RADIO TEST REPORT

Test Report No. : 10543199H-A-R1

Applicant	:	**Sony Mobile Communications Inc.**
Type of Equipment	:	**Bluetooth Speaker**
Model No.	:	**Bluetooth Speaker**
FCC ID	:	**PY7-RD0180**
Test regulation	:	**FCC Part 15 Subpart C: 2014**
Test Result	:	**Complied**

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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. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
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 10543199H-A. 10543199H-A is replaced with this report.

Date of test: November 21 to 29, 2014

Representative test engineer:
Kazuya Yoshioka
Engineer
Consumer Technology Division

Approved by:
Takayuki Shimada
Engineer
Consumer Technology Division

NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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REVISION HISTORY

Original Test Report No.: 10543199H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10543199H-A	December 8, 2014	-	-
1	10543199H-A-R1	December 18, 2014	P6	Correction of voltage and antenna requirements.

CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	Sony Mobile Communications Inc.
Address	:	Nya Vatterntornet Mobilvagen 10, Lund 22188, Sweden
Telephone Number	:	+46108023357
Facsimile Number	:	+46108002441
Contact Person	:	Hansson Mats

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

2.1 Identification of E.U.T.

Type of Equipment	:	Bluetooth Speaker
Model No.	:	Bluetooth Speaker
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5V (USB) DC 3.7V (Built-in lithium-ion battery)
Receipt Date of Sample	:	November 21, 2014
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering 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

General Specification

Clock frequency(ies) in the system	:	26MHz

Radio Specification

[Bluetooth Ver3.0 with EDR function]

Radio Type	:	Transceiver
Frequency of Operation	:	2402-2480MHz
Modulation	:	FHSS
Power Supply (radio part input)	:	DC 1.8V
Antenna type	:	Monopole antenna
Antenna Gain	:	0.43dBi (max)
Operating Temperature	:	5 deg. C to 40 deg. C

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C: 2014, final revised on August 15, 2014 and effective October 14, 2014
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.4:2003 7. AC powerline conducted emission measurements **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**QP** 14.4dB, 0.39821MHz, L **AV** 10.2dB, 24.00020MHz, N / 0.40241MHz, L	Complied	-
Carrier Frequency Separation	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1) **IC:** RSS-210 A8.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1) **IC:** RSS-210 A8.1 (a)		Complied	Conducted
Number of Hopping Frequency	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1)(iii) **IC:** RSS-210 A8.1 (d)		Complied	Conducted
Dwell time	**FCC:** FCC Public Notice DA 00-705 **IC:** -	**FCC:** Section15.247(a)(1)(iii) **IC:** RSS-210 A8.1 (d)		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-210 A8.4 (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-210 A8.5 RSS-Gen 8.9 RSS-Gen 8.10	7.3dB 62.624MHz, QP, Vert.	Complied	Conducted/ Radiated
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.					

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC Part 15.31 (e)
This EUT provides stable voltage (DC 1.8V) 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	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 4.6.1	**IC:** RSS-Gen 4.6.1	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.

Test room (semi-anechoic chamber)	Conducted emission (±dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.5dB
No.3	3.6dB
No.4	3.5dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(±dB)				(1m*)(±dB)		(0.5m*)(±dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (±dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (±dB)			Antenna terminal conducted emission (±dB)		Channel power (±dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

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

Radiated emission test (3m)
The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	8.0 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, 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
*The EUT does not have Inquiry mode.

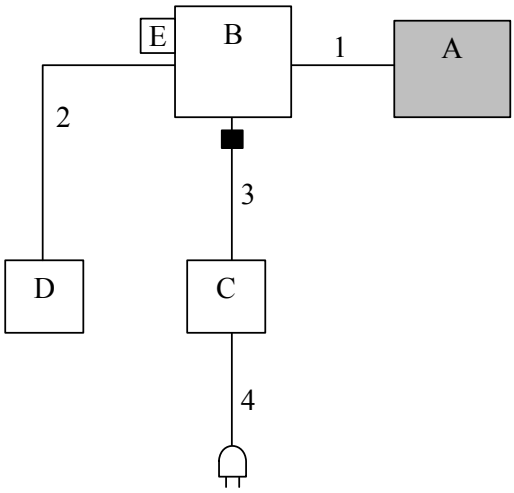
Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated), 20dB Bandwidth	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation	Tx (Hopping on) DH5, 3DH5	2402MHz 2441MHz 2480MHz
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	2402MHz 2441MHz 2480MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2441MHz 2480MHz

*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.

*EUT has the power settings by the software as follows;
Power settings: Same as production model
Software: Croft_SP2_Inspection V2.0
*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 and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Bluetooth Speaker	Bluetooth Speaker	1183 for AT* 1184 for other tests	Sony Mobile Communications Inc.	EUT
B	Laptop PC	Q32MC	NXRYXSJ00522505F2C1601	Acer Inc.	-
C	AC Adapter	PA-1650-80	ADT KP06503004223018DCPE09	LITE-ON TECHNOLOGY	-
D	Mouse	MO56UC	520026409	DELL	-
E	SD Memory Card	RP-SD256B	BJ8CA308933	Panasonic	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	USB Cable	1.8	Shielded	Shielded	-
3	DC Cable	1.8	Unshielded	Unshielded	-
4	AC Cable	1.0	Unshielded	Unshielded	-

*AT: Antenna Terminal Conducted Tests

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

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

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber .
The EUT 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	**: 0.15-30MHz**
Test data	**: APPENDIX**
Test result	**: Pass**

SECTION 6: Radiated Spurious Emission

Test Procedure
EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 and 4m 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	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Biconical	Logperiodic	Horn

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5 (IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

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

*1) Although 00-705 accepts VBW=10Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

- 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.

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

Measurement range : 30M-26.5GHz
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
20dB Bandwidth	3MHz	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold *1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *2)	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3MHz	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30MHz	300kHz	1MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100kHz, 1MHz	300kHz, 3MHz	As necessary capture the entire dwell time per hopping channel	Peak	Clear Write	Spectrum Analyzer
Conducted Spurious Emission *3)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 25GHz (Less or equal to 5GHz)	100kHz	300kHz				
Conducted Spurious Emission Band Edge compliance	10MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.
*2) Reference data
*3) 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.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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: Data of EMI test

Conducted Emission

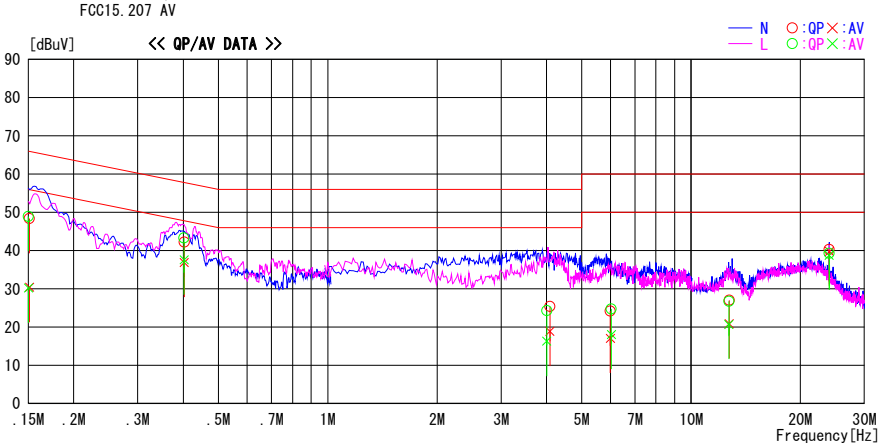
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/11/21

Report No. : 10543199H
Power : AC 120V / 60Hz
Temp./Humi. : 26deg. C / 40% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



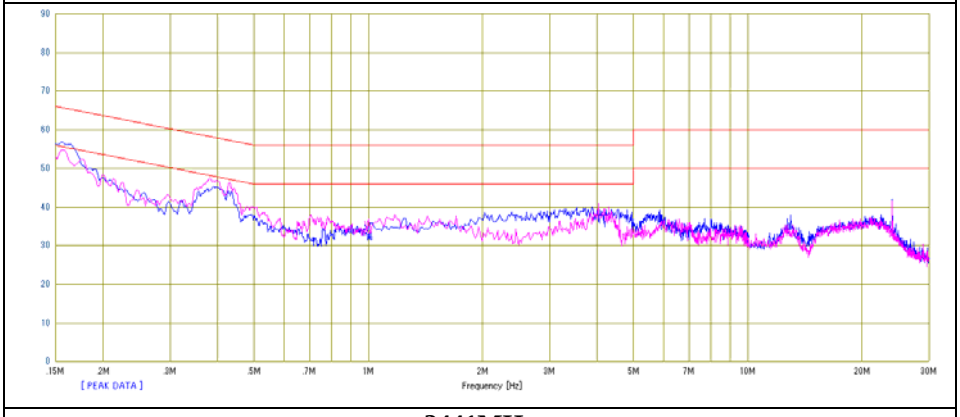
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15100	35.2	17.2	13.2	48.4	30.4	65.9	55.9	17.5	25.5	N	
0.40281	28.9	23.6	13.3	42.2	36.9	57.8	47.8	15.6	10.9	N	
4.08610	11.8	5.3	13.6	25.4	18.9	56.0	46.0	30.6	27.1	N	
5.99120	10.4	3.3	13.8	24.2	17.1	60.0	50.0	35.8	32.9	N	
12.73120	12.9	6.8	14.1	27.0	20.9	60.0	50.0	33.0	29.1	N	
24.00020	25.6	25.1	14.7	40.3	39.8	60.0	50.0	19.7	10.2	N	
0.15000	35.7	17.0	13.2	48.9	30.2	66.0	56.0	17.1	25.8	L	
0.40241	30.0	24.3	13.3	43.3	37.6	57.8	47.8	14.5	10.2	L	
4.00637	10.7	2.7	13.6	24.3	16.3	56.0	46.0	31.7	29.7	L	
6.03291	10.9	4.3	13.8	24.7	18.1	60.0	50.0	35.3	31.9	L	
12.69760	12.6	6.6	14.1	26.7	20.7	60.0	50.0	33.3	29.3	L	
23.99940	24.6	24.1	14.7	39.3	38.8	60.0	50.0	20.7	11.2	L	

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

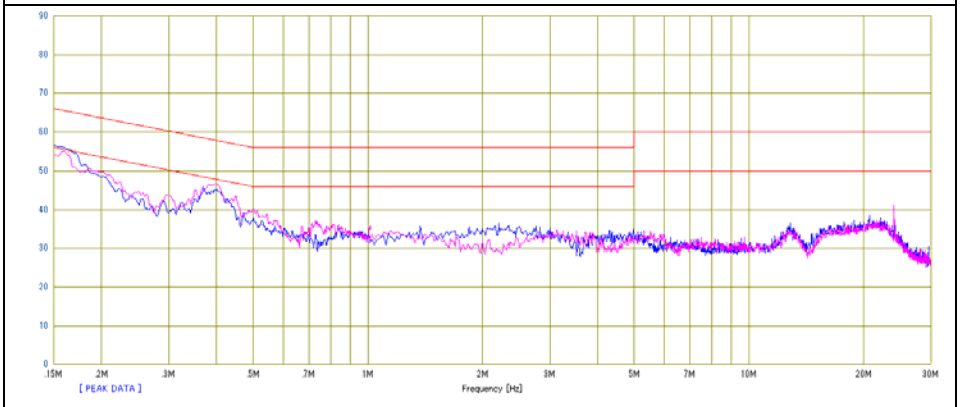
Conducted Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10543199H
Date	11/21/2014
Temperature/ Humidity	23 deg.C/ 40% RH
Engineer	Kazuya Yoshioka
Mode	Tx DH5

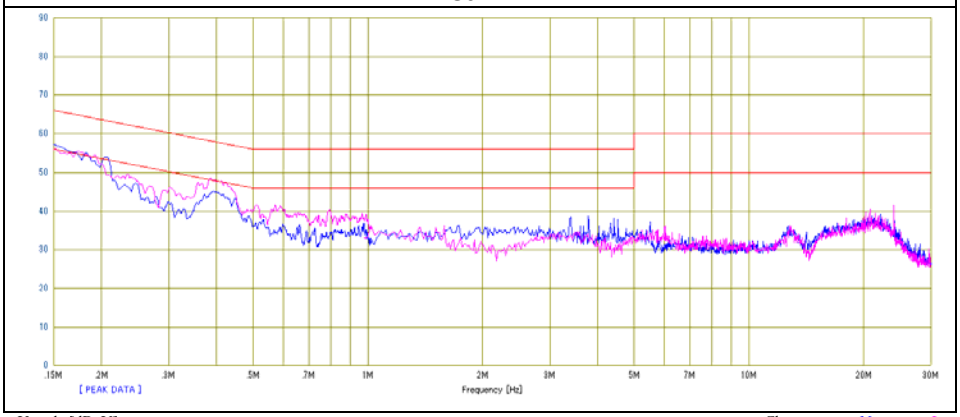
2402MHz



2441MHz



2480MHz



Y scale [dBuV] Chart — N — L

Conducted Emission

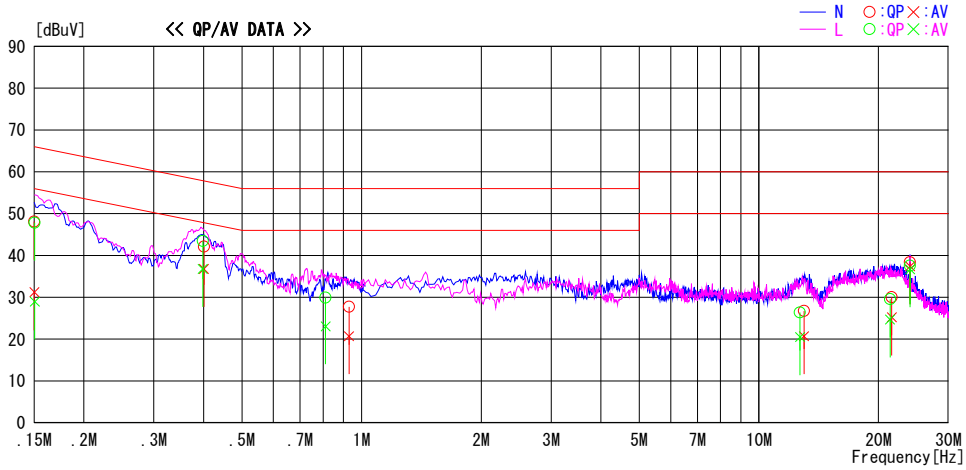
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
Date : 2014/11/21

Report No. : 10543199H
Power : AC 120V / 60Hz
Temp./Humi. : 26deg. C / 40% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 3DH5 2402MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



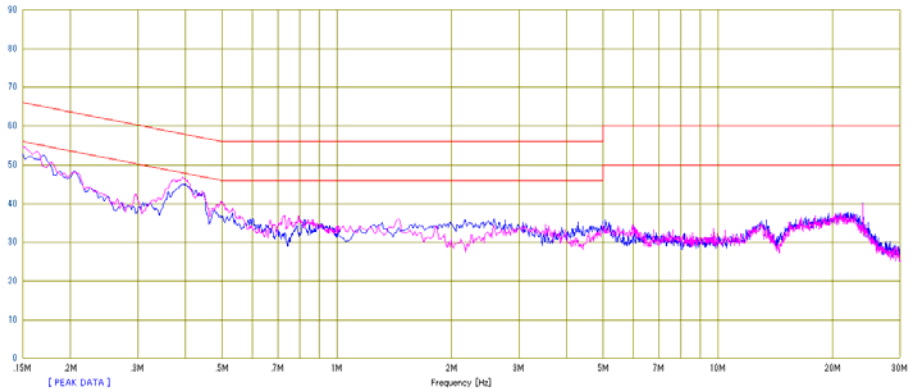
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	34.9	18.0	13.2	48.1	31.2	66.0	56.0	17.9	24.8	N	
0.40080	28.8	23.5	13.3	42.1	36.8	57.8	47.8	15.7	11.0	N	
0.92910	14.4	7.4	13.3	27.7	20.7	56.0	46.0	28.3	25.3	N	
12.98220	12.6	6.6	14.1	26.7	20.7	60.0	50.0	33.3	29.3	N	
21.59510	15.5	10.7	14.5	30.0	25.2	60.0	50.0	30.0	24.8	N	
24.00000	23.7	22.7	14.7	38.4	37.4	60.0	50.0	21.6	12.6	N	
0.15031	34.6	15.8	13.2	47.8	29.0	66.0	56.0	18.2	27.0	L	
0.39821	30.2	23.5	13.3	43.5	36.8	57.9	47.9	14.4	11.1	L	
0.81120	16.6	9.8	13.3	29.9	23.1	56.0	46.0	26.1	22.9	L	
12.68640	12.3	6.4	14.1	26.4	20.5	60.0	50.0	33.6	29.5	L	
21.39680	15.1	10.2	14.5	29.6	24.7	60.0	50.0	30.4	25.3	L	
24.00040	22.9	22.0	14.7	37.6	36.7	60.0	50.0	22.4	13.3	L	

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

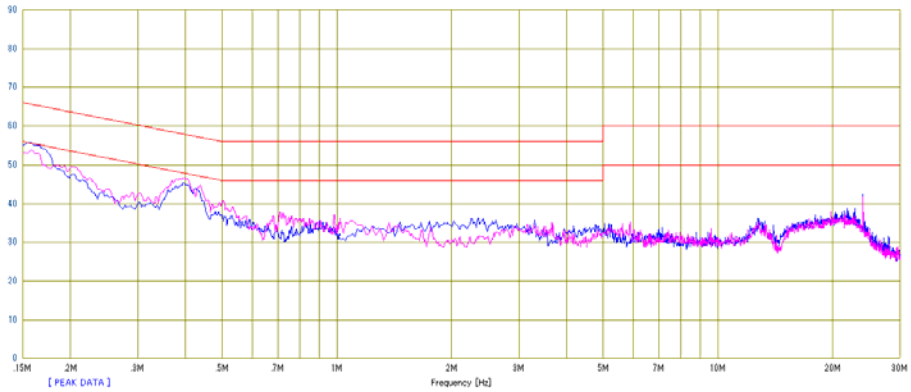
Conducted Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10543199H
Date	11/21/2014
Temperature/ Humidity	23 deg.C/ 40% RH
Engineer	Kazuya Yoshioka
Mode	Tx 3DH5

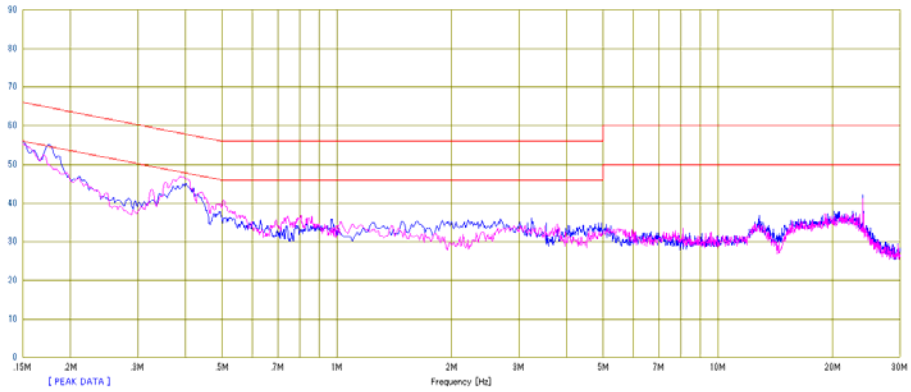
2402MHz



2441MHz



2480MHz



Y scale [dBuV] Chart — N — L

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20dB Bandwidth and Carrier Frequency Separation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on) DH5/3DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.959	1.000	>= 0.639
DH5	2441.0	0.951	1.000	>= 0.634
DH5	2480.0	0.953	1.000	>= 0.635
3DH5	2402.0	1.306	1.000	>= 0.871
3DH5	2441.0	1.311	1.000	>= 0.874
3DH5	2480.0	1.305	1.000	>= 0.870

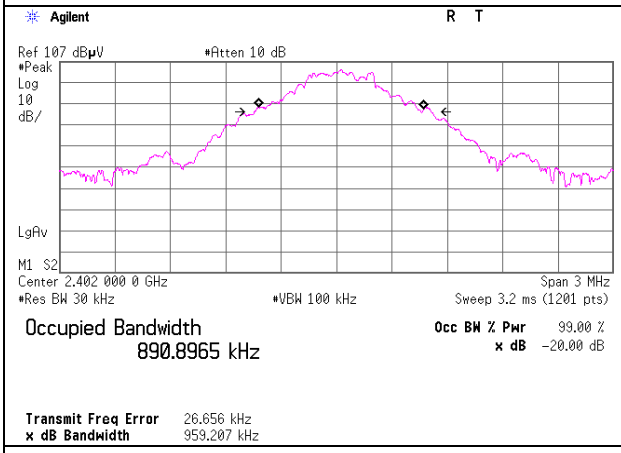
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation

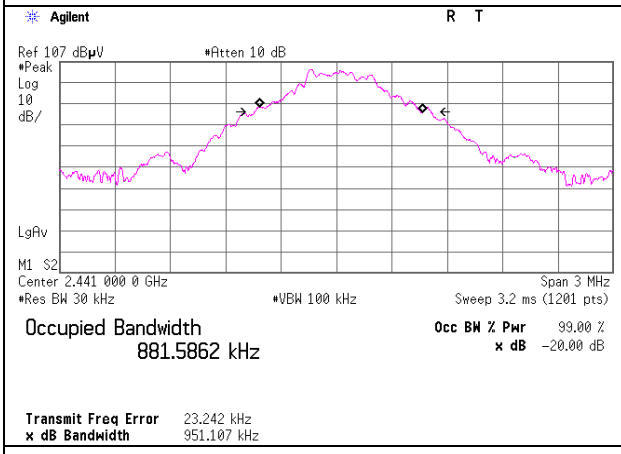
Tx DH5

20dB Bandwidth

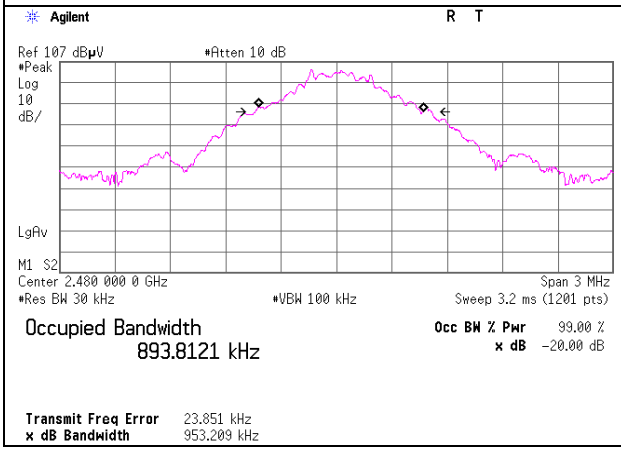
2402MHz



2441MHz

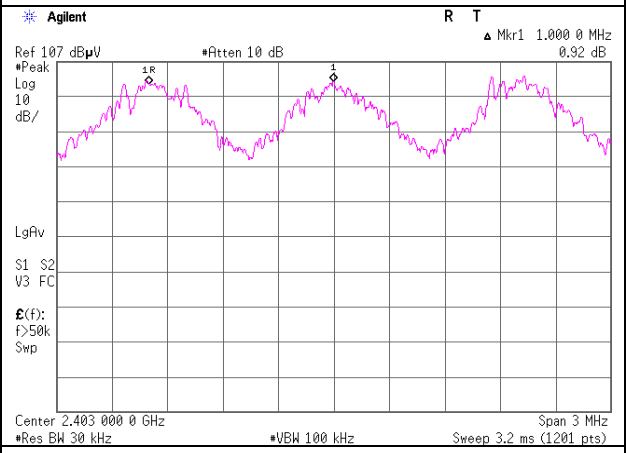


2480MHz

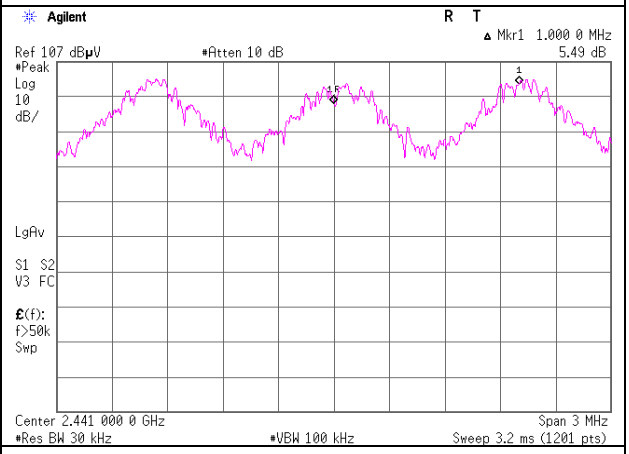


Carrier Frequency Separation

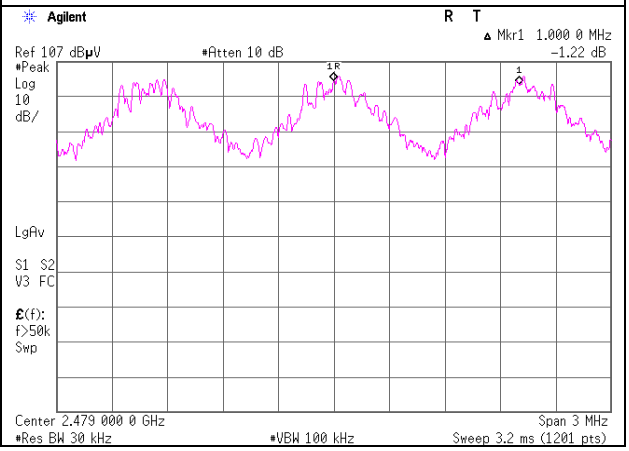
2402MHz



2441MHz



2480MHz

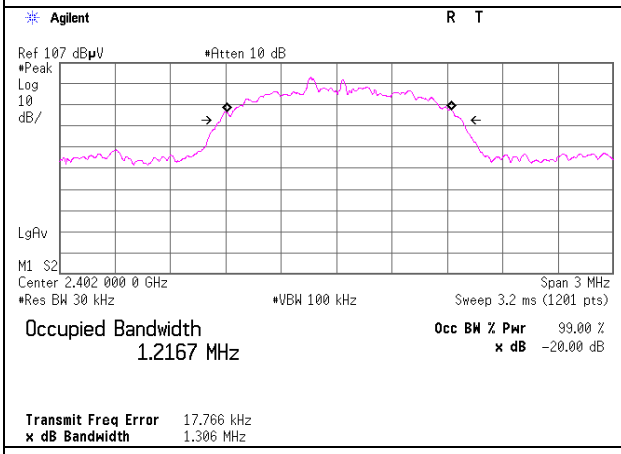


20dB Bandwidth and Carrier Frequency Separation

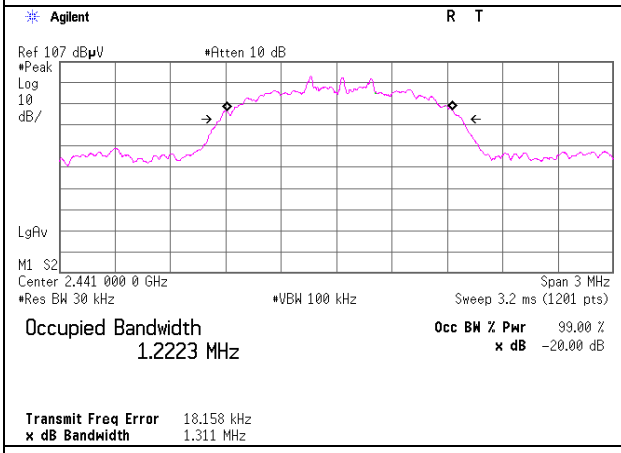
Tx 3DH5

20dB Bandwidth

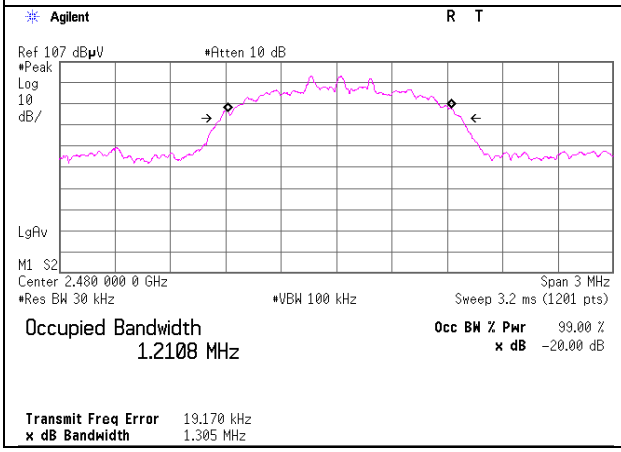
2402MHz



2441MHz

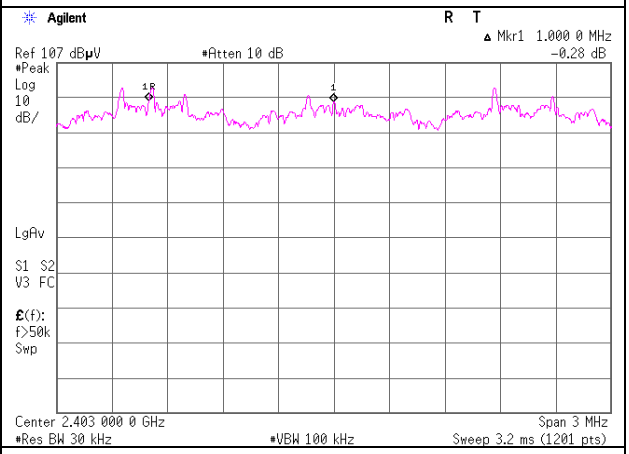


2480MHz

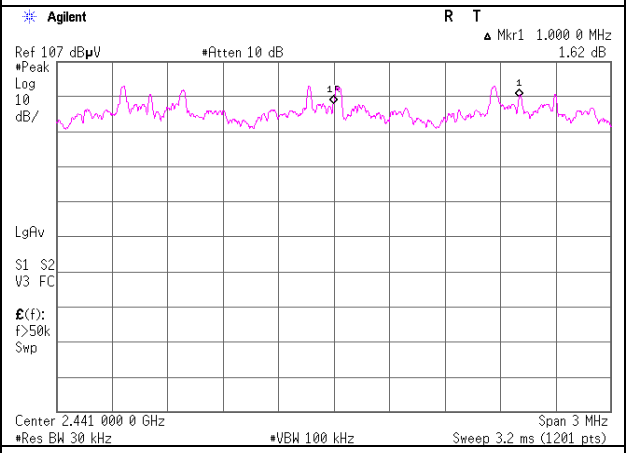


Carrier Frequency Separation

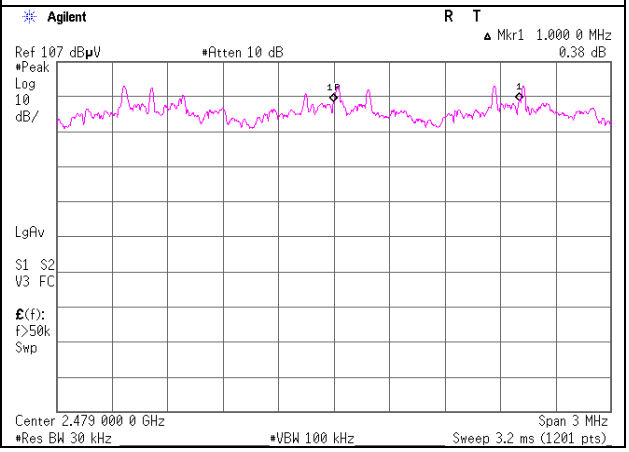
2402MHz



2441MHz



2480MHz



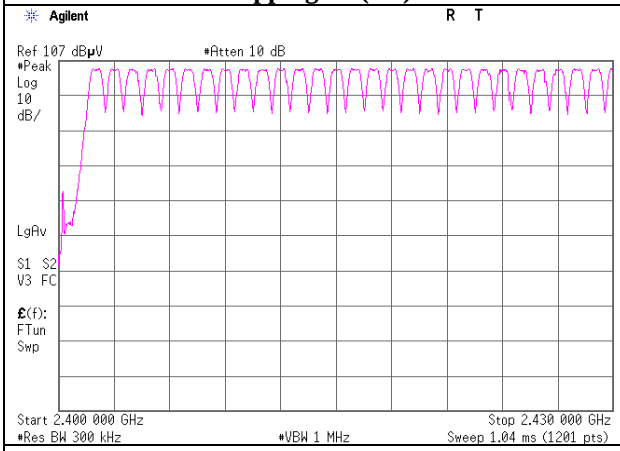
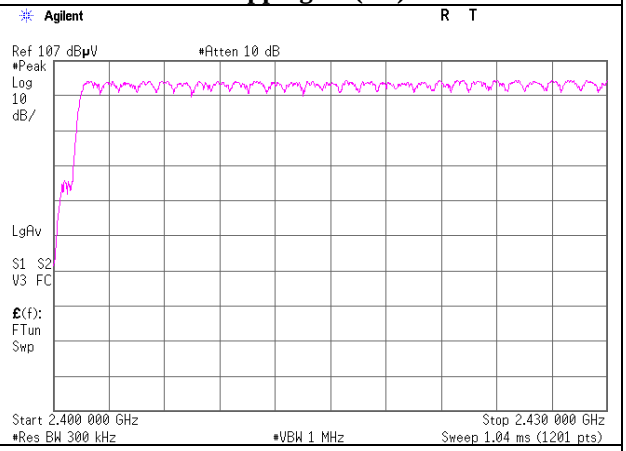
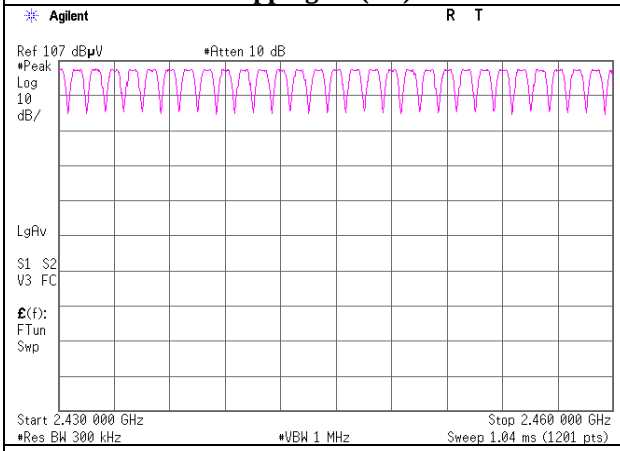
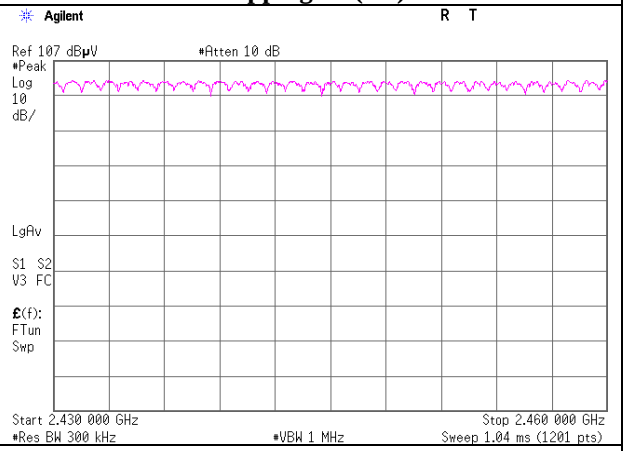
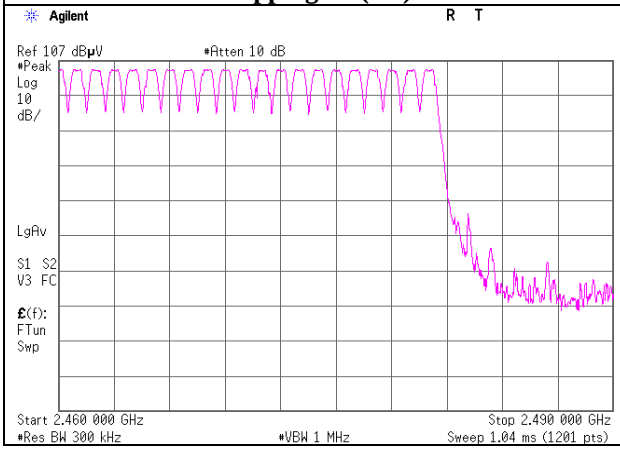
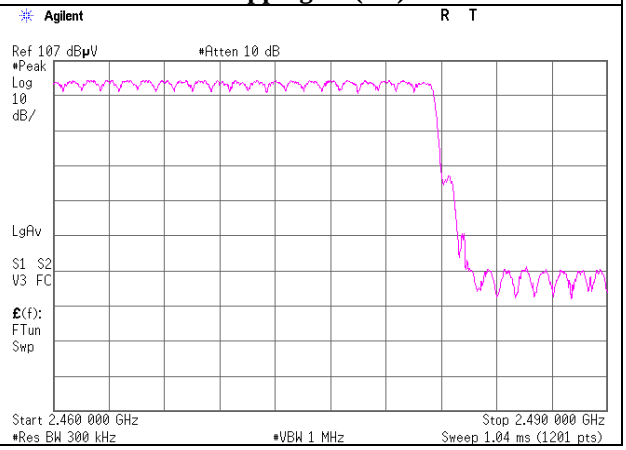
Number of Hopping Frequency

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on) DH5/3DH5

Mode	Number of channel [times]	Limit [times]
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

Tx DH5	Tx 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)**
	

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Dwell time

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on) DH5/3DH5

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.4 times / 5 sec. x 31.6 sec. = 319 times	0.403	129	400
DH3	29.6 times / 5 sec. x 31.6 sec. = 188 times	1.665	313	400
DH5	18.8 times / 5 sec. x 31.6 sec. = 119 times	2.920	347	400
3DH1	49.6 times / 5 sec. x 31.6 sec. = 314 times	0.411	129	400
3DH3	30.2 times / 5 sec. x 31.6 sec. = 191 times	1.672	319	400
3DH5	20.2 times / 5 sec. x 31.6 sec. = 128 times	2.927	375	400

Sample Calculation
Result = Number of transmission x Length of transmition time

*Average data of 5 tests.

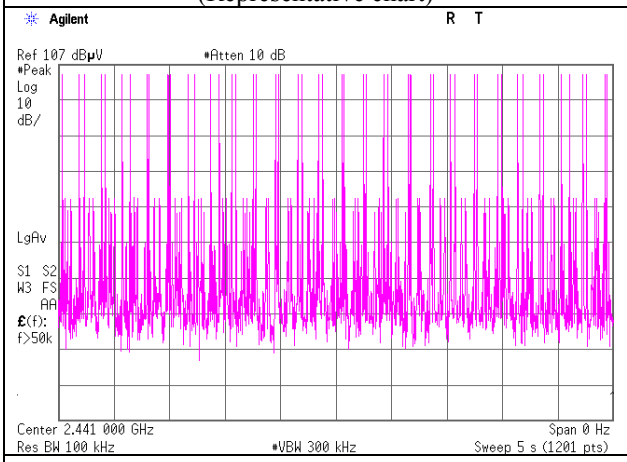
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	49	50	51	51	50.4
DH3	30	30	29	30	29	29.6
DH5	20	19	15	19	21	18.8
3DH1	50	50	50	49	49	49.6
3DH3	31	31	29	28	32	30.2
3DH5	20	21	20	20	20	20.2

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

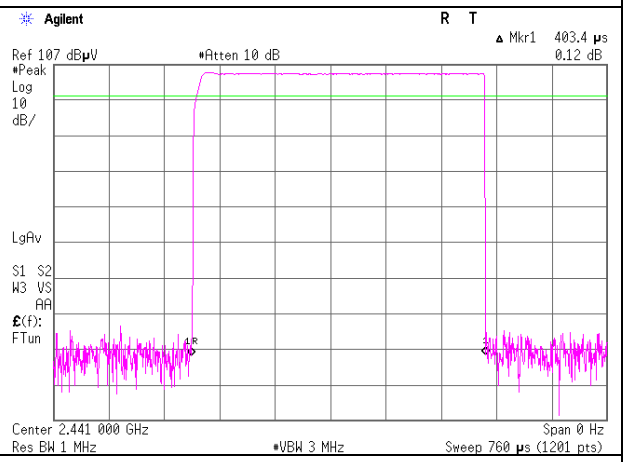
This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in N x 0.4s, where N is the number of channels being used in the hopping sequence ($20 \leq N \leq 79$), is always less than 0.4s regardless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

Dwell time

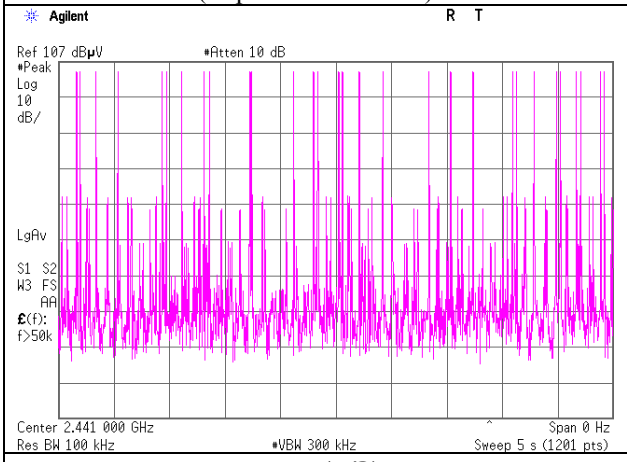
DH1 (1/2)
(Representative chart)



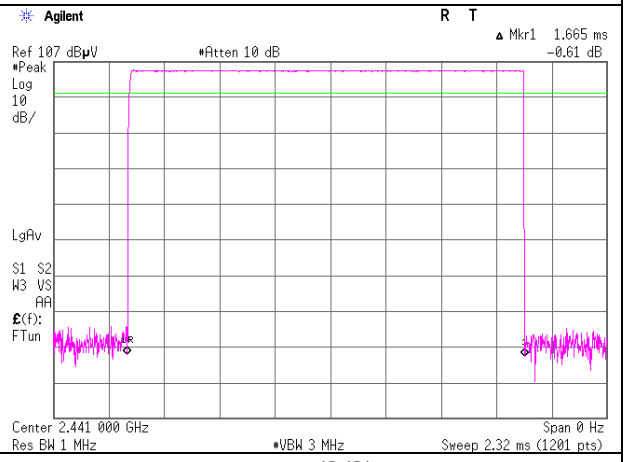
DH1 (2/2)



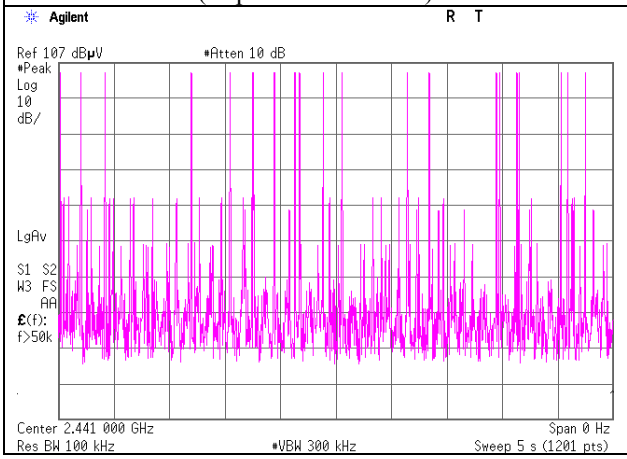
DH3 (1/2)
(Representative chart)



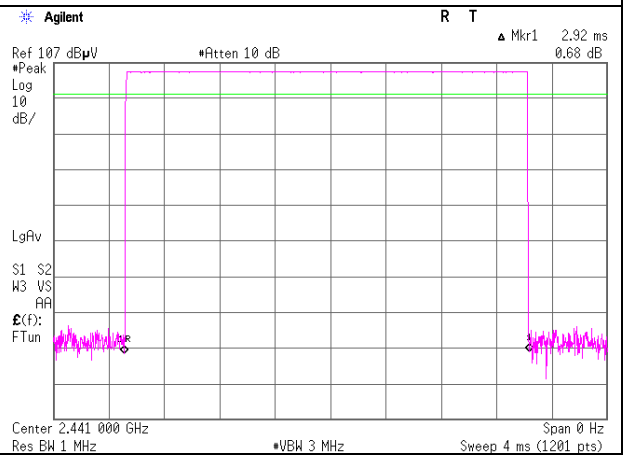
DH3 (2/2)



DH5 (1/2)
(Representative chart)

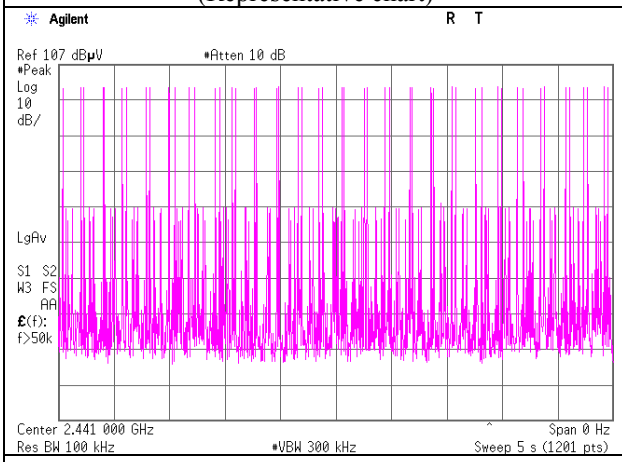


DH5 (2/2)

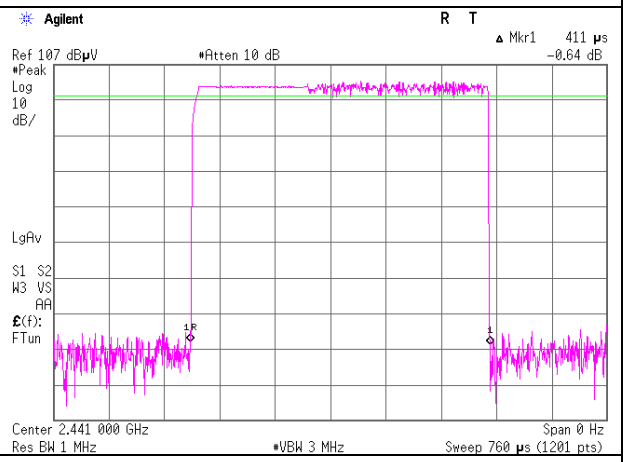


Dwell time

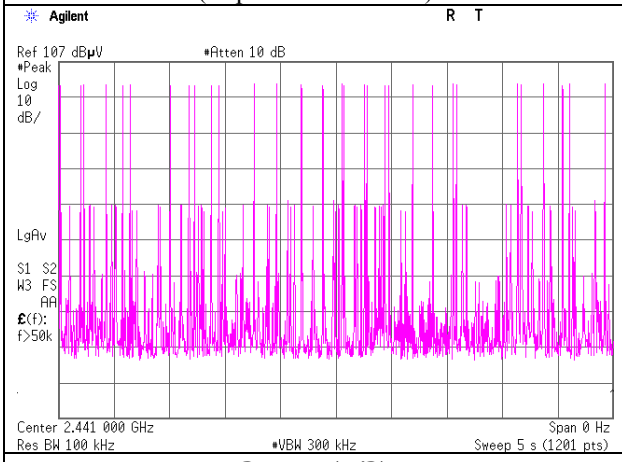
3DH1 (1/2)
(Representative chart)



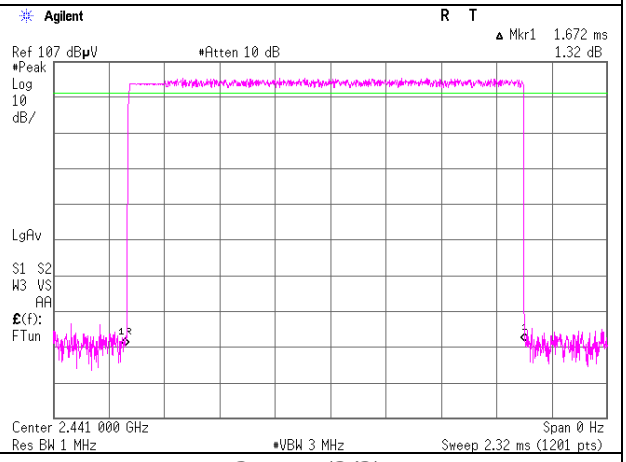
3DH1 (2/2)



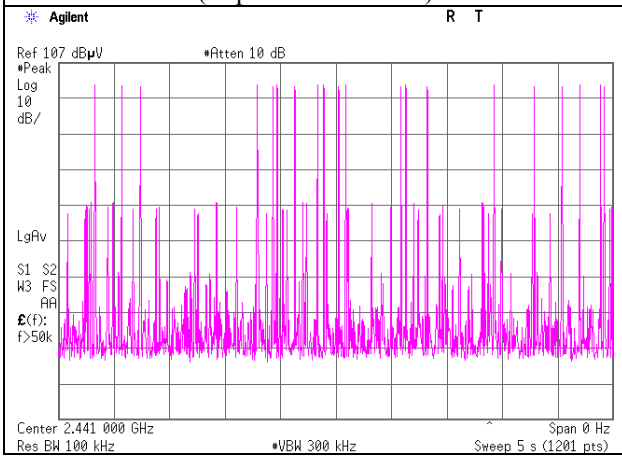
3DH3 (1/2)
(Representative chart)



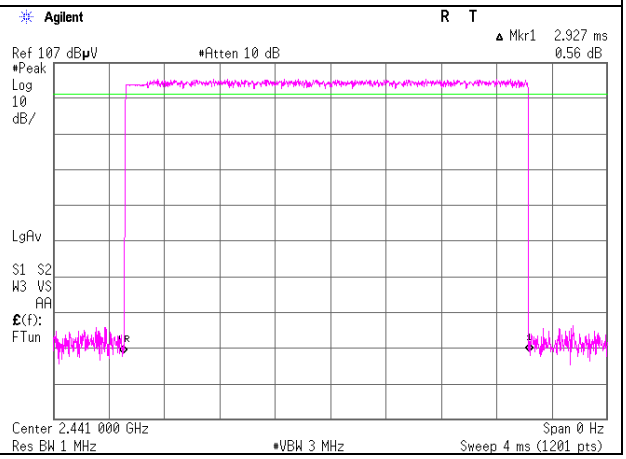
3DH3 (2/2)



3DH5 (1/2)
(Representative chart)



3DH5 (2/2)



Maximum Peak Output Power

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5/2DH5/3DH5

Mode	Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-2.70	1.93	10.00	9.23	8.38	20.96	125	11.73
DH5	2441.0	-2.78	1.98	10.00	9.20	8.32	20.96	125	11.76
DH5	2480.0	-2.82	1.98	10.00	9.16	8.24	20.96	125	11.80
2DH5	2402.0	-4.70	1.93	10.00	7.23	5.28	20.96	125	13.73
2DH5	2441.0	-4.67	1.98	10.00	7.31	5.38	20.96	125	13.65
2DH5	2480.0	-4.58	1.98	10.00	7.40	5.50	20.96	125	13.56
3DH5	2402.0	-4.57	1.93	10.00	7.36	5.45	20.96	125	13.60
3DH5	2441.0	-4.51	1.98	10.00	7.47	5.58	20.96	125	13.49
3DH5	2480.0	-4.45	1.98	10.00	7.53	5.66	20.96	125	13.43

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied)+ Attenuator

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) 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 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

Average Output Power
(Reference data for SAR testing)

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5/2DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Result [mW]
DH5	2402.0	-3.89	1.93	10.00	8.04	6.37
DH5	2441.0	-3.97	1.98	10.00	8.01	6.32
DH5	2480.0	-4.02	1.98	10.00	7.96	6.25
2DH5	2402.0	-7.71	1.93	10.00	4.22	2.64
2DH5	2441.0	-7.78	1.98	10.00	4.20	2.63
2DH5	2480.0	-7.44	1.98	10.00	4.54	2.84
3DH5	2402.0	-7.70	1.93	10.00	4.23	2.65
3DH5	2441.0	-7.76	1.98	10.00	4.22	2.64
3DH5	2480.0	-7.42	1.98	10.00	4.56	2.86

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied)+ Attenuator

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, DH5 2402MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	49.134	QP	30.6	10.9	7.4	32.1	16.8	40.0	23.2	
Hori	61.924	QP	44.2	7.5	7.6	32.1	27.2	40.0	12.8	
Hori	93.412	QP	46.0	8.8	8.0	32.1	30.7	43.5	12.8	
Hori	167.417	QP	43.3	15.7	8.8	32.0	35.8	43.5	7.7	
Hori	310.652	QP	41.1	17.3	10.0	31.9	36.5	46.0	9.5	
Hori	360.000	QP	40.2	17.8	10.3	31.9	36.4	46.0	9.6	
Hori	2390.000	PK	54.7	27.0	3.5	34.7	50.5	73.9	23.4	
Hori	4804.000	PK	42.4	31.8	5.8	33.9	46.1	73.9	27.8	
Hori	7206.000	PK	43.0	35.7	7.2	33.8	52.1	73.9	21.8	
Hori	9608.000	PK	42.6	38.0	8.1	34.4	54.3	73.9	19.6	
Hori	2390.000	AV	40.9	27.0	3.5	34.7	36.7	53.9	17.2	
Hori	4804.000	AV	30.8	31.8	5.8	33.9	34.5	53.9	19.4	
Hori	7206.000	AV	31.2	35.7	7.2	33.8	40.3	53.9	13.6	
Hori	9608.000	AV	31.3	38.0	8.1	34.4	43.0	53.9	10.9	
Vert	47.856	QP	41.1	11.4	7.4	32.1	27.8	40.0	12.2	
Vert	62.624	QP	49.8	7.4	7.6	32.1	32.7	40.0	7.3	
Vert	137.060	QP	32.3	14.2	8.6	32.0	23.1	43.5	20.4	
Vert	161.233	QP	30.7	15.5	8.8	32.0	23.0	43.5	20.5	
Vert	311.994	QP	32.2	17.3	10.0	31.9	27.6	46.0	18.4	
Vert	360.000	QP	42.0	17.8	10.3	31.9	38.2	46.0	7.8	
Vert	2390.000	PK	52.8	27.0	3.5	34.7	48.6	73.9	25.3	
Vert	4804.000	PK	42.5	31.8	5.8	33.9	46.2	73.9	27.7	
Vert	7206.000	PK	43.1	35.7	7.2	33.8	52.2	73.9	21.7	
Vert	9608.000	PK	42.8	38.0	8.1	34.4	54.5	73.9	19.4	
Vert	2390.000	AV	39.5	27.0	3.5	34.7	35.3	53.9	18.6	
Vert	4804.000	AV	30.8	31.8	5.8	33.9	34.5	53.9	19.4	
Vert	7206.000	AV	31.2	35.7	7.2	33.8	40.3	53.9	13.6	
Vert	9608.000	AV	31.3	38.0	8.1	34.4	43.0	53.9	10.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	109.4	27.0	3.5	34.7	105.2	-	-	Carrier
Hori	2400.000	PK	63.2	27.0	3.5	34.7	59.0	85.2	26.2	
Vert	2402.000	PK	108.0	27.0	3.5	34.7	103.8	-	-	Carrier
Vert	2400.000	PK	55.8	27.0	3.5	34.7	51.6	83.8	32.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, DH5 2441MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.208	QP	34.2	11.2	7.4	32.1	20.7	40.0	19.3	
Hori	63.417	QP	45.8	7.3	7.6	32.1	28.6	40.0	11.4	
Hori	93.412	QP	45.7	8.8	8.0	32.1	30.4	43.5	13.1	
Hori	167.417	QP	43.3	15.7	8.8	32.0	35.8	43.5	7.7	
Hori	310.652	QP	34.6	17.3	10.0	31.9	30.0	46.0	16.0	
Hori	360.000	QP	39.4	17.8	10.3	31.9	35.6	46.0	10.4	
Hori	4882.000	PK	42.9	32.0	5.9	33.9	46.9	73.9	27.0	
Hori	7323.000	PK	42.2	35.8	7.1	33.8	51.3	73.9	22.6	
Hori	9764.000	PK	43.0	38.3	8.1	34.5	54.9	73.9	19.0	
Hori	4882.000	AV	30.7	32.0	5.9	33.9	34.7	53.9	19.2	
Hori	7323.000	AV	31.1	35.8	7.1	33.8	40.2	53.9	13.7	
Hori	9764.000	AV	31.3	38.3	8.1	34.5	43.2	53.9	10.7	
Vert	48.209	QP	37.6	11.2	7.4	32.1	24.1	40.0	15.9	
Vert	63.410	QP	48.7	7.3	7.6	32.1	31.5	40.0	8.5	
Vert	140.250	QP	29.4	14.4	8.6	32.0	20.4	43.5	23.1	
Vert	167.440	QP	39.3	15.7	8.8	32.0	31.8	43.5	11.7	
Vert	311.994	QP	31.2	17.3	10.0	31.9	26.6	46.0	19.4	
Vert	360.000	QP	41.6	17.8	10.3	31.9	37.8	46.0	8.2	
Vert	4882.000	PK	43.1	32.0	5.9	33.9	47.1	73.9	26.8	
Vert	7323.000	PK	42.4	35.8	7.1	33.8	51.5	73.9	22.4	
Vert	9764.000	PK	43.1	38.3	8.1	34.5	55.0	73.9	18.9	
Vert	4882.000	AV	30.7	32.0	5.9	33.9	34.7	53.9	19.2	
Vert	7323.000	AV	31.1	35.8	7.1	33.8	40.2	53.9	13.7	
Vert	9764.000	AV	31.3	38.3	8.1	34.5	43.2	53.9	10.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, DH5 2480MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.208	QP	34.7	11.2	7.4	32.1	21.2	40.0	18.8	
Hori	63.417	QP	45.4	7.3	7.6	32.1	28.2	40.0	11.8	
Hori	93.412	QP	45.8	8.8	8.0	32.1	30.5	43.5	13.0	
Hori	167.417	QP	43.2	15.7	8.8	32.0	35.7	43.5	7.8	
Hori	310.652	QP	34.7	17.3	10.0	31.9	30.1	46.0	15.9	
Hori	360.000	QP	39.2	17.8	10.3	31.9	35.4	46.0	10.6	
Hori	2483.500	PK	62.9	26.9	3.5	34.7	58.6	73.9	15.3	
Hori	4960.000	PK	42.9	32.2	5.9	34.0	47.0	73.9	26.9	
Hori	7440.000	PK	43.3	35.8	7.0	33.9	52.2	73.9	21.7	
Hori	9920.000	PK	43.4	38.7	8.2	34.5	55.8	73.9	18.1	
Hori	2483.500	AV	43.0	26.9	3.5	34.7	38.7	53.9	15.2	
Hori	4960.000	AV	30.5	32.2	5.9	34.0	34.6	53.9	19.3	
Hori	7440.000	AV	31.7	35.8	7.0	33.9	40.6	53.9	13.3	
Hori	9920.000	AV	31.6	38.7	8.2	34.5	44.0	53.9	9.9	
Vert	48.209	QP	37.6	11.2	7.4	32.1	24.1	40.0	15.9	
Vert	63.410	QP	48.9	7.3	7.6	32.1	31.7	40.0	8.3	
Vert	140.250	QP	30.2	14.4	8.6	32.0	21.2	43.5	22.3	
Vert	167.440	QP	39.7	15.7	8.8	32.0	32.2	43.5	11.3	
Vert	311.994	QP	31.2	17.3	10.0	31.9	26.6	46.0	19.4	
Vert	360.000	QP	41.3	17.8	10.3	31.9	37.5	46.0	8.5	
Vert	2483.500	PK	65.1	26.9	3.5	34.7	60.8	73.9	13.1	
Vert	4960.000	PK	43.0	32.2	5.9	34.0	47.1	73.9	26.8	
Vert	7440.000	PK	43.4	35.8	7.0	33.9	52.3	73.9	21.6	
Vert	9920.000	PK	43.1	38.7	8.2	34.5	55.5	73.9	18.4	
Vert	2483.500	AV	43.0	26.9	3.5	34.7	38.7	53.9	15.2	
Vert	4960.000	AV	30.5	32.2	5.9	34.0	34.6	53.9	19.3	
Vert	7440.000	AV	31.7	35.8	7.0	33.9	40.6	53.9	13.3	
Vert	9920.000	AV	31.6	38.7	8.2	34.5	44.0	53.9	9.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, 3DH5 2402MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.208	QP	35.0	11.2	7.4	32.1	21.5	40.0	18.5	
Hori	63.417	QP	45.9	7.3	7.6	32.1	28.7	40.0	11.3	
Hori	93.412	QP	45.6	8.8	8.0	32.1	30.3	43.5	13.2	
Hori	167.417	QP	43.3	15.7	8.8	32.0	35.8	43.5	7.7	
Hori	310.652	QP	32.8	17.3	10.0	31.9	28.2	46.0	17.8	
Hori	360.000	QP	38.1	17.8	10.3	31.9	34.3	46.0	11.7	
Hori	2390.000	PK	54.5	27.0	3.5	34.7	50.3	73.9	23.6	
Hori	4804.000	PK	42.4	31.8	5.8	33.9	46.1	73.9	27.8	
Hori	7206.000	PK	43.0	35.7	7.2	33.8	52.1	73.9	21.8	
Hori	9608.000	PK	42.6	38.0	8.1	34.4	54.3	73.9	19.6	
Hori	2390.000	AV	44.8	27.0	3.5	34.7	40.6	53.9	13.3	
Hori	4804.000	AV	30.8	31.8	5.8	33.9	34.5	53.9	19.4	
Hori	7206.000	AV	31.2	35.7	7.2	33.8	40.3	53.9	13.6	
Hori	9608.000	AV	31.3	38.0	8.1	34.4	43.0	53.9	10.9	
Vert	48.209	QP	37.6	11.2	7.4	32.1	24.1	40.0	15.9	
Vert	63.410	QP	48.7	7.3	7.6	32.1	31.5	40.0	8.5	
Vert	140.250	QP	29.6	14.4	8.6	32.0	20.6	43.5	22.9	
Vert	167.440	QP	39.8	15.7	8.8	32.0	32.3	43.5	11.2	
Vert	311.994	QP	31.4	17.3	10.0	31.9	26.8	46.0	19.2	
Vert	360.000	QP	40.9	17.8	10.3	31.9	37.1	46.0	8.9	
Vert	2390.000	PK	52.8	27.0	3.5	34.7	48.6	73.9	25.3	
Vert	4804.000	PK	42.5	31.8	5.8	33.9	46.2	73.9	27.7	
Vert	7206.000	PK	43.1	35.7	7.2	33.8	52.2	73.9	21.7	
Vert	9608.000	PK	42.8	38.0	8.1	34.4	54.5	73.9	19.4	
Vert	2390.000	AV	43.4	27.0	3.5	34.7	39.2	53.9	14.7	
Vert	4804.000	AV	30.8	31.8	5.8	33.9	34.5	53.9	19.4	
Vert	7206.000	AV	31.2	35.7	7.2	33.8	40.3	53.9	13.6	
Vert	9608.000	AV	31.3	38.0	8.1	34.4	43.0	53.9	10.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	106.4	27.0	3.5	34.7	102.2	-	-	Carrier
Hori	2400.000	PK	60.5	27.0	3.5	34.7	56.3	82.2	25.9	
Vert	2402.000	PK	103.5	27.0	3.5	34.7	99.3	-	-	Carrier
Vert	2400.000	PK	58.2	27.0	3.5	34.7	54.0	79.3	25.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, 3DH5 2441MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.208	QP	35.3	11.2	7.4	32.1	21.8	40.0	18.2	
Hori	63.417	QP	45.3	7.3	7.6	32.1	28.1	40.0	11.9	
Hori	93.412	QP	45.8	8.8	8.0	32.1	30.5	43.5	13.0	
Hori	167.417	QP	43.4	15.7	8.8	32.0	35.9	43.5	7.6	
Hori	310.652	QP	34.4	17.3	10.0	31.9	29.8	46.0	16.2	
Hori	360.000	QP	39.0	17.8	10.3	31.9	35.2	46.0	10.8	
Hori	4882.000	PK	43.3	32.0	5.9	33.9	47.3	73.9	26.6	
Hori	7323.000	PK	42.4	35.8	7.1	33.8	51.5	73.9	22.4	
Hori	9764.000	PK	43.3	38.3	8.1	34.5	55.2	73.9	18.7	
Hori	4882.000	AV	30.7	32.0	5.9	33.9	34.7	53.9	19.2	
Hori	7323.000	AV	31.1	35.8	7.1	33.8	40.2	53.9	13.7	
Hori	9764.000	AV	31.3	38.3	8.1	34.5	43.2	53.9	10.7	
Vert	48.209	QP	37.7	11.2	7.4	32.1	24.2	40.0	15.8	
Vert	63.410	QP	48.8	7.3	7.6	32.1	31.6	40.0	8.4	
Vert	143.366	QP	31.1	14.6	8.6	32.0	22.3	43.5	21.2	
Vert	167.440	QP	39.7	15.7	8.8	32.0	32.2	43.5	11.3	
Vert	311.994	QP	31.4	17.3	10.0	31.9	26.8	46.0	19.2	
Vert	360.000	QP	41.2	17.8	10.3	31.9	37.4	46.0	8.6	
Vert	4882.000	PK	43.4	32.0	5.9	33.9	47.4	73.9	26.5	
Vert	7323.000	PK	42.2	35.8	7.1	33.8	51.3	73.9	22.6	
Vert	9764.000	PK	43.5	38.3	8.1	34.5	55.4	73.9	18.5	
Vert	4882.000	AV	30.7	32.0	5.9	33.9	34.7	53.9	19.2	
Vert	7323.000	AV	31.1	35.8	7.1	33.8	40.2	53.9	13.7	
Vert	9764.000	AV	31.3	38.3	8.1	34.5	43.2	53.9	10.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.2 and No.4 Semi Anechoic Chamber	
Report No.	10543199H	
Date	11/22/2014	11/29/2014
Temperature/ Humidity	23 deg. C / 40% RH	21deg. C / 51% RH
Engineer	Kazuya Yoshioka (1-26.5GHz)	Masatoshi Nishiguchi (30-1000MHz)
Mode	Tx, 3DH5 2480MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.208	QP	35.4	11.2	7.4	32.1	21.9	40.0	18.1	
Hori	63.417	QP	45.4	7.3	7.6	32.1	28.2	40.0	11.8	
Hori	93.412	QP	46.3	8.8	8.0	32.1	31.0	43.5	12.5	
Hori	167.417	QP	43.1	15.7	8.8	32.0	35.6	43.5	7.9	
Hori	310.652	QP	34.8	17.3	10.0	31.9	30.2	46.0	15.8	
Hori	360.000	QP	39.3	17.8	10.3	31.9	35.5	46.0	10.5	
Hori	2483.500	PK	61.3	26.9	3.5	34.7	57.0	73.9	16.9	
Hori	4960.000	PK	43.1	32.2	5.9	34.0	47.2	73.9	26.7	
Hori	7440.000	PK	42.9	35.8	7.0	33.9	51.8	73.9	22.1	
Hori	9920.000	PK	43.5	38.7	8.2	34.5	55.9	73.9	18.0	
Hori	2483.500	AV	41.0	26.9	3.5	34.7	36.7	53.9	17.2	
Hori	4960.000	AV	30.5	32.2	5.9	34.0	34.6	53.9	19.3	
Hori	7440.000	AV	31.7	35.8	7.0	33.9	40.6	53.9	13.3	
Hori	9920.000	AV	31.6	38.7	8.2	34.5	44.0	53.9	9.9	
Vert	48.209	QP	37.6	11.2	7.4	32.1	24.1	40.0	15.9	
Vert	63.410	QP	49.1	7.3	7.6	32.1	31.9	40.0	8.1	
Vert	143.366	QP	31.3	14.6	8.6	32.0	22.5	43.5	21.0	
Vert	167.440	QP	39.2	15.7	8.8	32.0	31.7	43.5	11.8	
Vert	311.994	QP	31.3	17.3	10.0	31.9	26.7	46.0	19.3	
Vert	360.000	QP	40.9	17.8	10.3	31.9	37.1	46.0	8.9	
Vert	2483.500	PK	61.1	26.9	3.5	34.7	56.8	73.9	17.1	
Vert	4960.000	PK	43.2	32.2	5.9	34.0	47.3	73.9	26.6	
Vert	7440.000	PK	43.0	35.8	7.0	33.9	51.9	73.9	22.0	
Vert	9920.000	PK	43.3	38.7	8.2	34.5	55.7	73.9	18.2	
Vert	2483.500	AV	41.0	26.9	3.5	34.7	36.7	53.9	17.2	
Vert	4960.000	AV	30.5	32.2	5.9	34.0	34.6	53.9	19.3	
Vert	7440.000	AV	31.7	35.8	7.0	33.9	40.6	53.9	13.3	
Vert	9920.000	AV	31.6	38.7	8.2	34.5	44.0	53.9	9.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

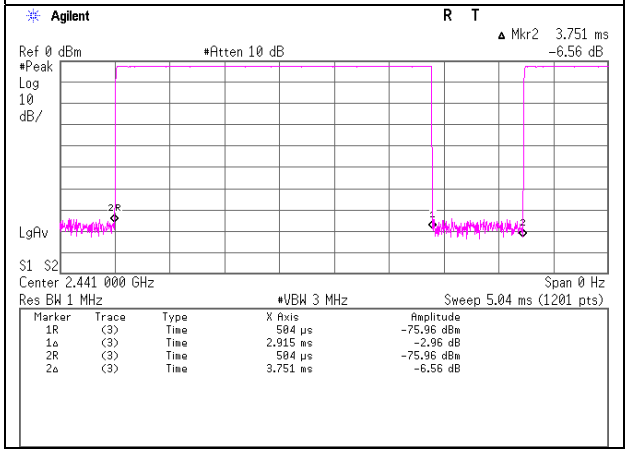
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

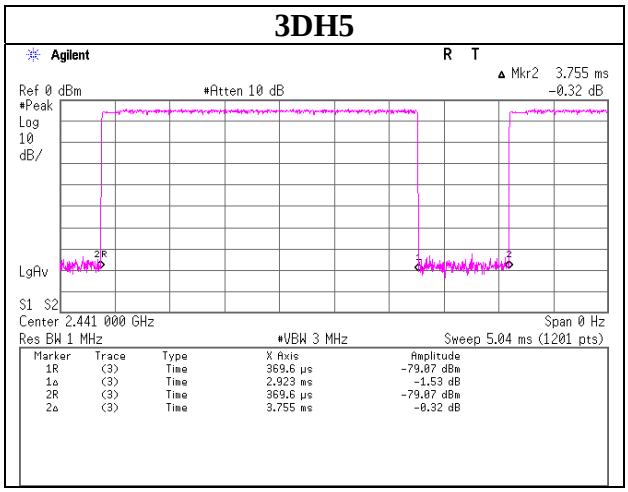
Duty Cycle

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5/3DH5

DH5



3DH5

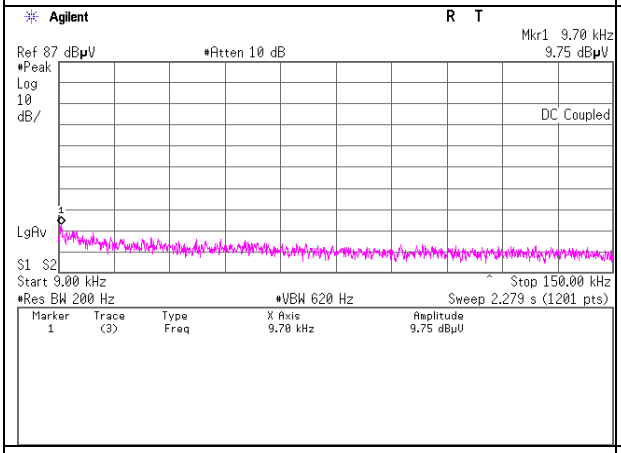


Conducted Spurious Emission

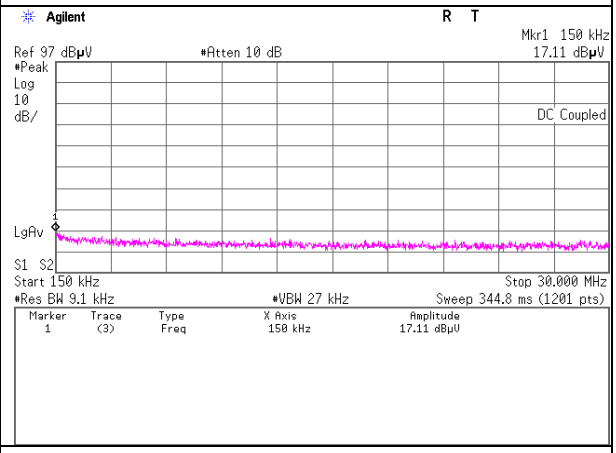
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2402MHz

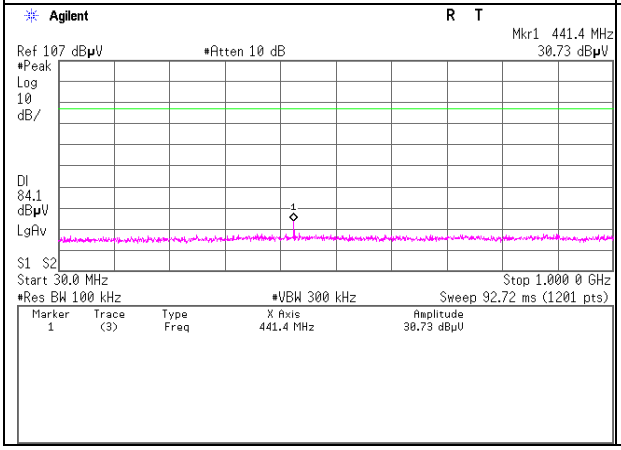
9kHz-150kHz



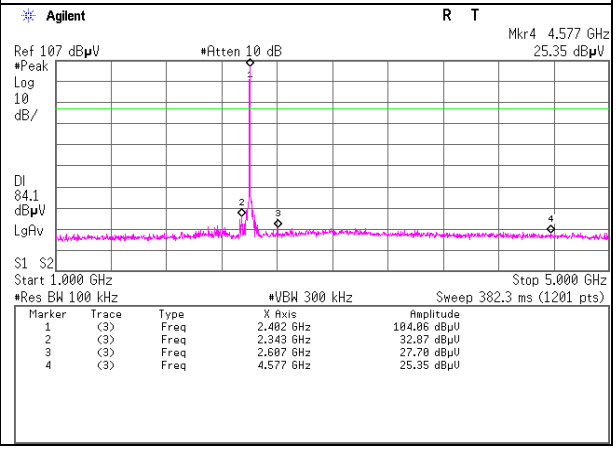
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz



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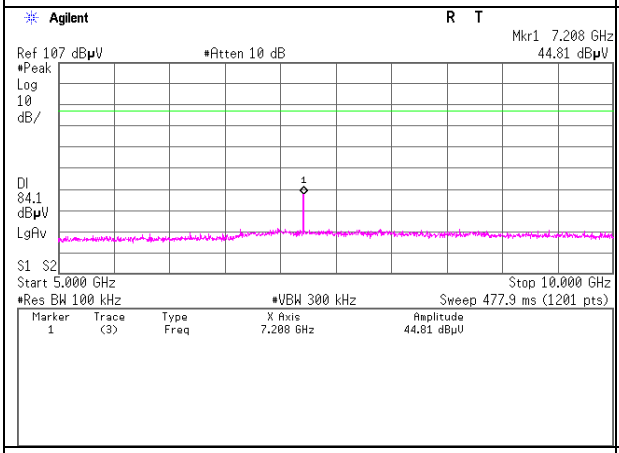
Conducted Spurious Emission

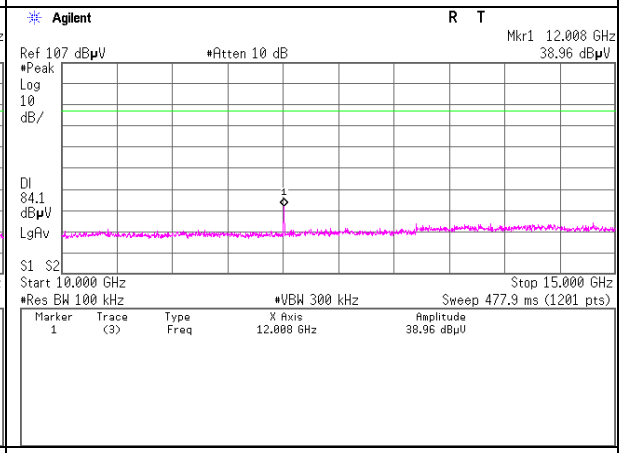
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2402MHz

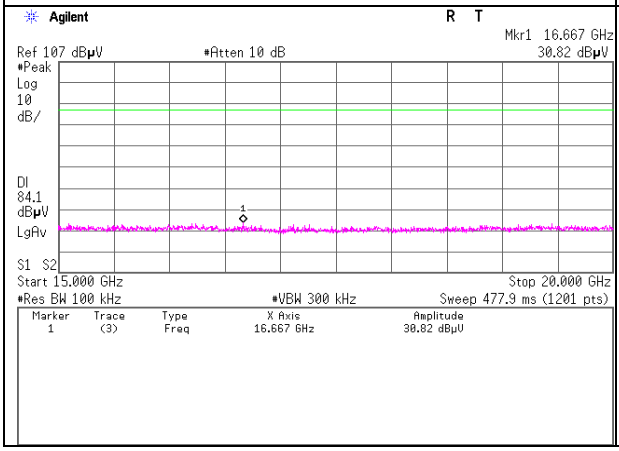
5GHz-10GHz



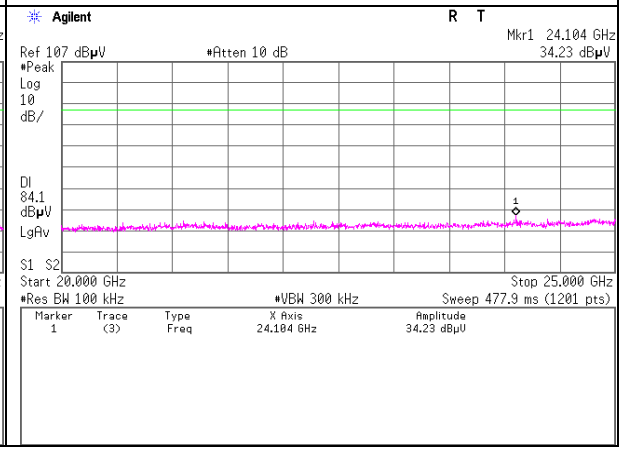
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

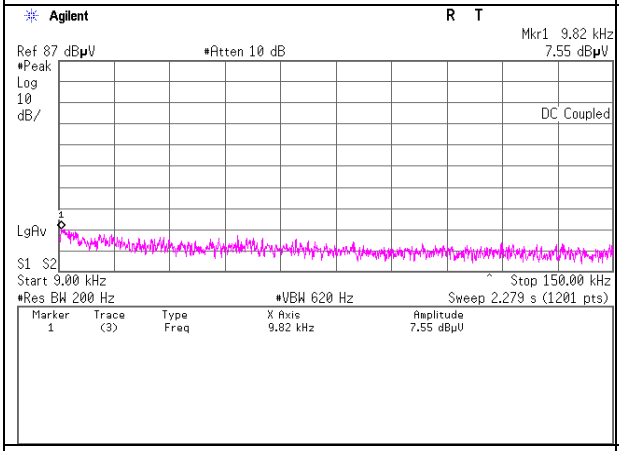


Conducted Spurious Emission

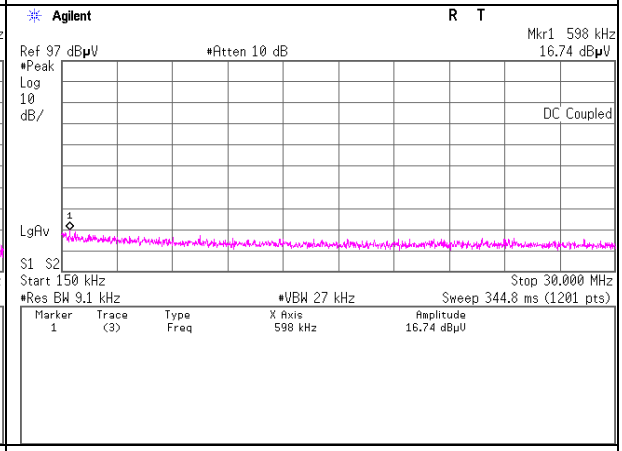
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2441MHz

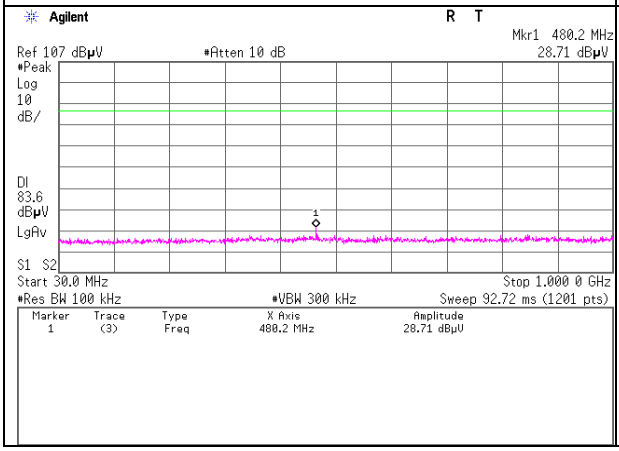
9kHz-150kHz



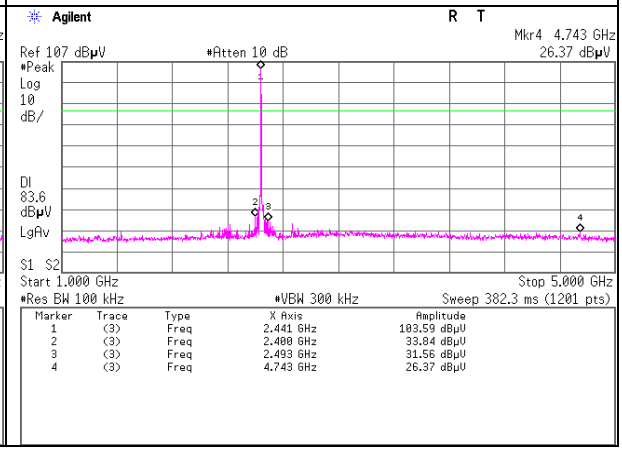
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz



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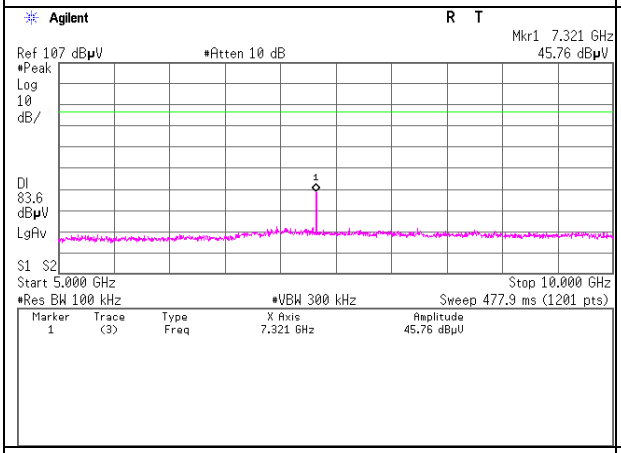
Conducted Spurious Emission

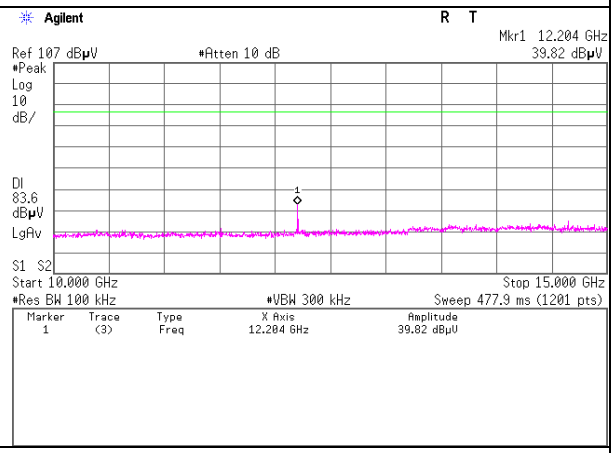
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2441MHz

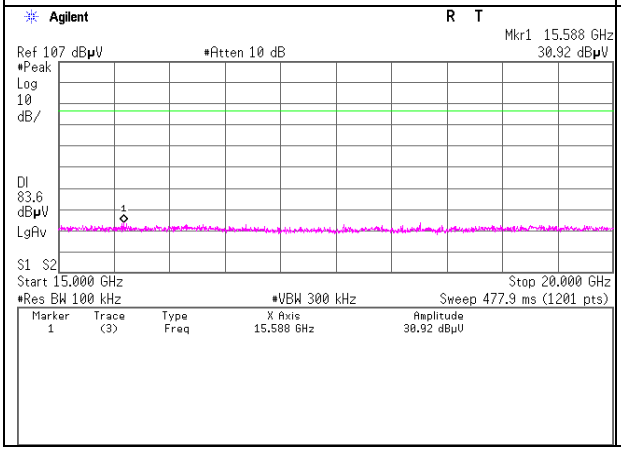
5GHz-10GHz



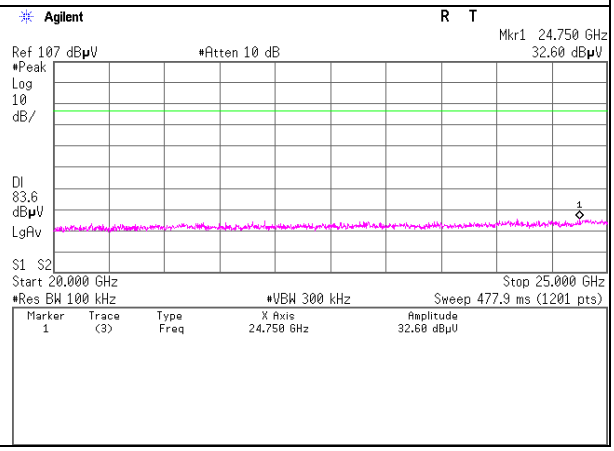
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

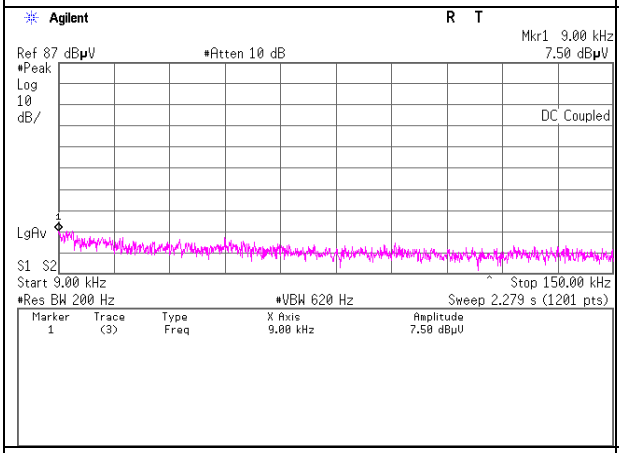


Conducted Spurious Emission

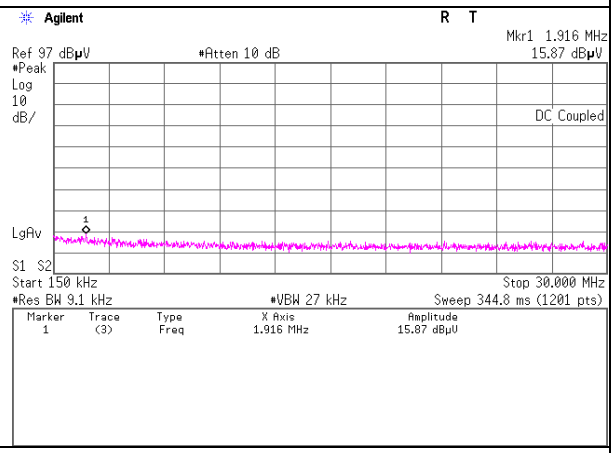
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2480MHz

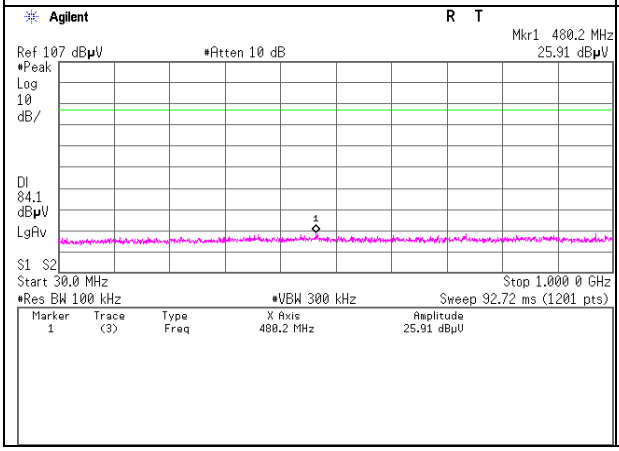
9kHz-150kHz



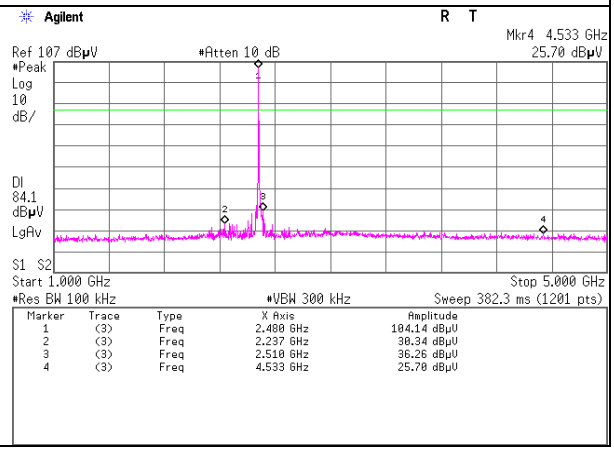
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

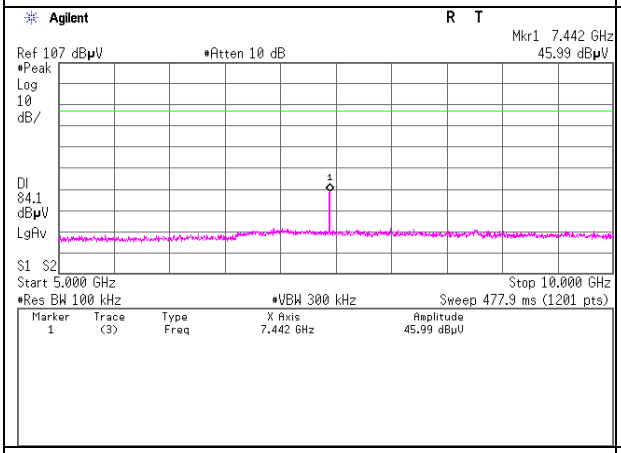


Conducted Spurious Emission

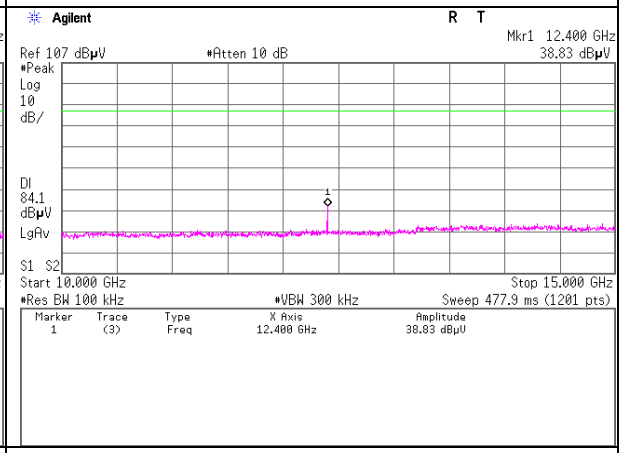
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5

Tx DH5 2480MHz

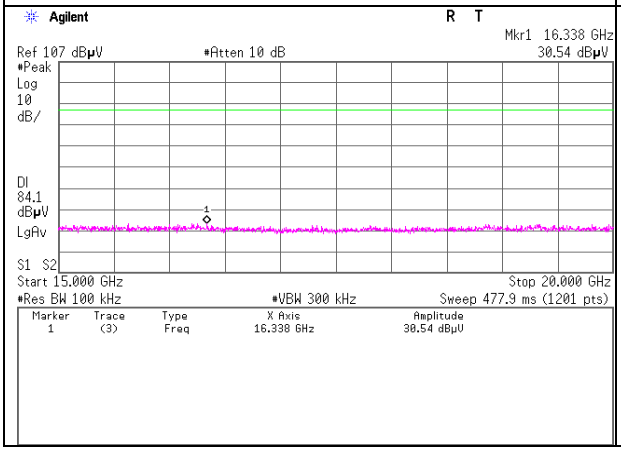
5GHz-10GHz



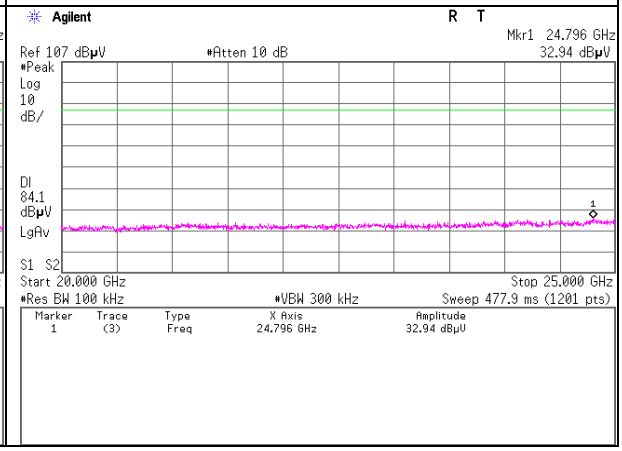
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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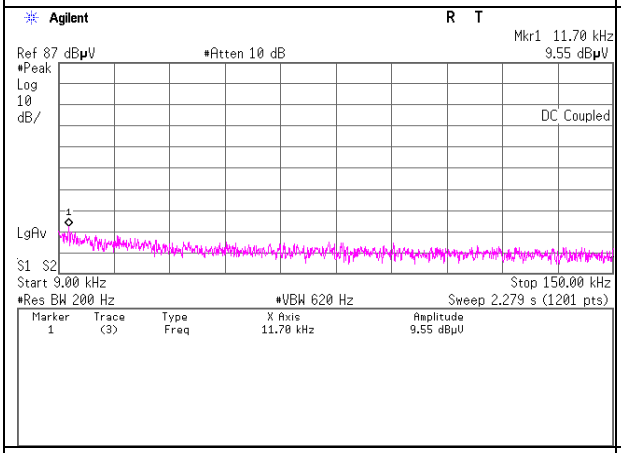
Conducted Spurious Emission

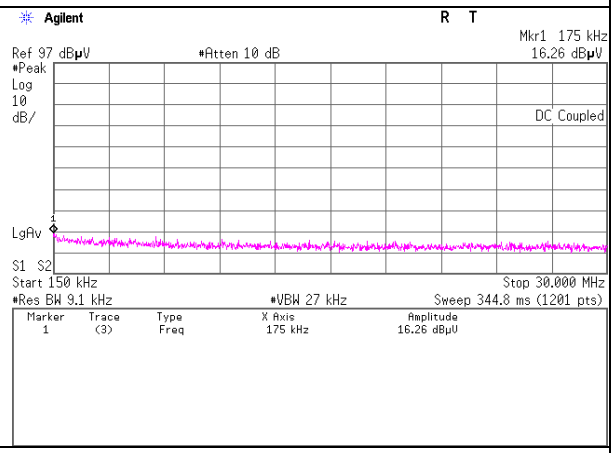
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2402MHz

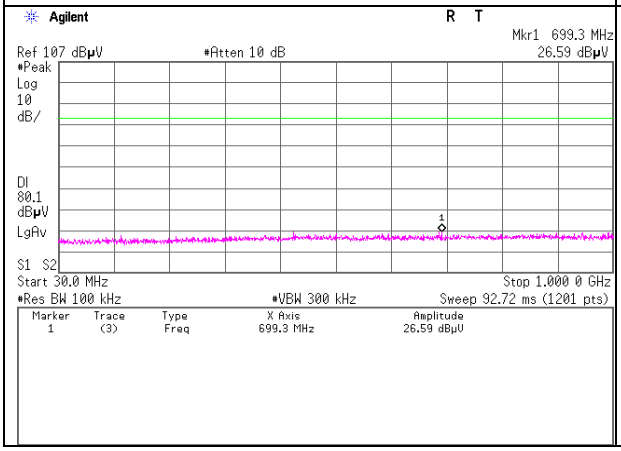
9kHz-150kHz



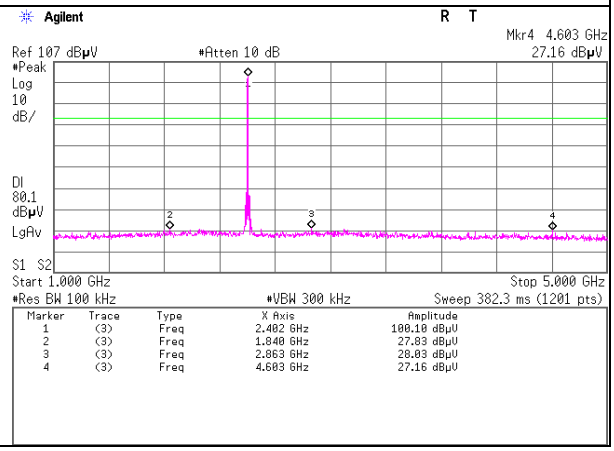
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz



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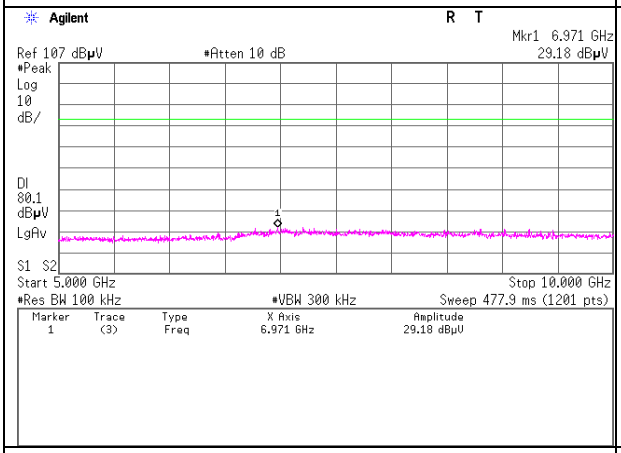
Conducted Spurious Emission

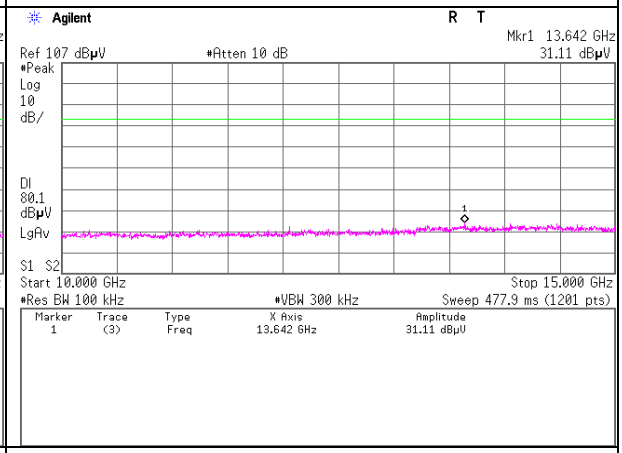
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2402MHz

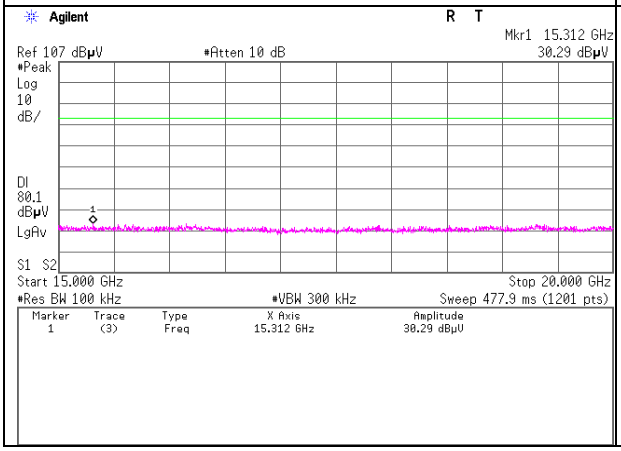
5GHz-10GHz



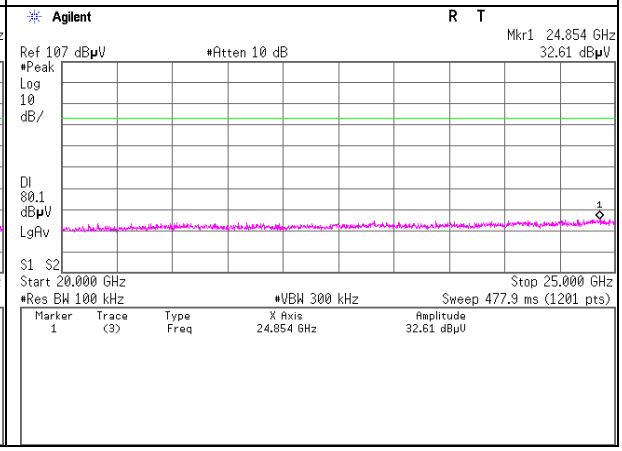
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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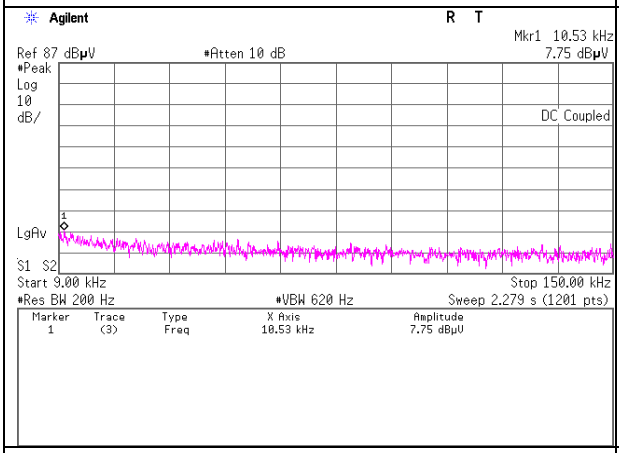
Conducted Spurious Emission

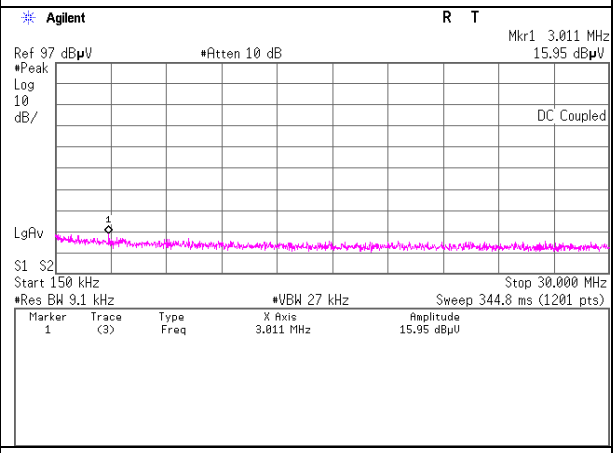
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2441MHz

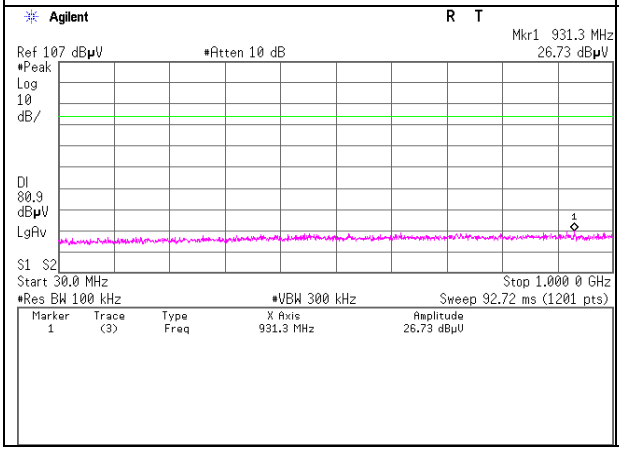
9kHz-150kHz



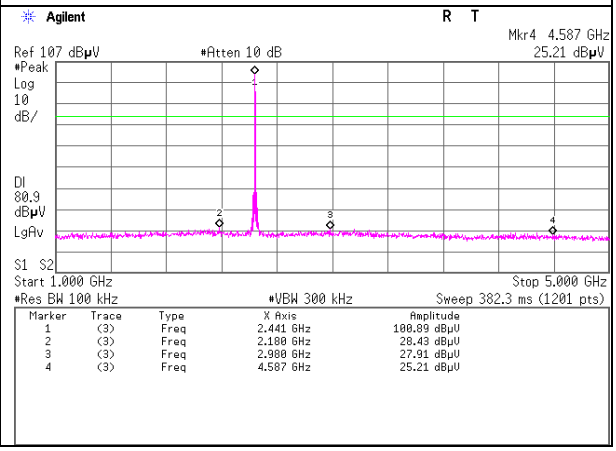
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

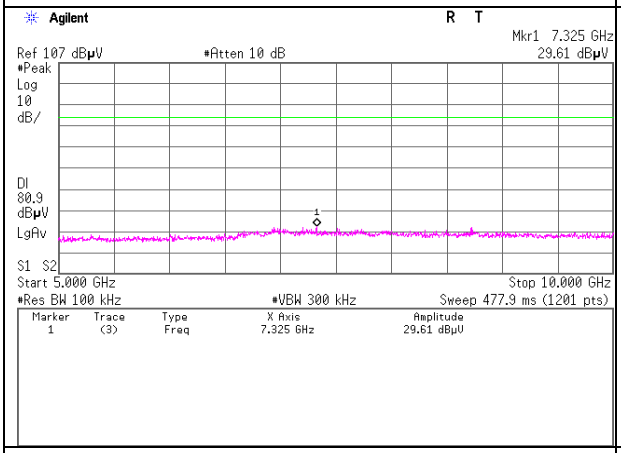


Conducted Spurious Emission

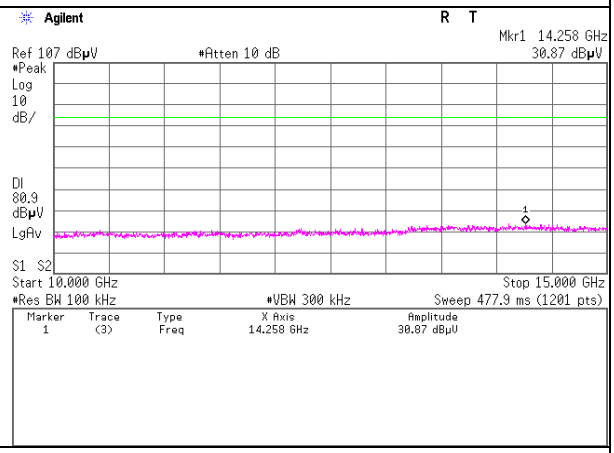
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2441MHz

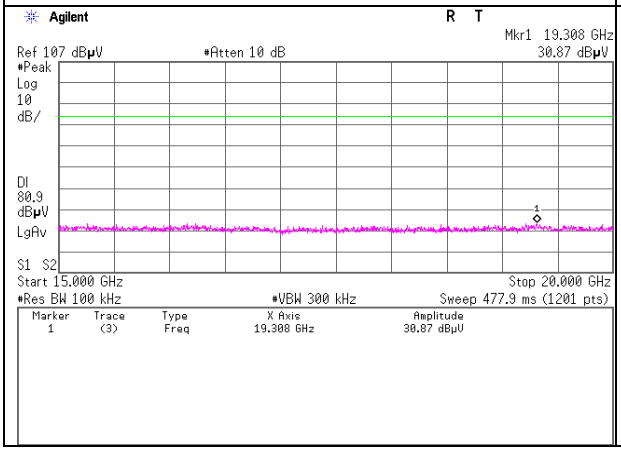
5GHz-10GHz



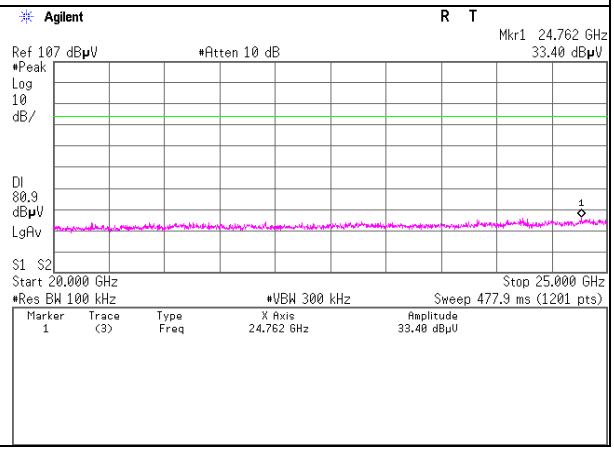
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
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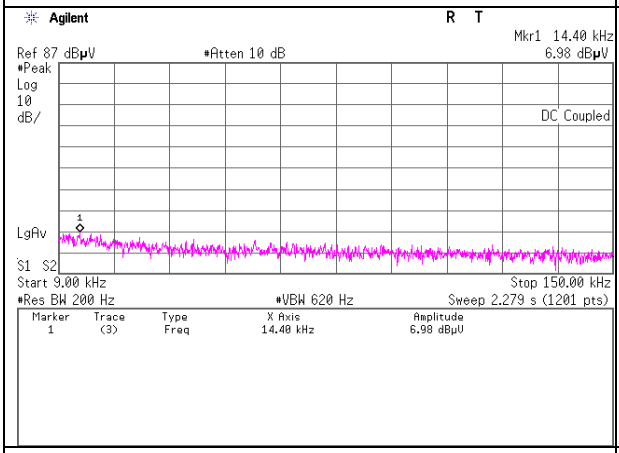
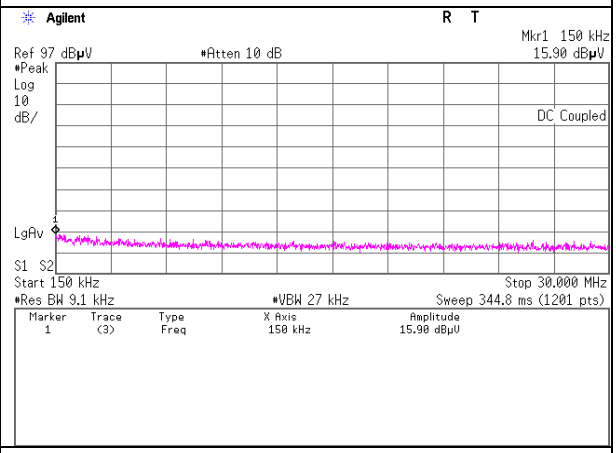
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2480MHz

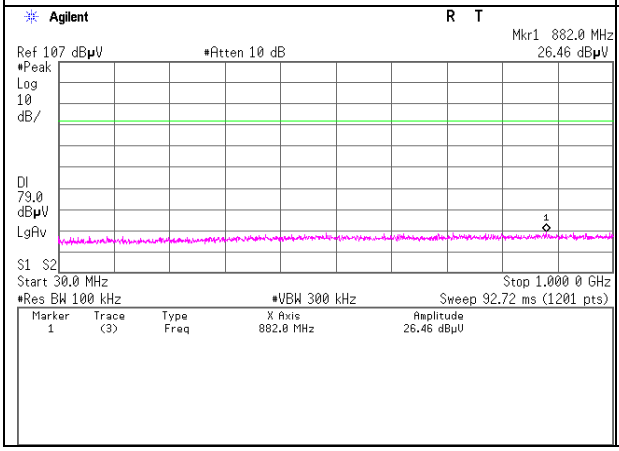
9kHz-150kHz



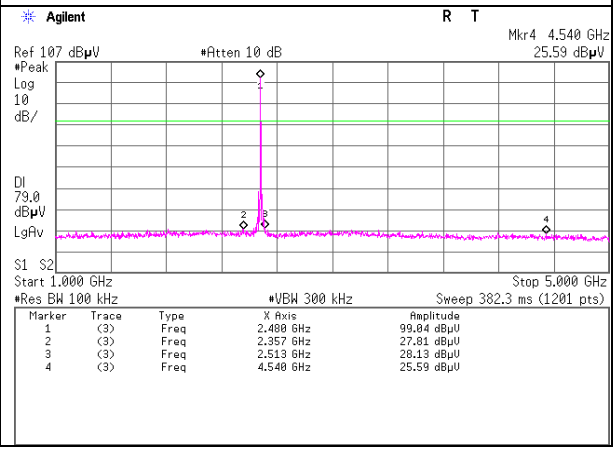
150kHz-30MHz



30MHz-1GHz



1GHz-5GHz

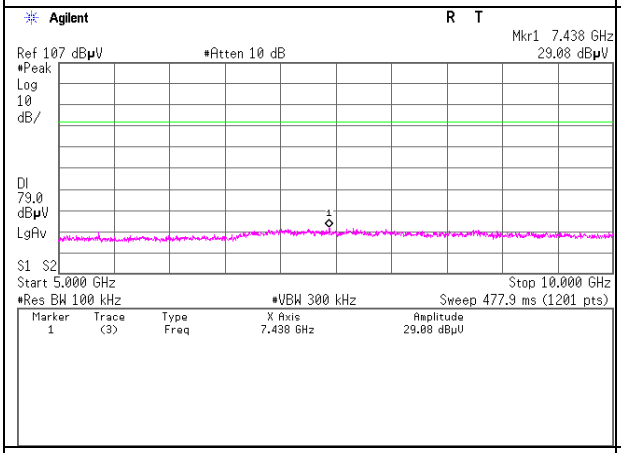


Conducted Spurious Emission

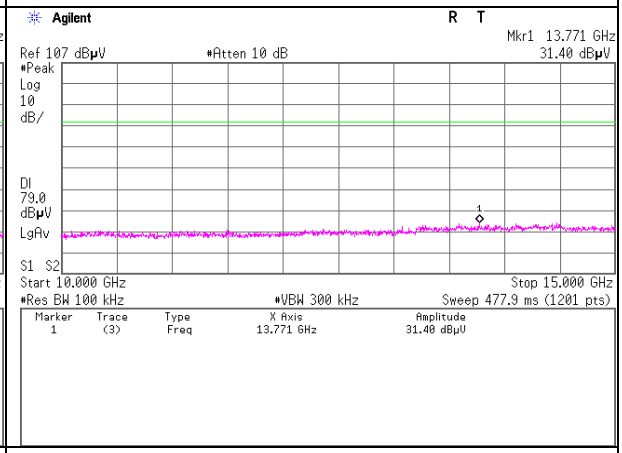
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) 3DH5

Tx 3DH5 2480MHz

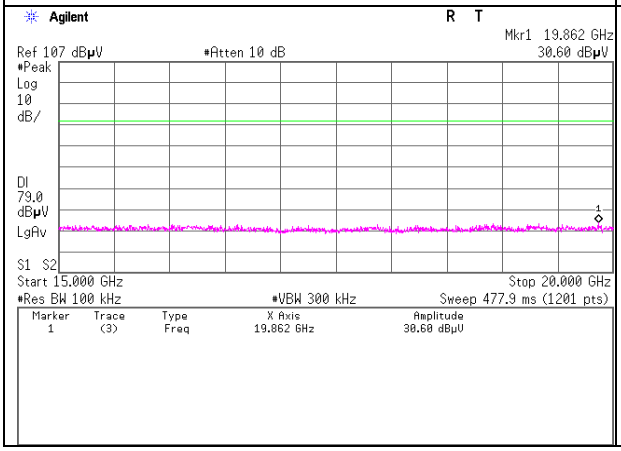
5GHz-10GHz



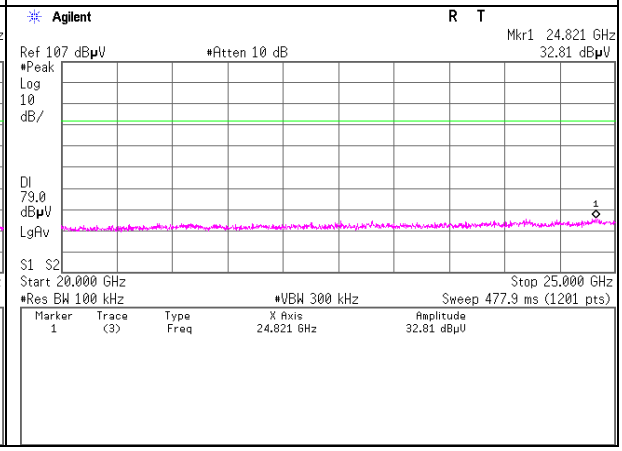
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

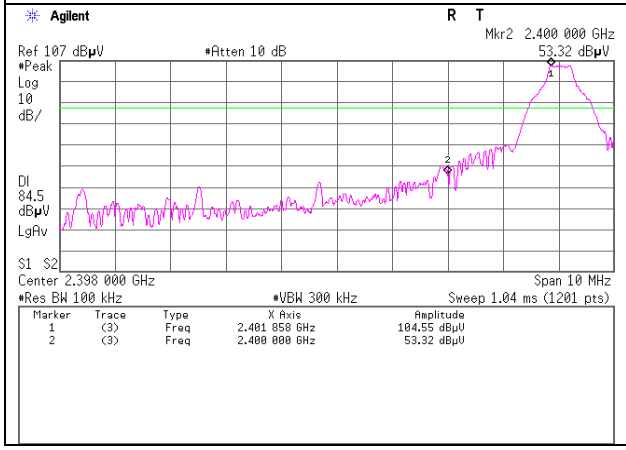


Conducted Emission Band Edge compliance

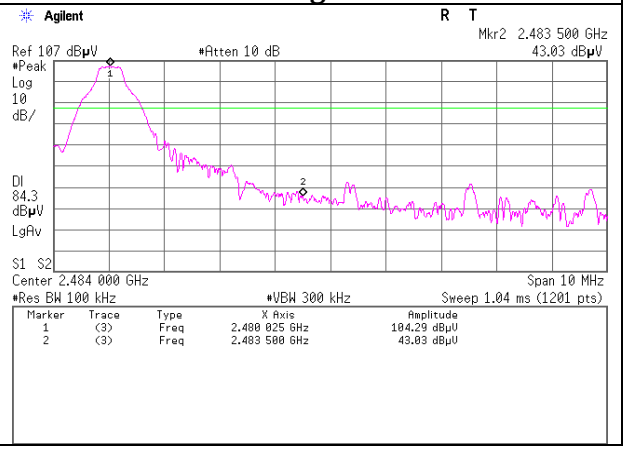
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on/off) DH5

Tx DH5, Hopping off

Low

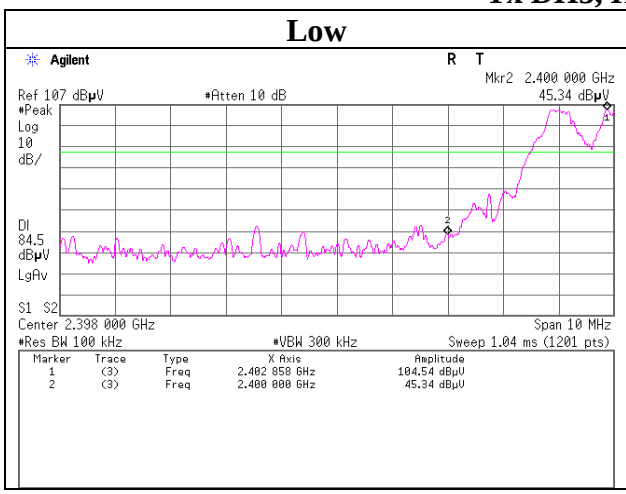


High

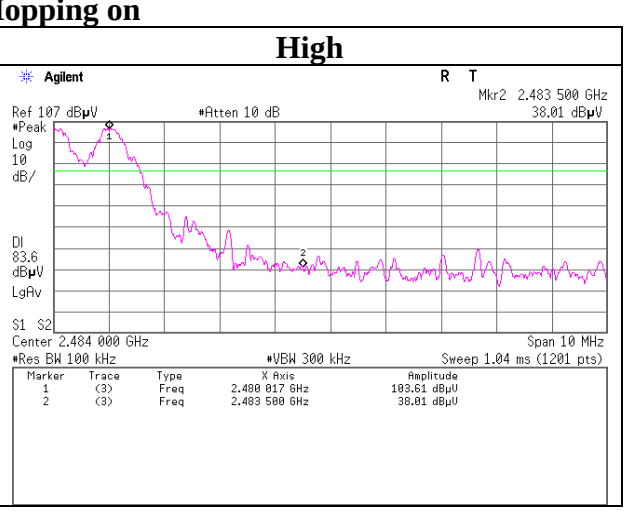


Tx DH5, Hopping on

Low



High



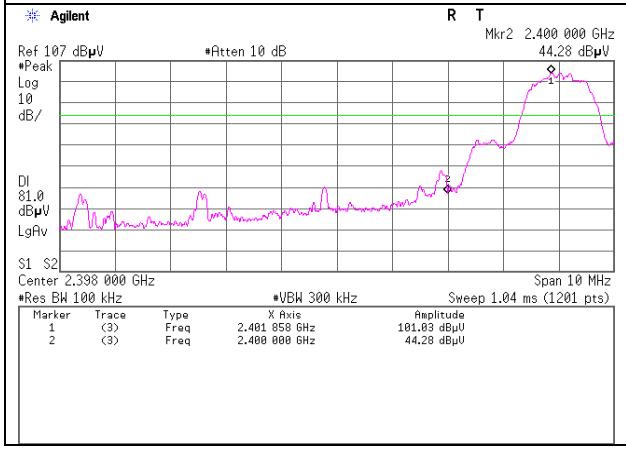
UL Japan, Inc.
Ise EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on/off) 3DH5

Tx 3DH5, Hopping off

Low



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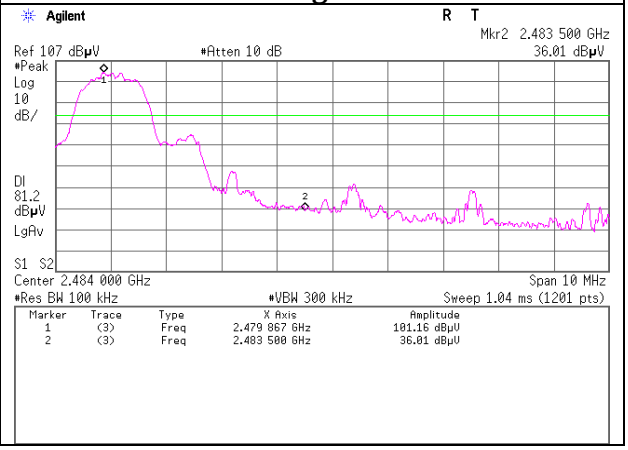
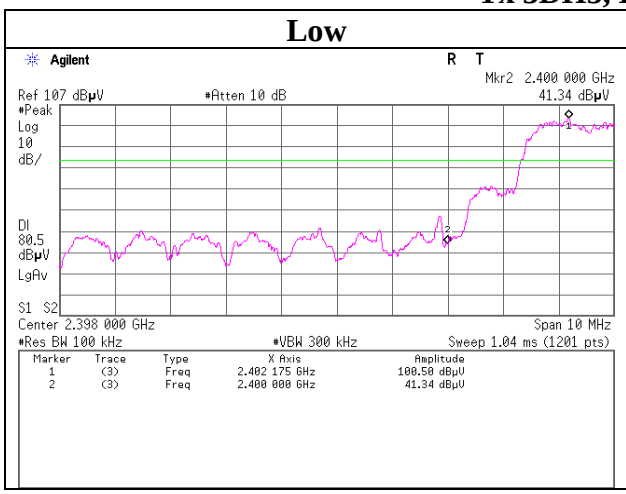
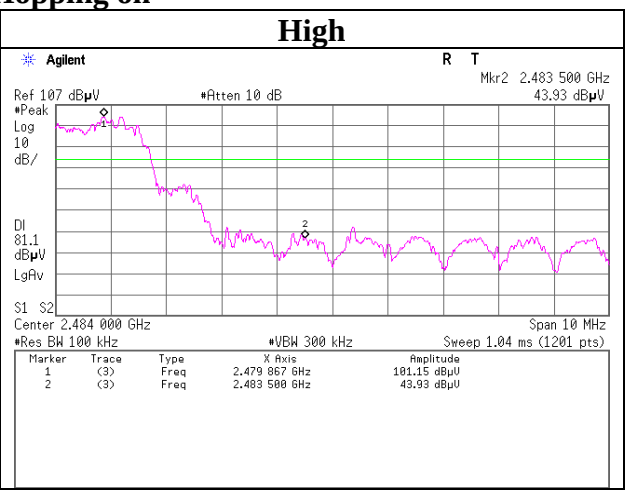


Tx 3DH5, Hopping on

Low



High



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Telephone : +81 596 24 8999
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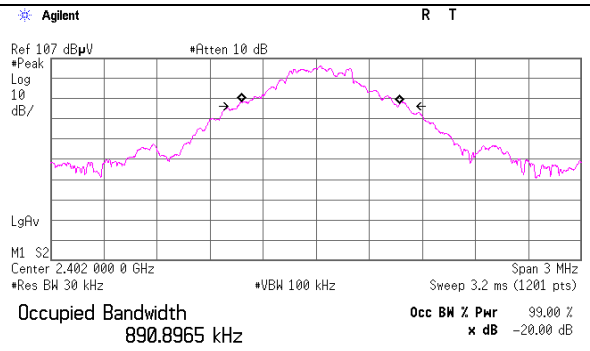
99%Occupied Bandwidth

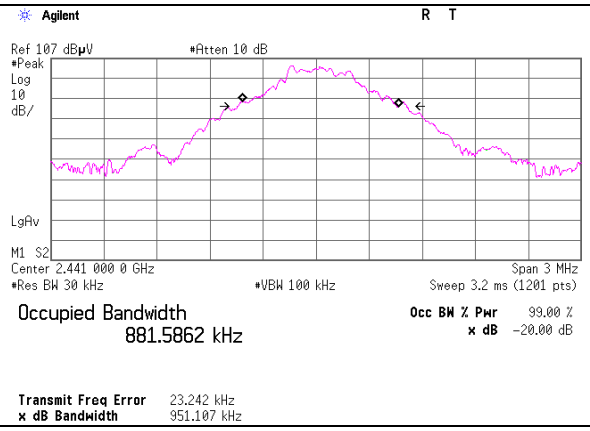
Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping off) DH5/3DH5

Tx DH5, Hopping off

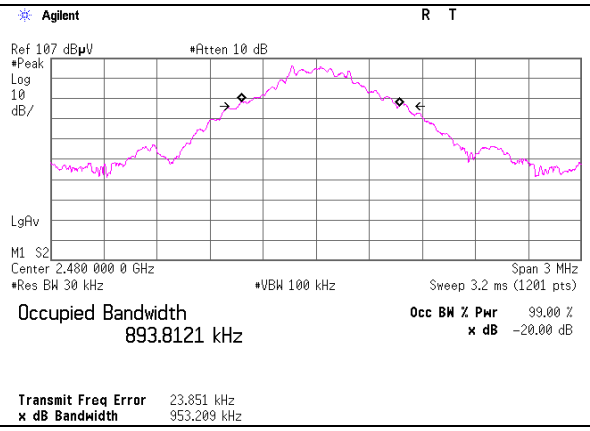
2402MHz



2441MHz

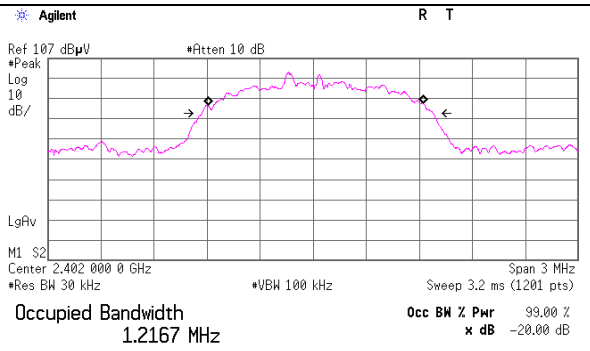


2480MHz

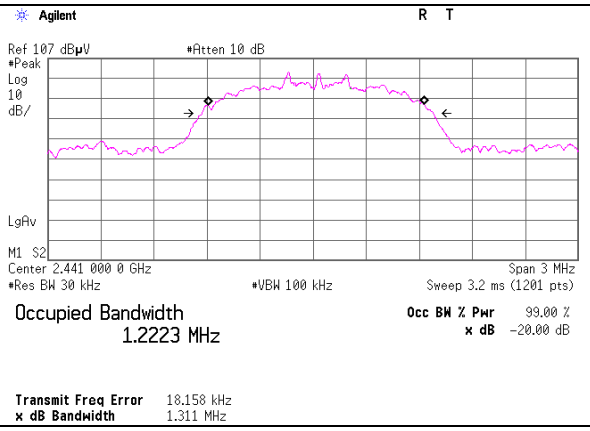


Tx 3DH5, Hopping off

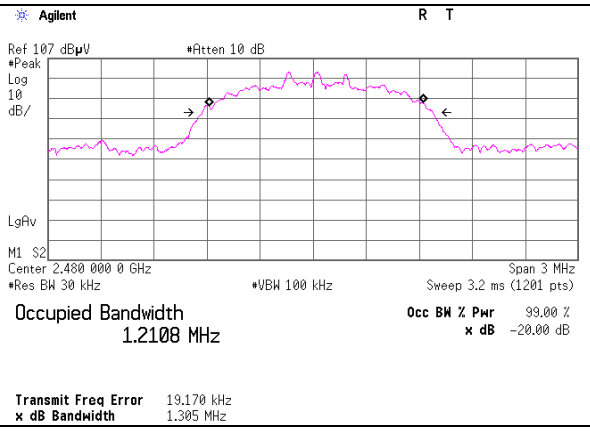
2402MHz



2441MHz



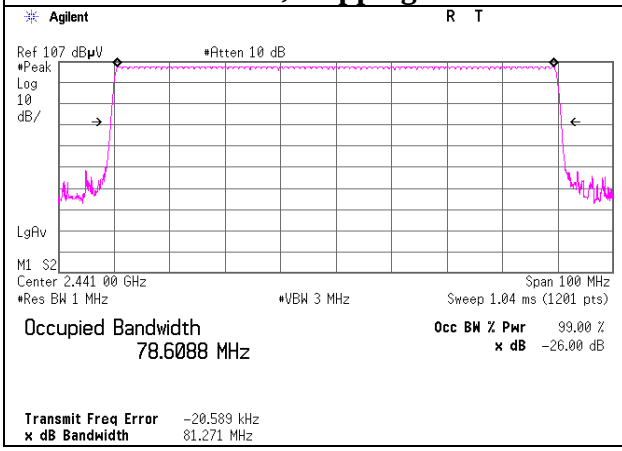
2480MHz



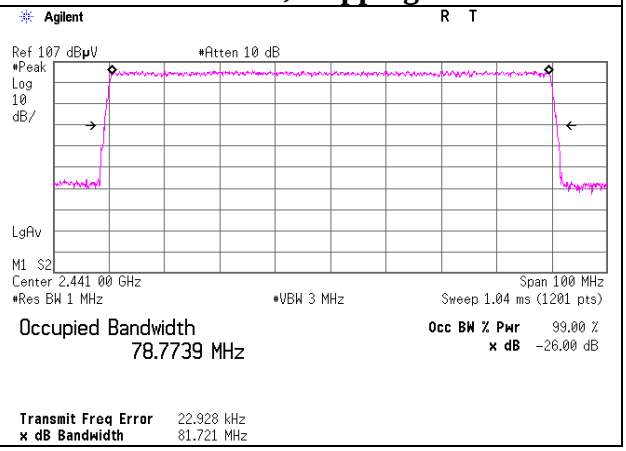
99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	10543199H
Date	11/25/2014
Temperature/ Humidity	23deg. C / 50% RH
Engineer	Kazuya Yoshioka
Mode	Tx (Hopping on) DH5/3DH5

Tx DH5, Hopping on



Tx 3DH5, Hopping on



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	CE	2014/02/27 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	CE	2014/02/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MRENT-116	Spectrum Analyzer	Agilent	E4440A	MY46187620	CE	2014/03/05 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE	2014/08/19 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2014/07/10 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2014/07/14 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2014/01/29 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2014/06/25 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2014/02/20 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2014/02/20 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2014/02/21 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2014/09/24 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2014/01/21 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2014/06/11 * 12
MHF-26	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	RE	2014/09/24 * 12
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2014/06/06 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2014/03/13 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2014/10/16 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2014/10/15 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2014/02/20 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2014/10/02 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2014/02/20 * 12
MJM-22	Measure	ASKUL	-	-	RE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2014/11/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2014/11/22 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2014/11/22 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2014/06/02 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2014/11/11 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2014/03/14 * 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