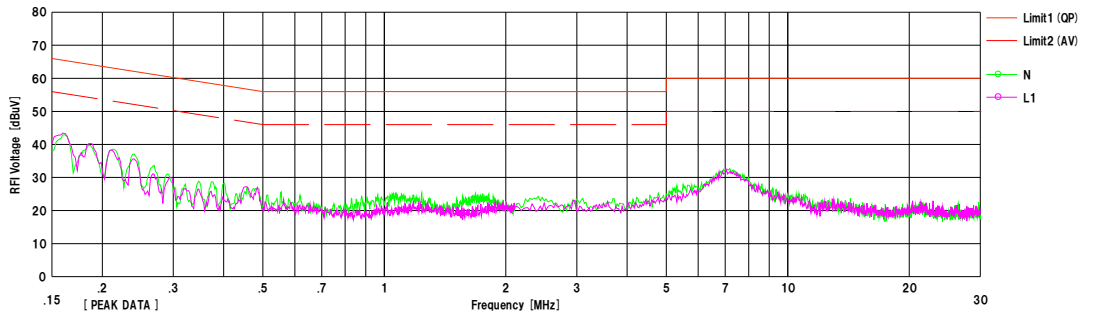
Test place	Shonan EMC Lab. No.3 Shilded room
Report No.	11319287S-A-R2
Date	July 26, 2016
Temperature / Humidity	25 deg. C / 61 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5

<Spec C>

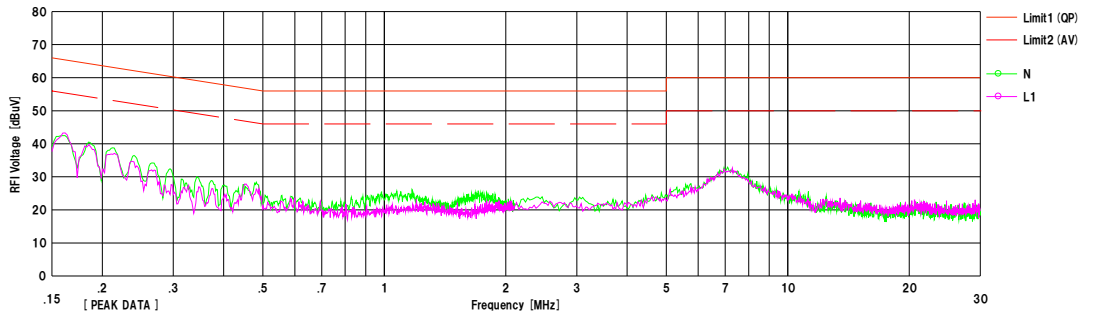
2402 MHz



2441 MHz



2480 MHz



<Spec C>

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Serial No. : C278
Remarks :

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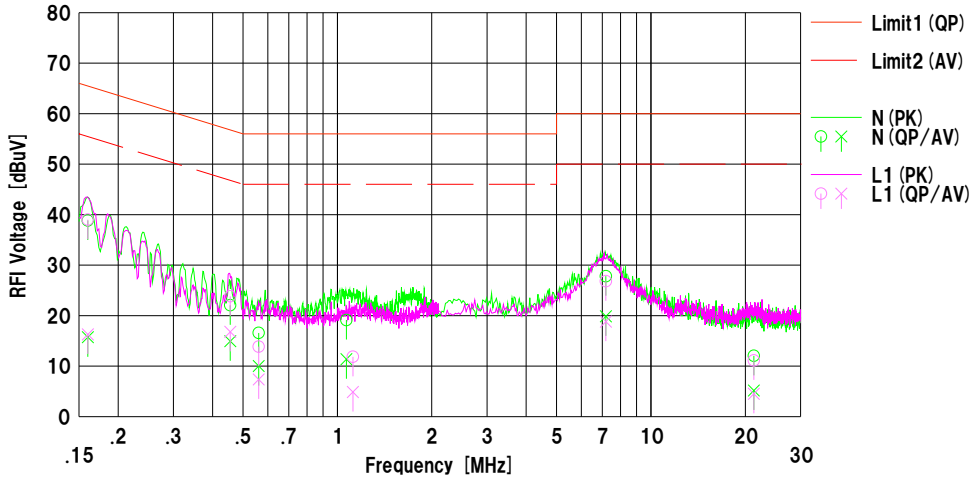
Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Kenichi Adachi



No.	Freq.	Reading <QP>	Reading <AV>	C.Fac	Results <QP>	Results <AV>	Limit <QP>	Limit <AV>	Margin <QP>	Margin <AV>	Phase	Comment
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16002	26.45	3.32	12.39	38.84	15.71	65.46	55.46	26.6	39.7	N	
2	0.45553	9.64	2.52	12.40	22.04	14.92	56.77	46.77	34.7	31.8	N	
3	0.56123	4.16	-2.40	12.41	16.57	10.01	56.00	46.00	39.4	35.9	N	
4	1.06885	6.66	-1.10	12.46	19.12	11.36	56.00	46.00	36.8	34.6	N	
5	7.18490	15.07	7.11	12.75	27.82	19.86	60.00	50.00	32.1	30.1	N	
6	21.29367	-1.28	-8.16	13.33	12.05	5.17	60.00	50.00	47.9	44.8	N	
7	0.16002	26.62	3.89	12.39	39.01	16.28	65.46	55.46	26.4	39.1	L1	
8	0.45553	11.43	4.38	12.40	23.83	16.78	56.77	46.77	32.9	29.9	L1	
9	0.56123	1.46	-5.05	12.41	13.87	7.36	56.00	46.00	42.1	38.6	L1	
10	1.12091	-0.61	-7.60	12.46	11.85	4.86	56.00	46.00	44.1	41.1	L1	
11	7.18490	14.05	6.07	12.75	26.80	18.82	60.00	50.00	33.2	31.1	L1	
12	21.29367	-2.20	-8.82	13.33	11.13	4.51	60.00	50.00	48.8	45.4	L1	

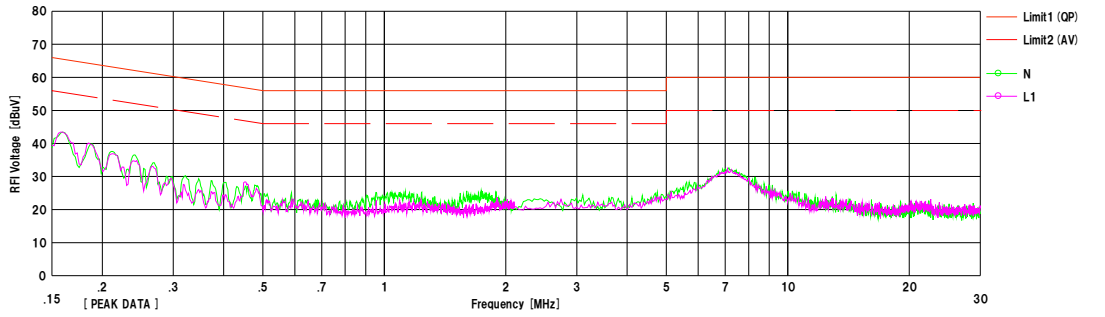
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-02 (with extended cable)

Conducted Emission

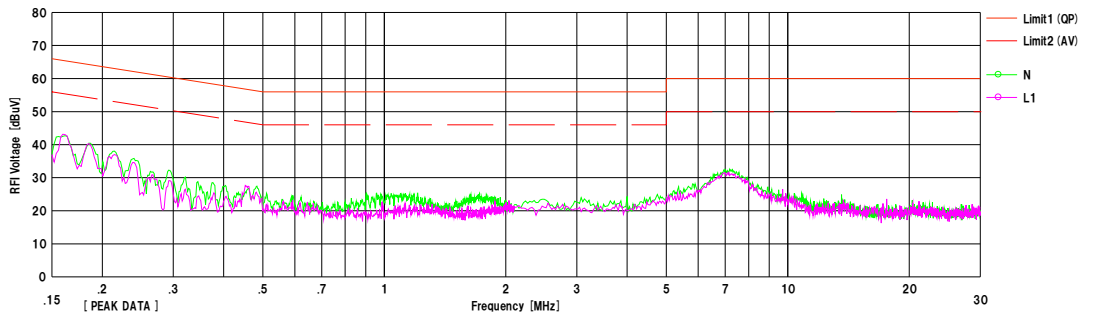
Test place	Shonan EMC Lab. No.3 Shilded room
Report No.	11319287S-A-R2
Date	July 26, 2016
Temperature / Humidity	25 deg. C / 61 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5

<Spec C>

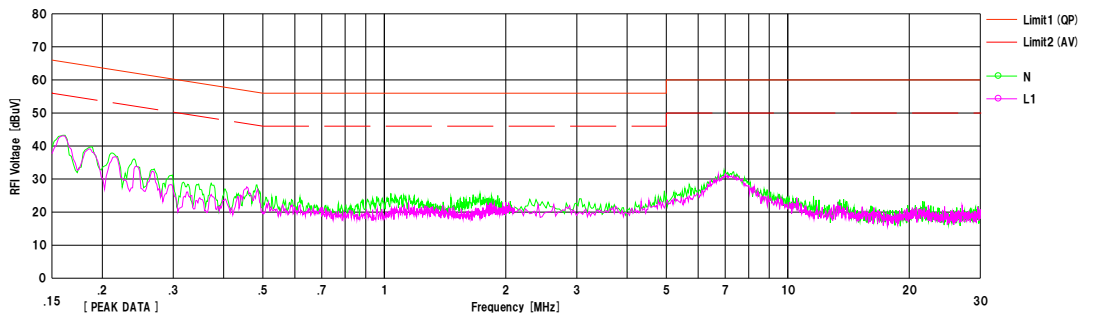
2402 MHz



2441 MHz



2480 MHz



Conducted Emission

<Spec A>

DATA OF CONDUCTED EMISSION TEST

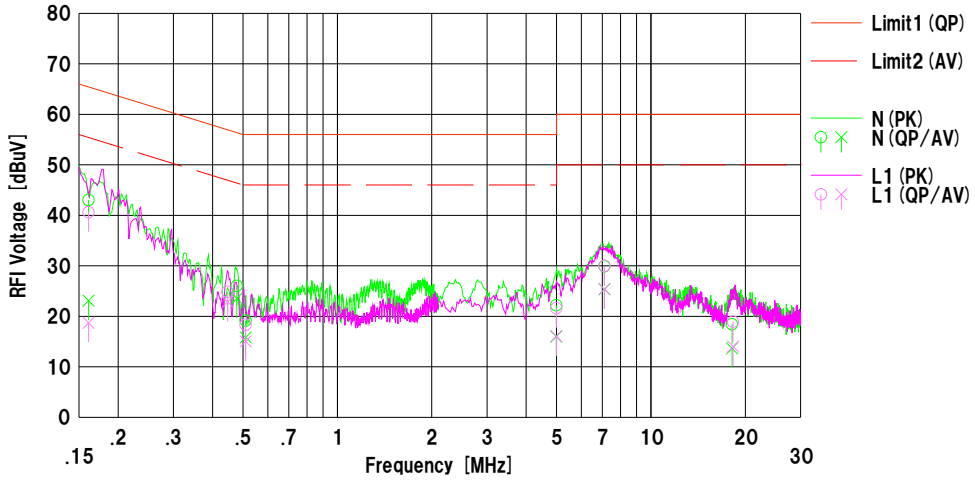
UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2016/07/26

Company : Nintendo Co., Ltd.
Kind of EUT : Full Keyboard controller
Model No. : HAC-013
Serial No. : A145
Remarks :

Mode : Tx, Bluetooth 3-DH5 2402 MHz
Order No. : 11319287S
Power : AC 120 V / 60 Hz (AC adapter input)
Temp./Humi. : 25 deg.C / 61 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Kenichi Adachi



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16097	30.65	10.72	12.39	43.04	23.11	65.41	55.41	22.3	32.3	N	
2	0.47772	13.62	11.12	12.40	26.02	23.52	56.38	46.38	30.3	22.8	N	
3	0.50965	6.75	3.42	12.40	19.15	15.82	56.00	46.00	36.8	30.1	N	
4	4.99258	9.52	3.31	12.67	22.19	15.98	56.00	46.00	33.8	30.0	N	
5	7.10788	17.16	12.60	12.75	29.91	25.35	60.00	50.00	30.0	24.6	N	
6	18.14025	5.22	0.44	13.20	18.42	13.64	60.00	50.00	41.5	36.3	N	
7	0.16097	28.23	6.32	12.39	40.62	18.71	65.41	55.41	24.7	36.7	L1	
8	0.44672	12.44	10.42	12.41	24.85	22.83	56.94	46.94	32.0	24.1	L1	
9	0.50964	5.94	2.63	12.40	18.34	15.03	56.00	46.00	37.6	30.9	L1	
10	4.99254	8.93	3.42	12.67	21.60	16.09	56.00	46.00	34.4	29.9	L1	
11	7.10788	17.22	12.61	12.75	29.97	25.36	60.00	50.00	30.0	24.6	L1	
12	18.28732	5.74	0.82	13.20	18.94	14.02	60.00	50.00	41.0	35.9	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-02 (with extended cable)

20 dB Bandwidth and Carrier Frequency Separation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off,

<Spec C>

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.967	1.005	>= 0.645
DH5	2441.0	0.967	1.003	>= 0.645
DH5	2480.0	0.973	1.003	>= 0.649
3DH5	2402.0	1.319	1.005	>= 0.879
3DH5	2441.0	1.316	1.003	>= 0.877
3DH5	2480.0	1.330	1.003	>= 0.887

Limit: Two-thirds of 20 dB Bandwidth or 25 kHz (whichever is greater).
No limit applies to 20 dB Bandwidth.

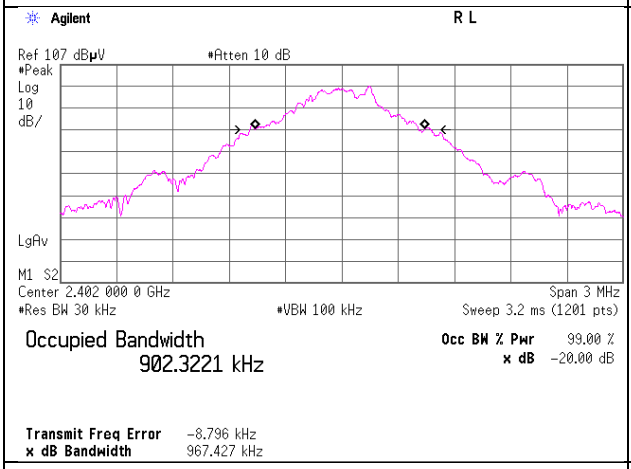
20 dB Bandwidth and Carrier Frequency Separation

<Spec C>

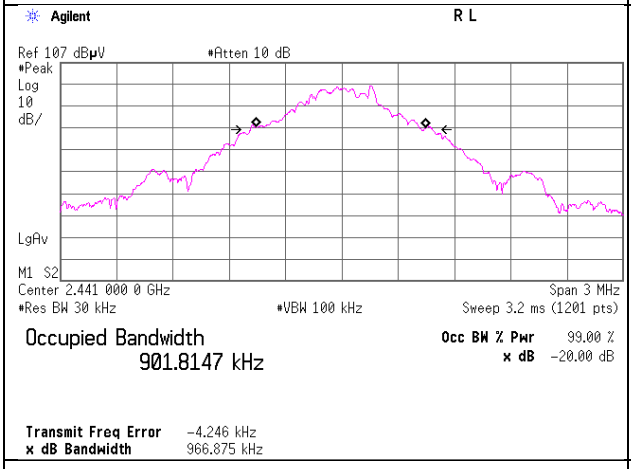
DH5

20 dB Bandwidth

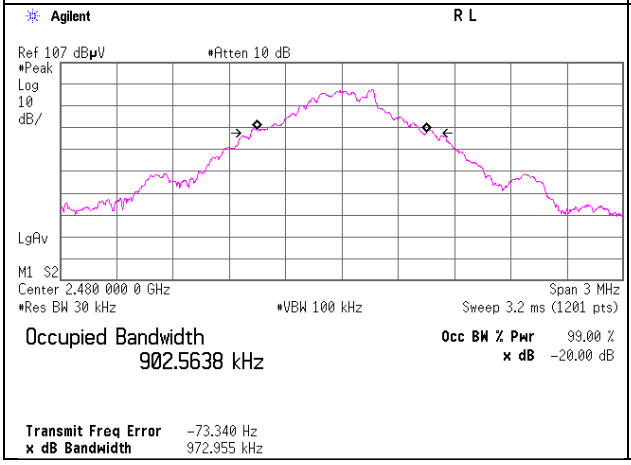
2402 MHz



2441 MHz

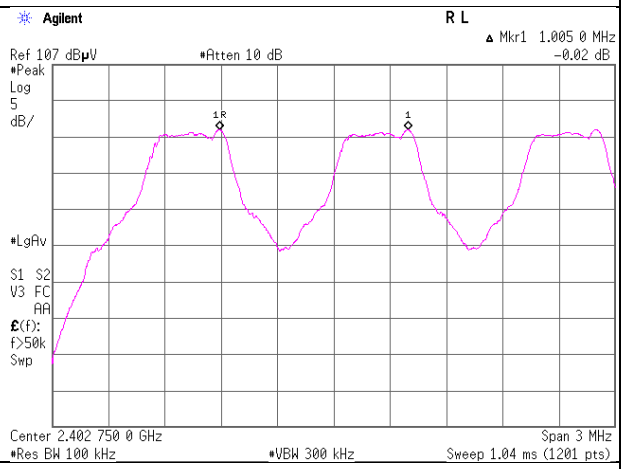


2480 MHz

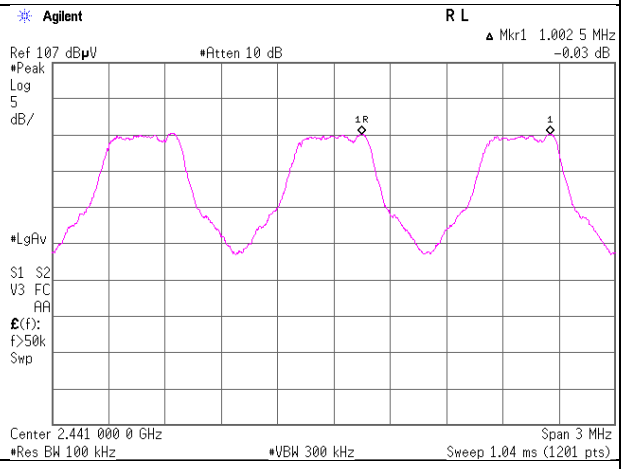


Carrier Frequency Separation

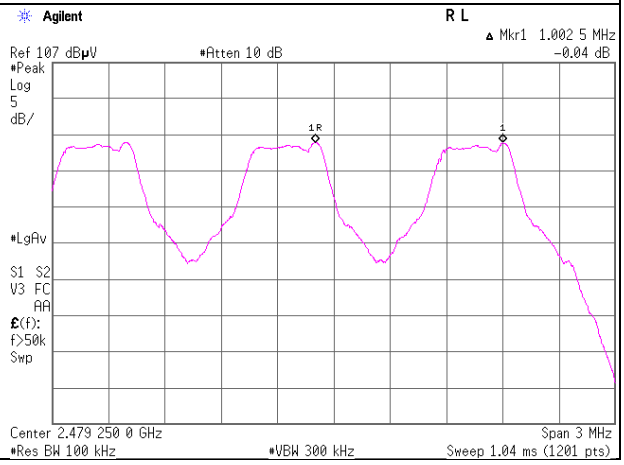
2402 MHz



2441 MHz



2480 MHz



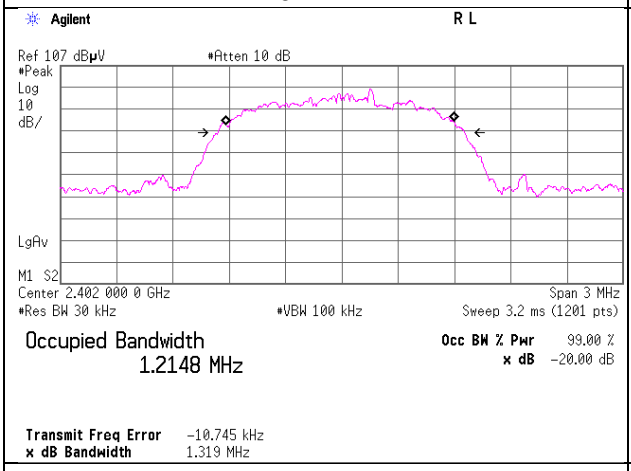
20 dB Bandwidth and Carrier Frequency Separation

<Spec C>

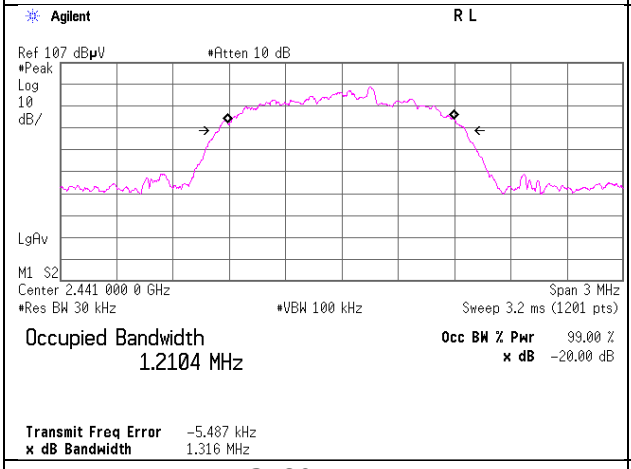
3DH5

20 dB Bandwidth

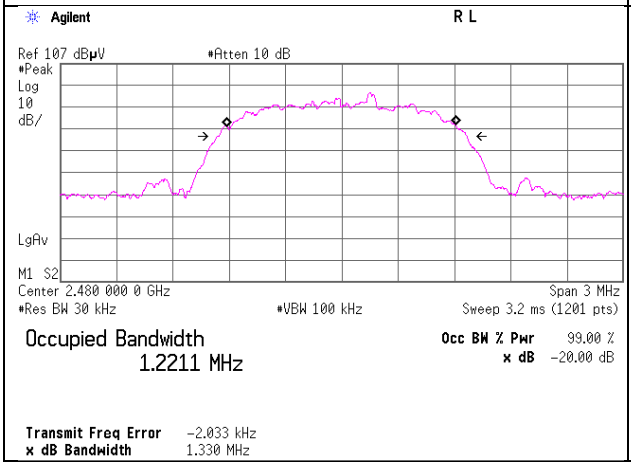
2402 MHz



2441MHz

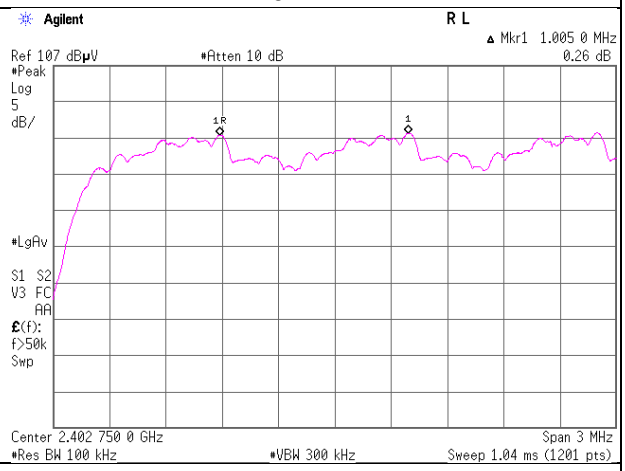


2480MHz

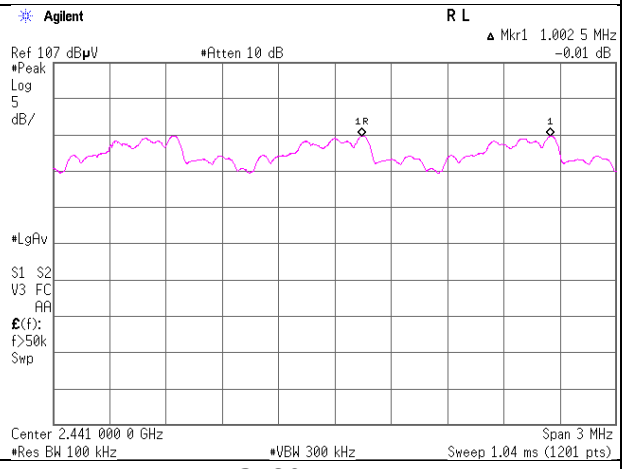


Carrier Frequency Separation

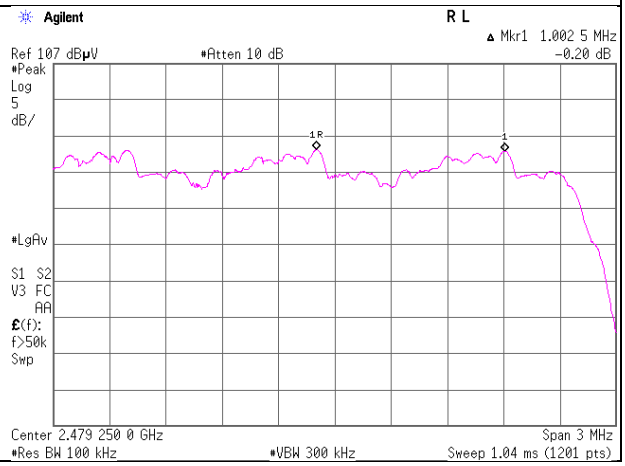
2402 MHz



2441 MHz



2480 MHz



Number of Hopping Frequency

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping On,

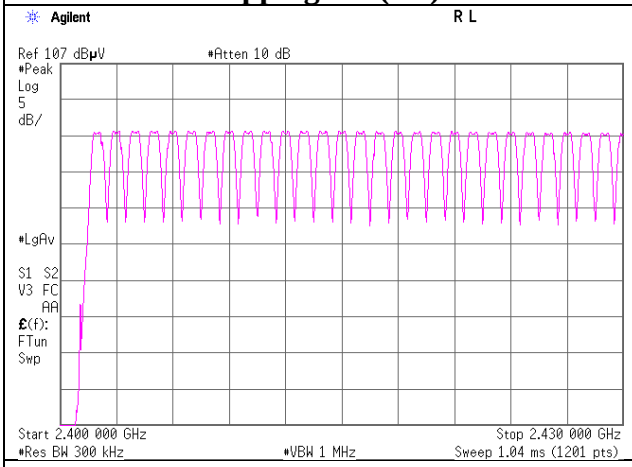
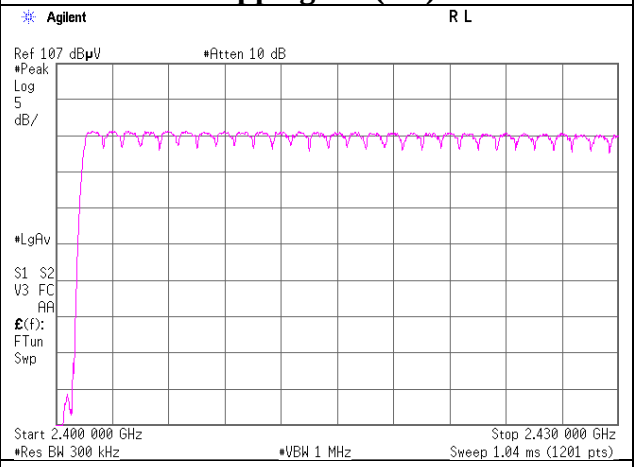
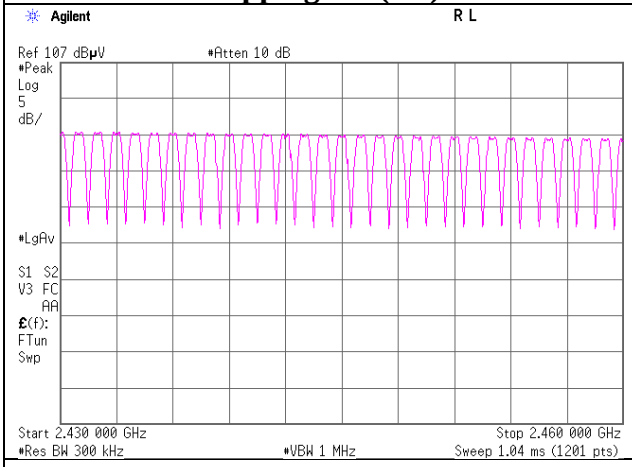
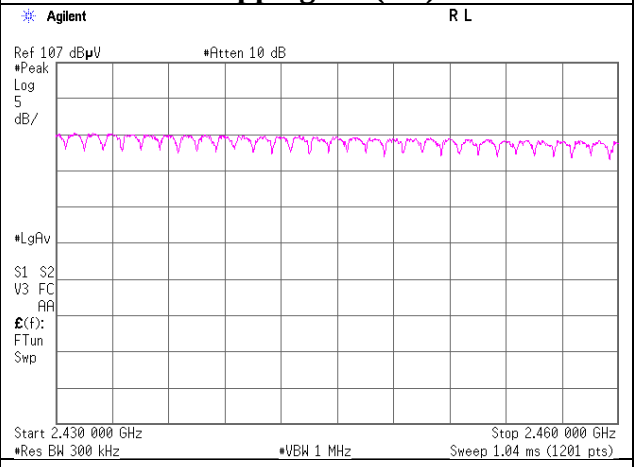
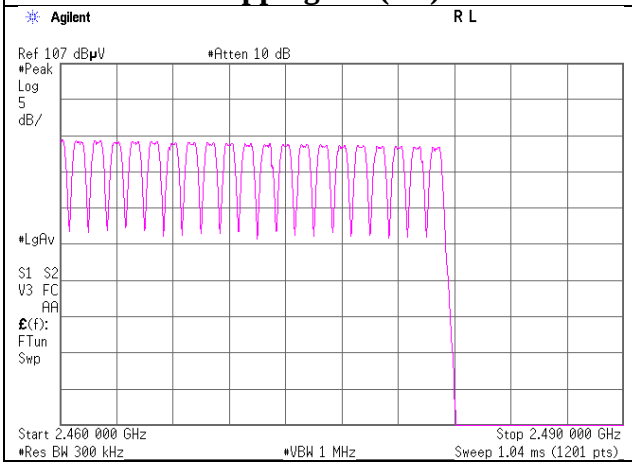
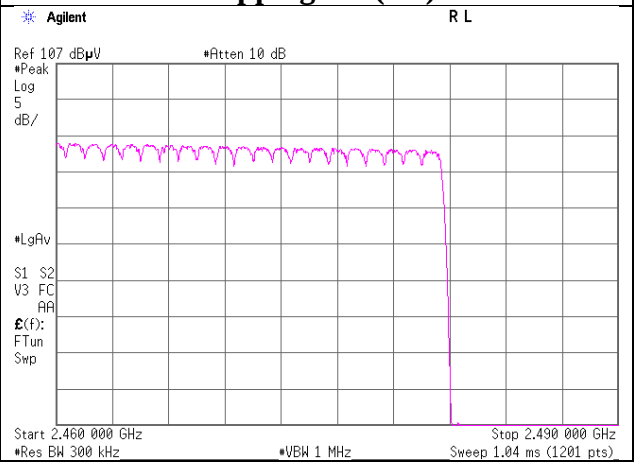
<Spec C>

Mode	Number of channel [channels]	Limit [channels]
DH5	79	>= 15
3DH5	79	>= 15

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency

<Spec C>

DH5	3DH5
Hopping On (1/3)	**Hopping On (1/3)**
	
Hopping On (2/3)	**Hopping On (2/3)**
	
Hopping On (3/3)	**Hopping On (3/3)**
	

Dwell time

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping On,

<Spec C>

Mode	Number of transmission in a 31.6 (79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) s period				Length of transmission [ms]	Result [ms]	Limit [ms]
DH1	50.8 times	/ 5 s	x 31.6 s	= 322 times	0.422	136	400
DH3	25.4 times	/ 5 s	x 31.6 s	= 161 times	1.678	270	400
DH5	19.2 times	/ 5 s	x 31.6 s	= 122 times	2.929	357	400
3DH1	49.2 times	/ 5 s	x 31.6 s	= 311 times	0.428	133	400
3DH3	24.4 times	/ 5 s	x 31.6 s	= 155 times	1.680	260	400
3DH5	16.6 times	/ 5 s	x 31.6 s	= 105 times	2.932	308	400

Sample Calculation
Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	51	50	51	51	50.8
DH3	30	28	21	25	23	25.4
DH5	25	20	14	17	20	19.2
3DH1	49	50	49	50	48	49.2
3DH3	21	30	25	21	25	24.4
3DH5	18	16	16	19	14	16.6

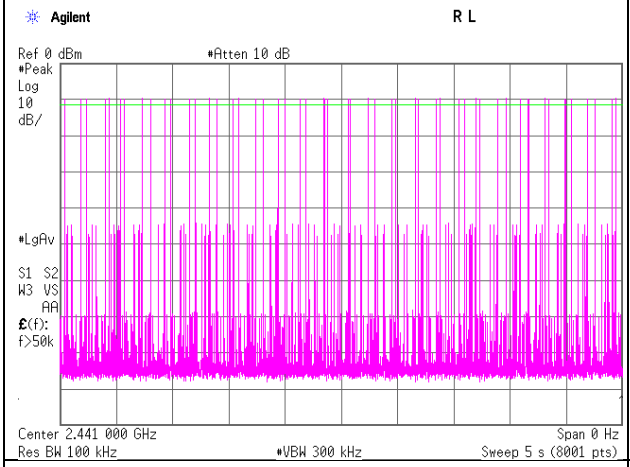
Sample Calculation
Average = Summation (Sampling 1 to 5) / 5

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless of packet size. This is confirmed in the test report for N = 79.

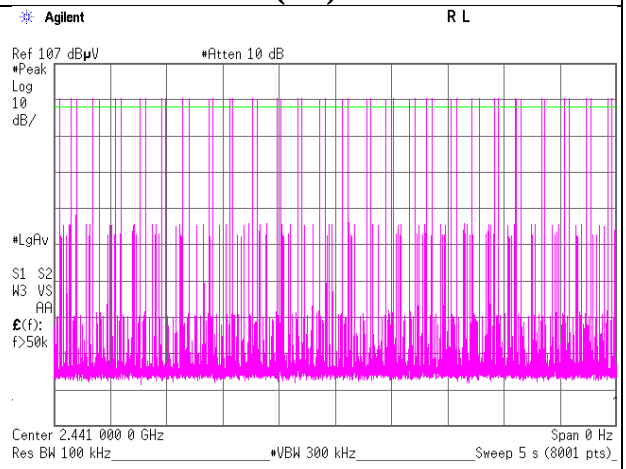
Dwell time

<Spec C>

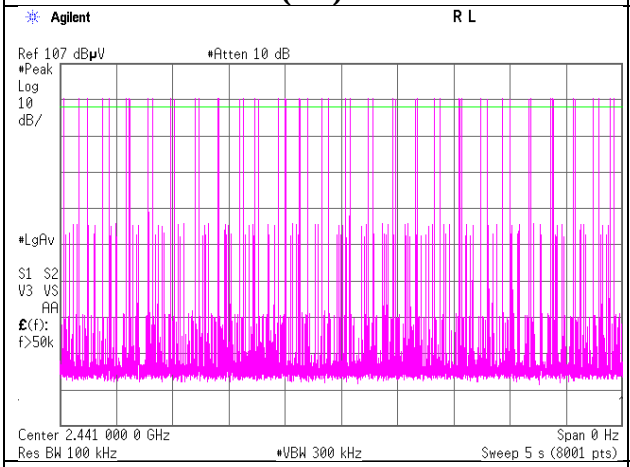
DH1 (1/6) in 5 s



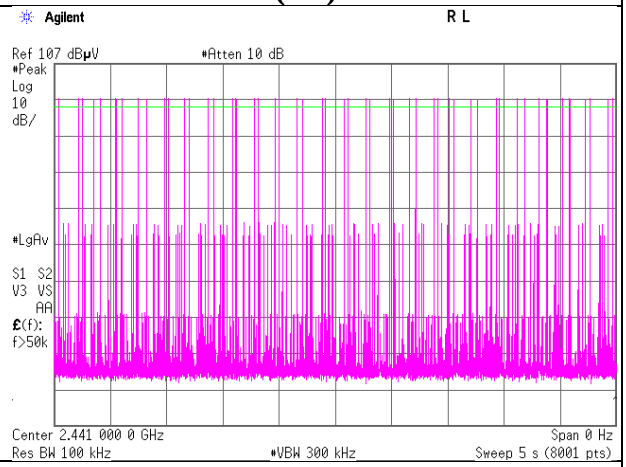
DH1 (2/6) in 5 s



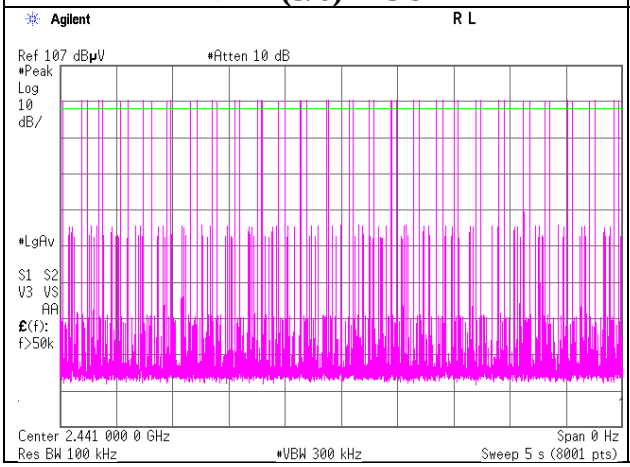
DH1 (3/6) in 5 s



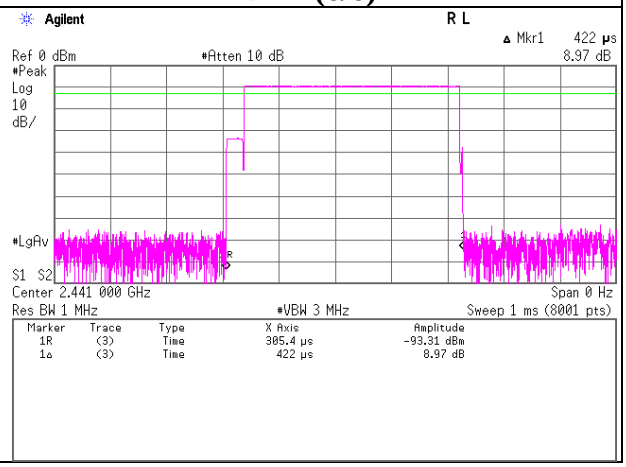
DH1 (4/6) in 5 s



DH1 (5/6) in 5 s



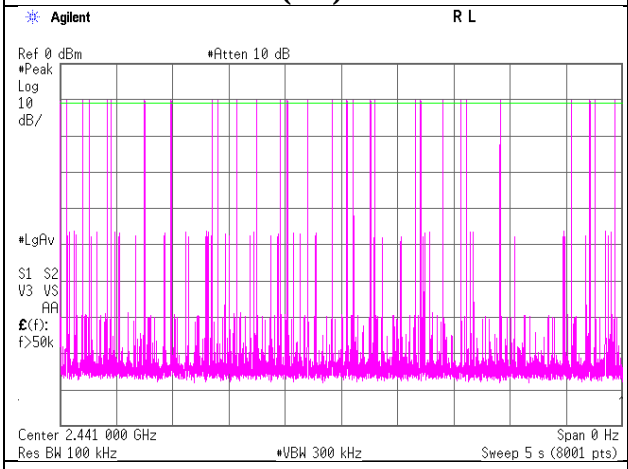
DH1 (6/6)



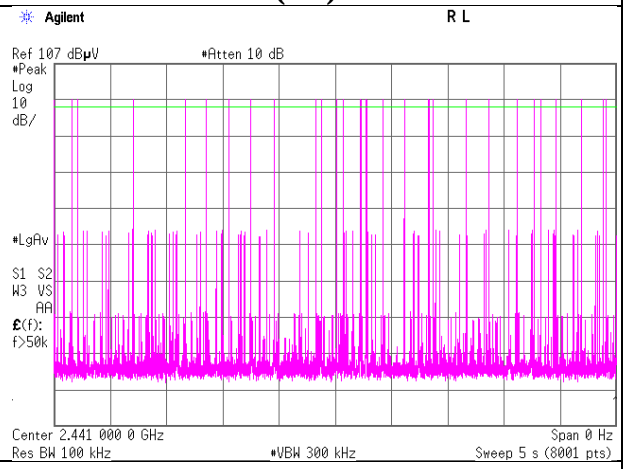
Dwell time

<Spec C>

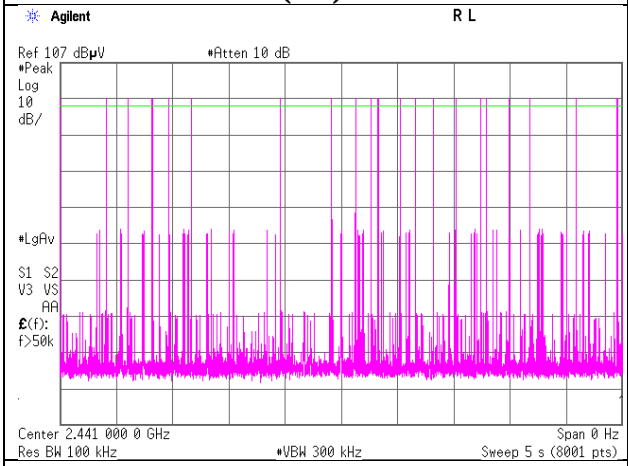
DH3 (1/6) in 5 s



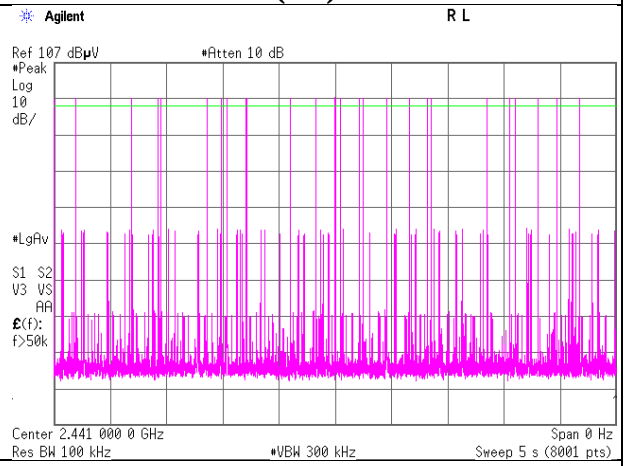
DH3 (2/6) in 5 s



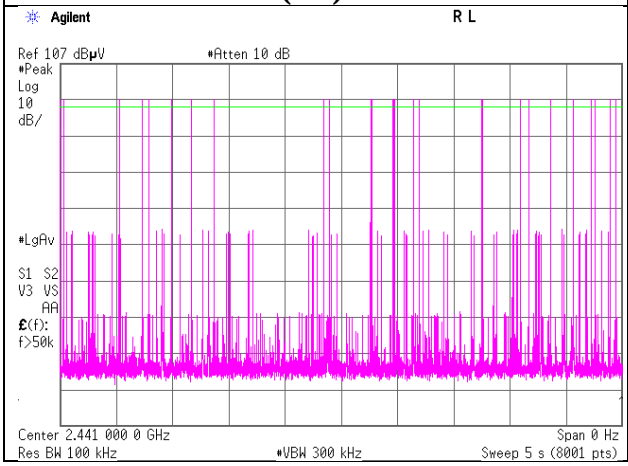
DH3 (3/6) in 5 s



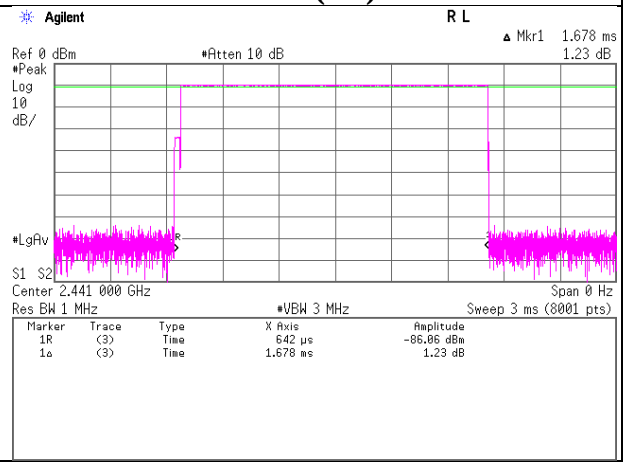
DH3 (4/6) in 5 s



DH3 (5/6) in 5 s



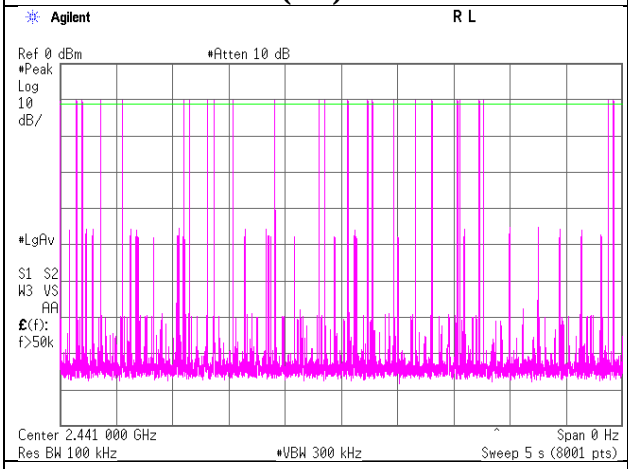
DH3 (6/6)



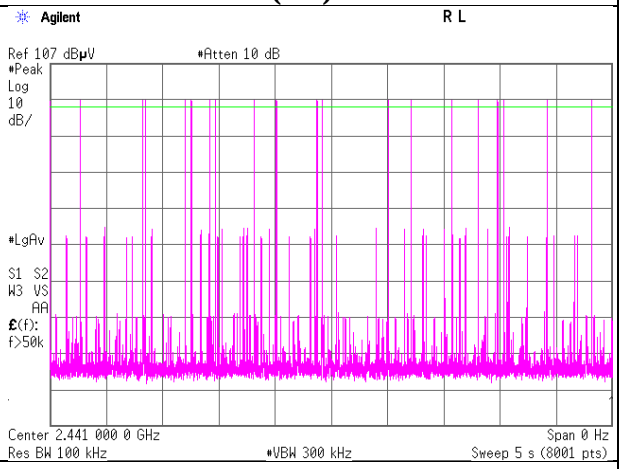
Dwell time

<Spec C>

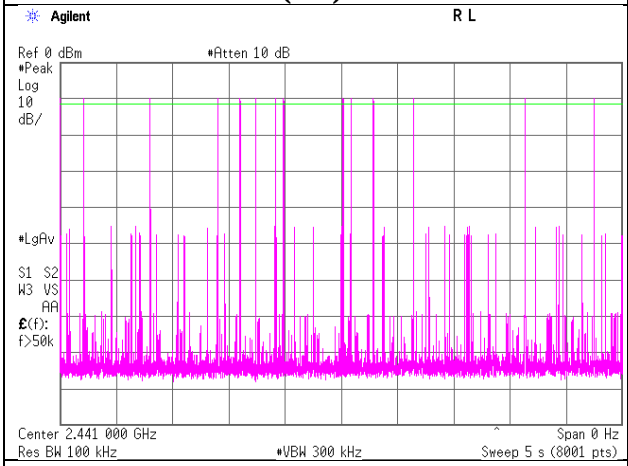
DH5 (1/6) in 5 s



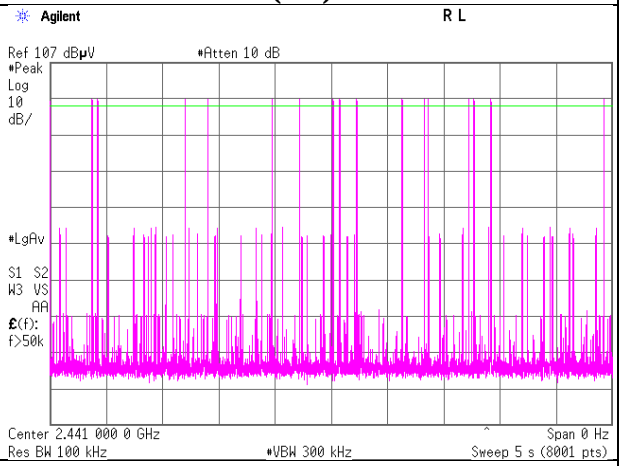
DH5 (2/6) in 5 s



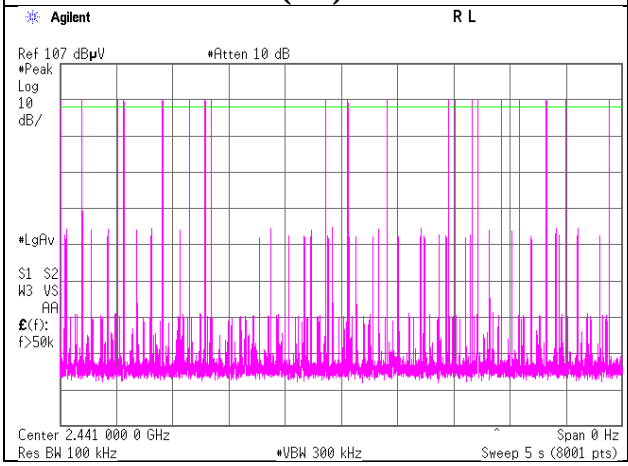
DH5 (3/6) in 5 s



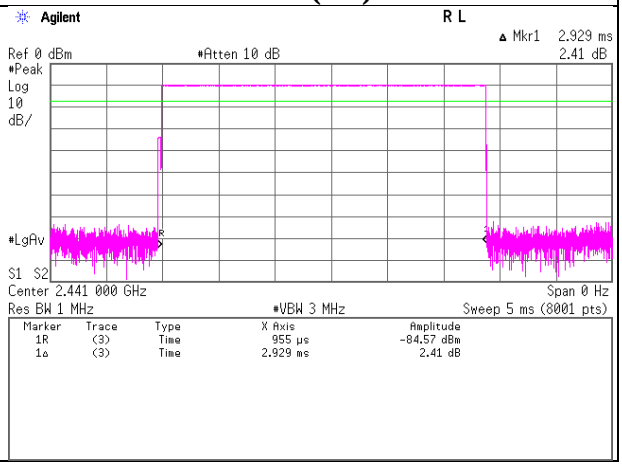
DH5 (4/6) in 5 s



DH5 (5/6) in 5 s



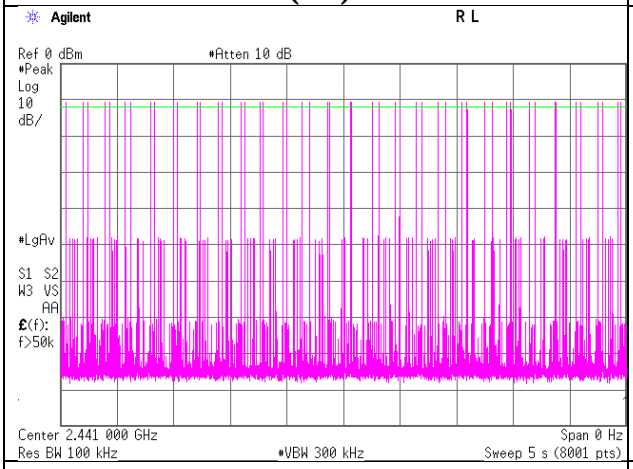
DH5 (6/6)



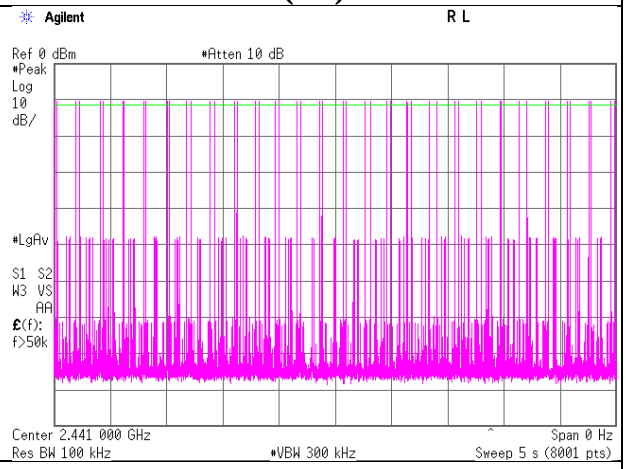
Dwell time

<Spec C>

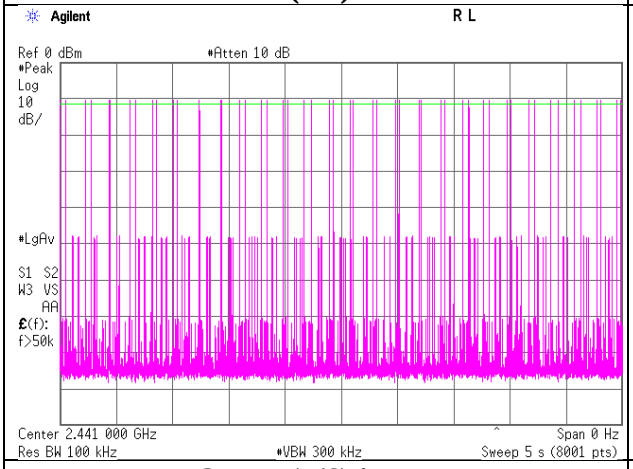
3DH1 (1/6) in 5 s



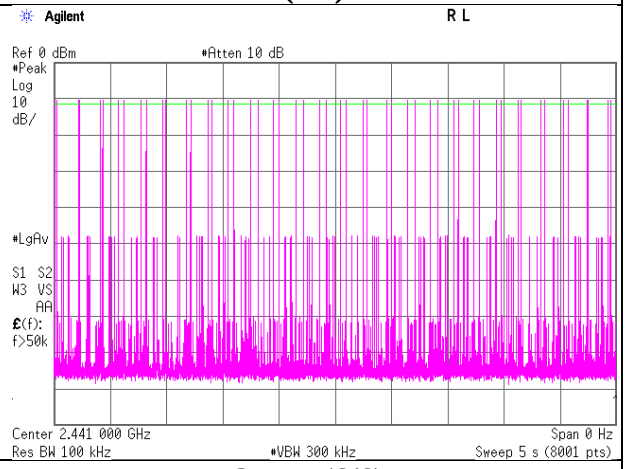
3DH1 (2/6) in 5 s



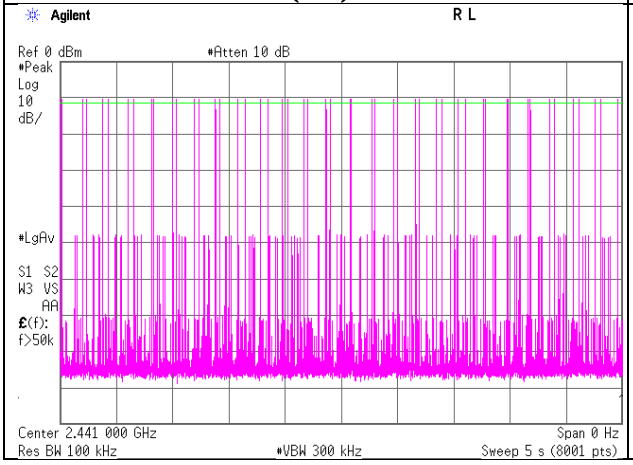
3DH1 (3/6) in 5 s



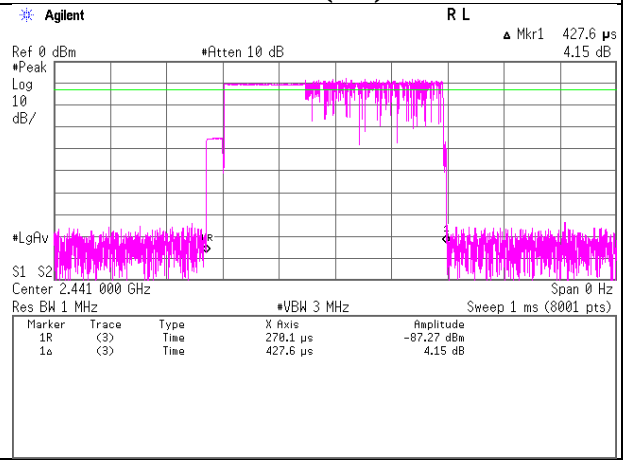
3DH1 (4/6) in 5 s



3DH1 (5/6) in 5 s



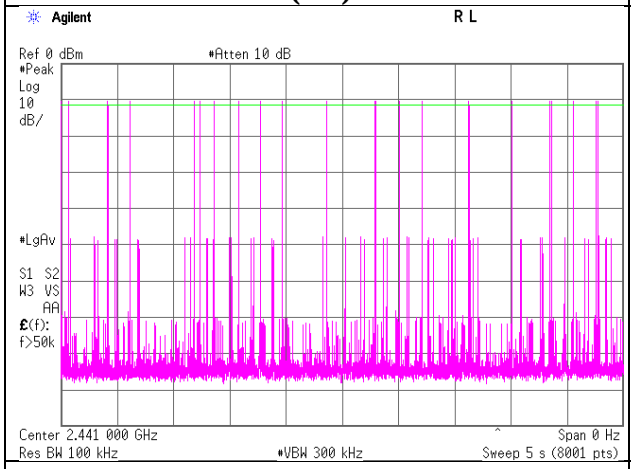
3DH1 (6/6)



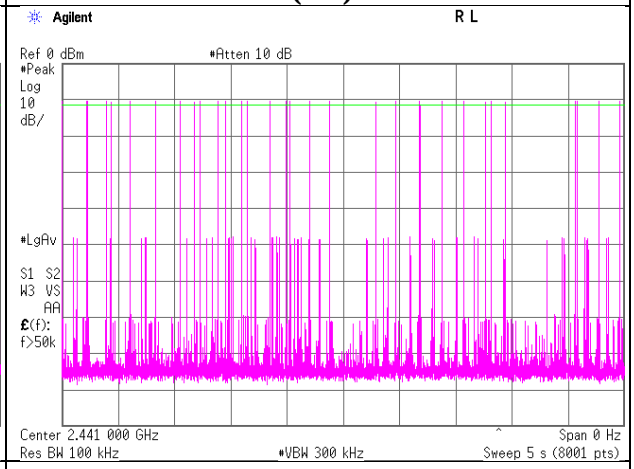
Dwell time

<Spec C>

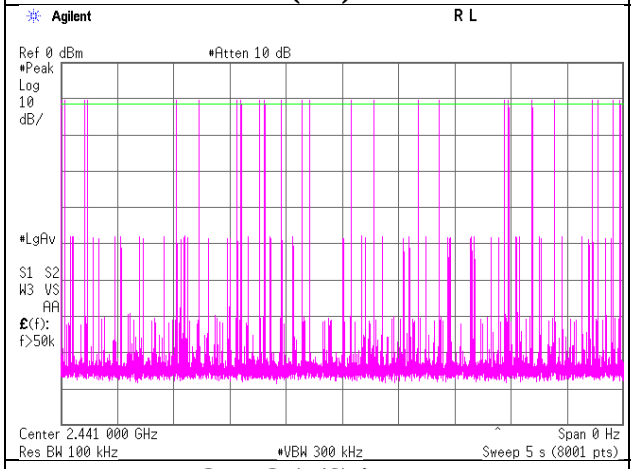
3DH3 (1/6) in 5 s



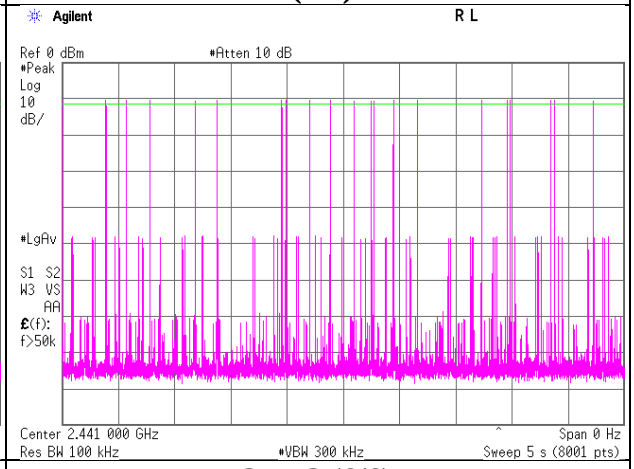
3DH3 (2/6) in 5 s



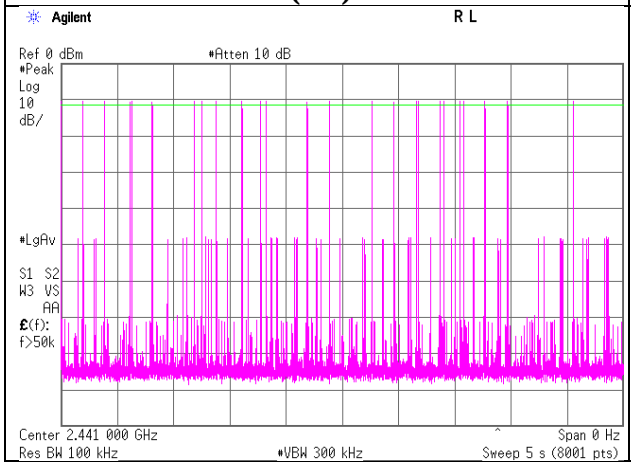
3DH3 (3/6) in 5 s



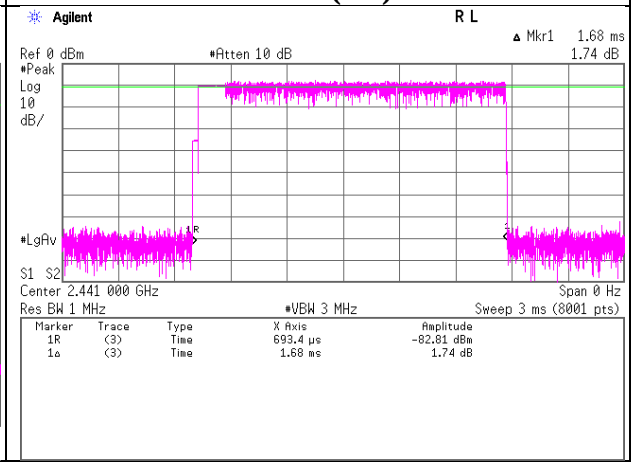
3DH3 (4/6) in 5 s



3DH3 (5/6) in 5 s



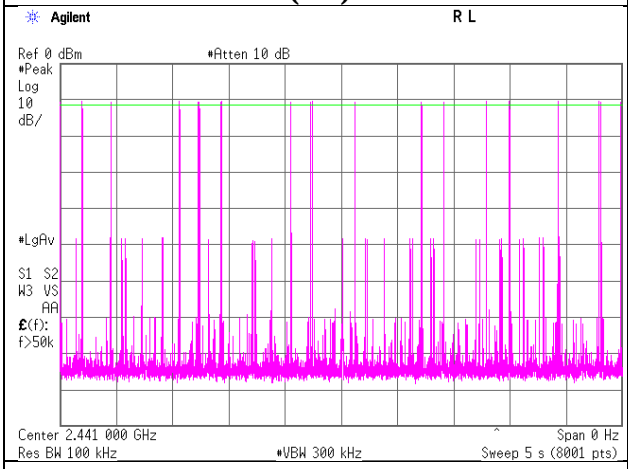
3DH3 (6/6)



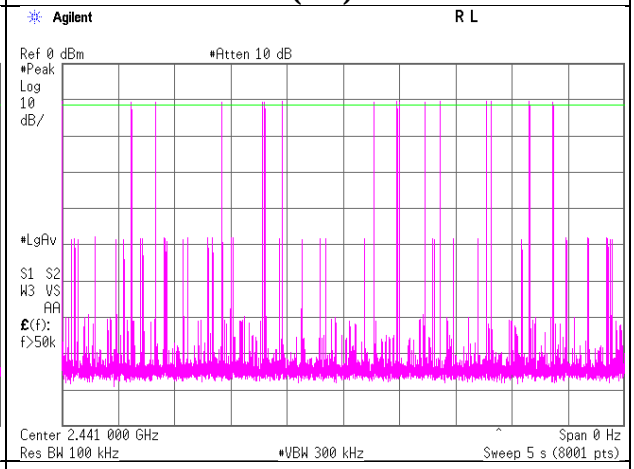
Dwell time

<Spec C>

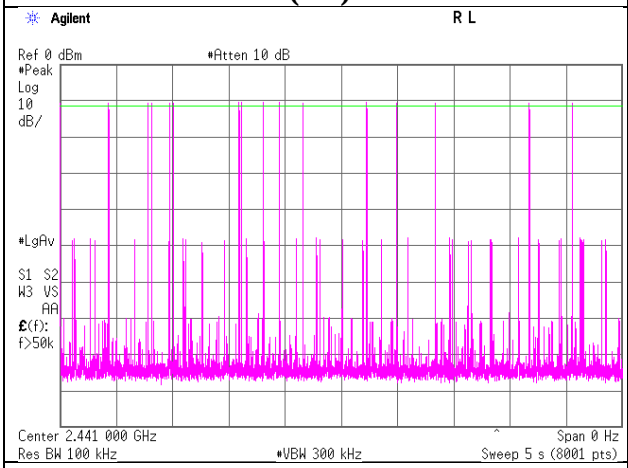
3DH5 (1/6) in 5 s



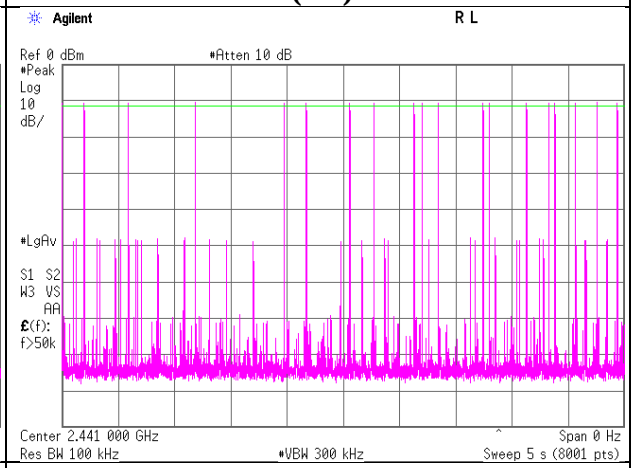
3DH5 (2/6) in 5 s



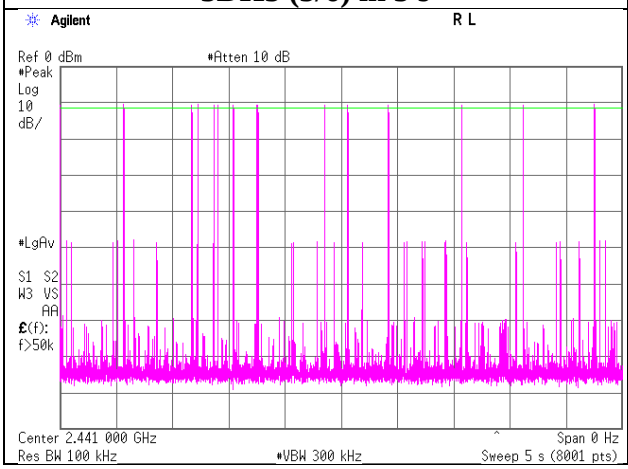
3DH5 (3/6) in 5 s



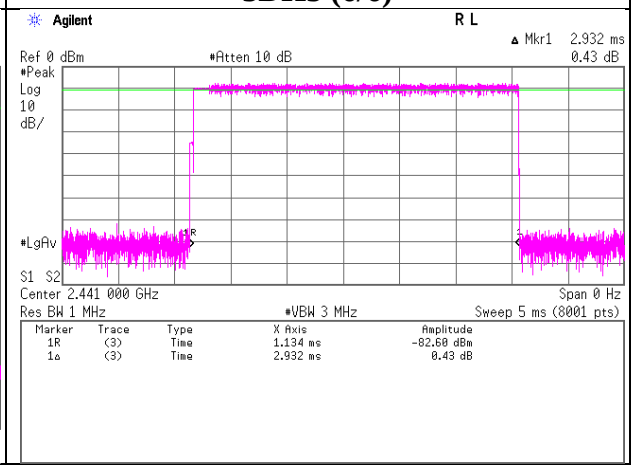
3DH5 (4/6) in 5 s



3DH5 (5/6) in 5 s



3DH5 (6/6)



Maximum Peak Output Power

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off,

<Spec C>

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-8.99	0.98	9.92	1.91	1.55	20.96	125	19.05
DH5	2441.0	-9.53	0.99	9.92	1.38	1.37	20.96	125	19.58
DH5	2480.0	-11.20	0.99	9.92	-0.29	0.94	20.96	125	21.25
2DH5	2402.0	-7.76	0.98	9.92	3.14	2.06	20.96	125	17.82
2DH5	2441.0	-8.62	0.99	9.92	2.29	1.69	20.96	125	18.67
2DH5	2480.0	-10.40	0.99	9.92	0.51	1.12	20.96	125	20.45
3DH5	2402.0	-7.56	0.98	9.92	3.34	2.16	20.96	125	17.62
3DH5	2441.0	-8.37	0.99	9.92	2.54	1.79	20.96	125	18.42
3DH5	2480.0	-10.18	0.99	9.92	0.73	1.18	20.96	125	20.23

Sample Calculation:
Result = Reading + Cable Loss + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

Test was not performed at AFH mode, because the decrease of number of channel (min: 20 ch) at AFH mode does not influence on the output power and bandwidth of the EUT.
As this device had AFH mode and frequency separation could not meet the requirement of over 20 dB BW without 2/3 relaxation, 125 mW power limit was applied to it.

Average Output Power
(Reference data for RF Exposure)

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off,

<Spec C>

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result (Time average)		Duty factor	Result (Burst power average)	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
DH5	2402.0	-10.33	0.98	9.92	0.57	1.14	1.07	1.64	1.46
DH5	2441.0	-10.88	0.99	9.92	0.03	1.01	1.07	1.10	1.29
DH5	2480.0	-12.46	0.99	9.92	-1.55	0.70	1.07	-0.48	0.90
2DH5	2402.0	-10.43	0.98	9.92	0.47	1.11	1.07	1.54	1.43
2DH5	2441.0	-11.26	0.99	9.92	-0.35	0.92	1.07	0.72	1.18
2DH5	2480.0	-13.05	0.99	9.92	-2.14	0.61	1.07	-1.07	0.78
3DH5	2402.0	-10.43	0.98	9.92	0.47	1.11	1.07	1.54	1.43
3DH5	2441.0	-11.37	0.99	9.92	-0.46	0.90	1.07	0.61	1.15
3DH5	2480.0	-13.07	0.99	9.92	-2.16	0.61	1.07	-1.09	0.78

Sample Calculation:
Result (Time average) = Reading + Cable Loss + Attenuator Loss
Result (Burst power average) = Time average power + Duty factor

*The equipment and cables were not used for factor 0 dB of the data sheets.

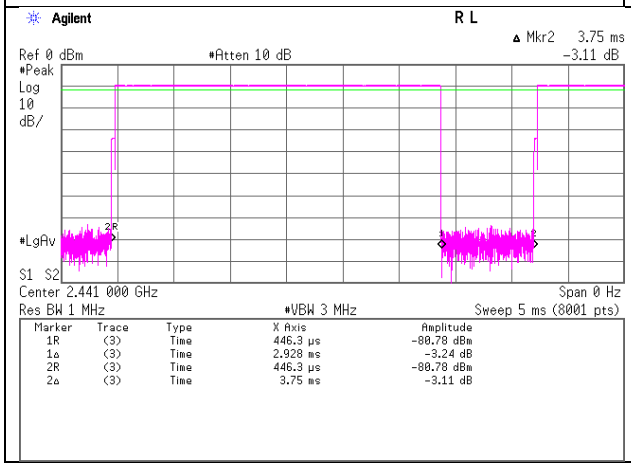
Burst Rate Confirmation

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off,

<Spec C>

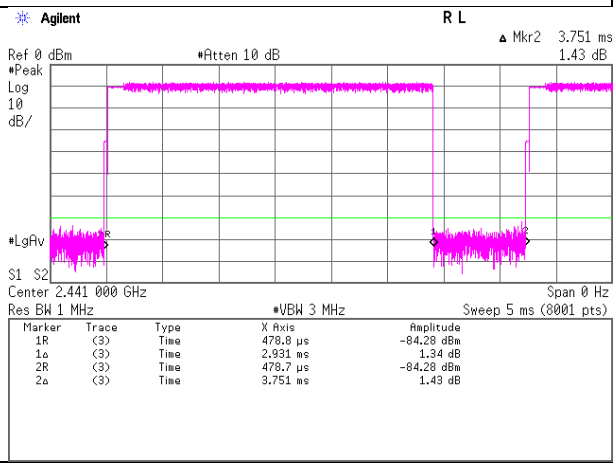
DH5

Tx on / (Tx on + Tx off) =	**0.781**
Tx on / (Tx on + Tx off) * 100 =	**78.1 %**
Duty factor = 10 * log (3.75 / 2.928) =	**1.07 dB**



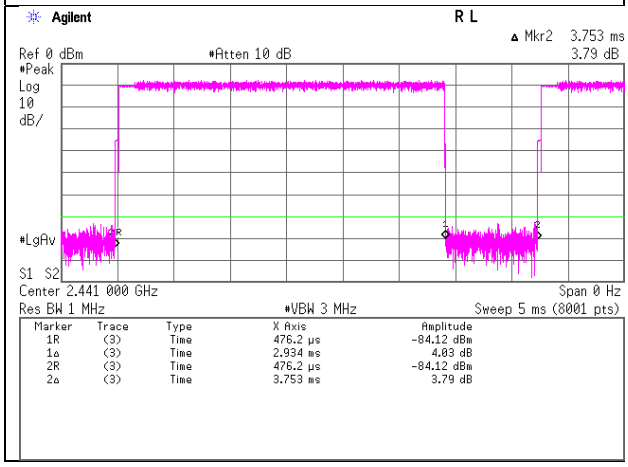
2-DH5

Tx on / (Tx on + Tx off) =	**0.781**
Tx on / (Tx on + Tx off) * 100 =	**78.1 %**
Duty factor = 10 * log (3.751 / 2.931) =	**1.07 dB**



3-DH5

Tx on / (Tx on + Tx off) =	**0.782**
Tx on / (Tx on + Tx off) * 100 =	**78.2 %**
Duty factor = 10 * log (3.753 / 2.934) =	**1.07 dB**



Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2402 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.432	QP	25.89	6.10	7.16	32.16	0.00	6.99	40.00	33.0	273	351	
Hori.	96.000	QP	22.29	8.94	7.40	32.14	0.00	6.49	43.50	37.0	304	168	
Hori.	479.997	QP	21.52	17.11	9.50	31.93	0.00	16.20	46.00	29.8	100	166	
Hori.	960.000	QP	21.51	22.69	11.21	30.52	0.00	24.89	46.00	21.1	100	194	
Hori.	2378.008	PK	47.64	27.73	13.81	40.70	3.33	51.81	73.97	22.1	280	194	
Hori.	2390.000	PK	46.29	27.75	13.82	40.70	3.33	50.49	73.97	23.4	280	194	
Hori.	3843.200	PK	53.21	28.87	5.58	41.67	3.33	49.32	73.97	24.6	180	322	
Hori.	4804.000	PK	47.25	31.41	6.01	41.54	3.33	46.46	73.97	27.5	150	0	
Hori.	7206.000	PK	47.56	36.89	7.55	41.12	3.33	54.21	73.97	19.7	150	0	
Hori.	9608.000	PK	46.27	38.46	8.40	40.49	3.33	55.97	73.97	18.0	150	0	
Hori.	12010.000	PK	46.42	39.69	9.82	39.88	3.33	59.38	73.97	14.5	150	0	
Hori.	2378.008	AV	38.04	27.73	13.81	40.70	3.33	42.21	53.97	11.7	280	194	
Hori.	2390.000	AV	34.40	27.75	13.82	40.70	3.33	38.60	53.97	15.3	280	194	
Hori.	3843.200	AV	47.36	28.87	5.58	41.67	3.33	43.47	53.97	10.5	180	322	
Hori.	4804.000	AV	35.80	31.41	6.01	41.54	3.33	35.01	53.97	18.9	150	0	
Hori.	7206.000	AV	35.38	36.89	7.55	41.12	3.33	42.03	53.97	11.9	150	0	
Hori.	9608.000	AV	34.76	38.46	8.40	40.49	3.33	44.46	53.97	9.5	150	0	
Hori.	12010.000	AV	34.83	39.69	9.82	39.88	3.33	47.79	53.97	6.1	150	0	
Vert.	69.296	QP	34.85	5.98	7.16	32.16	0.00	15.83	40.00	24.1	100	106	
Vert.	96.001	QP	23.78	8.94	7.40	32.14	0.00	7.98	43.50	35.5	104	193	
Vert.	479.999	QP	21.49	17.11	9.50	31.93	0.00	16.17	46.00	29.8	100	197	
Vert.	960.000	QP	21.57	22.69	11.21	30.52	0.00	24.95	46.00	21.0	100	188	
Vert.	2378.008	PK	47.73	27.73	13.81	40.70	3.33	51.90	73.97	22.0	148	213	
Vert.	2390.000	PK	47.45	27.75	13.82	40.70	3.33	51.65	73.97	22.3	148	213	
Vert.	3843.221	PK	53.40	28.87	5.58	41.67	3.33	49.51	73.97	24.4	157	208	
Vert.	4804.000	PK	46.81	31.41	6.01	41.54	3.33	46.02	73.97	27.9	150	0	
Vert.	7206.000	PK	47.24	36.89	7.55	41.12	3.33	53.89	73.97	20.0	150	0	
Vert.	9608.000	PK	46.14	38.46	8.40	40.49	3.33	55.84	73.97	18.1	150	0	
Vert.	12010.000	PK	46.53	39.69	9.82	39.88	3.33	59.49	73.97	14.4	150	0	
Vert.	2378.008	AV	36.62	27.73	13.81	40.70	3.33	40.79	53.97	13.1	148	213	
Vert.	2390.000	AV	34.59	27.75	13.82	40.70	3.33	38.79	53.97	15.1	148	213	
Vert.	3843.221	AV	47.21	28.87	5.58	41.67	3.33	43.32	53.97	10.6	157	208	
Vert.	4804.000	AV	35.56	31.41	6.01	41.54	3.33	34.77	53.97	19.2	150	0	
Vert.	7206.000	AV	35.22	36.89	7.55	41.12	3.33	41.87	53.97	12.1	150	0	
Vert.	9608.000	AV	34.51	38.46	8.40	40.49	3.33	44.21	53.97	9.7	150	0	
Vert.	12010.000	AV	34.94	39.69	9.82	39.88	3.33	47.90	53.97	**6.0**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.62	27.77	13.83	40.70	3.33	99.85	-	-	
Hori.	2400.000	PK	40.43	27.76	13.83	40.70	3.33	44.65	79.85	35.2	
Vert.	2402.000	PK	94.41	27.77	13.83	40.70	3.33	98.64	-	-	
Vert.	2400.000	PK	38.87	27.76	13.83	40.70	3.33	43.09	78.64	35.6	

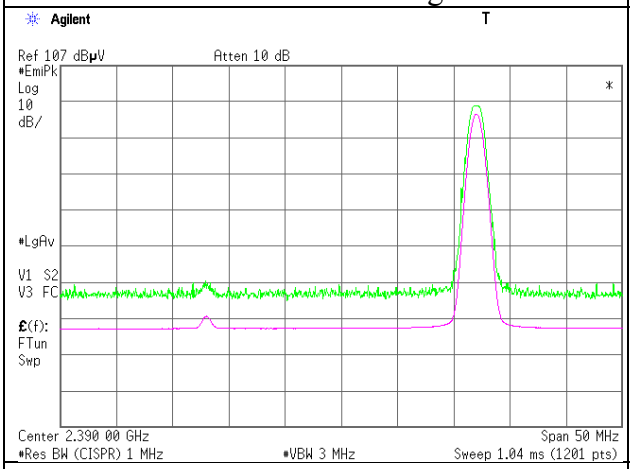
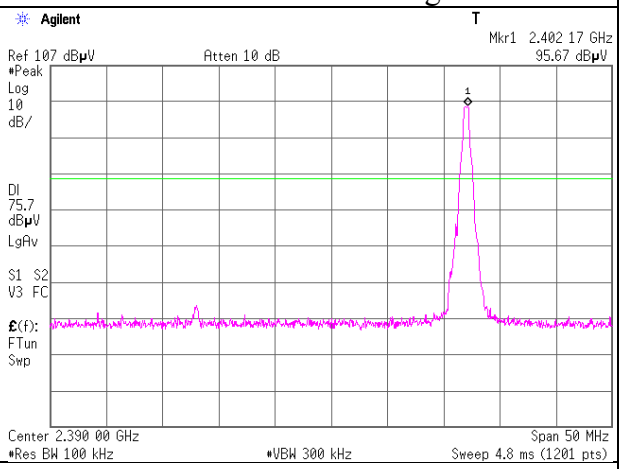
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

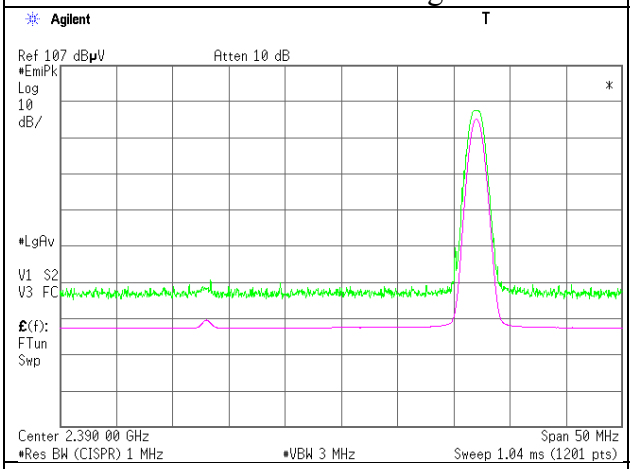
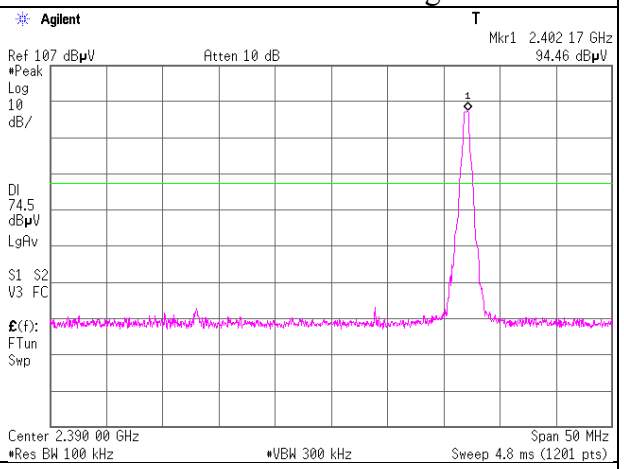
<Spec C>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, DH5 2402 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2441 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.474	QP	25.85	6.10	7.16	32.16	0.00	6.95	40.00	33.0	271	349	
Hori.	96.000	QP	22.26	8.94	7.40	32.14	0.00	6.46	43.50	37.0	303	169	
Hori.	479.996	QP	21.51	17.11	9.50	31.93	0.00	16.19	46.00	29.8	100	164	
Hori.	960.000	QP	21.53	22.69	11.21	30.52	0.00	24.91	46.00	21.0	100	191	
Hori.	3905.612	PK	53.60	28.98	5.58	41.74	3.33	49.75	73.97	24.2	156	321	
Hori.	4882.000	PK	47.06	31.70	6.04	41.39	3.33	46.74	73.97	27.2	150	0	
Hori.	7323.000	PK	46.10	36.92	7.59	41.25	3.33	52.69	73.97	21.2	150	0	
Hori.	9764.000	PK	45.31	38.45	8.49	40.41	3.33	55.17	73.97	18.8	150	0	
Hori.	12205.000	PK	44.66	39.61	9.97	39.79	3.33	57.78	73.97	16.1	100	0	
Hori.	3905.612	AV	47.81	28.98	5.58	41.74	3.33	43.96	53.97	10.0	156	321	
Hori.	4882.000	AV	35.51	31.70	6.04	41.39	3.33	35.19	53.97	18.7	150	0	
Hori.	7323.000	AV	34.59	36.92	7.59	41.25	3.33	41.18	53.97	12.7	150	0	
Hori.	9764.000	AV	33.50	38.45	8.49	40.41	3.33	43.36	53.97	10.6	150	0	
Hori.	12205.000	AV	33.08	39.61	9.97	39.79	3.33	46.20	53.97	**7.7**	100	0	
Vert.	69.229	QP	34.87	5.99	7.16	32.16	0.00	15.86	40.00	24.1	100	108	
Vert.	95.999	QP	23.68	8.94	7.40	32.14	0.00	7.88	43.50	35.6	106	191	
Vert.	479.997	QP	21.47	17.11	9.50	31.93	0.00	16.15	46.00	29.8	100	199	
Vert.	960.000	QP	21.54	22.69	11.21	30.52	0.00	24.92	46.00	21.0	100	192	
Vert.	3905.624	PK	53.26	28.98	5.58	41.74	3.33	49.41	73.97	24.5	156	212	
Vert.	4882.000	PK	46.41	31.70	6.04	41.39	3.33	46.09	73.97	27.8	150	0	
Vert.	7323.000	PK	46.03	36.92	7.59	41.25	3.33	52.62	73.97	21.3	150	0	
Vert.	9764.000	PK	45.16	38.45	8.49	40.41	3.33	55.02	73.97	18.9	150	0	
Vert.	12205.000	PK	44.54	39.61	9.97	39.79	3.33	57.66	73.97	16.3	150	0	
Vert.	3905.624	AV	47.45	28.98	5.58	41.74	3.33	43.60	53.97	10.3	156	212	
Vert.	4882.000	AV	35.34	31.70	6.04	41.39	3.33	35.02	53.97	18.9	150	0	
Vert.	7323.000	AV	34.53	36.92	7.59	41.25	3.33	41.12	53.97	12.8	150	0	
Vert.	9764.000	AV	33.37	38.45	8.49	40.41	3.33	43.23	53.97	10.7	150	0	
Vert.	12205.000	AV	33.10	39.61	9.97	39.79	3.33	46.22	53.97	**7.7**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2480 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.428	QP	25.84	6.10	7.16	32.16	0.00	6.94	40.00	33.0	277	348	
Hori.	95.999	QP	22.25	8.94	7.40	32.14	0.00	6.45	43.50	37.0	302	171	
Hori.	479.998	QP	21.49	17.11	9.50	31.93	0.00	16.17	46.00	29.8	150	168	
Hori.	960.000	QP	21.54	22.69	11.21	30.52	0.00	24.92	46.00	21.0	100	197	
Hori.	2483.500	PK	46.16	27.91	13.91	40.69	3.33	50.62	73.97	23.3	263	192	
Hori.	3968.023	PK	52.93	29.09	5.59	41.81	3.33	49.13	73.97	24.8	150	321	
Hori.	4960.000	PK	46.89	32.00	6.06	41.23	3.33	47.05	73.97	26.9	150	0	
Hori.	7440.000	PK	46.52	36.95	7.63	41.37	3.33	53.06	73.97	20.9	150	0	
Hori.	9920.000	PK	43.82	38.44	8.57	40.32	3.33	53.84	73.97	20.1	150	0	
Hori.	12400.000	PK	43.42	39.53	10.10	39.71	3.33	56.67	73.97	17.3	150	0	
Hori.	2483.500	AV	34.77	27.91	13.91	40.69	3.33	39.23	53.97	14.7	263	192	
Hori.	3968.023	AV	46.69	29.09	5.59	41.81	3.33	42.89	53.97	11.0	150	321	
Hori.	4960.000	AV	35.40	32.00	6.06	41.23	3.33	35.56	53.97	18.4	150	0	
Hori.	7440.000	AV	34.39	36.95	7.63	41.37	3.33	40.93	53.97	13.0	150	0	
Hori.	9920.000	AV	32.85	38.44	8.57	40.32	3.33	42.87	53.97	11.1	150	0	
Hori.	12400.000	AV	32.19	39.53	10.10	39.71	3.33	45.44	53.97	**8.5**	150	0	
Vert.	69.265	QP	34.35	5.98	7.16	32.16	0.00	15.33	40.00	24.6	100	109	
Vert.	96.000	QP	23.75	8.94	7.40	32.14	0.00	7.95	43.50	35.5	108	192	
Vert.	479.997	QP	21.45	17.11	9.50	31.93	0.00	16.13	46.00	29.8	100	195	
Vert.	960.000	QP	21.55	22.69	11.21	30.52	0.00	24.93	46.00	21.0	100	189	
Vert.	2483.500	PK	46.82	27.91	13.91	40.69	3.33	51.28	73.97	22.6	155	219	
Vert.	3968.025	PK	52.38	29.09	5.59	41.81	3.33	48.58	73.97	25.3	154	229	
Vert.	4960.000	PK	47.16	32.00	6.06	41.23	3.33	47.32	73.97	26.6	150	0	
Vert.	7440.000	PK	45.68	36.95	7.63	41.37	3.33	52.22	73.97	21.7	150	0	
Vert.	9920.000	PK	44.61	38.44	8.57	40.32	3.33	54.63	73.97	19.3	150	0	
Vert.	12400.000	PK	44.21	39.53	10.10	39.71	3.33	57.46	73.97	16.5	150	0	
Vert.	2483.500	AV	34.73	27.91	13.91	40.69	3.33	39.19	53.97	14.7	155	219	
Vert.	3968.025	AV	44.80	29.09	5.59	41.81	3.33	41.00	53.97	12.9	154	229	
Vert.	4960.000	AV	35.36	32.00	6.06	41.23	3.33	35.52	53.97	18.4	150	0	
Vert.	7440.000	AV	34.35	36.95	7.63	41.37	3.33	40.89	53.97	13.0	150	0	
Vert.	9920.000	AV	32.71	38.44	8.57	40.32	3.33	42.73	53.97	11.2	150	0	
Vert.	12400.000	AV	32.16	39.53	10.10	39.71	3.33	45.41	53.97	**8.5**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

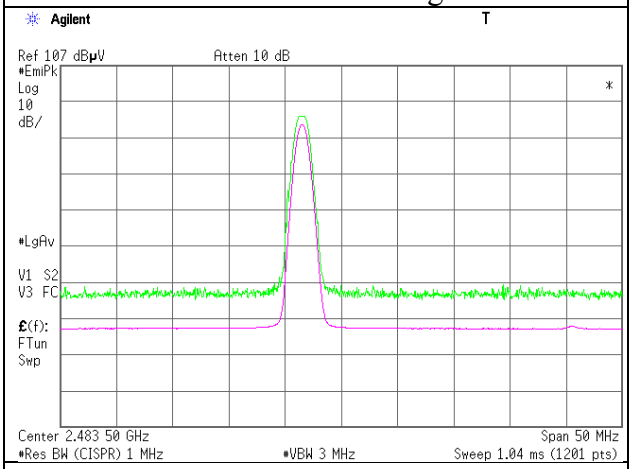
Radiated Spurious Emission
(Reference Plot for band-edge)

<Spec C>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

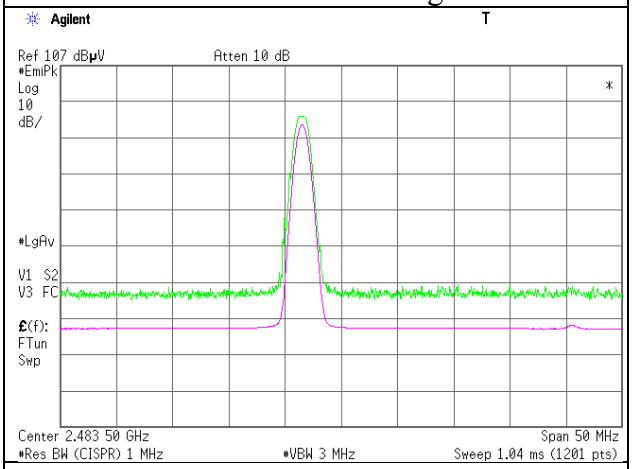
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2402 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.533	QP	25.78	6.09	7.16	32.16	0.00	6.87	40.00	33.1	278	349	
Hori.	96.000	QP	22.22	8.94	7.40	32.14	0.00	6.42	43.50	37.0	298	173	
Hori.	479.996	QP	21.49	17.11	9.50	31.93	0.00	16.17	46.00	29.8	100	164	
Hori.	960.000	QP	21.52	22.69	11.21	30.52	0.00	24.90	46.00	21.1	100	193	
Hori.	2378.025	PK	47.27	27.73	13.81	40.70	3.33	51.44	73.97	22.5	275	194	
Hori.	2390.000	PK	45.55	27.75	13.82	40.70	3.33	49.75	73.97	24.2	275	194	
Hori.	3843.214	PK	53.70	28.87	5.58	41.67	3.33	49.81	73.97	24.1	179	315	
Hori.	4804.000	PK	47.36	31.41	6.01	41.54	3.33	46.57	73.97	27.4	150	0	
Hori.	7206.000	PK	47.21	36.89	7.55	41.12	3.33	53.86	73.97	20.1	150	0	
Hori.	9608.000	PK	46.41	38.46	8.40	40.49	3.33	56.11	73.97	17.8	150	0	
Hori.	12010.000	PK	46.60	39.69	9.82	39.88	3.33	59.56	73.97	14.4	150	0	
Hori.	2378.025	AV	36.87	27.73	13.81	40.70	3.33	41.04	53.97	12.9	275	194	
Hori.	2390.000	AV	34.51	27.75	13.82	40.70	3.33	38.71	53.97	15.2	275	194	
Hori.	3843.214	AV	47.19	28.87	5.58	41.67	3.33	43.30	53.97	10.6	179	315	
Hori.	4804.000	AV	35.81	31.41	6.01	41.54	3.33	35.02	53.97	18.9	150	0	
Hori.	7206.000	AV	35.34	36.89	7.55	41.12	3.33	41.99	53.97	11.9	150	0	
Hori.	9608.000	AV	34.74	38.46	8.40	40.49	3.33	44.44	53.97	9.5	150	0	
Hori.	12010.000	AV	34.65	39.69	9.82	39.88	3.33	47.61	53.97	**6.3**	150	0	
Vert.	69.243	QP	34.98	5.99	7.16	32.16	0.00	15.97	40.00	24.0	100	103	
Vert.	95.999	QP	23.69	8.94	7.40	32.14	0.00	7.89	43.50	35.6	104	189	
Vert.	479.998	QP	21.52	17.11	9.50	31.93	0.00	16.20	46.00	29.8	100	198	
Vert.	960.000	QP	21.53	22.69	11.21	30.52	0.00	24.91	46.00	21.0	100	193	
Vert.	2378.068	PK	47.98	27.73	13.81	40.70	3.33	52.15	73.97	21.8	154	213	
Vert.	2390.000	PK	46.02	27.75	13.82	40.70	3.33	50.22	73.97	23.7	154	213	
Vert.	3843.223	PK	53.70	28.87	5.58	41.67	3.33	49.81	73.97	24.1	159	208	
Vert.	4804.000	PK	46.84	31.41	6.01	41.54	3.33	46.05	73.97	27.9	150	0	
Vert.	7206.000	PK	46.84	36.89	7.55	41.12	3.33	53.49	73.97	20.4	150	0	
Vert.	9608.000	PK	46.36	38.46	8.40	40.49	3.33	56.06	73.97	17.9	150	0	
Vert.	12010.000	PK	46.51	39.69	9.82	39.88	3.33	59.47	73.97	14.5	150	0	
Vert.	2378.068	AV	36.45	27.73	13.81	40.70	3.33	40.62	53.97	13.3	154	213	
Vert.	2390.000	AV	34.56	27.75	13.82	40.70	3.33	38.76	53.97	15.2	154	213	
Vert.	3843.223	AV	47.38	28.87	5.58	41.67	3.33	43.49	53.97	10.4	159	208	
Vert.	4804.000	AV	35.76	31.41	6.01	41.54	3.33	34.97	53.97	19.0	150	0	
Vert.	7206.000	AV	35.33	36.89	7.55	41.12	3.33	41.98	53.97	11.9	150	0	
Vert.	9608.000	AV	34.65	38.46	8.40	40.49	3.33	44.35	53.97	9.6	150	0	
Vert.	12010.000	AV	34.53	39.69	9.82	39.88	3.33	47.49	53.97	6.4	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.98	27.77	13.83	40.70	3.33	100.21	-	-	
Hori.	2400.000	PK	40.38	27.76	13.83	40.70	3.33	44.60	80.21	35.6	
Vert.	2402.000	PK	94.28	27.77	13.83	40.70	3.33	98.51	-	-	
Vert.	2400.000	PK	40.32	27.76	13.83	40.70	3.33	44.54	78.51	34.0	

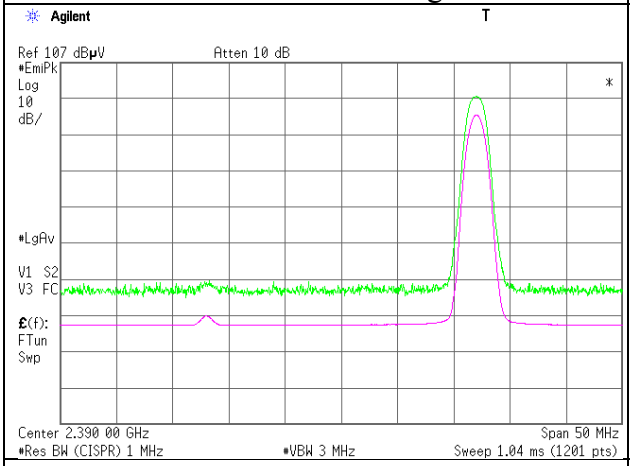
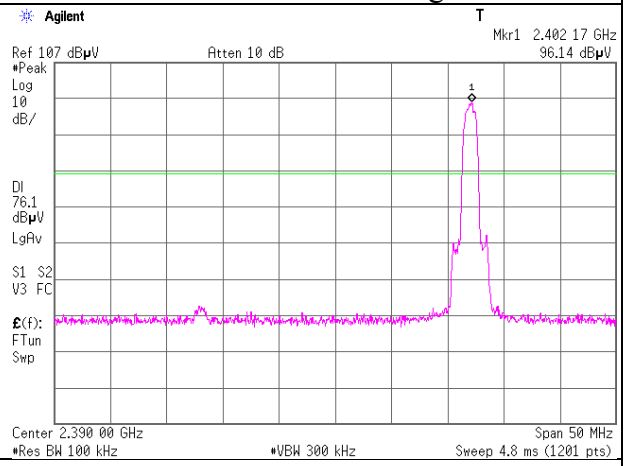
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

Radiated Spurious Emission
(Reference Plot for band-edge)

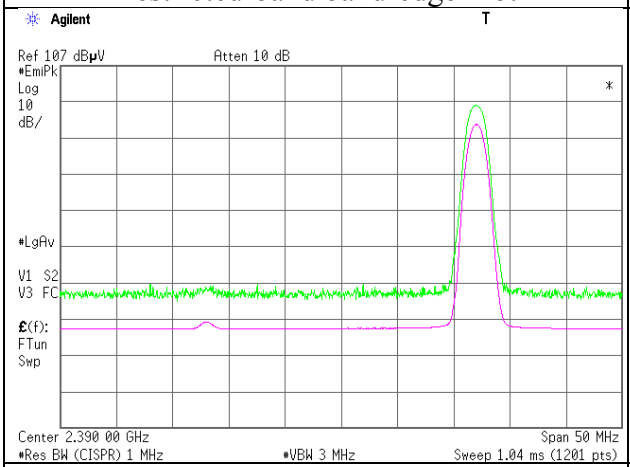
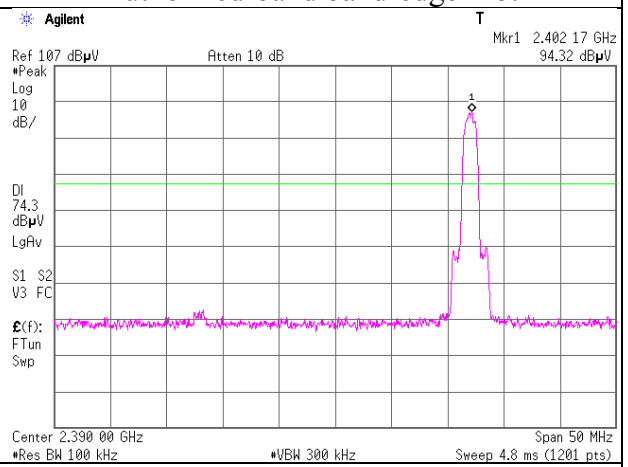
<Spec C>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, 3DH5 2402 MHz

Horizontal

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical

Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2441 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.643	QP	25.67	6.07	7.16	32.16	0.00	6.74	40.00	33.2	276	353	
Hori.	96.000	QP	22.21	8.94	7.40	32.14	0.00	6.41	43.50	37.0	304	165	
Hori.	479.998	QP	21.48	17.11	9.50	31.93	0.00	16.16	46.00	29.8	100	169	
Hori.	960.000	QP	21.52	22.69	11.21	30.52	0.00	24.90	46.00	21.1	100	188	
Hori.	3905.619	PK	53.87	28.98	5.58	41.74	3.33	50.02	73.97	23.9	155	324	
Hori.	4882.000	PK	47.00	31.70	6.04	41.39	3.33	46.68	73.97	27.2	150	0	
Hori.	7323.000	PK	45.56	36.92	7.59	41.25	3.33	52.15	73.97	21.8	150	0	
Hori.	9764.000	PK	45.84	38.45	8.49	40.41	3.33	55.70	73.97	18.2	150	0	
Hori.	12205.000	PK	44.99	39.61	9.97	39.79	3.33	58.11	73.97	15.8	150	0	
Hori.	3905.619	AV	47.69	28.98	5.58	41.74	3.33	43.84	53.97	10.1	155	324	
Hori.	4882.000	AV	35.59	31.70	6.04	41.39	3.33	35.27	53.97	18.7	150	0	
Hori.	7323.000	AV	34.63	36.92	7.59	41.25	3.33	41.22	53.97	12.7	150	0	
Hori.	9764.000	AV	33.57	38.45	8.49	40.41	3.33	43.43	53.97	10.5	150	0	
Hori.	12205.000	AV	33.14	39.61	9.97	39.79	3.33	46.26	53.97	**7.7**	150	0	
Vert.	69.129	QP	34.17	6.00	7.16	32.16	0.00	15.17	40.00	24.8	100	103	
Vert.	96.001	QP	23.69	8.94	7.40	32.14	0.00	7.89	43.50	35.6	106	189	
Vert.	479.996	QP	21.47	17.11	9.50	31.93	0.00	16.15	46.00	29.8	100	193	
Vert.	960.000	QP	21.53	22.69	11.21	30.52	0.00	24.91	46.00	21.0	100	179	
Vert.	3905.618	PK	53.43	28.98	5.58	41.74	3.33	49.58	73.97	24.3	157	210	
Vert.	4882.000	PK	46.36	31.70	6.04	41.39	3.33	46.04	73.97	27.9	150	0	
Vert.	7323.000	PK	45.83	36.92	7.59	41.25	3.33	52.42	73.97	21.5	150	0	
Vert.	9764.000	PK	44.59	38.45	8.49	40.41	3.33	54.45	73.97	19.5	150	0	
Vert.	12205.000	PK	43.84	39.61	9.97	39.79	3.33	56.96	73.97	17.0	150	0	
Vert.	3905.618	AV	47.42	28.98	5.58	41.74	3.33	43.57	53.97	10.4	157	210	
Vert.	4882.000	AV	35.53	31.70	6.04	41.39	3.33	35.21	53.97	18.7	150	0	
Vert.	7323.000	AV	34.63	36.92	7.59	41.25	3.33	41.22	53.97	12.7	150	0	
Vert.	9764.000	AV	33.46	38.45	8.49	40.41	3.33	43.32	53.97	10.6	150	0	
Vert.	12205.000	AV	33.15	39.61	9.97	39.79	3.33	46.27	53.97	**7.7**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

Radiated Spurious Emission

<Spec C>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2480 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: C278		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	68.445	QP	25.84	6.10	7.16	32.16	0.00	6.94	40.00	33.0	276	352	
Hori.	95.999	QP	22.27	8.94	7.40	32.14	0.00	6.47	43.50	37.0	303	171	
Hori.	479.997	QP	21.50	17.11	9.50	31.93	0.00	16.18	46.00	29.8	100	174	
Hori.	960.000	QP	21.52	22.69	11.21	30.52	0.00	24.90	46.00	21.1	100	193	
Hori.	2483.500	PK	45.89	27.91	13.91	40.69	3.33	50.35	73.97	23.6	261	193	
Hori.	3968.032	PK	53.44	29.09	5.59	41.81	3.33	49.64	73.97	24.3	155	321	
Hori.	4960.000	PK	47.35	32.00	6.06	41.23	3.33	47.51	73.97	26.4	100	0	
Hori.	7440.000	PK	45.52	36.95	7.63	41.37	3.33	52.06	73.97	21.9	100	0	
Hori.	9920.000	PK	44.10	38.44	8.57	40.32	3.33	54.12	73.97	19.8	100	0	
Hori.	12400.000	PK	43.21	39.53	10.10	39.71	3.33	56.46	73.97	17.5	100	0	
Hori.	2483.500	AV	34.72	27.91	13.91	40.69	3.33	39.18	53.97	14.7	261	193	
Hori.	3968.032	AV	46.68	29.09	5.59	41.81	3.33	42.88	53.97	11.0	155	321	
Hori.	4960.000	AV	35.51	32.00	6.06	41.23	3.33	35.67	53.97	18.3	100	0	
Hori.	7440.000	AV	34.40	36.95	7.63	41.37	3.33	40.94	53.97	13.0	100	0	
Hori.	9920.000	AV	32.85	38.44	8.57	40.32	3.33	42.87	53.97	11.1	100	0	
Hori.	12400.000	AV	32.19	39.53	10.10	39.71	3.33	45.44	53.97	**8.5**	100	0	
Vert.	69.218	QP	34.77	5.99	7.16	32.16	0.00	15.76	40.00	24.2	100	101	
Vert.	96.000	QP	23.71	8.94	7.40	32.14	0.00	7.91	43.50	35.5	105	191	
Vert.	479.998	QP	21.52	17.11	9.50	31.93	0.00	16.20	46.00	29.8	100	196	
Vert.	960.000	QP	21.55	22.69	11.21	30.52	0.00	24.93	46.00	21.0	100	192	
Vert.	2483.500	PK	46.15	27.91	13.91	40.69	3.33	50.61	73.97	23.3	155	221	
Vert.	3968.021	PK	52.84	29.09	5.59	41.81	3.33	49.04	73.97	24.9	152	230	
Vert.	4960.000	PK	47.45	32.00	6.06	41.23	3.33	47.61	73.97	26.3	150	0	
Vert.	7440.000	PK	46.63	36.95	7.63	41.37	3.33	53.17	73.97	20.8	150	0	
Vert.	9920.000	PK	44.51	38.44	8.57	40.32	3.33	54.53	73.97	19.4	150	0	
Vert.	12400.000	PK	43.74	39.53	10.10	39.71	3.33	56.99	73.97	16.9	150	0	
Vert.	2483.500	AV	34.65	27.91	13.91	40.69	3.33	39.11	53.97	14.8	155	221	
Vert.	3968.021	AV	44.79	29.09	5.59	41.81	3.33	40.99	53.97	12.9	152	230	
Vert.	4960.000	AV	35.48	32.00	6.06	41.23	3.33	35.64	53.97	18.3	150	0	
Vert.	7440.000	AV	34.39	36.95	7.63	41.37	3.33	40.93	53.97	13.0	150	0	
Vert.	9920.000	AV	32.80	38.44	8.57	40.32	3.33	42.82	53.97	11.1	150	0	
Vert.	12400.000	AV	32.18	39.53	10.10	39.71	3.33	45.43	53.97	**8.5**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB
13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

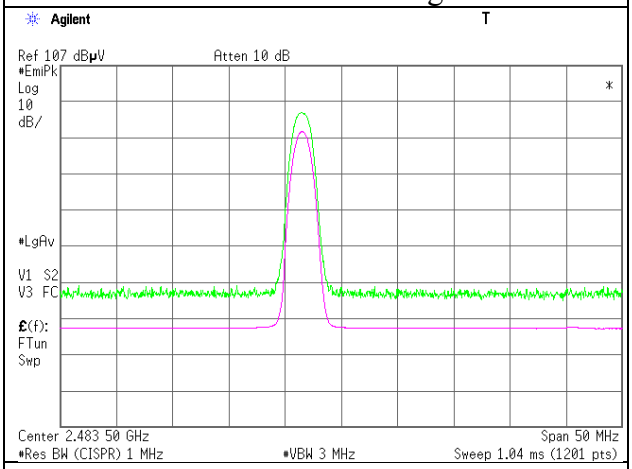
Radiated Spurious Emission
(Reference Plot for band-edge)

<Spec C>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

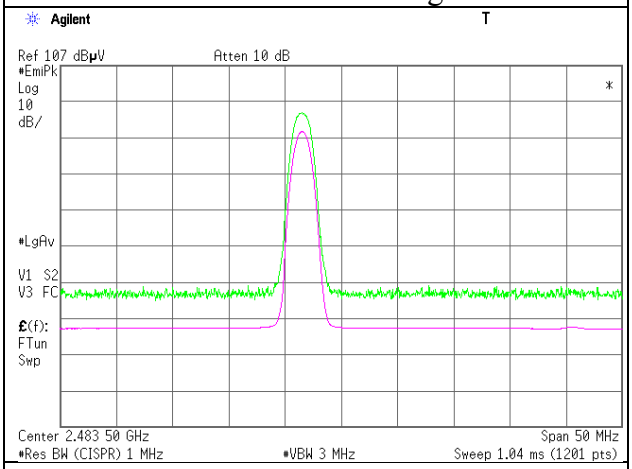
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2402 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2378.000	PK	46.81	27.73	13.81	40.70	3.33	50.98	73.97	22.9	100	202	
Hori.	2390.000	PK	46.75	27.75	13.82	40.70	3.33	50.95	73.97	23.0	131	26	
Hori.	3843.218	PK	53.32	28.87	5.58	41.67	3.33	49.43	73.97	24.5	216	308	
Hori.	4804.000	PK	47.30	31.41	6.01	41.54	3.33	46.51	73.97	27.4	150	0	
Hori.	7206.000	PK	46.12	36.89	7.55	41.12	3.33	52.77	73.97	21.2	150	0	
Hori.	9608.000	PK	46.48	38.46	8.40	40.49	3.33	56.18	73.97	17.7	150	0	
Hori.	12010.000	PK	45.60	39.69	9.82	39.88	3.33	58.56	73.97	15.4	150	0	
Hori.	2378.000	AV	36.70	27.73	13.81	40.70	3.33	40.87	53.97	13.1	100	202	
Hori.	2390.000	AV	34.07	27.75	13.82	40.70	3.33	38.27	53.97	15.7	131	26	
Hori.	3843.218	AV	47.68	28.87	5.58	41.67	3.33	43.79	53.97	10.1	216	308	
Hori.	4804.000	AV	35.74	31.41	6.01	41.54	3.33	34.95	53.97	19.0	150	0	
Hori.	7206.000	AV	35.42	36.89	7.55	41.12	3.33	42.07	53.97	11.9	150	0	
Hori.	9608.000	AV	34.59	38.46	8.40	40.49	3.33	44.29	53.97	9.6	150	0	
Hori.	12010.000	AV	34.81	39.69	9.82	39.88	3.33	47.77	53.97	**6.2**	150	0	
Vert.	2378.000	PK	47.98	27.73	13.81	40.70	3.33	52.15	73.97	21.8	101	244	
Vert.	2390.000	PK	46.75	27.75	13.82	40.70	3.33	50.95	73.97	23.0	174	260	
Vert.	3843.211	PK	53.90	28.87	5.58	41.67	3.33	50.01	73.97	23.9	261	27	
Vert.	4804.000	PK	46.58	31.41	6.01	41.54	3.33	45.79	73.97	28.1	150	0	
Vert.	7206.000	PK	46.01	36.89	7.55	41.12	3.33	52.66	73.97	21.3	150	0	
Vert.	9608.000	PK	46.08	38.46	8.40	40.49	3.33	55.78	73.97	18.1	150	0	
Vert.	12010.000	PK	45.86	39.69	9.82	39.88	3.33	58.82	73.97	15.1	150	0	
Vert.	2378.000	AV	37.69	27.73	13.81	40.70	3.33	41.86	53.97	12.1	101	244	
Vert.	2390.000	AV	34.18	27.75	13.82	40.70	3.33	38.38	53.97	15.5	174	260	
Vert.	3843.211	AV	47.63	28.87	5.58	41.67	3.33	43.74	53.97	10.2	261	27	
Vert.	4804.000	AV	35.70	31.41	6.01	41.54	3.33	34.91	53.97	19.0	150	0	
Vert.	7206.000	AV	35.29	36.89	7.55	41.12	3.33	41.94	53.97	12.0	150	0	
Vert.	9608.000	AV	34.57	38.46	8.40	40.49	3.33	44.27	53.97	9.7	150	0	
Vert.	12010.000	AV	34.65	39.69	9.82	39.88	3.33	47.61	53.97	6.3	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	94.23	27.77	13.83	40.70	3.33	98.46	-	-	
Hori.	2400.000	PK	38.16	27.76	13.83	40.70	3.33	42.38	78.46	36.1	
Vert.	2402.000	PK	96.23	27.77	13.83	40.70	3.33	100.46	-	-	
Vert.	2400.000	PK	41.31	27.76	13.83	40.70	3.33	45.53	80.46	34.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

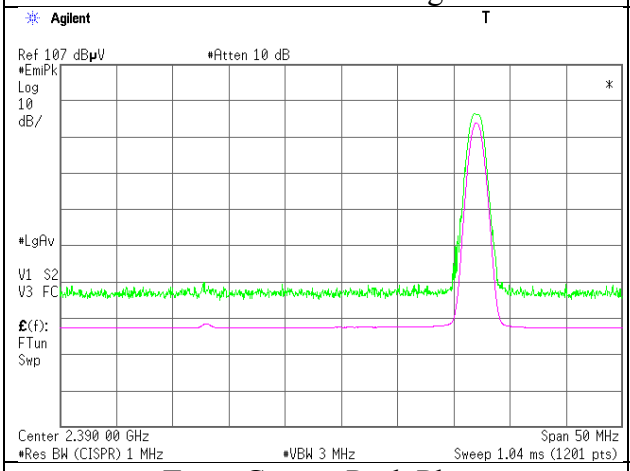
Radiated Spurious Emission

<Spec A>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Wataru Kojima
Mode	Tx, Hopping Off, DH5 2402 MHz

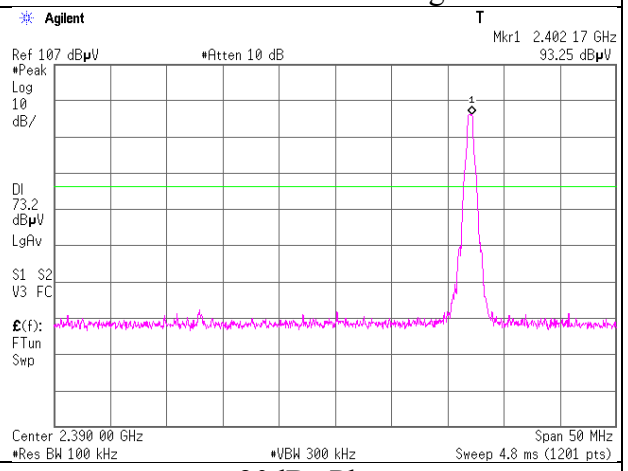
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

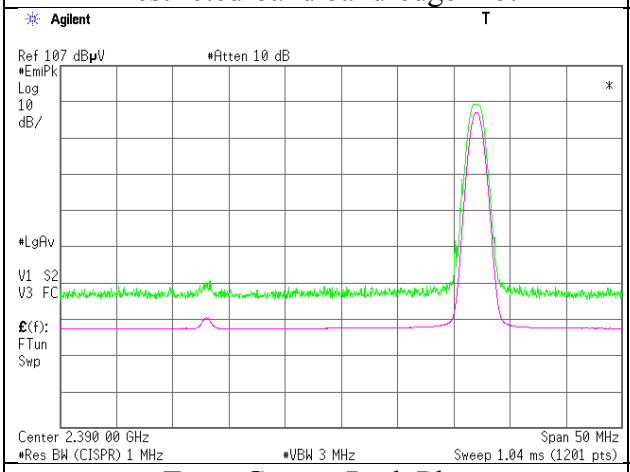
Authorized-band band-edge Plot



20dBc Plot

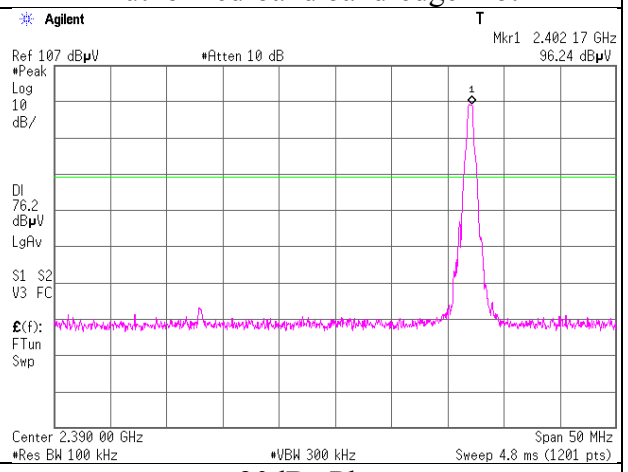
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2441 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	3905.620	PK	53.72	28.98	5.58	41.74	3.33	49.87	73.97	24.1	180	318	
Hori.	4882.000	PK	47.46	31.70	6.04	41.39	3.33	47.14	73.97	26.8	150	0	
Hori.	7323.000	PK	46.59	36.92	7.59	41.25	3.33	53.18	73.97	20.7	150	0	
Hori.	9764.000	PK	45.60	38.45	8.49	40.41	3.33	55.46	73.97	18.5	150	0	
Hori.	12205.000	PK	44.63	39.61	9.97	39.79	3.33	57.75	73.97	16.2	150	0	
Hori.	3905.620	AV	47.60	28.98	5.58	41.74	3.33	43.75	53.97	10.2	180	318	
Hori.	4882.000	AV	35.46	31.70	6.04	41.39	3.33	35.14	53.97	18.8	150	0	
Hori.	7323.000	AV	34.61	36.92	7.59	41.25	3.33	41.20	53.97	12.7	150	0	
Hori.	9764.000	AV	33.22	38.45	8.49	40.41	3.33	43.08	53.97	10.8	150	0	
Hori.	12205.000	AV	32.99	39.61	9.97	39.79	3.33	46.11	53.97	**7.8**	150	0	
Vert.	3905.615	PK	51.98	28.98	5.58	41.74	3.33	48.13	73.97	25.8	261	237	
Vert.	4882.000	PK	46.74	31.70	6.04	41.39	3.33	46.42	73.97	27.5	150	0	
Vert.	7323.000	PK	46.30	36.92	7.59	41.25	3.33	52.89	73.97	21.0	150	0	
Vert.	9764.000	PK	46.18	38.45	8.49	40.41	3.33	56.04	73.97	17.9	150	0	
Vert.	12205.000	PK	44.25	39.61	9.97	39.79	3.33	57.37	73.97	16.6	150	0	
Vert.	3905.615	AV	45.07	28.98	5.58	41.74	3.33	41.22	53.97	12.7	261	237	
Vert.	4882.000	AV	35.60	31.70	6.04	41.39	3.33	35.28	53.97	18.6	150	0	
Vert.	7323.000	AV	34.66	36.92	7.59	41.25	3.33	41.25	53.97	12.7	150	0	
Vert.	9764.000	AV	33.34	38.45	8.49	40.41	3.33	43.20	53.97	10.7	150	0	
Vert.	12205.000	AV	33.03	39.61	9.97	39.79	3.33	46.15	53.97	**7.8**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2480 MHz			
	Tx, Bluetooh, DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	45.97	27.91	13.91	40.69	3.33	50.43	73.97	23.5	240	205	
Hori.	3968.024	PK	52.87	29.09	5.59	41.81	3.33	49.07	73.97	24.9	240	320	
Hori.	4960.000	PK	46.86	32.00	6.06	41.23	3.33	47.02	73.97	26.9	150	0	
Hori.	7440.000	PK	46.37	36.95	7.63	41.37	3.33	52.91	73.97	21.0	150	0	
Hori.	9920.000	PK	44.12	38.44	8.57	40.32	3.33	54.14	73.97	19.8	150	0	
Hori.	12400.000	PK	43.80	39.53	10.10	39.71	3.33	57.05	73.97	16.9	150	0	
Hori.	2483.500	AV	34.20	27.91	13.91	40.69	3.33	38.66	53.97	15.3	240	205	
Hori.	3968.024	AV	45.60	29.09	5.59	41.81	3.33	41.80	53.97	12.1	240	320	
Hori.	4960.000	AV	35.19	32.00	6.06	41.23	3.33	35.35	53.97	18.6	150	0	
Hori.	7440.000	AV	34.41	36.95	7.63	41.37	3.33	40.95	53.97	13.0	150	0	
Hori.	9920.000	AV	32.73	38.44	8.57	40.32	3.33	42.75	53.97	11.2	150	0	
Hori.	12400.000	AV	32.37	39.53	10.10	39.71	3.33	45.62	53.97	**8.3**	150	0	
Vert.	2483.500	PK	46.07	27.91	13.91	40.69	3.33	50.53	73.97	23.4	155	248	
Vert.	3968.031	PK	51.14	29.09	5.59	41.81	3.33	47.34	73.97	26.6	267	31	
Vert.	4960.000	PK	47.21	32.00	6.06	41.23	3.33	47.37	73.97	26.6	150	0	
Vert.	7440.000	PK	46.97	36.95	7.63	41.37	3.33	53.51	73.97	20.4	150	0	
Vert.	9920.000	PK	44.02	38.44	8.57	40.32	3.33	54.04	73.97	19.9	150	0	
Vert.	12400.000	PK	43.37	39.53	10.10	39.71	3.33	56.62	73.97	17.3	150	0	
Vert.	2483.500	AV	34.24	27.91	13.91	40.69	3.33	38.70	53.97	15.2	155	248	
Vert.	3968.031	AV	43.98	29.09	5.59	41.81	3.33	40.18	53.97	13.7	267	31	
Vert.	4960.000	AV	35.50	32.00	6.06	41.23	3.33	35.66	53.97	18.3	150	0	
Vert.	7440.000	AV	34.41	36.95	7.63	41.37	3.33	40.95	53.97	13.0	150	0	
Vert.	9920.000	AV	32.72	38.44	8.57	40.32	3.33	42.74	53.97	11.2	150	0	
Vert.	12400.000	AV	32.22	39.53	10.10	39.71	3.33	45.47	53.97	8.5	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

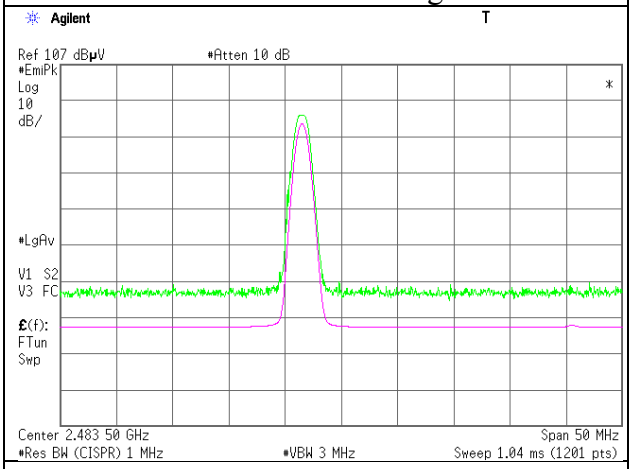
Radiated Spurious Emission

<Spec A>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Wataru Kojima
Mode	Tx, Hopping Off, DH5 2480 MHz

Horizontal

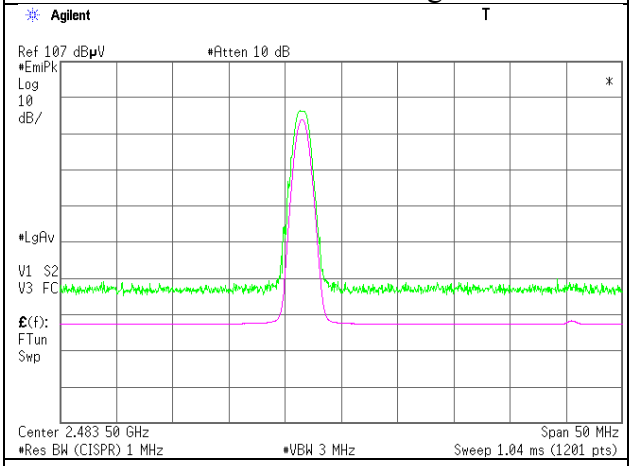
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2402 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	69.049	QP	24.67	6.02	7.16	32.16	0.00	5.69	40.00	34.3	279	355	
Hori.	95.999	QP	22.04	8.94	7.40	32.14	0.00	6.24	43.50	37.2	302	166	
Hori.	479.995	QP	21.48	17.11	9.50	31.93	0.00	16.16	46.00	29.8	100	174	
Hori.	960.000	QP	21.52	22.69	11.21	30.52	0.00	24.90	46.00	21.1	100	189	
Hori.	2377.982	PK	47.17	27.73	13.81	40.70	3.33	51.34	73.97	22.6	150	207	
Hori.	2390.000	PK	46.75	27.75	13.82	40.70	3.33	50.95	73.97	23.0	217	215	
Hori.	3843.202	PK	53.46	28.87	5.58	41.67	3.33	49.57	73.97	24.4	214	313	
Hori.	4804.000	PK	46.63	31.41	6.01	41.54	3.33	45.84	73.97	28.1	150	0	
Hori.	7206.000	PK	47.03	36.89	7.55	41.12	3.33	53.68	73.97	20.2	150	0	
Hori.	9608.000	PK	46.75	38.46	8.40	40.49	3.33	56.45	73.97	17.5	150	0	
Hori.	12010.000	PK	46.48	39.69	9.82	39.88	3.33	59.44	73.97	14.5	150	0	
Hori.	2377.982	AV	36.60	27.73	13.81	40.70	3.33	40.77	53.97	13.2	150	207	
Hori.	2390.000	AV	34.26	27.75	13.82	40.70	3.33	38.46	53.97	15.5	217	215	
Hori.	3843.202	AV	47.73	28.87	5.58	41.67	3.33	43.84	53.97	10.1	214	313	
Hori.	4804.000	AV	35.64	31.41	6.01	41.54	3.33	34.85	53.97	19.1	150	0	
Hori.	7206.000	AV	35.44	36.89	7.55	41.12	3.33	42.09	53.97	11.8	150	0	
Hori.	9608.000	AV	34.74	38.46	8.40	40.49	3.33	44.44	53.97	9.5	150	0	
Hori.	12010.000	AV	34.83	39.69	9.82	39.88	3.33	47.79	53.97	**6.1**	150	0	
Vert.	69.043	QP	33.94	6.02	7.16	32.16	0.00	14.96	40.00	25.0	100	99	
Vert.	96.001	QP	24.73	8.94	7.40	32.14	0.00	8.93	43.50	34.5	106	194	
Vert.	479.997	QP	21.45	17.11	9.50	31.93	0.00	16.13	46.00	29.8	100	196	
Vert.	960.000	QP	21.55	22.69	11.21	30.52	0.00	24.93	46.00	21.0	100	191	
Vert.	2390.000	PK	46.43	27.75	13.82	40.70	3.33	50.63	73.97	23.3	100	241	
Vert.	3843.203	PK	52.88	28.87	5.58	41.67	3.33	48.99	73.97	24.9	201	32	
Vert.	4804.000	PK	47.62	31.41	6.01	41.54	3.33	46.83	73.97	27.1	150	0	
Vert.	7206.000	PK	47.36	36.89	7.55	41.12	3.33	54.01	73.97	19.9	150	0	
Vert.	9608.000	PK	46.38	38.46	8.40	40.49	3.33	56.08	73.97	17.8	150	0	
Vert.	12010.000	PK	45.84	39.69	9.82	39.88	3.33	58.80	73.97	15.1	150	0	
Vert.	2377.982	AV	36.41	27.73	13.81	40.70	3.33	40.58	53.97	13.3	101	286	
Vert.	2390.000	AV	34.10	27.75	13.82	40.70	3.33	38.30	53.97	15.6	100	241	
Vert.	3843.203	AV	47.37	28.87	5.58	41.67	3.33	43.48	53.97	10.4	201	32	
Vert.	4804.000	AV	35.85	31.41	6.01	41.54	3.33	35.06	53.97	18.9	150	0	
Vert.	7206.000	AV	35.37	36.89	7.55	41.12	3.33	42.02	53.97	11.9	150	0	
Vert.	9608.000	AV	34.66	38.46	8.40	40.49	3.33	44.36	53.97	9.6	150	0	
Vert.	12010.000	AV	34.77	39.69	9.82	39.88	3.33	47.73	53.97	6.2	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	95.67	27.77	13.83	40.70	3.33	99.90	-	-	
Hori.	2400.000	PK	41.20	27.76	13.83	40.70	3.33	45.42	79.90	34.5	
Vert.	2402.000	PK	95.46	27.77	13.83	40.70	3.33	99.69	-	-	
Vert.	2400.000	PK	41.06	27.76	13.83	40.70	3.33	45.28	79.69	34.4	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

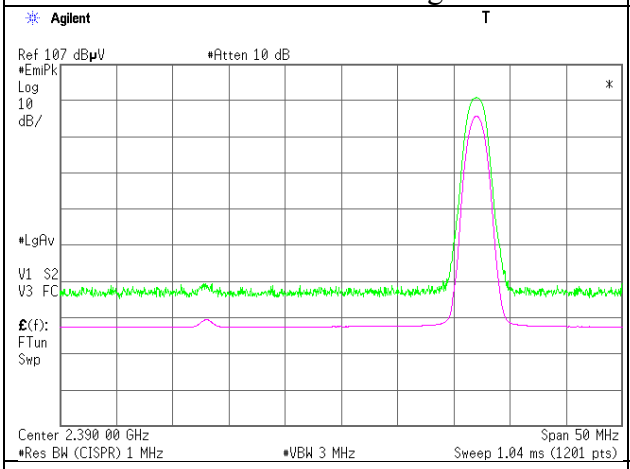
Radiated Spurious Emission

<Spec A>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Wataru Kojima
Mode	Tx, Hopping Off, 3DH5 2402 MHz

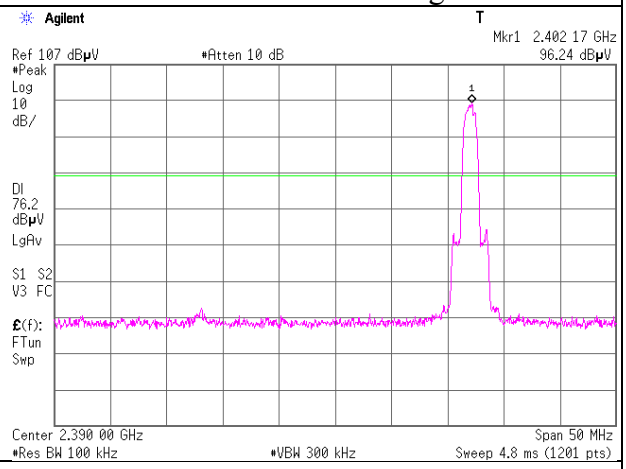
Horizontal

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

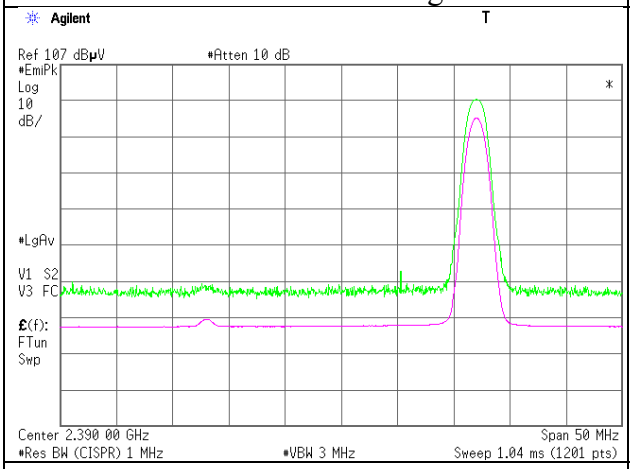
Authorized-band band-edge Plot



20dBc Plot

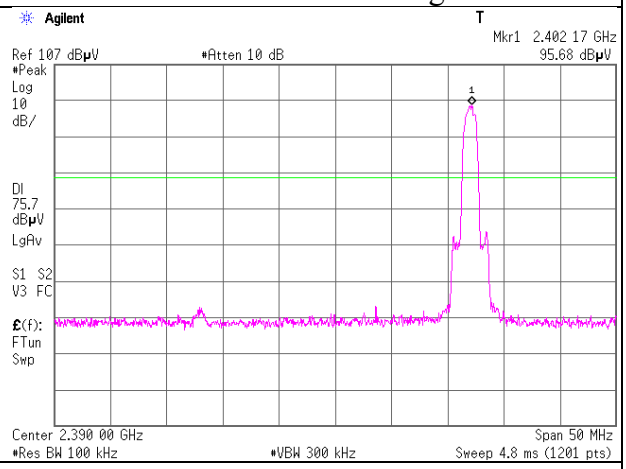
Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Authorized-band band-edge Plot



20dBc Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2441 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	3905.625	PK	53.13	28.98	5.58	41.74	3.33	49.28	73.97	24.6	175	320	
Hori.	4882.000	PK	47.21	31.70	6.04	41.39	3.33	46.89	73.97	27.0	150	0	
Hori.	7323.000	PK	46.43	36.92	7.59	41.25	3.33	53.02	73.97	20.9	150	0	
Hori.	9764.000	PK	44.85	38.45	8.49	40.41	3.33	54.71	73.97	19.2	150	0	
Hori.	12205.000	PK	44.51	39.61	9.97	39.79	3.33	57.63	73.97	16.3	150	0	
Hori.	3905.625	AV	47.71	28.98	5.58	41.74	3.33	43.86	53.97	10.1	175	320	
Hori.	4882.000	AV	35.41	31.70	6.04	41.39	3.33	35.09	53.97	18.8	150	0	
Hori.	7323.000	AV	34.74	36.92	7.59	41.25	3.33	41.33	53.97	12.6	150	0	
Hori.	9764.000	AV	33.53	38.45	8.49	40.41	3.33	43.39	53.97	10.5	150	0	
Hori.	12205.000	AV	33.37	39.61	9.97	39.79	3.33	46.49	53.97	**7.4**	150	0	
Vert.	3905.607	PK	52.58	28.98	5.58	41.74	3.33	48.73	73.97	25.2	143	36	
Vert.	4882.000	PK	47.07	31.70	6.04	41.39	3.33	46.75	73.97	27.2	150	0	
Vert.	7323.000	PK	45.83	36.92	7.59	41.25	3.33	52.42	73.97	21.5	150	0	
Vert.	9764.000	PK	45.36	38.45	8.49	40.41	3.33	55.22	73.97	18.7	150	0	
Vert.	12205.000	PK	44.56	39.61	9.97	39.79	3.33	57.68	73.97	16.2	150	0	
Vert.	3905.607	AV	46.11	28.98	5.58	41.74	3.33	42.26	53.97	11.7	143	36	
Vert.	4882.000	AV	35.61	31.70	6.04	41.39	3.33	35.29	53.97	18.6	150	0	
Vert.	7323.000	AV	34.70	36.92	7.59	41.25	3.33	41.29	53.97	12.6	150	0	
Vert.	9764.000	AV	33.44	38.45	8.49	40.41	3.33	43.30	53.97	10.6	150	0	
Vert.	12205.000	AV	32.97	39.61	9.97	39.79	3.33	46.09	53.97	7.8	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

Radiated Spurious Emission

<Spec A>

UL Japan, Inc. Shonan EMC Lab.

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg.C, 53 %RH	23 deg.C, 53 %RH	26 deg.C, 59 %RH	26 deg.C, 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, 2480 MHz			
	Tx, Bluetooth, 3-DH5, PRBS9	s/n: A145		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Antenna Factor [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.36	27.91	13.91	40.69	3.33	50.82	73.97	23.1	236	206	
Hori.	3968.025	PK	51.72	29.09	5.59	41.81	3.33	47.92	73.97	26.0	243	322	
Hori.	4960.000	PK	46.90	32.00	6.06	41.23	3.33	47.06	73.97	26.9	150	0	
Hori.	7440.000	PK	46.19	36.95	7.63	41.37	3.33	52.73	73.97	21.2	150	0	
Hori.	9920.000	PK	44.82	38.44	8.57	40.32	3.33	54.84	73.97	19.1	150	0	
Hori.	12400.000	PK	44.22	39.53	10.10	39.71	3.33	57.47	73.97	16.5	150	0	
Hori.	2483.500	AV	34.16	27.91	13.91	40.69	3.33	38.62	53.97	15.3	236	206	
Hori.	3968.025	AV	45.63	29.09	5.59	41.81	3.33	41.83	53.97	12.1	243	322	
Hori.	4960.000	AV	35.25	32.00	6.06	41.23	3.33	35.41	53.97	18.5	150	0	
Hori.	7440.000	AV	34.38	36.95	7.63	41.37	3.33	40.92	53.97	13.0	150	0	
Hori.	9920.000	AV	32.71	38.44	8.57	40.32	3.33	42.73	53.97	11.2	150	0	
Hori.	12400.000	AV	32.28	39.53	10.10	39.71	3.33	45.53	53.97	**8.4**	150	0	
Vert.	2483.500	PK	46.61	27.91	13.91	40.69	3.33	51.07	73.97	22.9	112	252	
Vert.	3968.044	PK	52.04	29.09	5.59	41.81	3.33	48.24	73.97	25.7	188	25	
Vert.	4960.000	PK	47.06	32.00	6.06	41.23	3.33	47.22	73.97	26.7	150	0	
Vert.	7440.000	PK	45.48	36.95	7.63	41.37	3.33	52.02	73.97	21.9	150	0	
Vert.	9920.000	PK	43.80	38.44	8.57	40.32	3.33	53.82	73.97	20.1	150	0	
Vert.	12400.000	PK	43.14	39.53	10.10	39.71	3.33	56.39	73.97	17.5	150	0	
Vert.	2483.500	AV	34.20	27.91	13.91	40.69	3.33	38.66	53.97	15.3	112	252	
Vert.	3968.044	AV	44.14	29.09	5.59	41.81	3.33	40.34	53.97	13.6	188	25	
Vert.	4960.000	AV	35.66	32.00	6.06	41.23	3.33	35.82	53.97	18.1	150	0	
Vert.	7440.000	AV	34.77	36.95	7.63	41.37	3.33	41.31	53.97	12.6	150	0	
Vert.	9920.000	AV	32.99	38.44	8.57	40.32	3.33	43.01	53.97	10.9	150	0	
Vert.	12400.000	AV	32.26	39.53	10.10	39.71	3.33	45.51	53.97	**8.4**	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor) - Gain(Amprifier)
Distance factor : 1 GHz - 13 GHz : 20log (4.4 m / 3.0 m) = 3.33 dB

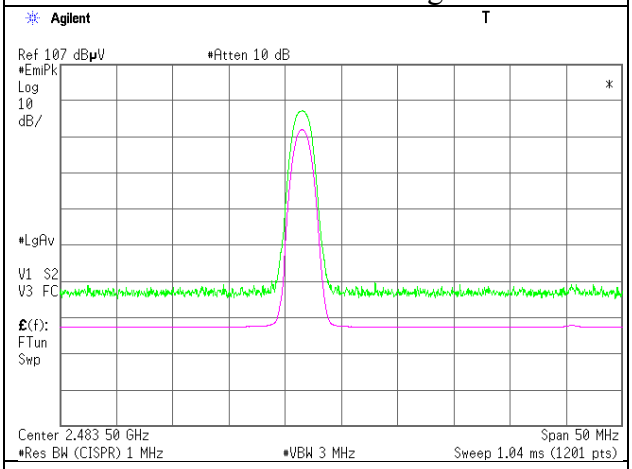
Radiated Spurious Emission

<Spec A>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11319287S-A-R2
Date	July 12, 2016
Temperature / Humidity	23 deg. C / 53 % RH
Engineer	Wataru Kojima
Mode	Tx, Hopping Off, 3DH5 2480 MHz

Horizontal

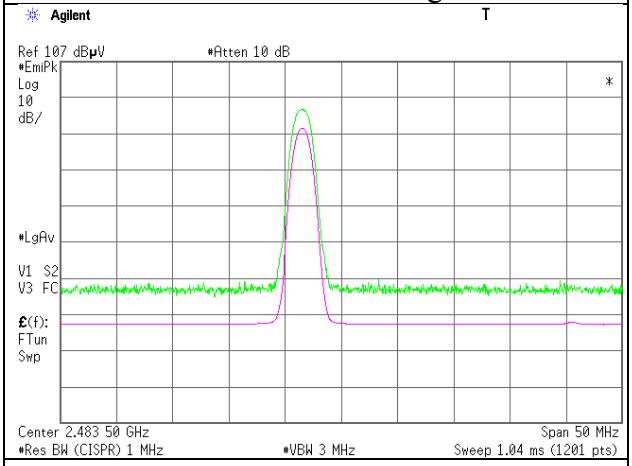
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



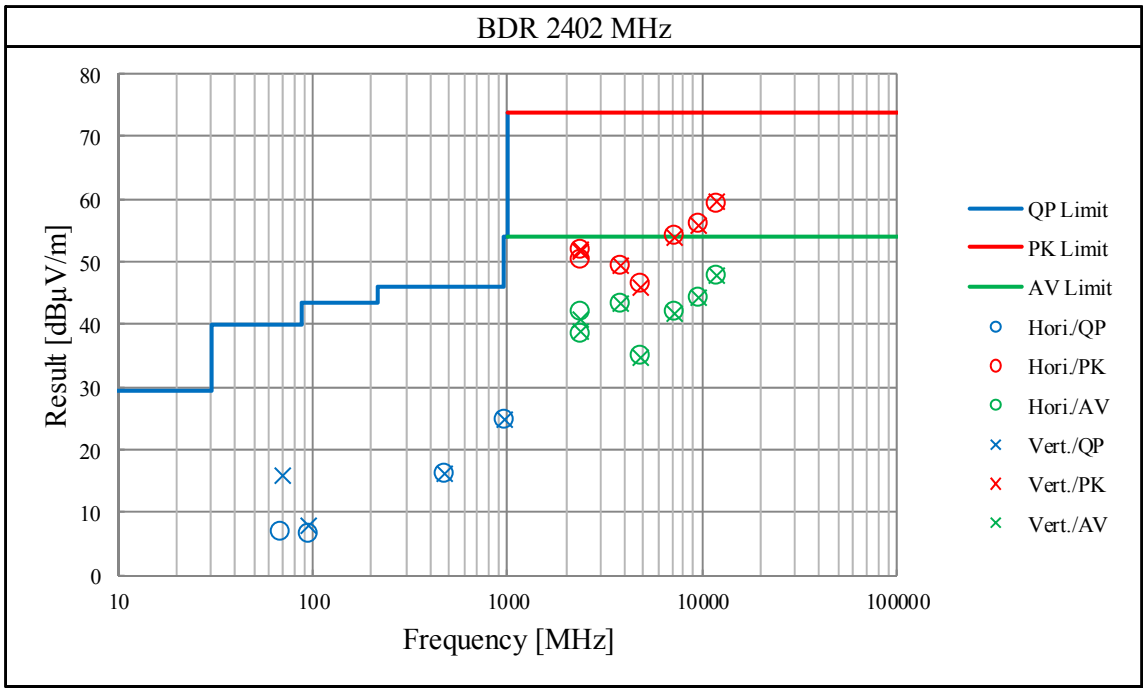
Trace Green : Peak Plot
Trace Purple : Average Plot

* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

<Spec C>

Test place	Shonan EMC Lab. No.3 Semi Anechoic Chamber			
Report No.	11319287S-A-R2			
Date	July 12, 2016	July 12, 2016	July 21, 2016	July 26, 2016
Temperature / Humidity	23 deg. C / 53 % RH	23 deg.C / 53 %RH	26 deg.C / 59 %RH	26 deg.C / 68 %RH
Engineer	Wataru Kojima	Shinichi Takano	Kenichi Adachi	Kenichi Adachi
Mode	Tx, Hopping Off, DH5 2402 MHz			



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

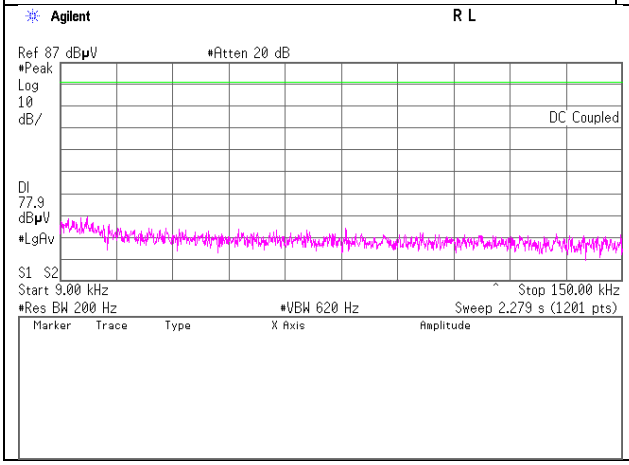
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, DH5,

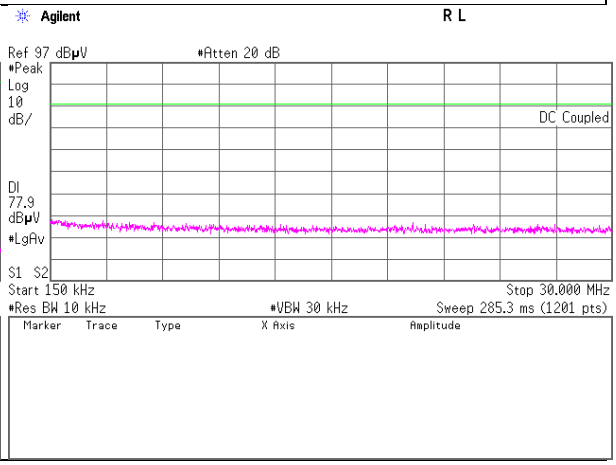
<Spec C>

2402 MHz

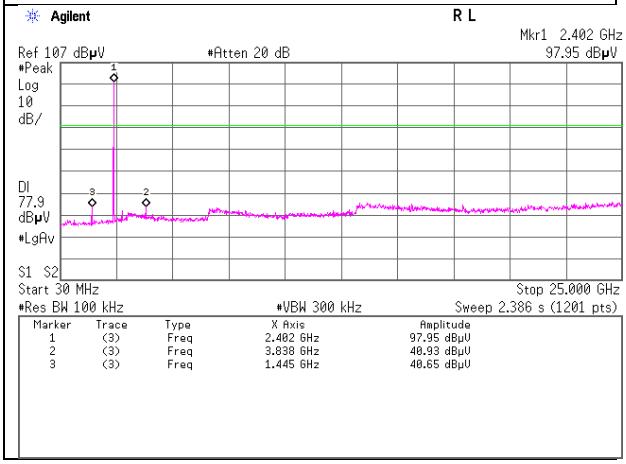
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz



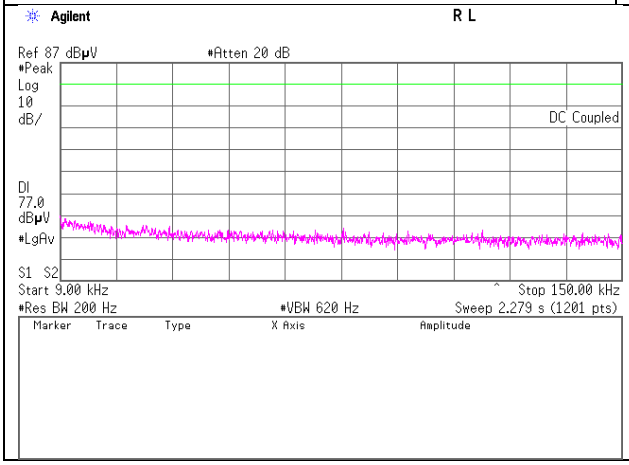
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, DH5,

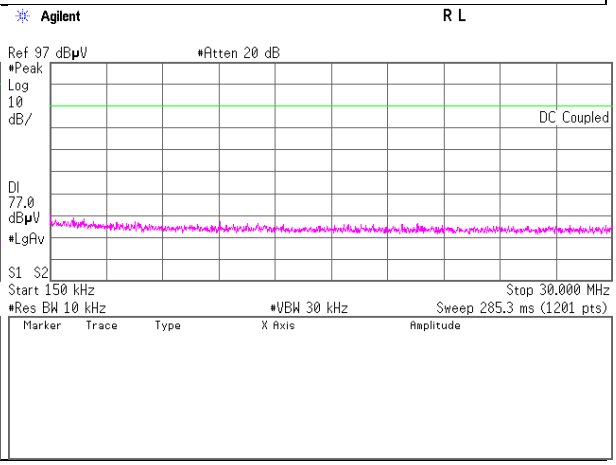
<Spec C>

2441 MHz

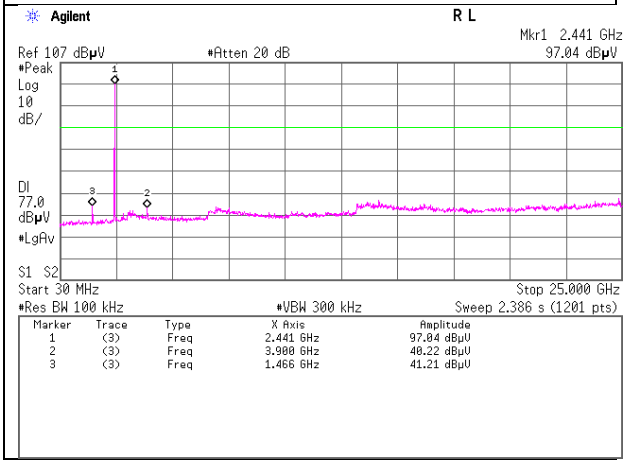
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz



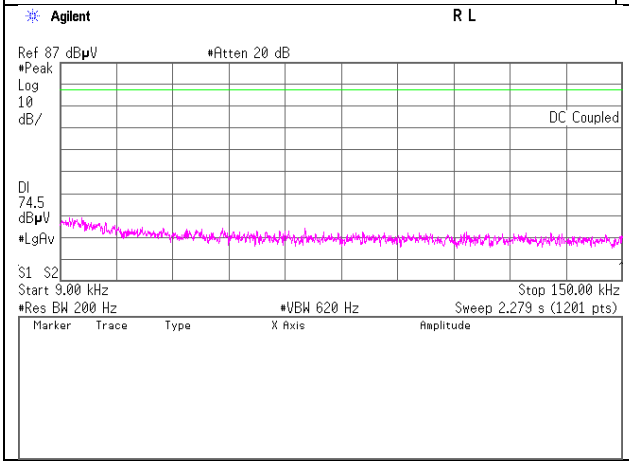
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, DH5,

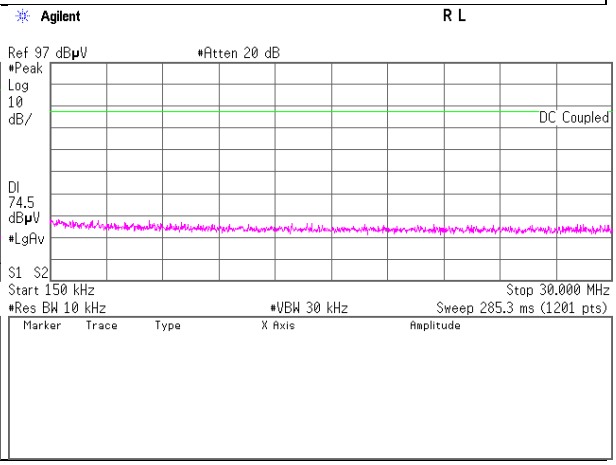
<Spec C>

2480 MHz

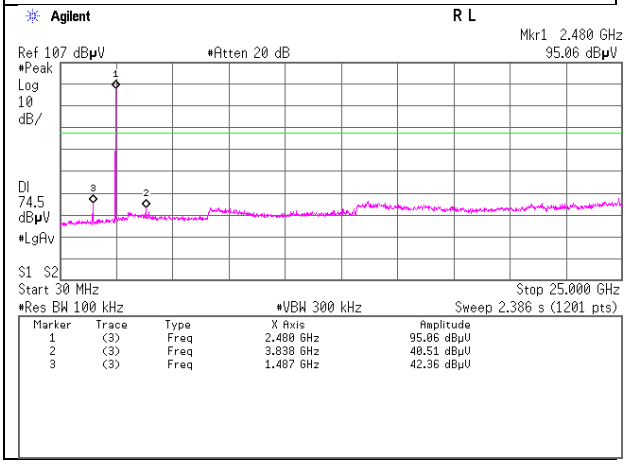
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz



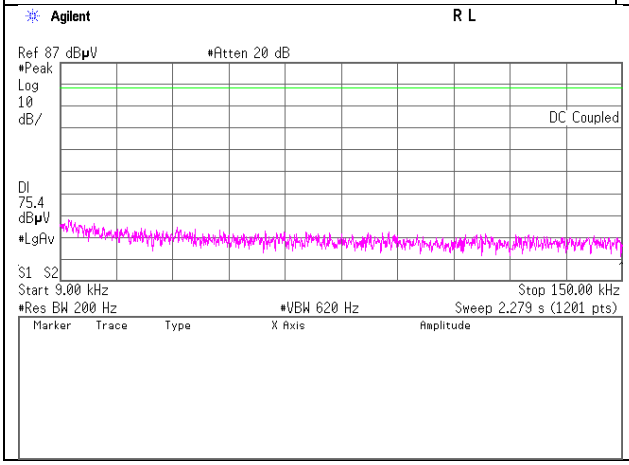
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, 3DH5,

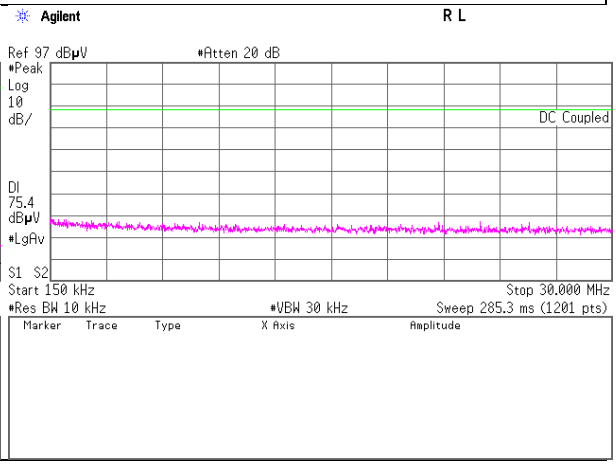
<Spec C>

2402 MHz

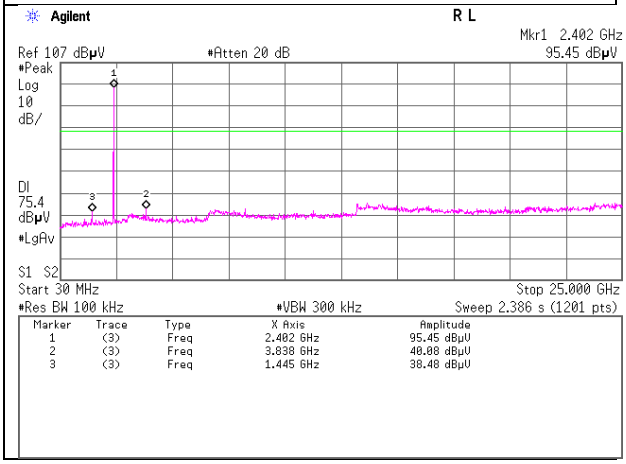
9 kHz – 150 kHz



150 kHz – 30 MHz



30 MHz – 25 GHz



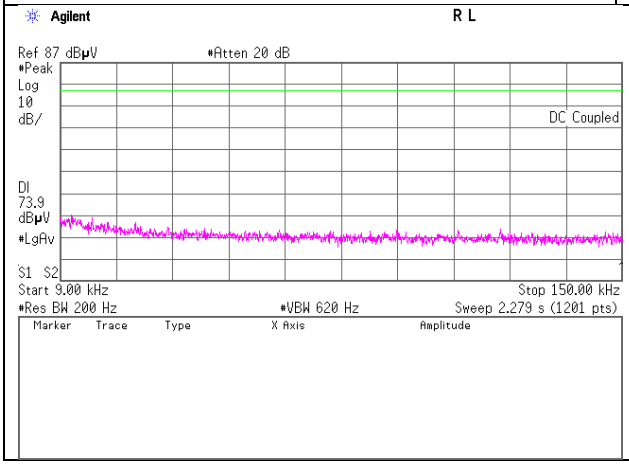
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, 3DH5,

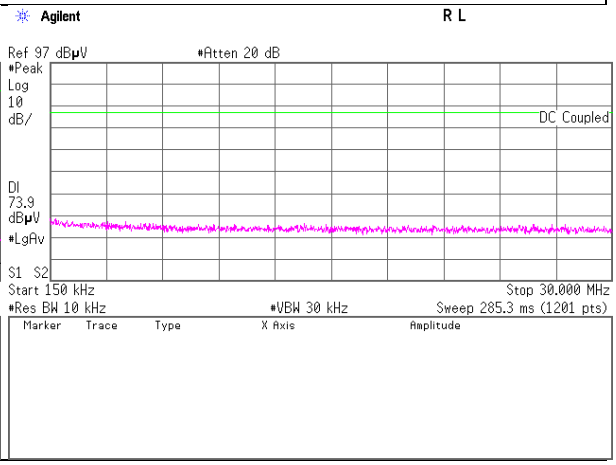
<Spec C>

2441 MHz

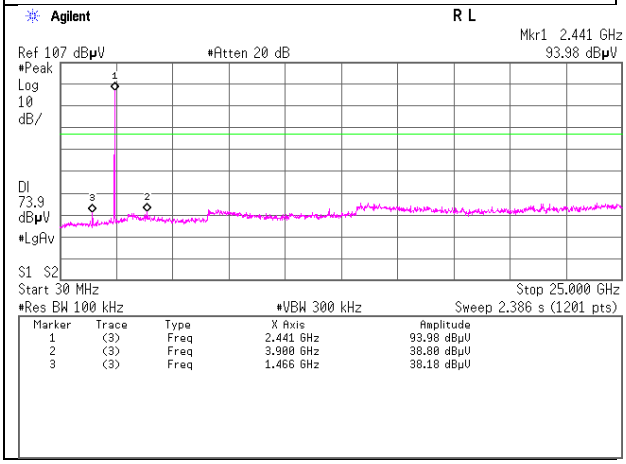
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz



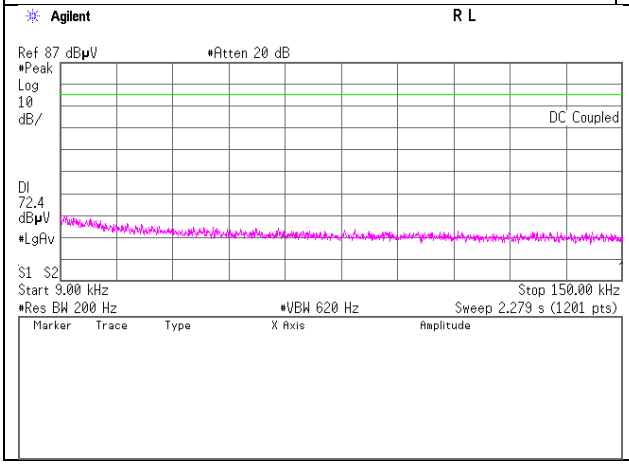
Conducted Spurious Emission

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, 3DH5,

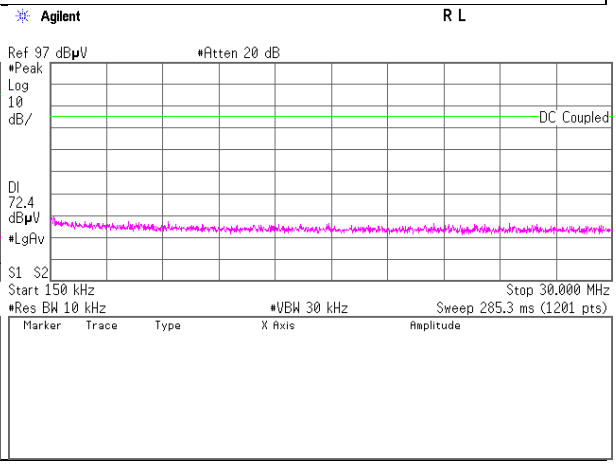
<Spec C>

2480 MHz

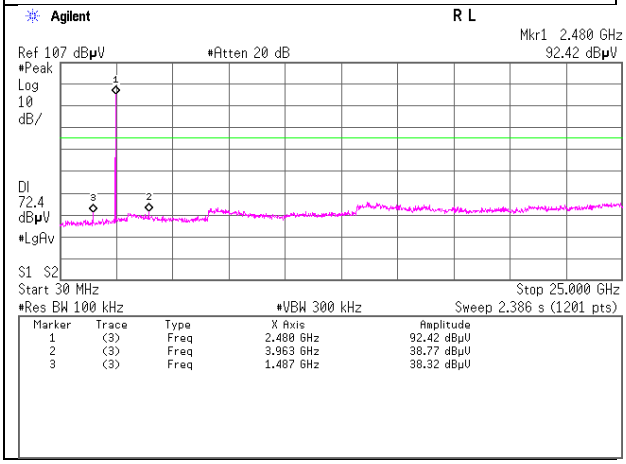
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 25 GHz



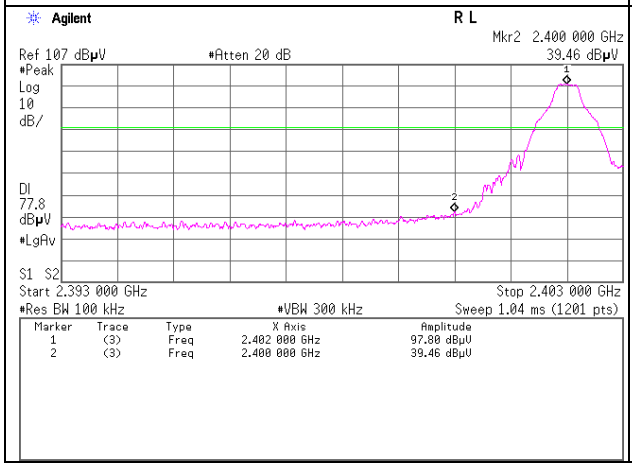
Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping On, Off, DH5

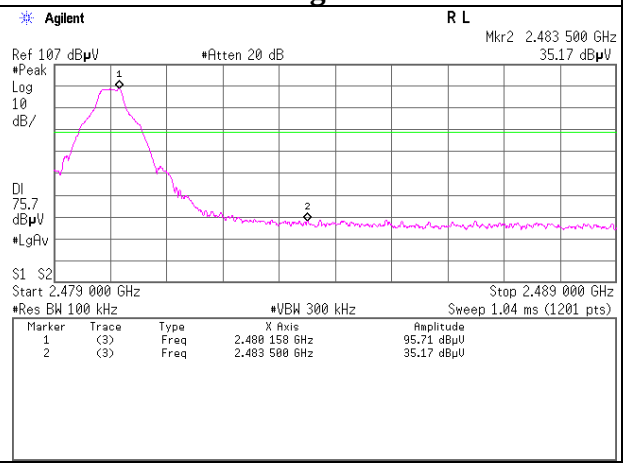
<Spec C>

Hopping On

Low



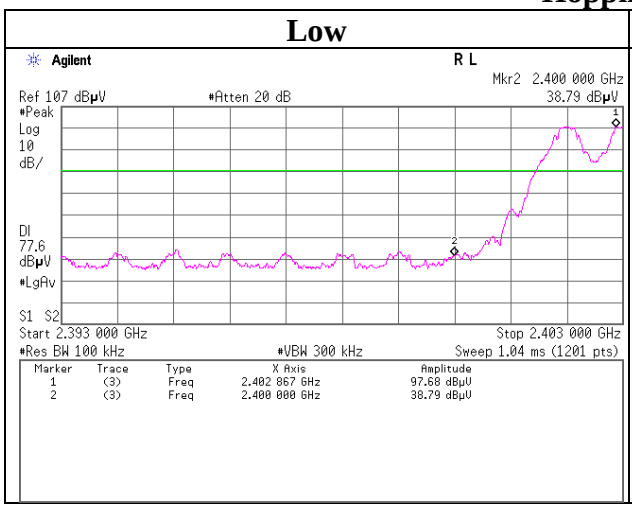
High



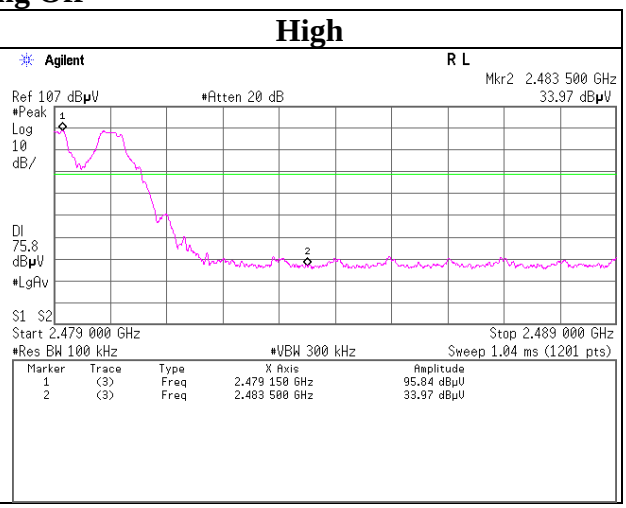
<Type C>

Hopping Off

Low



High



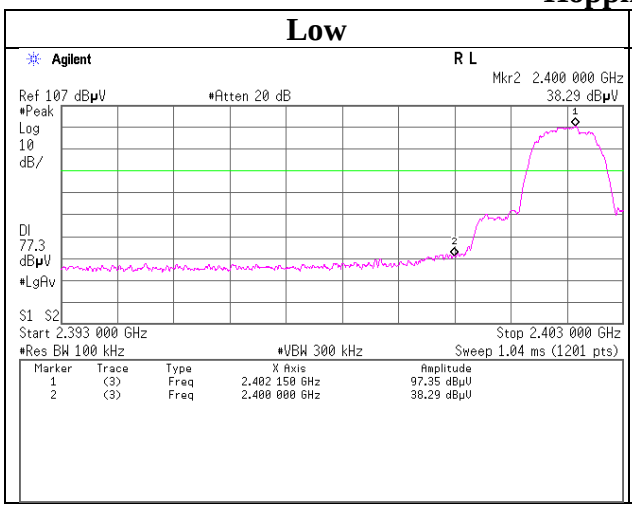
Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping On, Off, 3-DH5

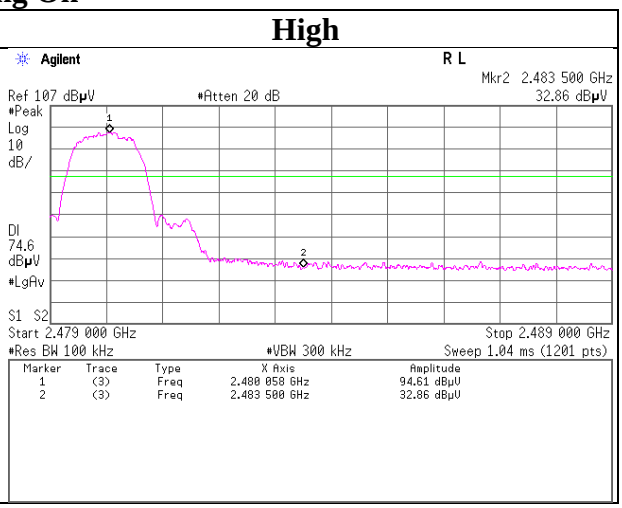
<Spec C>

Hopping On

Low



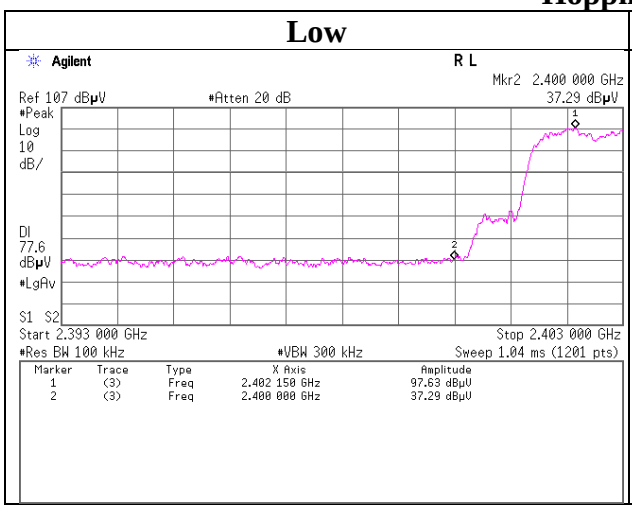
High



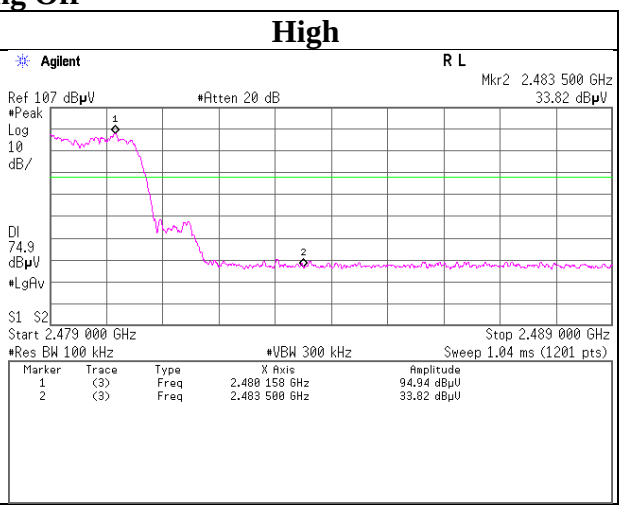
<Type C>

Hopping Off

Low



High

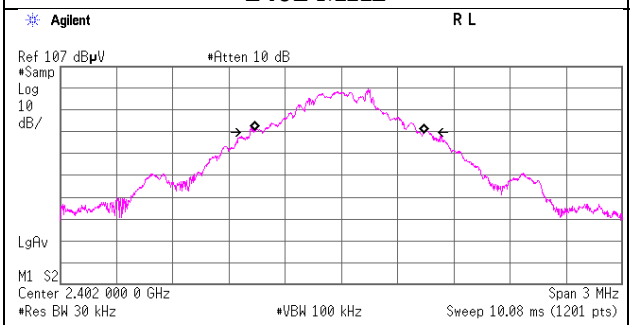


99 %Occupied Bandwidth

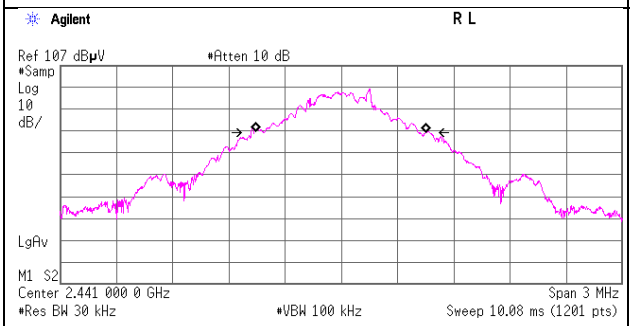
Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off,
	<Spec C>

Hopping Off, DH5

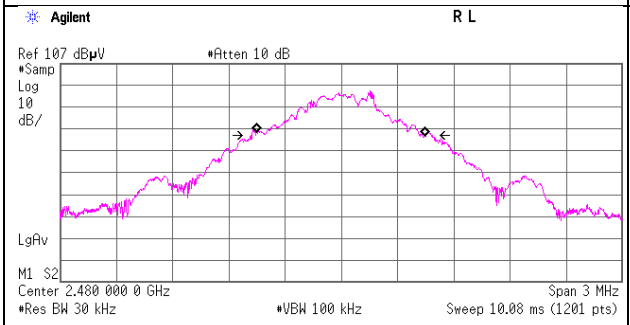
2402 MHz



2441 MHz

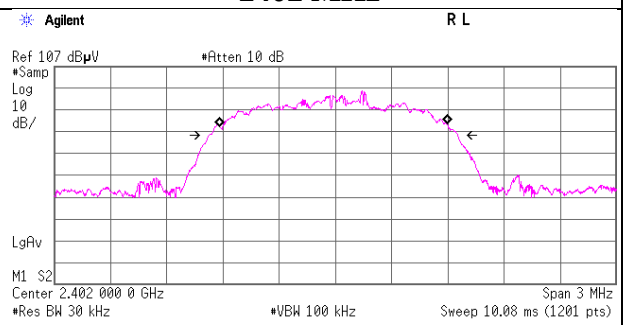


2480 MHz

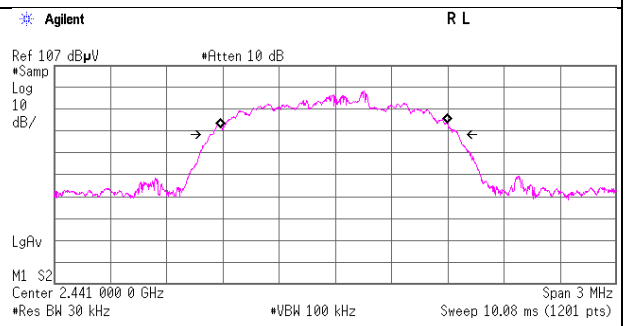


Hopping Off, 3DH5

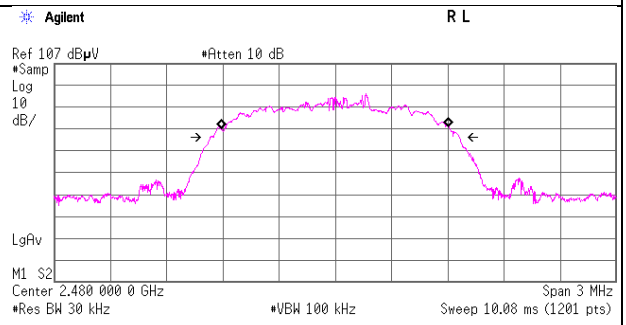
2402 MHz



2441 MHz



2480 MHz

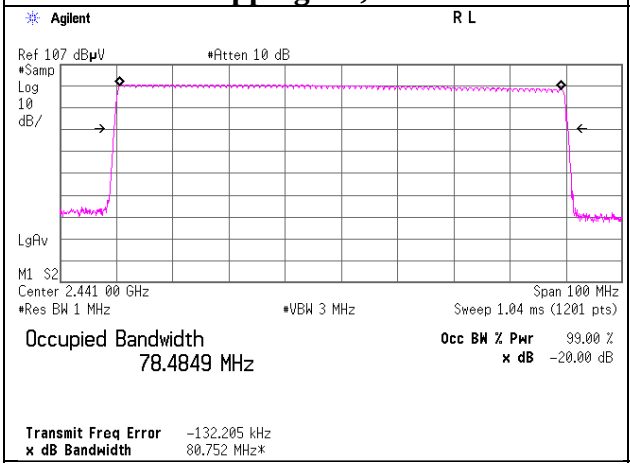


99 % Occupied Bandwidth

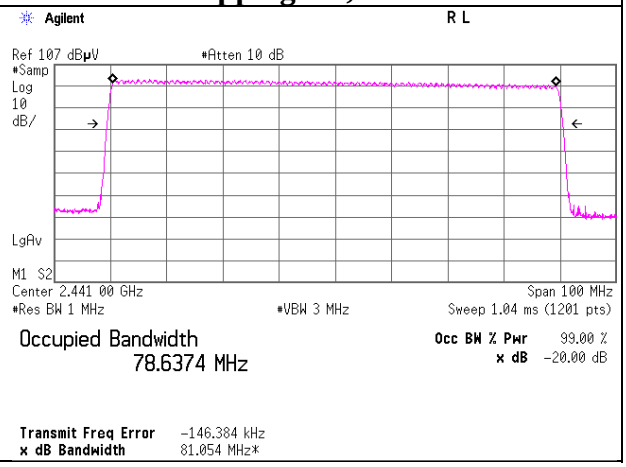
Test place	Shonan EMC Lab. No.1 Measurement Room
Report No.	11319287S-A-R2
Date	July 17, 2016
Temperature / Humidity	24 deg. C / 66 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping On,

<Spec C>

Hopping On, DH5



Hopping On, 3DH5



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2016/04/01 * 12
SPSS-01	Power Sensor	Anritsu	MA2444D	0738366	AT	2016/04/01 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT, RE	2016/03/23 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2016/03/23 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2016/04/18 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2015/10/22 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	AT	2015/11/18 * 12
SRENT-05	Spectrum Analyzer	KEYSIGHT	E4440A	MY46187752	AT	2015/10/05 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2015/12/07 * 12
KTS-08	Digital Tester	SANWA	PC500	7019224	AT	2016/03/15 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2016/03/22 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2016/06/23 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2016/05/11 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2015/08/11 * 12
SAJ-01	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S001	RE	Pre Check
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2015/10/22 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2016/04/22 * 12
SJM-15	Measure	ASKUL	-	-	RE, CE	-
SAEC-03(SVSWR)	Semi-Anechoic Chamber	TDK	SAEC-03(SVSWR)	3	RE	2015/08/28 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE, CE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE, CE	2015/11/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2015/11/04 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2015/11/16 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2016/07/15 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2015/10/11 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2015/10/11 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2016/08/04 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2016/04/22 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2016/02/25 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE, CE	2016/03/28 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2016/03/24 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2015/09/07 * 12
SCC-G20	Coaxial Cable	Junkosha	J12J102518-00	APR-15-15-003	RE	2016/04/18 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE (EUT)	2016/02/08 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2015/09/18 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2016/04/22 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2015/12/07 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: **CE: Conducted Emission test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test

(Tested date)
Conducted Emission test : July 26, 2016
Radiated Emissions test : July 12 to 26, 2016
Antenna Terminal Conducted test : July 17, 2016