



RADIO TEST REPORT

Test Report No. : 11251380S-A-R3

Applicant : Nintendo Co., Ltd.
Type of Equipment : Wireless Game Device
Model No. : HAC-016
FCC ID : BKEHAC016
Test regulation : FCC Part 15 Subpart C: 2016
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. 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 11251380S-A-R2. 11251380S-A-R2 is replaced with this report.

Date of test: April 22 to June 16, 2016

Representative test engineer:



Hikaru Shirasawa

Engineer

Consumer Technology Division

Approved by:



Akio Hayashi

Leader

Consumer Technology Division



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

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Conducted Emission.....	10
SECTION 6: Radiated Spurious Emission	11
SECTION 7: Antenna Terminal Conducted Tests.....	12
APPENDIX 1: Test data	13
Conducted Emission	13
20 dB Bandwidth and Carrier Frequency Separation.....	19
Number of Hopping Frequency	22
Dwell time.....	24
Maximum Peak Output Power.....	31
Average Output Power	32
Burst Rate Confirmation	33
Radiated Spurious Emission	34
Conducted Spurious Emission	56
Conducted Emission Band Edge compliance	62
99 %Occupied Bandwidth	64
APPENDIX 2: Test instruments	66
APPENDIX 3: Photographs of test setup	68
Conducted Emission	68
Radiated Spurious Emission	69
Pre-check of Worst Case Position.....	70

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	:	Wireless Game Device
Model No.	:	HAC-016
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	Vbat: DC 3.2 V to DC 4.5 V (Typical: DC 3.7 V) Vin: DC 5.0 V
Receipt Date of Sample	:	April 20, 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-016 (referred to as the EUT in this report) is a Wireless Game Device.

General Specification

Clock frequency(ies) in the system	:	Bluetooth: 24 MHz, NFC: 27.12 MHz
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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	:	Inverted-F Antenna
Antenna Gain	:	1.85 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 Antenna
Operation temperature	:	+5 deg.C to +35 deg.C

*1) Refer to test report no. 11251380S-B.

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	21.0 dB (0.16826 MHz, N, QP, Tx DH5 2402 MHz)	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)(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	4.5 dB (12010.00 MHz, AV, Hori, Tx DH5 2402 MHz, Type-DA)	Complied	Conducted/ Radiated (above 30 MHz) *1)
99% Occupied Bandwidth	IC: RSS-Gen 6.6	IC: -	-	-	Conducted

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)

The EUT is supplied the power from battery or host device.

In either method, the EUT provides stable voltage (DC 1.8 V) constantly to RF Module regardless of input voltage.

In the case of battery method, the test was performed with the full-charged battery.

Therefore, the 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 EUT complies with the requirement.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
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

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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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
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
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 report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

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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)

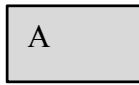
Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

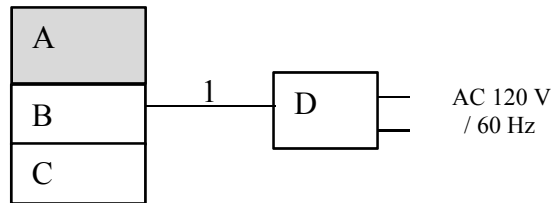
Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Carrier Frequency Separation	Tx (Hopping On) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
20 dB Bandwidth	Tx (Hopping Off) DH5, 3DH5	2402 MHz 2441 MHz 2480 MHz
Number 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

(1) For radiated emissions tests *



(2) For conducted emissions tests



* Pre-check measurement was performed with the EUT (supplied from the host device, and battery operation). It was confirmed that there was no difference.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Game Device	HAC-016	*1)	NINTENDO	EUT
B	Grip(Fixing Jig)	-	-	NINTENDO	-
C	Wireless Game Device	HAC-015	XBL0000002524	NINTENDO	-
D	AC adapter	HAC-002	MAIN JPN No.1	NINTENDO	-

*1)

	Antenna port conducted tests	Conducted emission tests	Radiated emission tests (below 1GHz)	Radiated emission tests (above 1GHz)
Serial number	XCL0000002580 (Type-TX)	XCL0000002574 (Type-TX)	XCL0000000861 (Type-DA) XCL0000002574 (Type-TX)	XCL0000000861 (Type-DA) XCL0000002574 (Type-TX)

*The EUT for final test was selected based on following preliminary test.

- Radiated Emission (below 1 GHz, Type-DA): Worst mode of Type-TX.
- Conducted Emission: Representative mode.
- Antenna Terminal Conducted test: Output Power

Accessory and model differences

The difference between Type-DA and Type-TX is as following table.

The two crystals and 1.8 V LDO are compatible and are electrically identical having same radio parameters.

	Type-DA	Type-TX
Crystal (X1)	DSX211SH	7R24080002
1.8 V LDO (U37)	LD39020DTPU18R	RP202K181D

So, for the Antenna port conducted tests, Conducted emission tests and Radiated emission tests (below 1GHz), the E.U.T. was selected worse Type by preliminary tests.

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB cable	1.5	Shielded	Shielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1.0 m by 2.0 m, raised 80 cm 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.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a shielded room. 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 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	3.95 m*2) (1 GHz – 13 GHz), 1 m*3) (13 GHz – 26.5 GHz)		3.95 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: $20 \times \log(3.95 \text{ m}/3.0 \text{ m}) = 2.4 \text{ dB}$

*3) Distance Factor: $20 \times \log(1.0 \text{ m}/3.0 \text{ m}) = -9.5 \text{ dB}$

- 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	Y	X	Y	X
Vertical	X	X	X	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

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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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

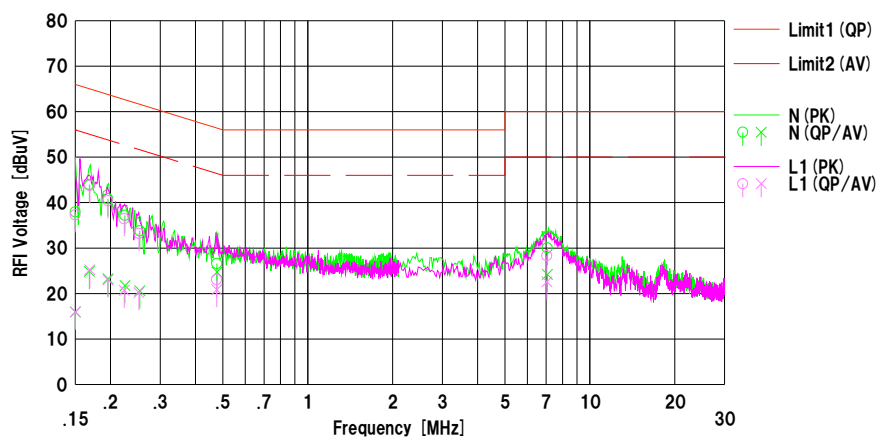
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/15

Serial No. : XCL0000002574
Remarks : -

Mode : Tx DH5 2402 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

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

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]		
1	0.15000	25.41	3.42	12.54	37.95	15.96	66.00	56.00	28.0	40.0	N	
2	0.16826	31.42	12.33	12.55	43.97	24.88	65.05	55.05	21.0	30.1	N	
3	0.19592	28.31	10.71	12.55	40.86	23.26	63.78	53.78	22.9	30.5	N	
4	0.22503	24.63	9.18	12.56	37.19	21.74	62.63	52.63	25.4	30.8	N	
5	0.25399	21.23	8.06	12.56	33.79	20.62	61.63	51.63	27.8	31.0	N	
6	0.47658	14.02	12.15	12.58	26.60	24.73	56.40	46.40	29.8	21.6	N	
7	7.06962	16.62	10.80	13.42	30.04	24.22	60.00	50.00	29.9	25.7	N	
8	0.15000	24.75	3.45	12.54	37.29	15.99	66.00	56.00	28.7	40.0	L1	
9	0.16892	31.19	12.68	12.55	43.74	25.23	65.01	55.01	21.2	29.7	L1	
10	0.19586	27.85	10.46	12.55	40.40	23.01	63.78	53.78	23.3	30.7	L1	
11	0.22365	23.89	8.16	12.55	36.44	20.71	62.68	52.68	26.2	31.9	L1	
12	0.25221	20.67	7.63	12.56	33.23	20.19	61.68	51.68	28.4	31.4	L1	
13	0.47589	10.48	8.29	12.58	23.06	20.87	56.41	46.41	33.3	25.5	L1	
14	7.03941	14.91	9.18	13.41	28.32	22.59	60.00	50.00	31.6	27.4	L1	

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

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Conducted Emission

DATA OF CONDUCTED EMISSION TEST

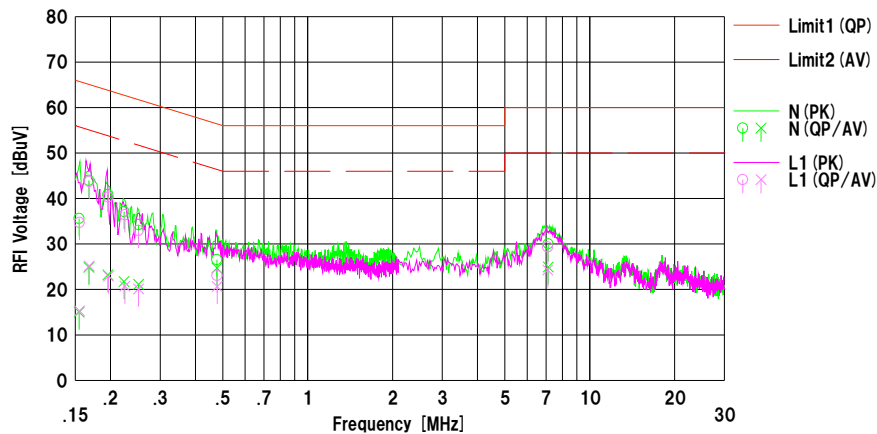
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/15

Serial No. : XCL0000002574
Remarks : -

Mode : Tx DH5 2441 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

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

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15487	23.05	2.49	12.54	35.59	15.03	65.73	55.73	30.1	40.7	N	
2	0.16769	31.42	12.33	12.55	43.97	24.88	65.07	55.07	21.1	30.1	N	
3	0.19572	28.28	10.67	12.55	40.83	23.22	63.79	53.79	22.9	30.5	N	
4	0.22334	24.56	9.19	12.55	37.11	21.74	62.69	52.69	25.5	30.9	N	
5	0.25152	21.67	8.57	12.56	34.23	21.13	61.71	51.71	27.4	30.5	N	
6	0.47680	13.98	12.15	12.58	26.56	24.73	56.39	46.39	29.8	21.6	N	
7	7.12678	16.60	11.50	13.42	30.02	24.92	60.00	50.00	29.9	25.0	N	
8	0.15531	22.17	2.76	12.54	34.71	15.30	65.71	55.71	31.0	40.4	L1	
9	0.16823	31.17	12.61	12.55	43.72	25.16	65.05	55.05	21.3	29.8	L1	
10	0.19672	27.80	10.39	12.55	40.35	22.94	63.75	53.75	23.4	30.8	L1	
11	0.22492	23.86	8.17	12.55	36.41	20.72	62.64	52.64	26.2	31.9	L1	
12	0.25140	20.39	7.56	12.56	32.95	20.12	61.71	51.71	28.7	31.5	L1	
13	0.47780	10.47	8.08	12.58	23.05	20.66	56.38	46.38	33.3	25.7	L1	
14	7.10240	15.90	10.86	13.42	29.32	24.28	60.00	50.00	30.6	25.7	L1	

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

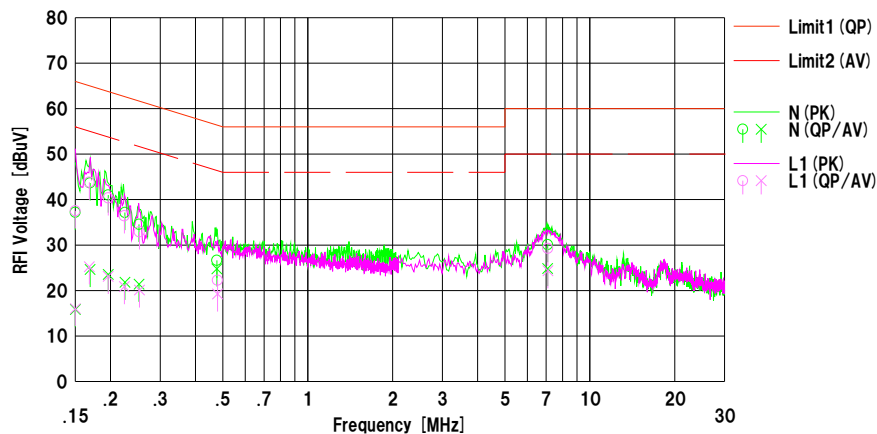
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/16

Serial No. : XCL0000002574
Remarks : -
Mode : Tx DH5 2480 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]		
1	0.15000	24.66	3.29	12.54	37.20	15.83	66.00	56.00	28.8	40.1	N	
2	0.16929	31.11	12.07	12.55	43.66	24.62	65.00	55.00	21.3	30.3	N	
3	0.19629	28.45	11.00	12.55	41.00	23.55	63.77	53.77	22.7	30.2	N	
4	0.22493	24.60	9.27	12.55	37.15	21.82	62.63	52.63	25.4	30.8	N	
5	0.25232	21.98	8.85	12.56	34.54	21.41	61.68	51.68	27.1	30.2	N	
6	0.47650	14.06	12.19	12.58	26.64	24.77	56.40	46.40	29.7	21.6	N	
7	7.08700	16.66	11.41	13.42	30.08	24.83	60.00	50.00	29.9	25.1	N	
8	0.15000	24.99	3.49	12.54	37.53	16.03	66.00	56.00	28.4	39.9	L1	
9	0.16817	31.27	12.67	12.55	43.82	25.22	65.05	55.05	21.2	29.8	L1	
10	0.19621	27.82	10.56	12.55	40.37	23.11	63.77	53.77	23.4	30.6	L1	
11	0.22392	23.88	8.31	12.55	36.43	20.86	62.67	52.67	26.2	31.8	L1	
12	0.25330	20.34	7.56	12.56	32.90	20.12	61.65	51.65	28.7	31.5	L1	
13	0.47917	9.68	6.67	12.58	22.26	19.25	56.35	46.35	34.0	27.1	L1	
14	7.10277	15.84	10.92	13.42	29.26	24.34	60.00	50.00	30.7	25.6	L1	

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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

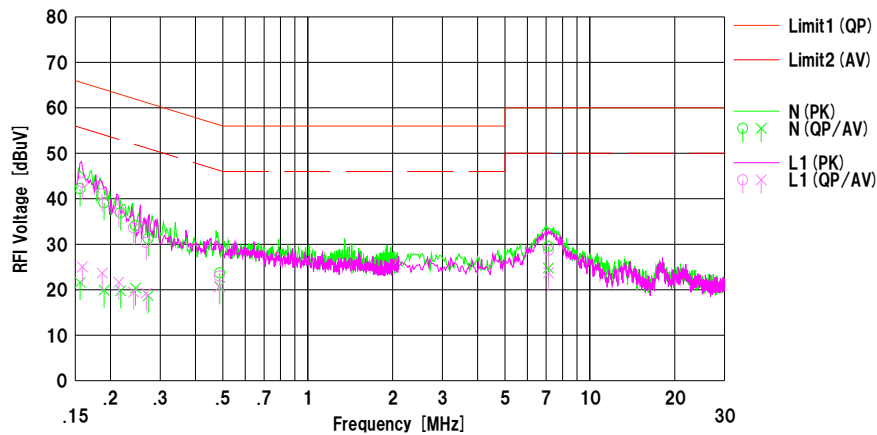
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/16

Serial No. : XCL0000002574
Remarks : -

Mode : Tx 3-DH5 2402 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

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

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15592	29.67	9.06	12.54	42.21	21.60	65.68	55.68	23.4	34.0	N	
2	0.18973	26.58	7.38	12.54	39.12	19.92	64.05	54.05	24.9	34.1	N	
3	0.21727	24.36	7.22	12.55	36.91	19.77	62.92	52.92	26.0	33.1	N	
4	0.24514	21.54	7.80	12.56	34.10	20.36	61.92	51.92	27.8	31.5	N	
5	0.27209	18.67	6.12	12.56	31.23	18.68	61.05	51.05	29.8	32.3	N	
6	0.48789	11.10	8.19	12.58	23.68	20.77	56.20	46.20	32.5	25.4	N	
7	7.13100	16.08	11.36	13.42	29.50	24.78	60.00	50.00	30.5	25.2	N	
8	0.15892	31.06	12.47	12.54	43.60	25.01	65.52	55.52	21.9	30.5	L1	
9	0.18672	28.49	11.12	12.54	41.03	23.66	64.18	54.18	23.1	30.5	L1	
10	0.21392	25.00	9.08	12.55	37.55	21.63	63.05	53.05	25.5	31.4	L1	
11	0.24163	21.07	6.94	12.56	33.63	19.50	62.04	52.04	28.4	32.5	L1	
12	0.26780	17.81	6.68	12.56	30.37	19.24	61.19	51.19	30.8	31.9	L1	
13	0.48594	10.41	8.04	12.58	22.99	20.62	56.24	46.24	33.2	25.6	L1	
14	7.14236	15.24	10.30	13.42	28.66	23.72	60.00	50.00	31.3	26.2	L1	

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

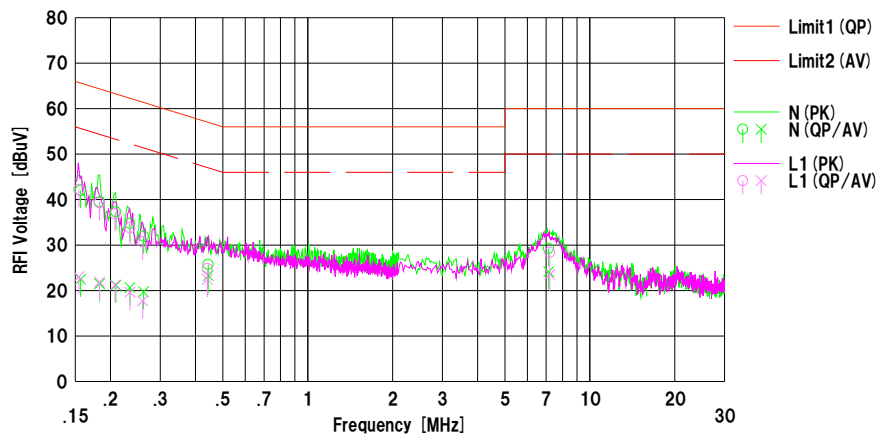
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/16

Serial No. : XCL0000002574
Remarks : -
Mode : Tx 3-DH5 2441 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]		
1	0.15666	29.49	9.96	12.54	42.03	22.50	65.64	55.64	23.6	33.1	N	
2	0.18290	26.96	8.91	12.55	39.51	21.46	64.35	54.35	24.8	32.8	N	
3	0.20912	24.76	8.63	12.55	37.31	21.18	63.24	53.24	25.9	32.0	N	
4	0.23426	22.17	8.11	12.56	34.73	20.67	62.30	52.30	27.5	31.6	N	
5	0.26188	19.39	7.19	12.56	31.95	19.75	61.37	51.37	29.4	31.6	N	
6	0.44398	13.17	10.67	12.57	25.74	23.24	56.99	46.99	31.2	23.7	N	
7	7.14928	15.86	10.71	13.42	29.28	24.13	60.00	50.00	30.7	25.8	N	
8	0.15463	29.65	10.51	12.54	42.19	23.05	65.75	55.75	23.5	32.7	L1	
9	0.18288	26.72	9.30	12.55	39.27	21.85	64.35	54.35	25.0	32.5	L1	
10	0.20738	24.34	8.68	12.55	36.89	21.23	63.31	53.31	26.4	32.0	L1	
11	0.23450	21.23	7.06	12.56	33.79	19.62	62.29	52.29	28.5	32.6	L1	
12	0.26010	18.07	5.20	12.56	30.63	17.76	61.43	51.43	30.8	33.6	L1	
13	0.44100	12.24	9.89	12.57	24.81	22.46	57.04	47.04	32.2	24.5	L1	
14	7.21459	14.96	10.16	13.44	28.40	23.60	60.00	50.00	31.6	26.4	L1	

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

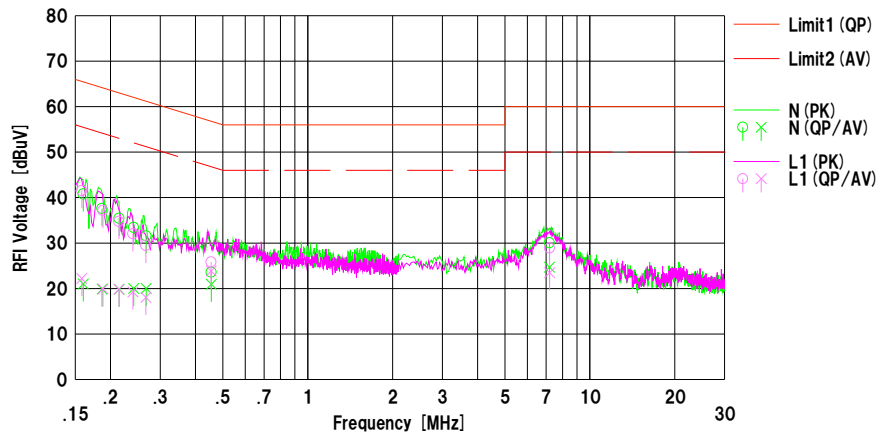
Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2016/06/16

Serial No. : XCL0000002574
Remarks : -
Mode : Tx 3-DH5 2480 MHz
Order No. : 11251380S
Power : AC 120 V / 60 Hz
Temp./Humi. : 26 deg.C / 58 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV
Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.16008	28.25	8.46	12.55	40.80	21.01	65.46	55.46	24.6	34.4	N	
2	0.18669	25.06	7.34	12.54	37.60	19.88	64.18	54.18	26.5	34.3	N	
3	0.21461	22.88	7.31	12.55	35.43	19.86	63.03	53.03	27.6	33.1	N	
4	0.24159	20.89	7.46	12.56	33.45	20.02	62.04	52.04	28.5	32.0	N	
5	0.26761	19.00	7.46	12.56	31.56	20.02	61.19	51.19	29.6	31.1	N	
6	0.45513	11.02	8.38	12.57	23.59	20.95	56.78	46.78	33.1	25.8	N	
7	7.19200	16.61	11.27	13.44	30.05	24.71	60.00	50.00	29.9	25.2	N	
8	0.15816	29.00	9.67	12.54	41.54	22.21	65.56	55.56	24.0	33.3	L1	
9	0.18795	24.61	7.38	12.54	37.15	19.92	64.13	54.13	26.9	34.2	L1	
10	0.21424	22.17	7.31	12.55	34.72	19.86	63.04	53.04	28.3	33.1	L1	
11	0.24002	19.49	6.70	12.56	32.05	19.26	62.10	52.10	30.0	32.8	L1	
12	0.26701	16.92	5.50	12.56	29.48	18.06	61.21	51.21	31.7	33.1	L1	
13	0.45472	13.25	11.29	12.57	25.82	23.86	56.79	46.79	30.9	22.9	L1	
14	7.19800	15.47	10.02	13.44	28.91	23.46	60.00	50.00	31.0	26.5	L1	

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

20 dB Bandwidth and Carrier Frequency Separation

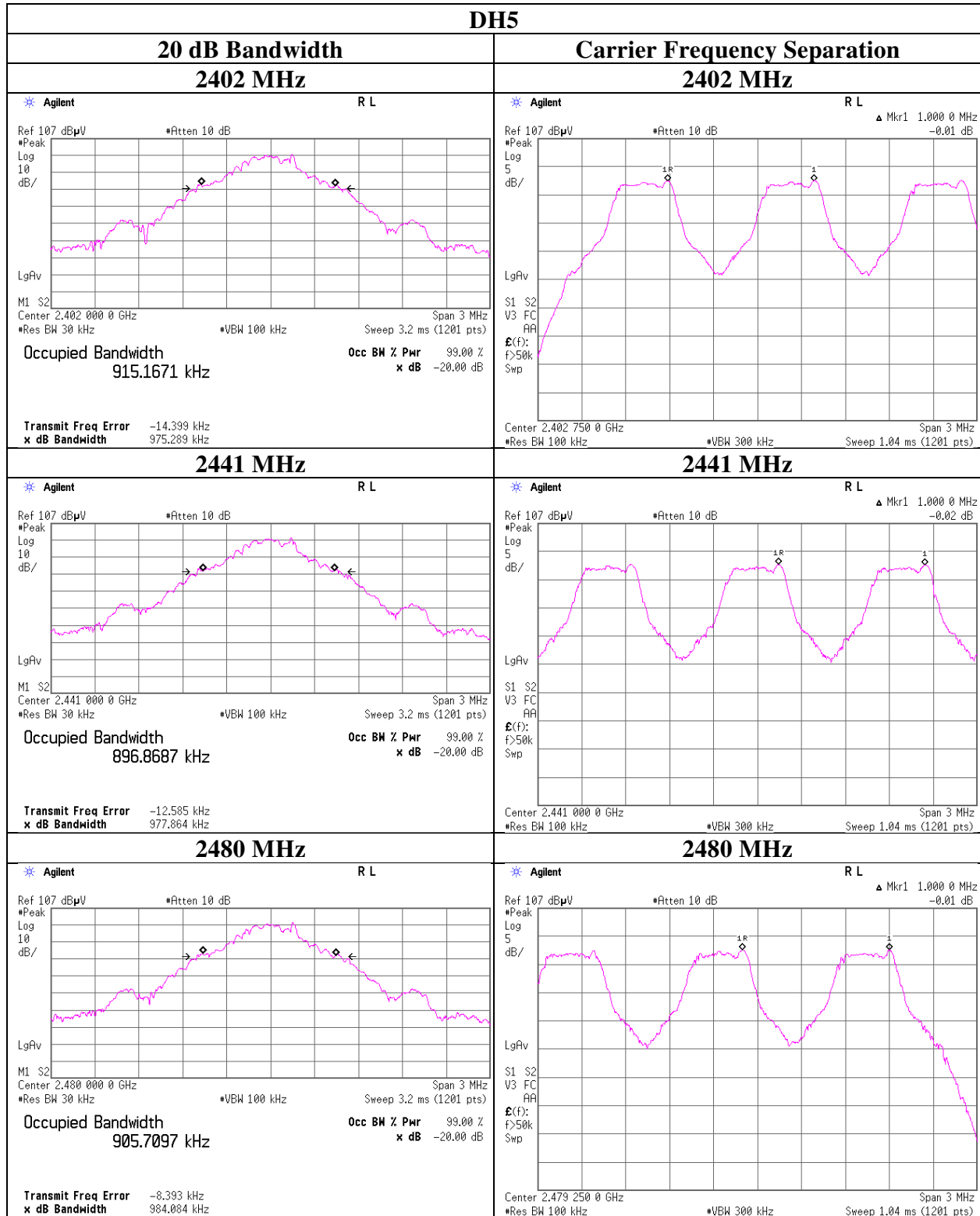
Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11251380S-A-R3
Date April 22, 2016
Temperature / Humidity 26 deg.C / 51 % RH
Engineer Shinichi Takano
Mode Tx, Hopping Off, On

Mode	Freq. [MHz]	20 dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.975	1.000	≥ 0.650
DH5	2441.0	0.978	1.000	≥ 0.652
DH5	2480.0	0.984	1.000	≥ 0.656
3DH5	2402.0	1.344	1.000	≥ 0.896
3DH5	2441.0	1.319	1.000	≥ 0.880
3DH5	2480.0	1.311	1.000	≥ 0.874

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



UL Japan, Inc.

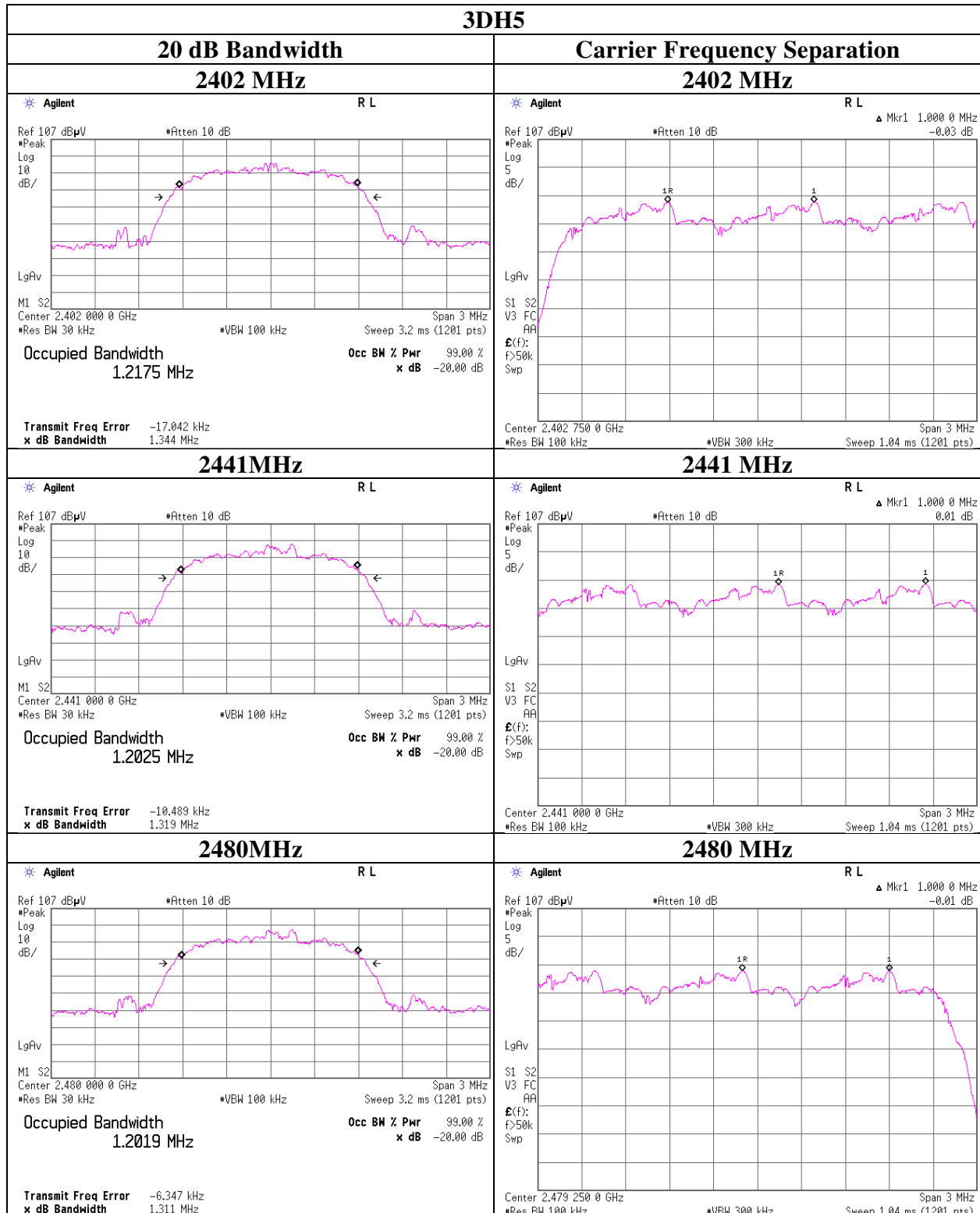
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

20 dB Bandwidth and Carrier Frequency Separation



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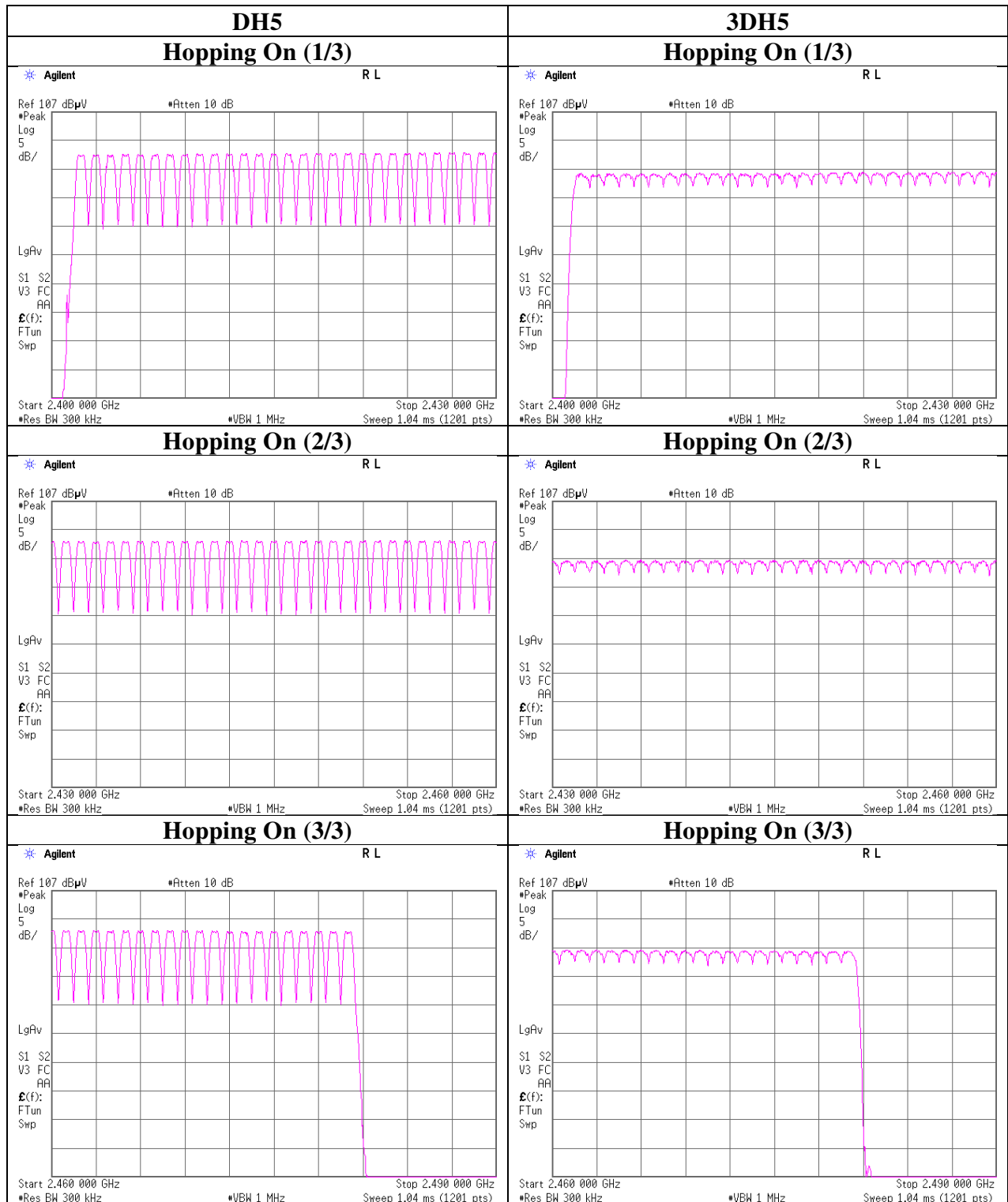
Number of Hopping Frequency

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11251380S-A-R3
Date April 22, 2016
Temperature / Humidity 26 deg.C / 51 % RH
Engineer Shinichi Takano
Mode Tx, Hopping On

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



UL Japan, Inc.

Shonan EMC Lab.

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Dwell time

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11251380S-A-R3
Date April 22, 2016
Temperature / Humidity 26 deg.C / 51 % RH
Engineer Shinichi Takano
Mode Tx, Hopping On

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	25.8 times	/	5 s x 31.6 s = 164 times	1.683	276	400
DH5	19.2 times	/	5 s x 31.6 s = 122 times	2.931	358	400
3DH1	50.6 times	/	5 s x 31.6 s = 320 times	0.428	137	400
3DH3	26.0 times	/	5 s x 31.6 s = 165 times	1.686	278	400
3DH5	18.6 times	/	5 s x 31.6 s = 118 times	2.939	347	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

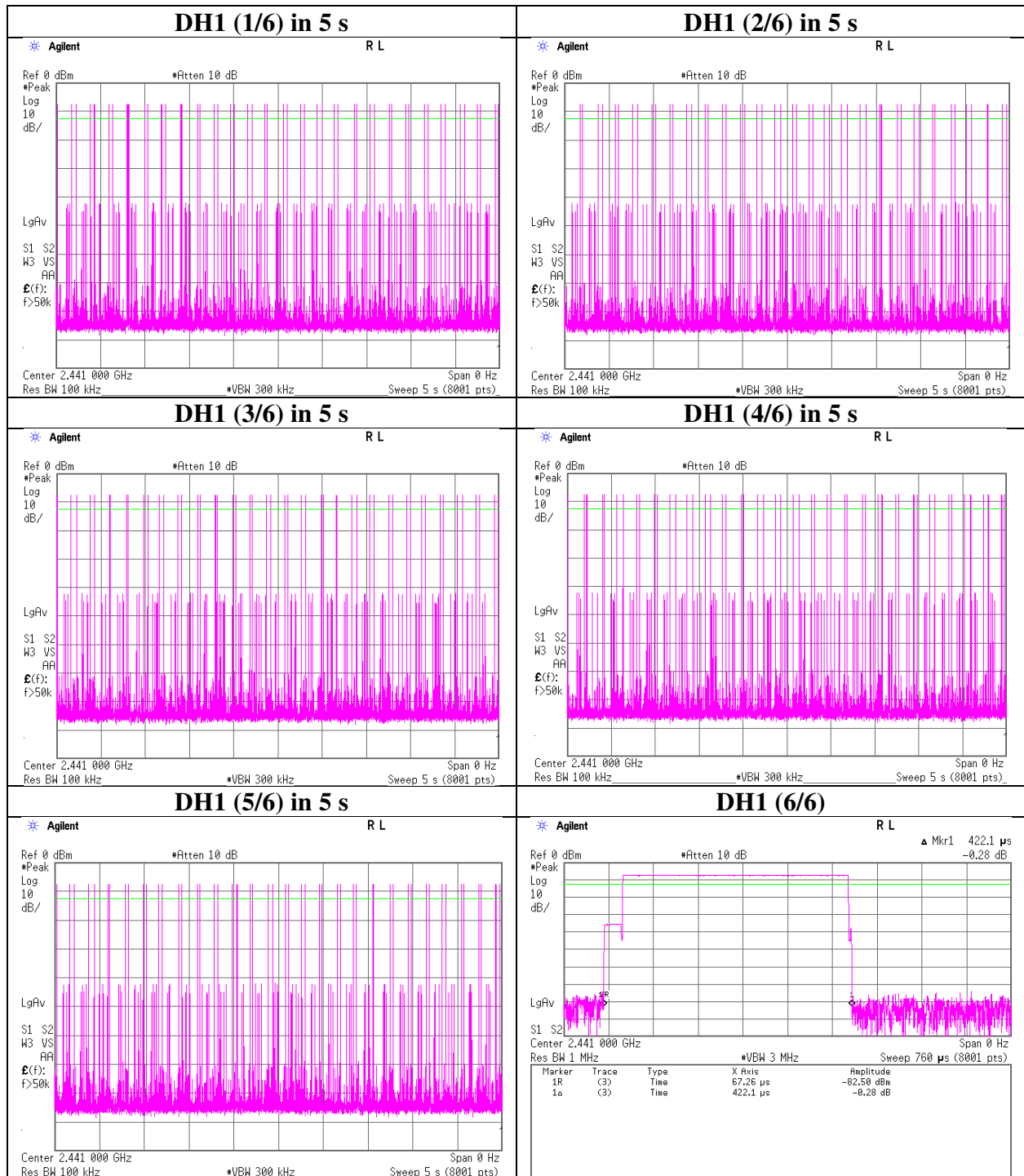
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	50	51	51	51	50.8
DH3	23	27	27	24	28	25.8
DH5	19	20	17	20	20	19.2
3DH1	51	51	51	50	50	50.6
3DH3	25	28	24	27	26	26.0
3DH5	20	19	17	17	20	18.6

Sample Calculation

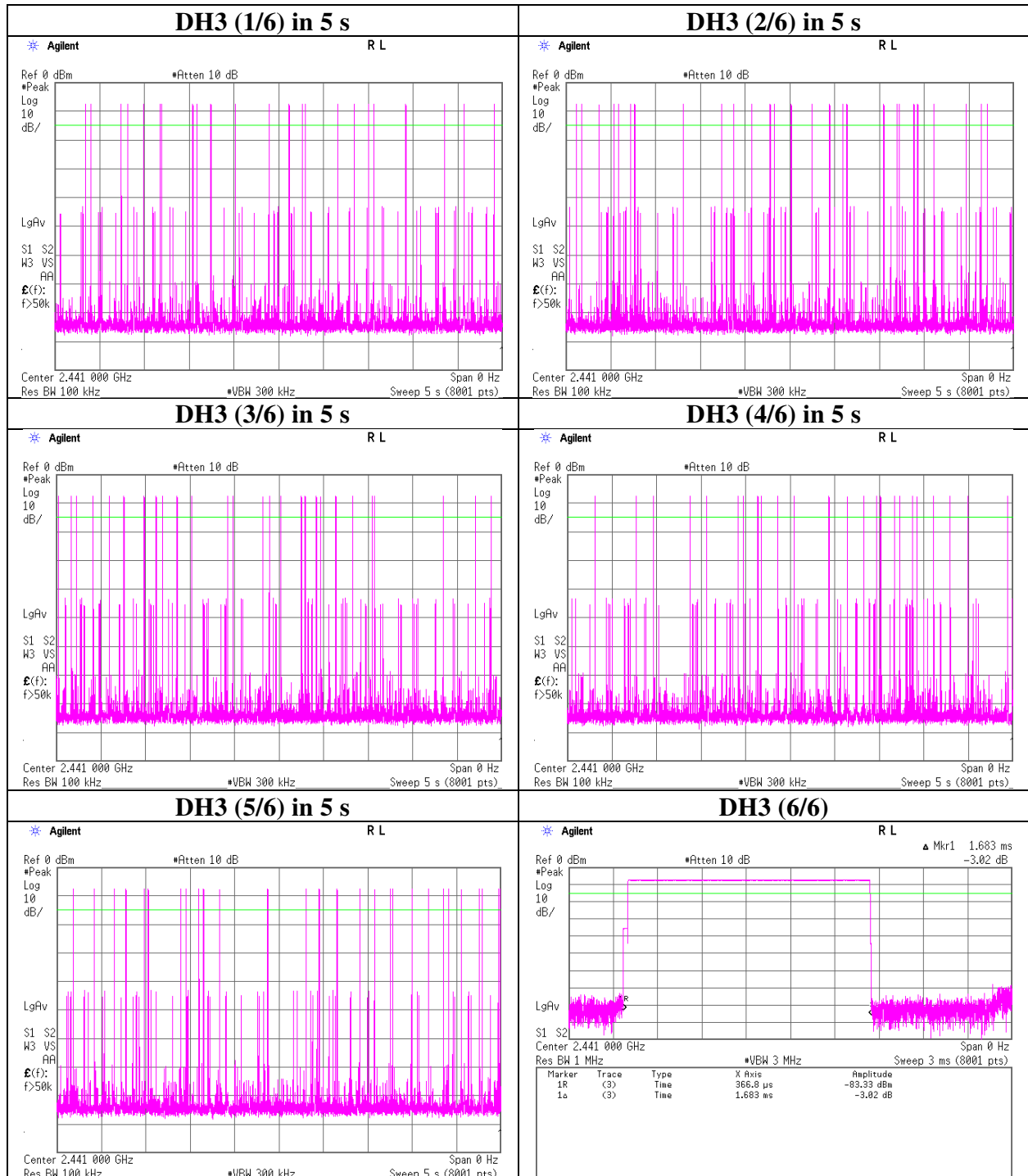
Average = Summation (Sampling 1 to 5) / 5

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 $N \times 0.4s$, 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 $N = 79$.

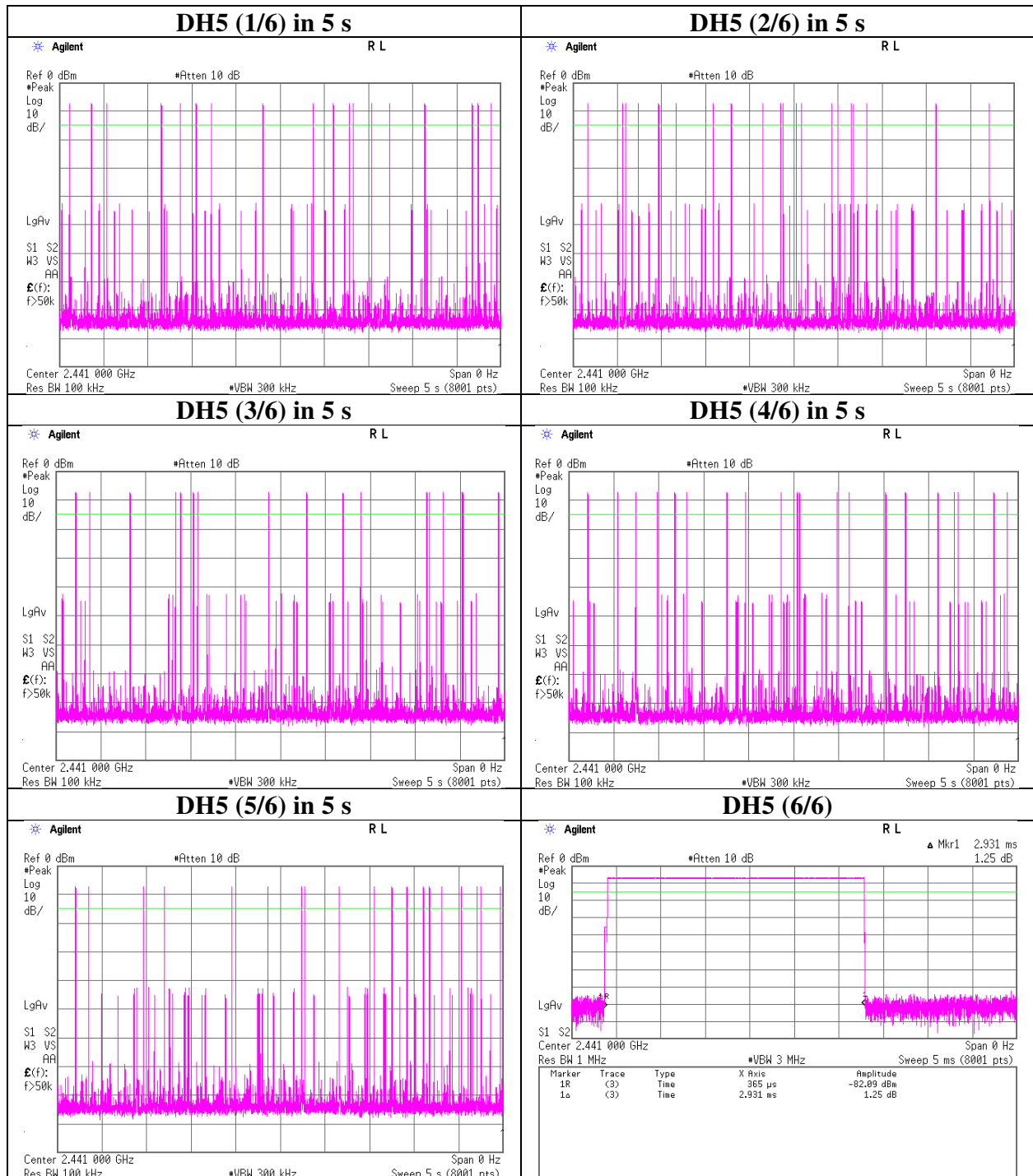
Dwell time



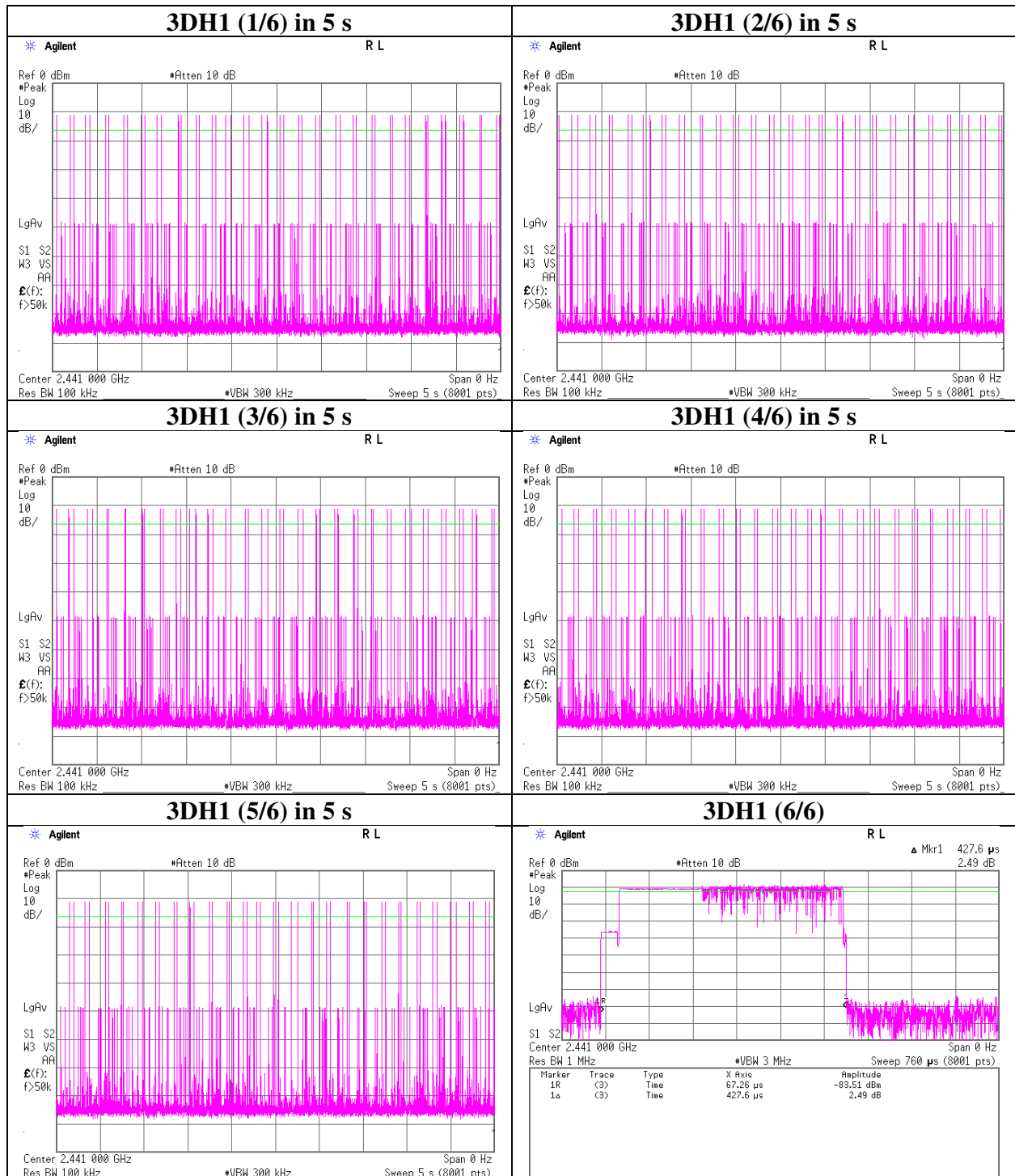
Dwell time



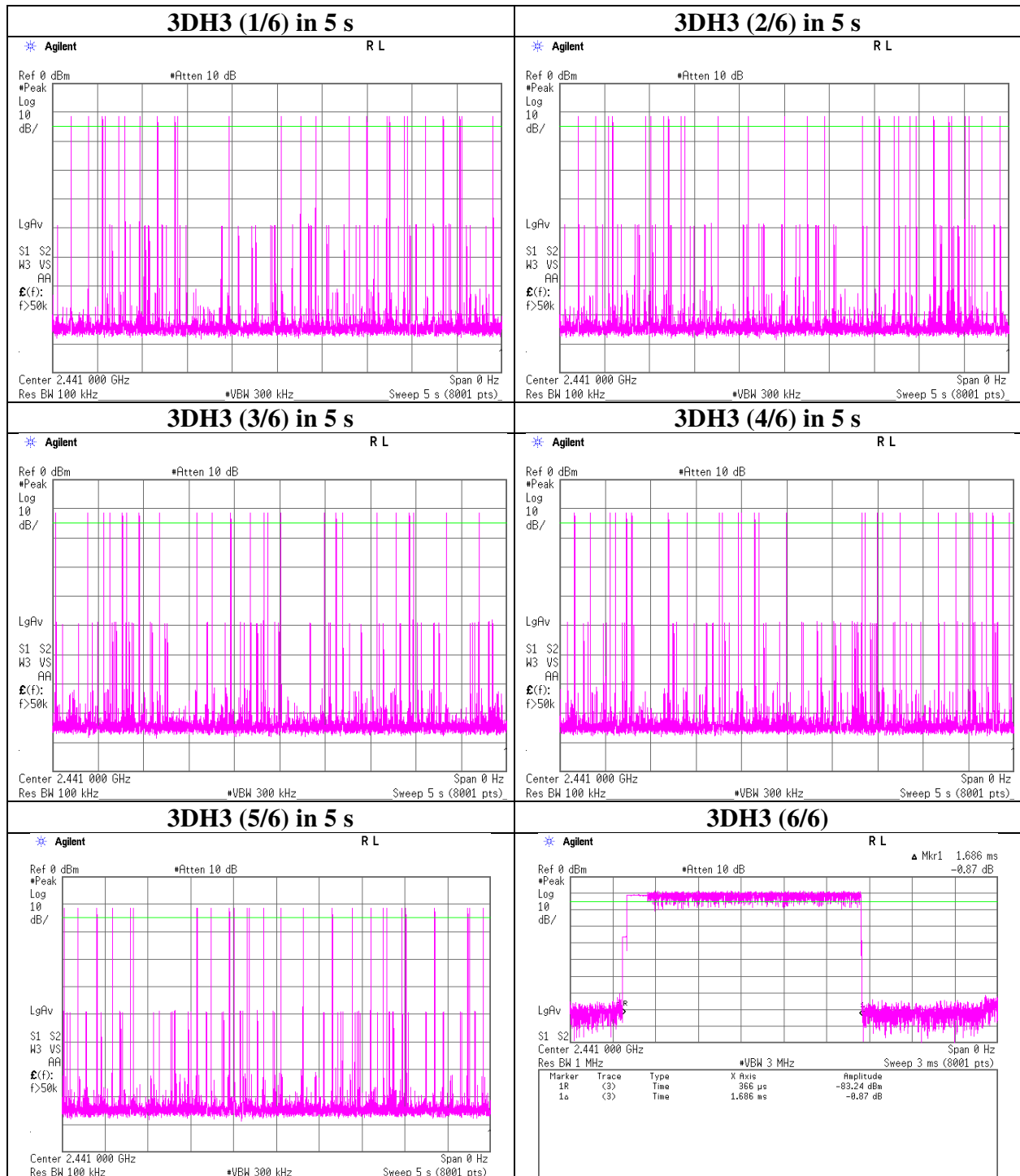
Dwell time



Dwell time



Dwell time



UL Japan, Inc.

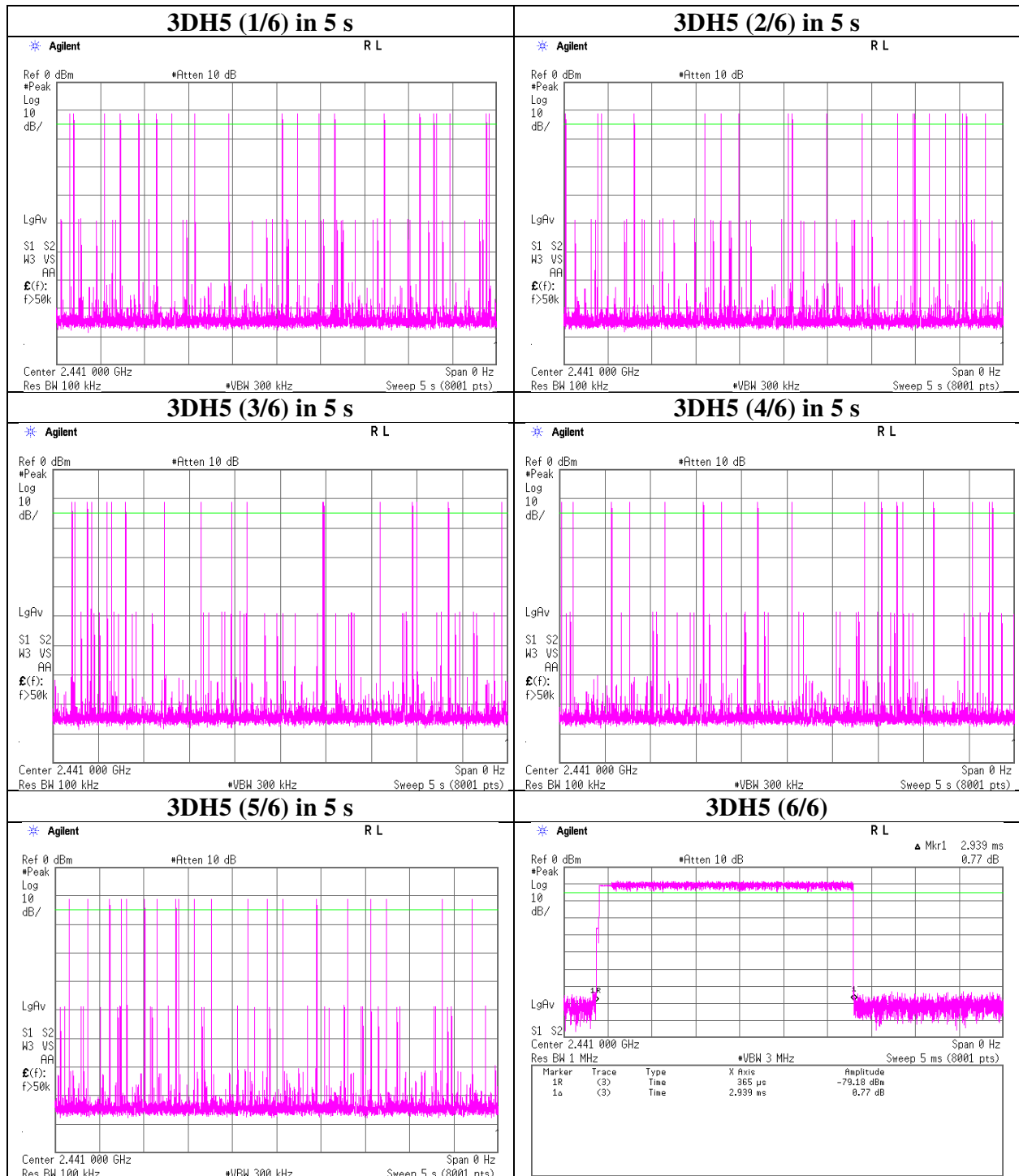
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Dwell time



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

Maximum Peak Output Power

Test place Shonan EMC Lab. No.5 Shielded Room
Report No. 11251380S-A-R3
Date April 22, 2016
Temperature / Humidity 26 deg.C / 51 % RH
Engineer Shinichi Takano
Mode Tx, Hopping Off

Mode	Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
DH5	2402.0	-7.80	1.79	9.92	3.91	2.46	20.96	125	17.05
DH5	2441.0	-7.36	1.76	9.92	4.32	2.70	20.96	125	16.64
DH5	2480.0	-7.51	1.78	9.92	4.19	2.62	20.96	125	16.77
2DH5	2402.0	-8.77	1.79	9.92	2.94	1.97	20.96	125	18.02
2DH5	2441.0	-8.42	1.76	9.92	3.26	2.12	20.96	125	17.70
2DH5	2480.0	-8.66	1.78	9.92	3.04	2.01	20.96	125	17.92
3DH5	2402.0	-8.57	1.79	9.92	3.14	2.06	20.96	125	17.82
3DH5	2441.0	-8.21	1.76	9.92	3.47	2.22	20.96	125	17.49
3DH5	2480.0	-8.43	1.78	9.92	3.27	2.12	20.96	125	17.69

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 / SAR testing)

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Time average)		Duty factor [dB]	Result (Burst power average)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-9.12	1.79	9.92	2.59	1.82	1.08	3.67	2.33
DH5	2441.0	-8.69	1.76	9.92	2.99	1.99	1.08	4.07	2.55
DH5	2480.0	-8.84	1.78	9.92	2.86	1.93	1.08	3.94	2.48
2DH5	2402.0	-12.53	1.79	9.92	-0.82	0.83	1.07	0.25	1.06
2DH5	2441.0	-12.17	1.76	9.92	-0.49	0.89	1.07	0.58	1.14
2DH5	2480.0	-12.40	1.78	9.92	-0.70	0.85	1.07	0.37	1.09
3DH5	2402.0	-12.52	1.79	9.92	-0.81	0.83	1.07	0.26	1.06
3DH5	2441.0	-12.15	1.76	9.92	-0.47	0.90	1.07	0.60	1.15
3DH5	2480.0	-12.39	1.78	9.92	-0.69	0.85	1.07	0.38	1.09

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.

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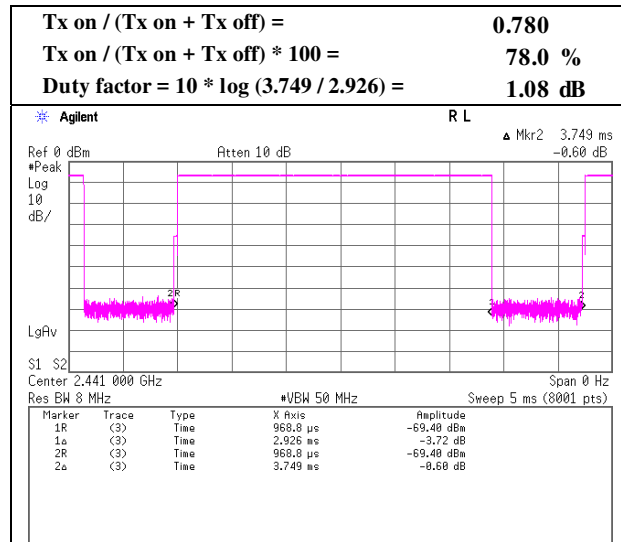
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

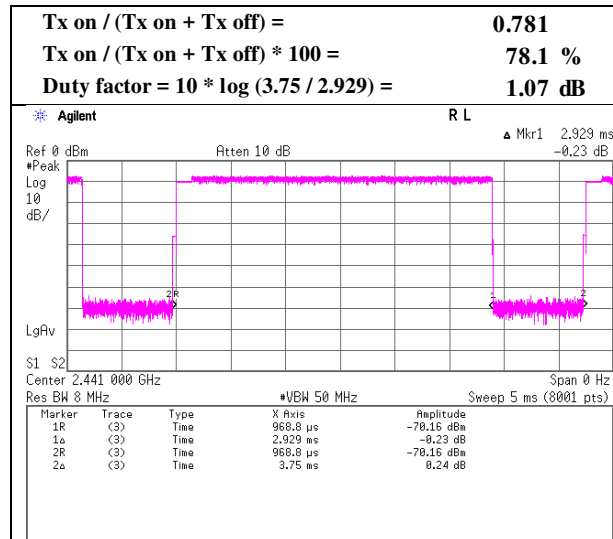
Burst Rate Confirmation

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off

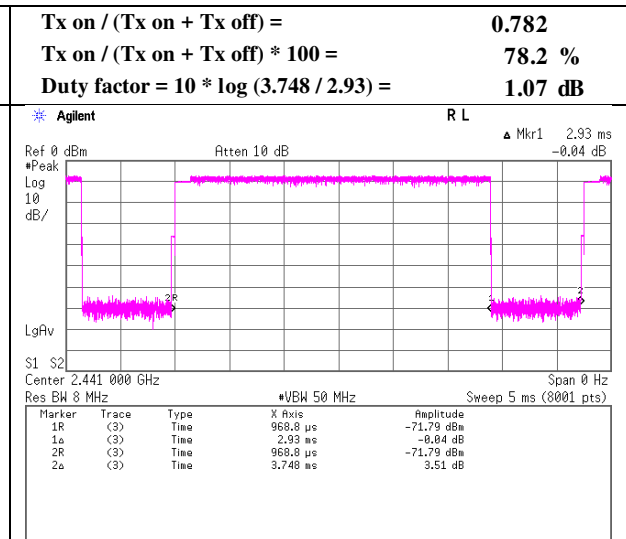
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 27, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 40 % RH 24 deg. C / 48 % RH 25 deg. C / 35 % RH
Engineer : Hikaru Shirasawa Shinichi Takano Shinichi Takano
Mode : (1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Tx, Hopping Off, DH5 2402 MHz, Type-DA

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.148	QP	23.2	16.2	8.9	31.8	0.0	16.5	43.5	27.0	304	343	
Hori.	889.883	QP	23.2	22.2	9.8	31.4	0.0	23.8	46.0	22.2	157	61	
Hori.	1445.064	PK	43.9	24.7	12.8	35.1	2.4	48.7	73.9	25.2	150	247	
Hori.	2390.000	PK	43.3	27.7	13.7	34.3	2.4	52.8	73.9	21.1	310	118	
Hori.	4804.000	PK	40.3	31.4	6.0	33.8	2.4	46.3	73.9	27.6	150	135	
Hori.	7206.000	PK	41.7	36.9	7.4	33.8	2.4	54.6	73.9	19.3	150	130	
Hori.	9608.000	PK	42.3	38.0	7.9	34.3	2.4	56.3	73.9	17.6	150	359	
Hori.	12010.000	PK	45.5	39.7	9.7	33.9	2.4	63.4	73.9	10.5	150	0	
Hori.	1445.064	AV	31.5	24.7	12.8	35.1	2.4	36.3	53.9	17.6	150	247	
Hori.	2390.000	AV	30.7	27.7	13.7	34.3	2.4	40.2	53.9	13.7	310	118	
Hori.	4804.000	AV	29.4	31.4	6.0	33.8	2.4	35.4	53.9	18.5	150	135	
Hori.	7206.000	AV	30.6	36.9	7.4	33.8	2.4	43.5	53.9	10.4	150	130	
Hori.	9608.000	AV	31.2	38.0	7.9	34.3	2.4	45.2	53.9	8.7	150	359	
Hori.	12010.000	AV	31.5	39.7	9.7	33.9	2.4	49.4	53.9	4.5	150	0	
Vert.	36.095	QP	23.7	15.2	7.2	31.8	0.0	14.3	40.0	25.7	100	34	
Vert.	78.595	QP	23.4	5.9	8.2	31.8	0.0	5.7	40.0	34.3	100	118	
Vert.	225.833	QP	23.3	16.7	9.4	31.7	0.0	17.7	46.0	28.3	100	18	
Vert.	518.282	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	249	
Vert.	937.613	QP	23.1	22.5	9.9	31.1	0.0	24.4	46.0	21.6	100	199	
Vert.	1445.078	PK	45.0	24.7	12.8	35.1	2.4	49.8	73.9	24.1	150	233	
Vert.	2390.000	PK	43.0	27.7	13.7	34.3	2.4	52.5	73.9	21.4	117	132	
Vert.	4804.000	PK	42.6	31.4	6.0	33.8	2.4	48.6	73.9	25.3	150	124	
Vert.	7206.000	PK	43.2	36.9	7.4	33.8	2.4	56.1	73.9	17.8	150	359	
Vert.	9608.000	PK	43.1	38.0	7.9	34.3	2.4	57.1	73.9	16.8	150	0	
Vert.	12010.000	PK	43.3	39.7	9.7	33.9	2.4	61.2	73.9	12.7	150	359	
Vert.	1445.078	AV	31.5	24.7	12.8	35.1	2.4	36.3	53.9	17.6	150	233	
Vert.	2390.000	AV	30.7	27.7	13.7	34.3	2.4	40.2	53.9	13.7	117	132	
Vert.	4804.000	AV	29.2	31.4	6.0	33.8	2.4	35.2	53.9	18.7	150	124	
Vert.	7206.000	AV	30.3	36.9	7.4	33.8	2.4	43.2	53.9	10.7	150	359	
Vert.	9608.000	AV	30.7	38.0	7.9	34.3	2.4	44.7	53.9	9.2	150	0	
Vert.	12010.000	AV	31.0	39.7	9.7	33.9	2.4	48.9	53.9	5.0	150	359	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor
Distance factor : 1 GHz - 13 GHz : 20log (3.95 m / 3.0 m) = 2.4 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

* These results have sufficient margin without taking account Dwell time factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	79.9	27.8	13.7	34.3	2.4	89.5	-	-	Carrier
Hori.	2400.000	PK	34.5	27.7	13.7	34.3	2.4	44.0	69.4	25.4	
Vert.	2402.000	PK	80.7	27.8	13.7	34.3	2.4	90.3	-	-	Carrier
Vert.	2400.000	PK	34.2	27.7	13.7	34.3	2.4	43.7	70.2	26.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : 20log (3.95 m / 3.0 m) = 2.4 dB

13 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.5 dB

* These results have sufficient margin without taking account Dwell time factor.

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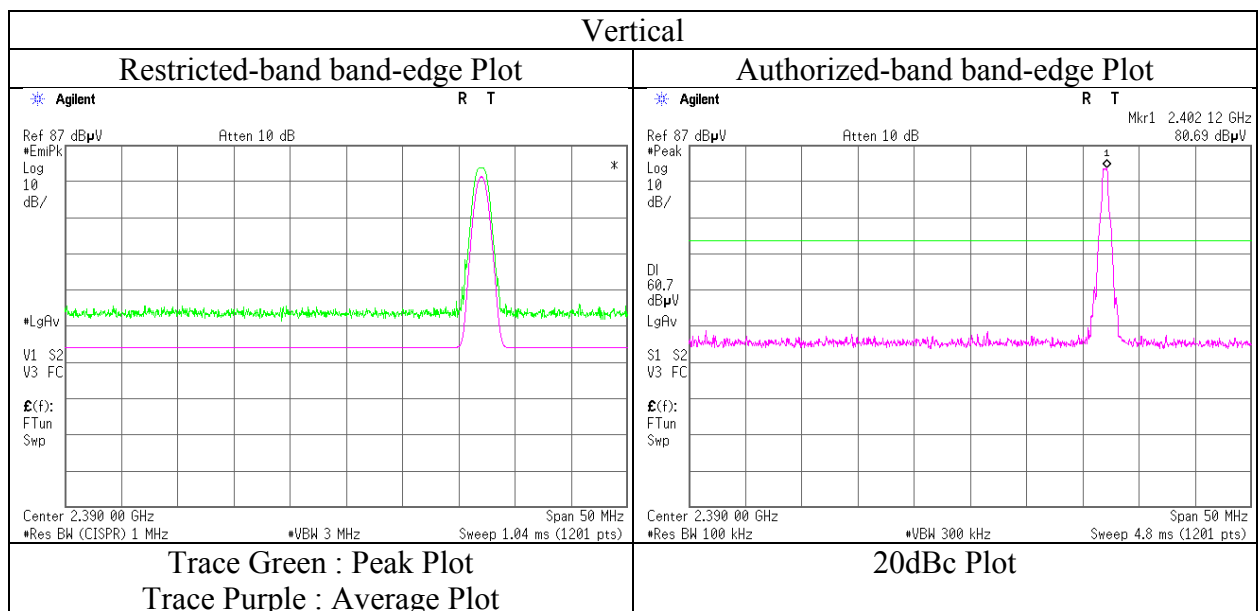
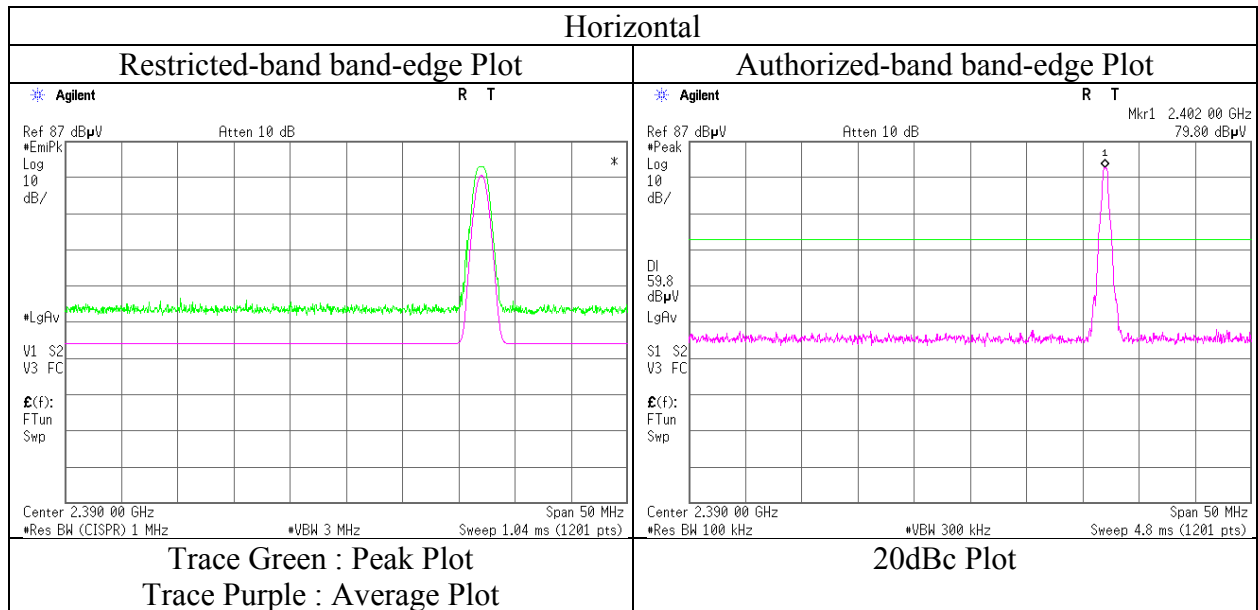
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 27, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, DH5 2402 MHz, Type-DA



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber		
Report No.	11251380S-A-R3		
Date	May 27, 2016	June 1, 2016	June 2, 2016
Temperature / Humidity	24 deg. C / 40 % RH	24 deg.C / 48 %RH	25 deg.C / 35 %RH
Engineer	Hikaru Shirasawa	Shinichi Takano	Shinichi Takano
	(1-13 GHz, No.2)	(above 13 GHz, No.1)	(below 1 GHz, No.1)
Mode	Tx, Hopping Off, DH5 2441 MHz,-Type-DA		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1465.874	PK	44.7	24.7	12.9	35.1	2.4	49.6	73.9	24.3	150	144	
Hori.	4882.000	PK	42.3	31.6	6.0	33.8	2.4	48.5	73.9	25.4	150	160	
Hori.	7323.000	PK	42.1	36.9	7.6	33.9	2.4	55.1	73.9	18.8	150	359	
Hori.	9764.000	PK	43.6	38.1	8.1	34.3	2.4	57.9	73.9	16.0	150	0	
Hori.	12205.000	PK	42.7	39.6	9.8	33.7	2.4	60.8	73.9	13.1	150	359	
Hori.	1465.874	AV	31.6	24.7	12.9	35.1	2.4	36.5	53.9	17.4	150	144	
Hori.	4882.000	AV	29.8	31.6	6.0	33.8	2.4	36.0	53.9	17.9	150	160	
Hori.	7323.000	AV	30.2	36.9	7.6	33.9	2.4	43.2	53.9	10.7	150	359	
Hori.	9764.000	AV	30.7	38.1	8.1	34.3	2.4	45.0	53.9	8.9	150	0	
Hori.	12205.000	AV	30.2	39.6	9.8	33.7	2.4	48.3	53.9	5.6	150	359	
Vert.	1466.480	PK	44.1	24.7	12.9	35.1	2.4	49.0	73.9	24.9	150	165	
Vert.	4882.000	PK	42.5	31.6	6.0	33.8	2.4	48.7	73.9	25.2	150	128	
Vert.	7323.000	PK	42.5	36.9	7.6	33.9	2.4	55.5	73.9	18.4	150	0	
Vert.	9764.000	PK	42.9	38.1	8.1	34.3	2.4	57.2	73.9	16.7	150	359	
Vert.	12205.000	PK	42.3	39.6	9.8	33.7	2.4	60.4	73.9	13.5	150	0	
Vert.	1466.480	AV	31.4	24.7	12.9	35.1	2.4	36.3	53.9	17.6	150	165	
Vert.	4882.000	AV	29.3	31.6	6.0	33.8	2.4	35.5	53.9	18.4	150	128	
Vert.	7323.000	AV	30.1	36.9	7.6	33.9	2.4	43.1	53.9	10.8	150	0	
Vert.	9764.000	AV	30.6	38.1	8.1	34.3	2.4	44.9	53.9	9.0	150	359	
Vert.	12205.000	AV	30.2	39.6	9.8	33.7	2.4	48.3	53.9	5.6	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 27, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 40 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Hikaru Shirasawa Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, DH5 2480 MHz, Type-DA

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1488.154	PK	44.7	24.7	12.9	35.0	2.4	49.7	73.9	24.2	150	272	
Hori.	2483.500	PK	43.1	27.9	13.8	34.3	2.4	52.9	73.9	21.0	154	199	
Hori.	4960.000	PK	40.7	31.9	6.1	33.8	2.4	47.3	73.9	26.6	106	145	
Hori.	7440.000	PK	42.1	37.0	7.7	34.0	2.4	55.2	73.9	18.7	150	359	
Hori.	9920.000	PK	42.0	38.2	8.3	34.4	2.4	56.5	73.9	17.4	150	0	
Hori.	12400.000	PK	41.0	39.5	10.0	33.5	2.4	59.4	73.9	14.5	150	359	
Hori.	1488.154	AV	31.7	24.7	12.9	35.0	2.4	36.7	53.9	17.2	150	272	
Hori.	2483.500	AV	31.1	27.9	13.8	34.3	2.4	40.9	53.9	13.0	154	199	
Hori.	4960.000	AV	29.7	31.9	6.1	33.8	2.4	36.3	53.9	17.6	106	145	
Hori.	7440.000	AV	29.9	37.0	7.7	34.0	2.4	43.0	53.9	10.9	150	359	
Hori.	9920.000	AV	30.0	38.2	8.3	34.4	2.4	44.5	53.9	9.4	150	0	
Hori.	12400.000	AV	28.9	39.5	10.0	33.5	2.4	47.3	53.9	6.6	150	359	
Vert.	1487.142	PK	44.9	24.7	12.9	35.0	2.4	49.9	73.9	24.0	114	88	
Vert.	2483.500	PK	42.9	27.9	13.8	34.3	2.4	52.7	73.9	21.2	226	144	
Vert.	4960.000	PK	41.8	31.9	6.1	33.8	2.4	48.4	73.9	25.5	120	171	
Vert.	7440.000	PK	42.4	37.0	7.7	34.0	2.4	55.5	73.9	18.4	100	359	
Vert.	9920.000	PK	41.4	38.2	8.3	34.4	2.4	55.9	73.9	18.0	100	0	
Vert.	12400.000	PK	41.0	39.5	10.0	33.5	2.4	59.4	73.9	14.5	150	359	
Vert.	1487.142	AV	31.4	24.7	12.9	35.0	2.4	36.4	53.9	17.5	114	88	
Vert.	2483.500	AV	30.6	27.9	13.8	34.3	2.4	40.4	53.9	13.5	226	144	
Vert.	4960.000	AV	29.4	31.9	6.1	33.8	2.4	36.0	53.9	17.9	120	171	
Vert.	7440.000	AV	29.9	37.0	7.7	34.0	2.4	43.0	53.9	10.9	100	359	
Vert.	9920.000	AV	30.0	38.2	8.3	34.4	2.4	44.5	53.9	9.4	100	0	
Vert.	12400.000	AV	29.0	39.5	10.0	33.5	2.4	47.4	53.9	6.5	150	359	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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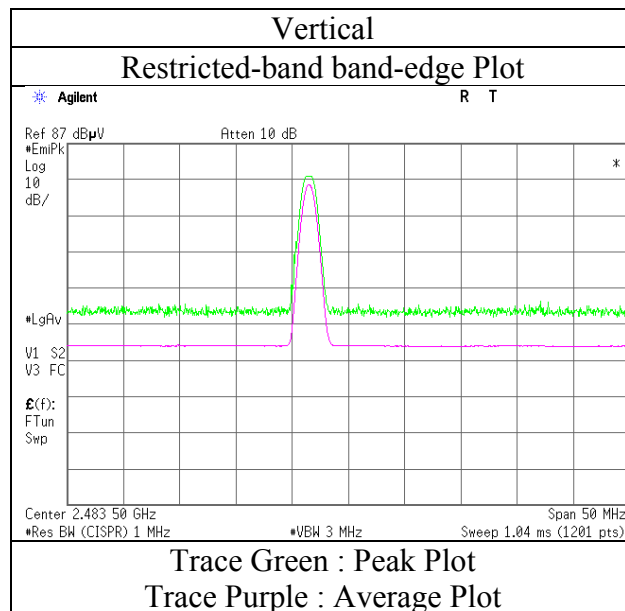
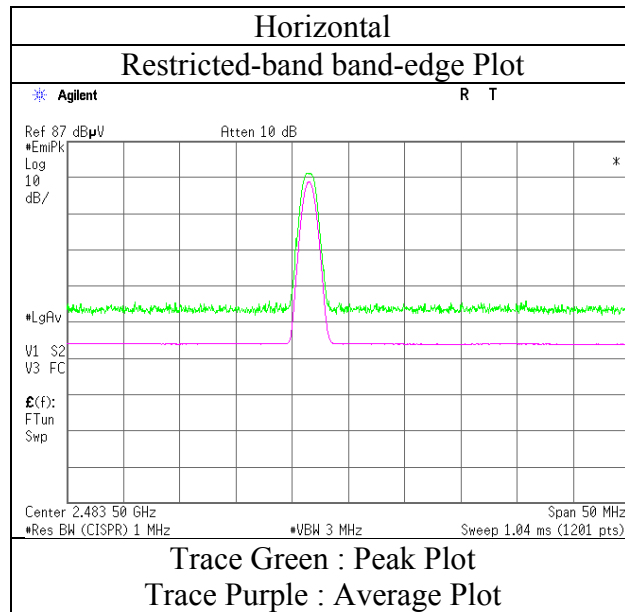
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 27, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, DH5 2480 MHz, Type-DA



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 27, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 40 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Hikaru Shirasawa Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, 3DH5 2402 MHz, Type-DA

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1445.297	PK	44.4	24.7	12.8	35.1	2.4	49.2	73.9	24.7	150	325	
Hori.	2390.000	PK	42.9	27.7	13.7	34.3	2.4	52.4	73.9	21.5	212	131	
Hori.	4804.000	PK	42.0	31.4	6.0	33.8	2.4	48.0	73.9	25.9	151	85	
Hori.	7206.000	PK	43.1	36.9	7.4	33.8	2.4	56.0	73.9	17.9	150	359	
Hori.	9608.000	PK	43.2	38.0	7.9	34.3	2.4	57.2	73.9	16.7	150	0	
Hori.	12010.000	PK	43.2	39.7	9.7	33.9	2.4	61.1	73.9	12.8	150	359	
Hori.	1445.297	AV	31.5	24.7	12.8	35.1	2.4	36.3	53.9	17.6	150	325	
Hori.	2390.000	AV	30.6	27.7	13.7	34.3	2.4	40.1	53.9	13.8	212	131	
Hori.	4804.000	AV	29.3	31.4	6.0	33.8	2.4	35.3	53.9	18.6	151	85	
Hori.	7206.000	AV	30.4	36.9	7.4	33.8	2.4	43.3	53.9	10.6	150	359	
Hori.	9608.000	AV	30.9	38.0	7.9	34.3	2.4	44.9	53.9	9.0	150	0	
Hori.	12010.000	AV	31.1	39.7	9.7	33.9	2.4	49.0	53.9	4.9	150	359	
Vert.	1445.191	PK	44.7	24.7	12.8	35.1	2.4	49.5	73.9	24.4	150	323	
Vert.	2390.000	PK	42.6	27.7	13.7	34.3	2.4	52.1	73.9	21.8	215	125	
Vert.	4804.000	PK	41.8	31.4	6.0	33.8	2.4	47.8	73.9	26.1	150	138	
Vert.	7206.000	PK	42.8	36.9	7.4	33.8	2.4	55.7	73.9	18.2	150	359	
Vert.	9608.000	PK	43.2	38.0	7.9	34.3	2.4	57.2	73.9	16.7	150	0	
Vert.	12010.000	PK	43.1	39.7	9.7	33.9	2.4	61.0	73.9	12.9	150	259	
Vert.	1445.191	AV	31.4	24.7	12.8	35.1	2.4	36.2	53.9	17.7	150	323	
Vert.	2390.000	AV	30.4	27.7	13.7	34.3	2.4	39.9	53.9	14.0	215	125	
Vert.	4804.000	AV	29.3	31.4	6.0	33.8	2.4	35.3	53.9	18.6	150	138	
Vert.	7206.000	AV	30.5	36.9	7.4	33.8	2.4	43.4	53.9	10.5	150	359	
Vert.	9608.000	AV	30.9	38.0	7.9	34.3	2.4	44.9	53.9	9.0	150	0	
Vert.	12010.000	AV	31.2	39.7	9.7	33.9	2.4	49.1	53.9	4.8	150	259	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	75.8	27.8	13.7	34.3	2.4	85.4	-	-	Carrier
Hori.	2400.000	PK	34.4	27.7	13.7	34.3	2.4	43.9	65.4	21.5	
Vert.	2402.000	PK	77.1	27.8	13.7	34.3	2.4	86.7	-	-	Carrier
Vert.	2400.000	PK	33.9	27.7	13.7	34.3	2.4	43.4	66.6	23.2	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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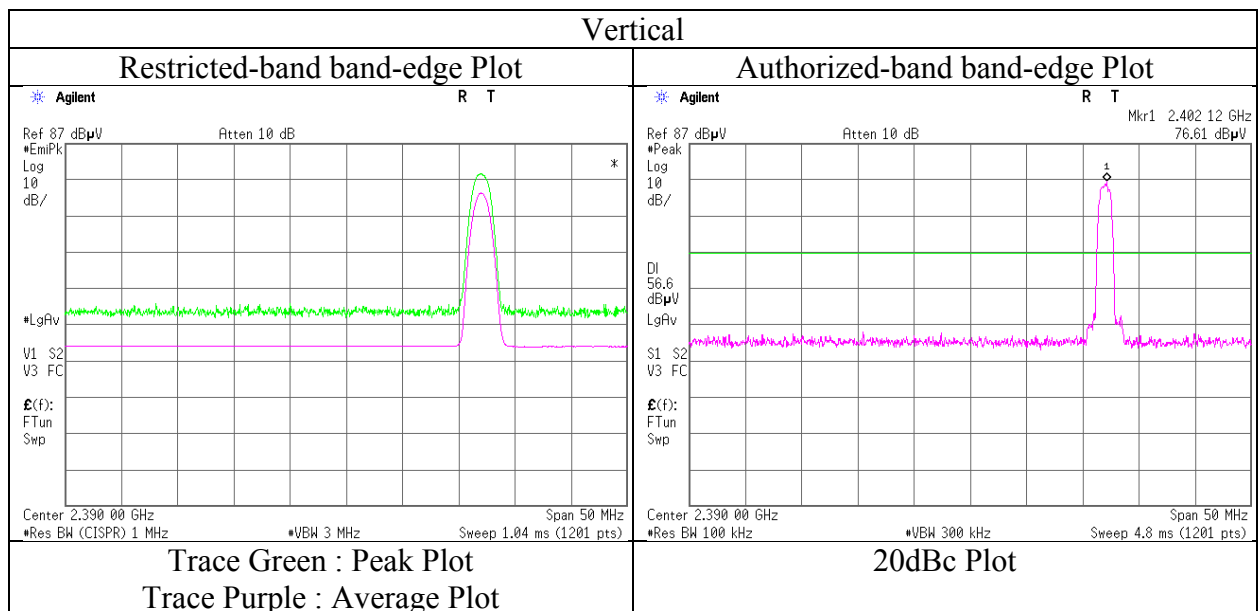
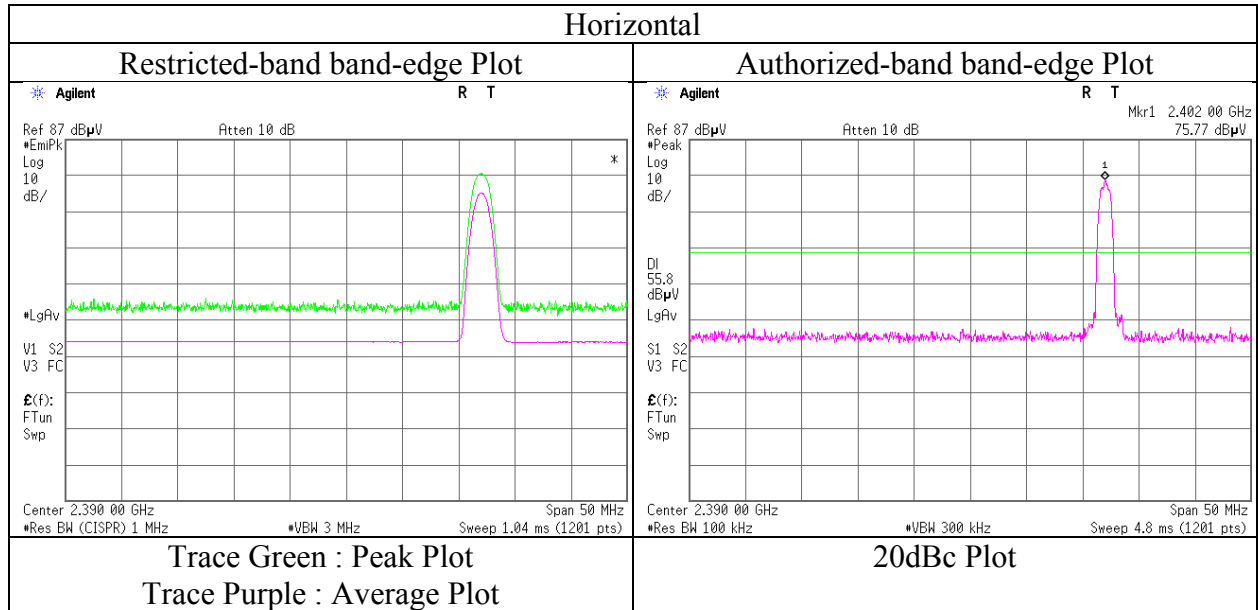
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 27, 2016
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Hikaru Shirasawa
Mode	Tx, Hopping Off, 3DH5 2402 MHz, Type-DA



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber		
Report No.	11251380S-A-R3		
Date	May 27, 2016	June 1, 2016	June 2, 2016
Temperature / Humidity	24 deg. C / 40 % RH	24 deg.C / 48 %RH	25 deg.C / 35 %RH
Engineer	Hikaru Shirasawa	Shinichi Takano	Shinichi Takano
	(1-13 GHz, No.2)	(above 13 GHz, No.1)	(below 1 GHz, No.1)
Mode	Tx, Hopping Off, 3DH5 2441 MHz, Type-DA		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1465.874	PK	45.6	24.7	12.9	35.1	2.4	50.5	73.9	23.4	171	303	
Hori.	4882.000	PK	41.8	31.6	6.0	33.8	2.4	48.0	73.9	25.9	150	154	
Hori.	7323.000	PK	42.5	36.9	7.6	33.9	2.4	55.5	73.9	18.4	150	359	
Hori.	9764.000	PK	43.0	38.1	8.1	34.3	2.4	57.3	73.9	16.6	150	0	
Hori.	12205.000	PK	43.5	39.6	9.8	33.7	2.4	61.6	73.9	12.3	150	359	
Hori.	1465.874	AV	31.5	24.7	12.9	35.1	2.4	36.4	53.9	17.5	171	303	
Hori.	4882.000	AV	29.6	31.6	6.0	33.8	2.4	35.8	53.9	18.1	150	154	
Hori.	7323.000	AV	30.2	36.9	7.6	33.9	2.4	43.2	53.9	10.7	150	359	
Hori.	9764.000	AV	30.8	38.1	8.1	34.3	2.4	45.1	53.9	8.8	150	0	
Hori.	12205.000	AV	30.3	39.6	9.8	33.7	2.4	48.4	53.9	5.5	150	359	
Vert.	1466.322	PK	44.4	24.7	12.9	35.1	2.4	49.3	73.9	24.6	151	177	
Vert.	4882.000	PK	41.8	31.6	6.0	33.8	2.4	48.0	73.9	25.9	241	359	
Vert.	7323.000	PK	43.0	36.9	7.6	33.9	2.4	56.0	73.9	17.9	150	0	
Vert.	9764.000	PK	43.6	38.1	8.1	34.3	2.4	57.9	73.9	16.0	150	359	
Vert.	12205.000	PK	42.7	39.6	9.8	33.7	2.4	60.8	73.9	13.1	150	0	
Vert.	1466.322	AV	31.6	24.7	12.9	35.1	2.4	36.5	53.9	17.4	151	177	
Vert.	4882.000	AV	29.5	31.6	6.0	33.8	2.4	35.7	53.9	18.2	241	359	
Vert.	7323.000	AV	30.2	36.9	7.6	33.9	2.4	43.2	53.9	10.7	150	0	
Vert.	9764.000	AV	30.7	38.1	8.1	34.3	2.4	45.0	53.9	8.9	150	359	
Vert.	12205.000	AV	30.3	39.6	9.8	33.7	2.4	48.4	53.9	5.5	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 27, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 40 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Hikaru Shirasawa Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, 3DH5 2480 MHz, Type-DA

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1488.082	PK	44.8	24.7	12.9	35.0	2.4	49.8	73.9	24.1	204	281	
Hori.	2483.500	PK	43.5	27.9	13.8	34.3	2.4	53.3	73.9	20.6	212	199	
Hori.	4960.000	PK	41.7	31.9	6.1	33.8	2.4	48.3	73.9	25.6	150	145	
Hori.	7440.000	PK	41.8	37.0	7.7	34.0	2.4	54.9	73.9	19.0	150	0	
Hori.	9920.000	PK	41.7	38.2	8.3	34.4	2.4	56.2	73.9	17.7	150	359	
Hori.	12400.000	PK	41.8	39.5	10.0	33.5	2.4	60.2	73.9	13.7	150	0	
Hori.	1488.082	AV	31.7	24.7	12.9	35.0	2.4	36.7	53.9	17.2	204	281	
Hori.	2483.500	AV	30.5	27.9	13.8	34.3	2.4	40.3	53.9	13.6	212	199	
Hori.	4960.000	AV	29.2	31.9	6.1	33.8	2.4	35.8	53.9	18.1	150	145	
Hori.	7440.000	AV	29.8	37.0	7.7	34.0	2.4	42.9	53.9	11.0	150	0	
Hori.	9920.000	AV	30.0	38.2	8.3	34.4	2.4	44.5	53.9	9.4	150	359	
Hori.	12400.000	AV	29.1	39.5	10.0	33.5	2.4	47.5	53.9	6.4	150	0	
Vert.	1488.312	PK	44.3	24.7	12.9	35.0	2.4	49.3	73.9	24.6	149	131	
Vert.	2483.500	PK	43.4	27.9	13.8	34.3	2.4	53.2	73.9	20.7	192	174	
Vert.	4960.000	PK	42.0	31.9	6.1	33.8	2.4	48.6	73.9	25.3	150	122	
Vert.	7440.000	PK	42.2	37.0	7.7	34.0	2.4	55.3	73.9	18.6	150	0	
Vert.	9920.000	PK	42.9	38.2	8.3	34.4	2.4	57.4	73.9	16.5	150	359	
Vert.	12400.000	PK	42.5	39.5	10.0	33.5	2.4	60.9	73.9	13.0	150	0	
Vert.	1488.312	AV	31.5	24.7	12.9	35.0	2.4	36.5	53.9	17.4	149	131	
Vert.	2483.500	AV	30.5	27.9	13.8	34.3	2.4	40.3	53.9	13.6	192	174	
Vert.	4960.000	AV	29.3	31.9	6.1	33.8	2.4	35.9	53.9	18.0	150	122	
Vert.	7440.000	AV	29.9	37.0	7.7	34.0	2.4	43.0	53.9	10.9	150	0	
Vert.	9920.000	AV	30.0	38.2	8.3	34.4	2.4	44.5	53.9	9.4	150	359	
Vert.	12400.000	AV	29.2	39.5	10.0	33.5	2.4	47.6	53.9	6.3	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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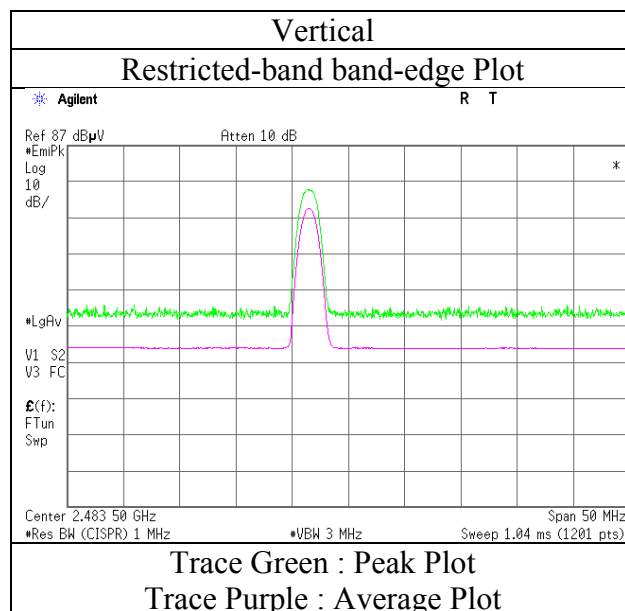
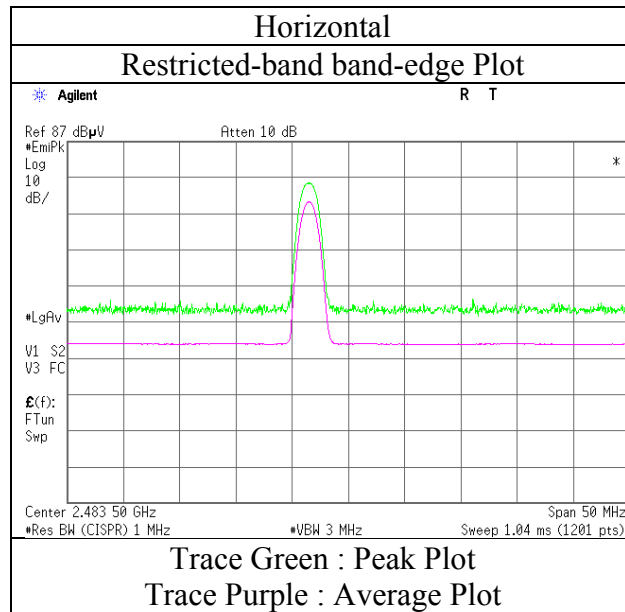
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Facsimile : +81 463 50 6401

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No. 11251380S-A-R3
Date May 27, 2016
Temperature / Humidity 24 deg. C / 40 % RH
Engineer Hikaru Shirasawa

Mode Tx, Hopping Off, 3DH5 2480 MHz, Type-DA



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 29, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 56 % RH 24 deg. C / 48 % RH 25 deg. C / 35 % RH
Engineer : Kenichi Adachi Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, DH5 2402 MHz, Type-TX

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.205	QP	23.3	16.2	8.9	31.8	0.0	16.6	43.5	26.9	196	11	
Hori.	890.261	QP	23.2	22.2	9.8	31.4	0.0	23.8	46.0	22.2	156	67	
Hori.	1441.153	PK	44.8	24.7	12.8	35.1	2.4	49.6	73.9	24.3	179	178	
Hori.	2390.000	PK	42.6	27.7	13.7	34.3	2.4	52.1	73.9	21.8	188	142	
Hori.	4804.000	PK	42.5	31.4	5.9	33.8	2.4	48.4	73.9	25.5	139	242	
Hori.	7206.000	PK	41.8	36.9	7.2	33.8	2.4	54.5	73.9	19.4	150	0	
Hori.	9608.000	PK	42.1	38.0	7.9	34.3	2.4	56.1	73.9	17.8	150	0	
Hori.	12010.000	PK	42.7	39.7	9.4	33.9	2.4	60.3	73.9	13.6	150	0	
Hori.	1441.153	AV	32.5	24.7	12.8	35.1	2.4	37.3	53.9	16.6	179	178	
Hori.	2390.000	AV	31.6	27.7	13.7	34.3	2.4	41.1	53.9	12.8	188	142	
Hori.	4804.000	AV	29.1	31.4	5.9	33.8	2.4	35.0	53.9	18.9	139	242	
Hori.	7206.000	AV	28.7	36.9	7.2	33.8	2.4	41.4	53.9	12.5	150	0	
Hori.	9608.000	AV	29.5	38.0	7.9	34.3	2.4	43.5	53.9	10.4	150	0	
Hori.	12010.000	AV	29.7	39.7	9.4	33.9	2.4	47.3	53.9	6.6	150	0	
Vert.	36.296	QP	23.6	15.1	7.2	31.8	0.0	14.1	40.0	25.9	100	290	
Vert.	78.657	QP	23.3	5.9	8.2	31.8	0.0	5.6	40.0	34.4	100	356	
Vert.	225.784	QP	23.3	16.7	9.4	31.7	0.0	17.7	46.0	28.3	100	332	
Vert.	518.436	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	9	
Vert.	937.540	QP	23.4	22.5	9.9	31.1	0.0	24.7	46.0	21.3	100	285	
Vert.	1441.153	PK	44.5	24.7	12.8	35.1	2.4	49.3	73.9	24.6	166	226	
Vert.	2390.000	PK	42.5	27.7	13.7	34.3	2.4	52.0	73.9	21.9	136	133	
Vert.	4804.000	PK	42.3	31.4	5.9	33.8	2.4	48.2	73.9	25.7	100	181	
Vert.	7206.000	PK	41.9	36.9	7.2	33.8	2.4	54.6	73.9	19.3	150	0	
Vert.	9608.000	PK	42.0	38.0	7.9	34.3	2.4	56.0	73.9	17.9	150	0	
Vert.	12010.000	PK	42.8	39.7	9.4	33.9	2.4	60.4	73.9	13.5	150	0	
Vert.	1441.153	AV	31.4	24.7	12.8	35.1	2.4	36.2	53.9	17.7	166	226	
Vert.	2390.000	AV	31.0	27.7	13.7	34.3	2.4	40.5	53.9	13.4	136	133	
Vert.	4804.000	AV	29.0	31.4	5.9	33.8	2.4	34.9	53.9	19.0	100	181	
Vert.	7206.000	AV	28.8	36.9	7.2	33.8	2.4	41.5	53.9	12.4	150	0	
Vert.	9608.000	AV	29.4	38.0	7.9	34.3	2.4	43.4	53.9	10.5	150	0	
Vert.	12010.000	AV	29.8	39.7	9.4	33.9	2.4	47.4	53.9	6.5	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	80.4	27.8	13.7	34.3	2.4	90.0	-	-	Carrier
Hori.	2400.000	PK	34.8	27.7	13.7	34.3	2.4	44.3	69.9	25.6	
Vert.	2402.000	PK	78.3	27.8	13.7	34.3	2.4	87.9	-	-	Carrier
Vert.	2400.000	PK	34.7	27.7	13.7	34.3	2.4	44.2	67.8	23.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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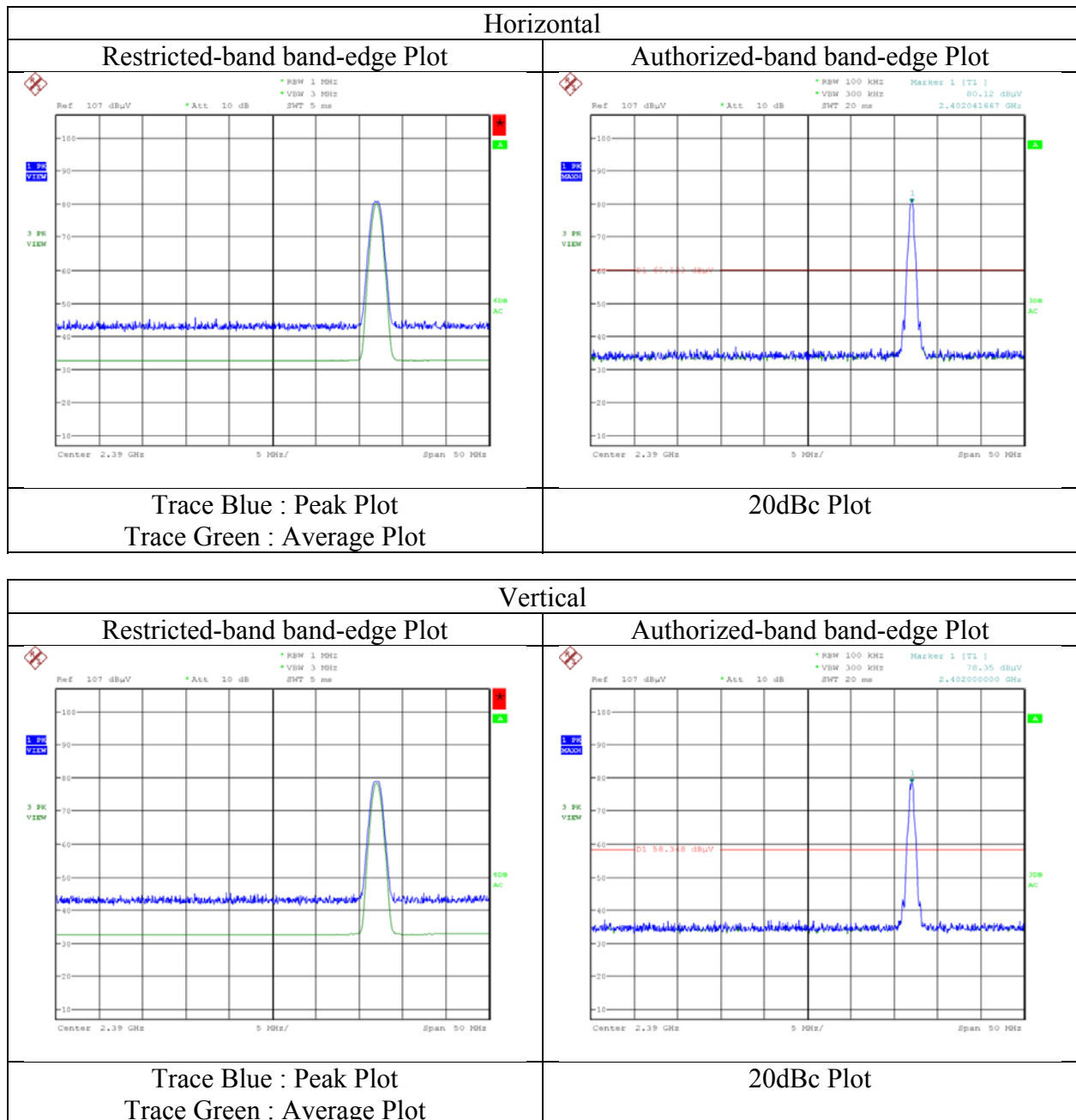
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 29, 2016
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5 2402 MHz, Type-TX



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 29, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 56 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Kenichi Adachi Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, DH5 2441 MHz, Type-TX

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.214	QP	23.3	16.2	8.9	31.8	0.0	16.6	43.5	26.9	187	62	
Hori.	890.284	QP	23.1	22.2	9.8	31.4	0.0	23.7	46.0	22.3	100	255	
Hori.	1464.590	PK	44.6	24.7	12.9	35.1	2.4	49.5	73.9	24.4	163	168	
Hori.	4882.000	PK	43.9	31.6	6.0	33.8	2.4	50.1	73.9	23.8	144	235	
Hori.	7323.000	PK	43.4	36.9	7.3	33.9	2.4	56.1	73.9	17.8	150	0	
Hori.	9764.000	PK	44.1	38.1	8.0	34.3	2.4	58.3	73.9	15.6	150	0	
Hori.	12205.000	PK	44.4	39.6	9.4	33.7	2.4	62.1	73.9	11.8	150	0	
Hori.	1464.590	AV	32.8	24.7	12.9	35.1	2.4	37.7	53.9	16.2	163	168	
Hori.	4882.000	AV	31.1	31.6	6.0	33.8	2.4	37.3	53.9	16.6	144	235	
Hori.	7323.000	AV	30.5	36.9	7.3	33.9	2.4	43.2	53.9	10.7	150	0	
Hori.	9764.000	AV	31.3	38.1	8.0	34.3	2.4	45.5	53.9	8.4	150	0	
Hori.	12205.000	AV	31.6	39.6	9.4	33.7	2.4	49.3	53.9	4.6	150	0	
Vert.	36.089	QP	23.7	15.2	7.2	31.8	0.0	14.3	40.0	25.7	100	0	
Vert.	78.813	QP	23.4	5.9	8.3	31.8	0.0	5.8	40.0	34.2	100	13	
Vert.	225.599	QP	23.2	16.6	9.4	31.7	0.0	17.5	46.0	28.5	100	359	
Vert.	518.468	QP	23.2	17.7	7.9	31.9	0.0	16.9	46.0	29.1	100	351	
Vert.	937.866	QP	23.1	22.5	10.0	31.1	0.0	24.5	46.0	21.5	100	180	
Vert.	1464.590	PK	44.6	24.7	12.9	35.1	2.4	49.5	73.9	24.4	168	233	
Vert.	4882.000	PK	43.9	31.6	6.0	33.8	2.4	50.1	73.9	23.8	150	182	
Vert.	7323.000	PK	43.4	36.9	7.3	33.9	2.4	56.1	73.9	17.8	150	0	
Vert.	9764.000	PK	44.1	38.1	8.0	34.3	2.4	58.3	73.9	15.6	150	0	
Vert.	12205.000	PK	44.3	39.6	9.4	33.7	2.4	62.0	73.9	11.9	150	0	
Vert.	1464.590	AV	31.7	24.7	12.9	35.1	2.4	36.6	53.9	17.3	168	233	
Vert.	4882.000	AV	30.9	31.6	6.0	33.8	2.4	37.1	53.9	16.8	150	182	
Vert.	7323.000	AV	30.5	36.9	7.3	33.9	2.4	43.2	53.9	10.7	150	0	
Vert.	9764.000	AV	31.3	38.1	8.0	34.3	2.4	45.5	53.9	8.4	150	0	
Vert.	12205.000	AV	31.5	39.6	9.4	33.7	2.4	49.2	53.9	4.7	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 29, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 56 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Kenichi Adachi Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, DH5 2480 MHz, Type-TX

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.236	QP	23.2	16.2	8.9	31.8	0.0	16.5	43.5	27.0	215	234	
Hori.	889.907	QP	23.1	22.2	9.8	31.4	0.0	23.7	46.0	22.3	150	350	
Hori.	1488.014	PK	44.3	24.7	12.9	35.0	2.4	49.3	73.9	24.6	164	166	
Hori.	2483.500	PK	42.9	27.9	13.8	34.3	2.4	52.7	73.9	21.2	186	140	
Hori.	4960.000	PK	41.5	31.9	6.0	33.8	2.4	48.0	73.9	25.9	138	238	
Hori.	7440.000	PK	41.4	37.0	7.4	34.0	2.4	54.2	73.9	19.7	150	0	
Hori.	9920.000	PK	42.1	38.2	8.1	34.4	2.4	56.4	73.9	17.5	150	0	
Hori.	12400.000	PK	42.2	39.5	9.4	33.5	2.4	60.0	73.9	13.9	150	0	
Hori.	1488.014	AV	32.5	24.7	12.9	35.0	2.4	37.5	53.9	16.4	164	166	
Hori.	2483.500	AV	30.6	27.9	13.8	34.3	2.4	40.4	53.9	13.5	186	140	
Hori.	4960.000	AV	29.4	31.9	6.0	33.8	2.4	35.9	53.9	18.0	138	238	
Hori.	7440.000	AV	29.2	37.0	7.4	34.0	2.4	42.0	53.9	11.9	150	0	
Hori.	9920.000	AV	29.6	38.2	8.1	34.4	2.4	43.9	53.9	10.0	150	0	
Hori.	12400.000	AV	29.7	39.5	9.4	33.5	2.4	47.5	53.9	6.4	150	0	
Vert.	36.044	QP	23.7	15.2	7.2	31.8	0.0	14.3	40.0	25.7	100	351	
Vert.	78.688	QP	23.4	5.9	8.2	31.8	0.0	5.7	40.0	34.3	100	352	
Vert.	225.712	QP	23.3	16.6	9.4	31.7	0.0	17.6	46.0	28.4	100	231	
Vert.	518.563	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	220	
Vert.	937.561	QP	23.2	22.5	9.9	31.1	0.0	24.5	46.0	21.5	100	177	
Vert.	1488.014	PK	44.3	24.7	12.9	35.0	2.4	49.3	73.9	24.6	167	228	
Vert.	2483.500	PK	42.9	27.9	13.8	34.3	2.4	52.7	73.9	21.2	133	142	
Vert.	4960.000	PK	41.4	31.9	6.0	33.8	2.4	47.9	73.9	26.0	100	186	
Vert.	7440.000	PK	41.4	37.0	7.4	34.0	2.4	54.2	73.9	19.7	150	0	
Vert.	9920.000	PK	42.2	38.2	8.1	34.4	2.4	56.5	73.9	17.4	150	0	
Vert.	12400.000	PK	42.3	39.5	9.4	33.5	2.4	60.1	73.9	13.8	150	0	
Vert.	1488.014	AV	31.3	24.7	12.9	35.0	2.4	36.3	53.9	17.6	167	228	
Vert.	2483.500	AV	30.5	27.9	13.8	34.3	2.4	40.3	53.9	13.6	133	142	
Vert.	4960.000	AV	29.1	31.9	6.0	33.8	2.4	35.6	53.9	18.3	100	186	
Vert.	7440.000	AV	29.3	37.0	7.4	34.0	2.4	42.1	53.9	11.8	150	0	
Vert.	9920.000	AV	29.7	38.2	8.1	34.4	2.4	44.0	53.9	9.9	150	0	
Vert.	12400.000	AV	29.8	39.5	9.4	33.5	2.4	47.6	53.9	6.3	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

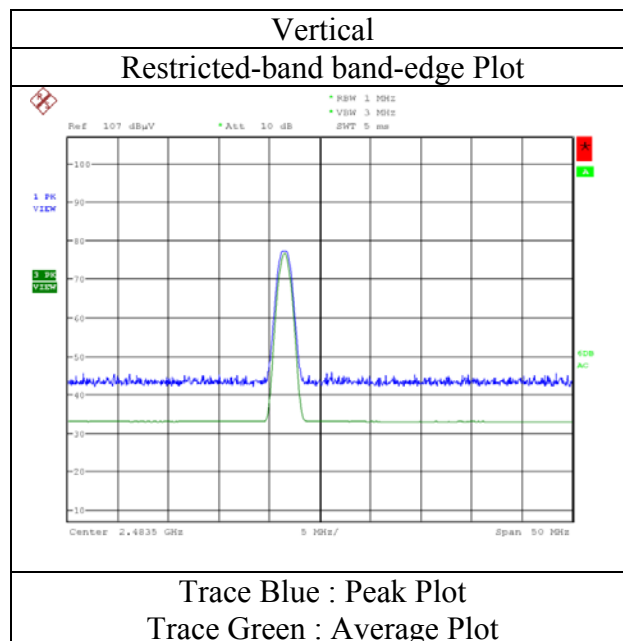
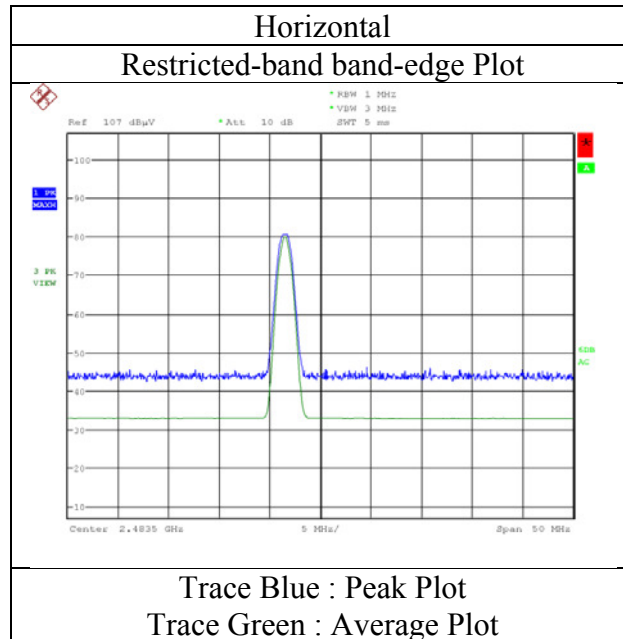
Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 29, 2016
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, DH5 2480 MHz, Type-TX



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

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 29, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 56 % RH 24 deg. C / 48 % RH 25 deg. C / 35 % RH
Engineer : Kenichi Adachi Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, 3DH5 2402 MHz, Type-TX

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.235	QP	23.3	16.2	8.9	31.8	0.0	16.6	43.5	26.9	187	125	
Hori.	890.211	QP	23.2	22.2	9.8	31.4	0.0	23.8	46.0	22.2	100	357	
Hori.	1441.154	PK	44.6	24.7	12.8	35.1	2.4	49.4	73.9	24.5	177	175	
Hori.	2390.000	PK	42.6	27.7	13.7	34.3	2.4	52.1	73.9	21.8	189	144	
Hori.	4804.000	PK	42.4	31.4	5.9	33.8	2.4	48.3	73.9	25.6	136	236	
Hori.	7206.000	PK	41.9	36.9	7.2	33.8	2.4	54.6	73.9	19.3	150	0	
Hori.	9608.000	PK	42.1	38.0	7.9	34.3	2.4	56.1	73.9	17.8	150	0	
Hori.	12010.000	PK	42.8	39.7	9.4	33.9	2.4	60.4	73.9	13.5	150	0	
Hori.	1441.154	AV	32.4	24.7	12.8	35.1	2.4	37.2	53.9	16.7	177	175	
Hori.	2390.000	AV	30.9	27.7	13.7	34.3	2.4	40.4	53.9	13.5	189	144	
Hori.	4804.000	AV	29.0	31.4	5.9	33.8	2.4	34.9	53.9	19.0	136	236	
Hori.	7206.000	AV	29.8	36.9	7.2	33.8	2.4	42.5	53.9	11.4	150	0	
Hori.	9608.000	AV	29.5	38.0	7.9	34.3	2.4	43.5	53.9	10.4	150	0	
Hori.	12010.000	AV	29.8	39.7	9.4	33.9	2.4	47.4	53.9	6.5	150	0	
Vert.	36.395	QP	23.7	15.1	7.2	31.8	0.0	14.2	40.0	25.8	100	12	
Vert.	78.670	QP	23.4	5.9	8.2	31.8	0.0	5.7	40.0	34.3	100	10	
Vert.	225.983	QP	23.3	16.7	9.4	31.7	0.0	17.7	46.0	28.3	100	131	
Vert.	518.386	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	14	
Vert.	937.377	QP	23.1	22.5	9.9	31.1	0.0	24.4	46.0	21.6	100	11	
Vert.	1441.154	PK	44.2	24.7	12.8	35.1	2.4	49.0	73.9	24.9	169	231	
Vert.	2390.000	PK	42.5	27.7	13.7	34.3	2.4	52.0	73.9	21.9	138	137	
Vert.	4804.000	PK	42.3	31.4	5.9	33.8	2.4	48.2	73.9	25.7	100	187	
Vert.	7206.000	PK	41.8	36.9	7.2	33.8	2.4	54.5	73.9	19.4	150	0	
Vert.	9608.000	PK	42.0	38.0	7.9	34.3	2.4	56.0	73.9	17.9	150	0	
Vert.	12010.000	PK	42.8	39.7	9.4	33.9	2.4	60.4	73.9	13.5	150	0	
Vert.	1441.154	AV	31.4	24.7	12.8	35.1	2.4	36.2	53.9	17.7	169	231	
Vert.	2390.000	AV	30.9	27.7	13.7	34.3	2.4	40.4	53.9	13.5	138	137	
Vert.	4804.000	AV	28.9	31.4	5.9	33.8	2.4	34.8	53.9	19.1	100	187	
Vert.	7206.000	AV	28.7	36.9	7.2	33.8	2.4	41.4	53.9	12.5	150	0	
Vert.	9608.000	AV	29.4	38.0	7.9	34.3	2.4	43.4	53.9	10.5	150	0	
Vert.	12010.000	AV	29.6	39.7	9.4	33.9	2.4	47.2	53.9	6.7	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	74.2	27.8	13.7	34.3	2.4	83.8	-	-	Carrier
Hori.	2400.000	PK	37.1	27.7	13.7	34.3	2.4	46.6	63.8	17.2	
Vert.	2402.000	PK	73.6	27.8	13.7	34.3	2.4	83.2	-	-	Carrier
Vert.	2400.000	PK	34.1	27.7	13.7	34.3	2.4	43.6	63.1	19.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

UL Japan, Inc.

Shonan EMC Lab.

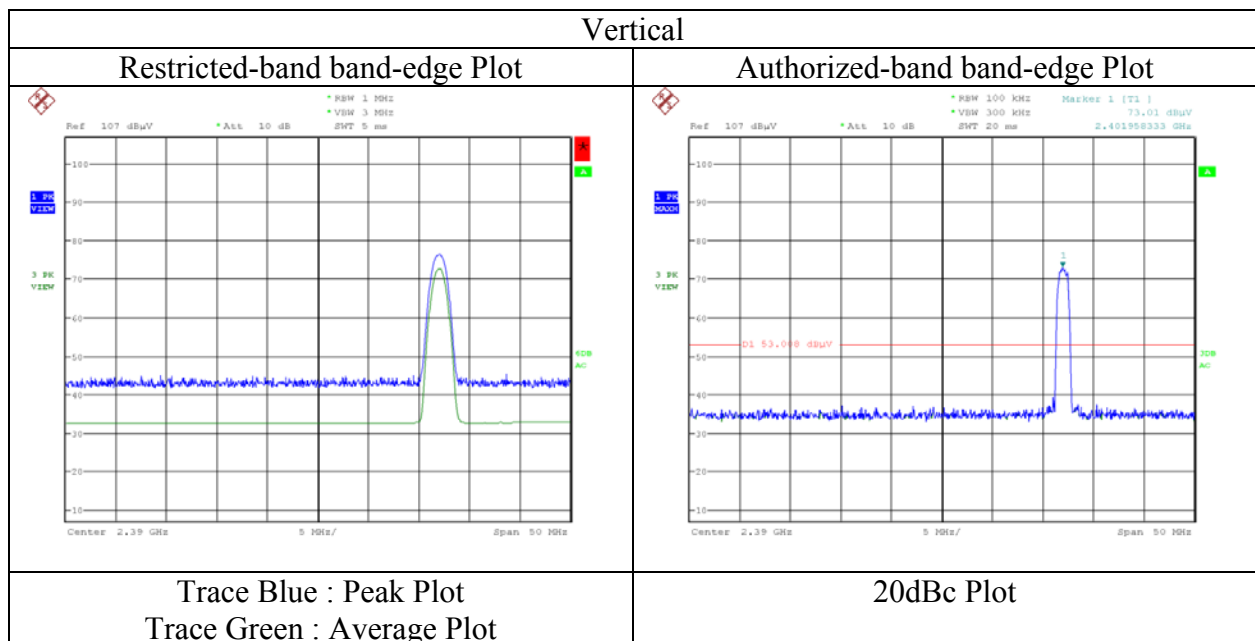
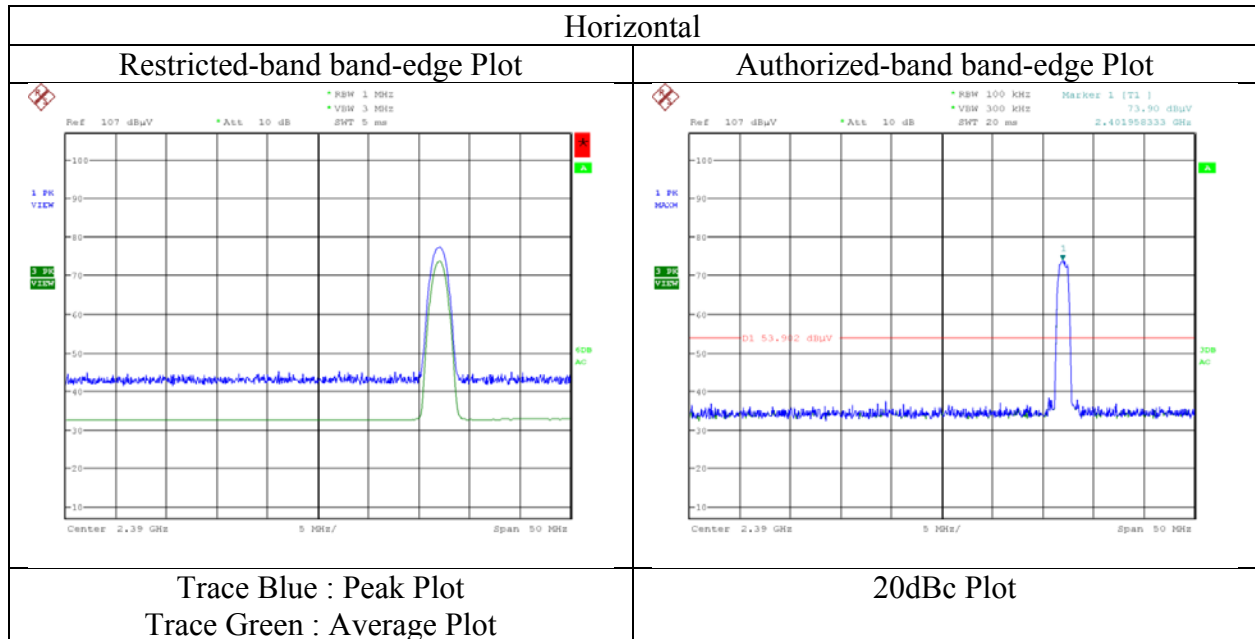
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 29, 2016
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5 2402 MHz, Type-TX



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

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber		
Report No.	11251380S-A-R3		
Date	May 29, 2016	June 1, 2016	June 2, 2016
Temperature / Humidity	24 deg. C / 56 % RH	24 deg. C / 48 % RH	25 deg. C / 35 % RH
Engineer	Kenichi Adachi	Shinichi Takano	Shinichi Takano
	(1-13 GHz, No.2)	(above 13 GHz, No.1)	(below 1 GHz, No.1)
Mode	Tx, Hopping Off, 3DH5 2441 MHz, Type-TX		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.184	QP	23.3	16.2	8.9	31.8	0.0	16.6	43.5	26.9	302	354	
Hori.	890.067	QP	23.2	22.2	9.8	31.4	0.0	23.8	46.0	22.2	136	222	
Hori.	1464.587	PK	44.5	24.7	12.9	35.1	2.4	49.4	73.9	24.5	168	178	
Hori.	4882.000	PK	43.8	31.6	6.0	33.8	2.4	50.0	73.9	23.9	137	239	
Hori.	7323.000	PK	43.5	36.9	7.3	33.9	2.4	56.2	73.9	17.7	150	0	
Hori.	9764.000	PK	44.2	38.1	8.0	34.3	2.4	58.4	73.9	15.5	150	0	
Hori.	12205.000	PK	44.2	39.6	9.4	33.7	2.4	61.9	73.9	12.0	150	0	
Hori.	1464.587	AV	32.7	24.7	12.9	35.1	2.4	37.6	53.9	16.3	168	178	
Hori.	4882.000	AV	31.0	31.6	6.0	33.8	2.4	37.2	53.9	16.7	137	239	
Hori.	7323.000	AV	30.5	36.9	7.3	33.9	2.4	43.2	53.9	10.7	150	0	
Hori.	9764.000	AV	31.4	38.1	8.0	34.3	2.4	45.6	53.9	8.3	150	0	
Hori.	12205.000	AV	31.3	39.6	9.4	33.7	2.4	49.0	53.9	4.9	150	0	
Vert.	36.126	QP	23.7	15.2	7.2	31.8	0.0	14.3	40.0	25.7	100	48	
Vert.	78.557	QP	23.4	5.9	8.2	31.8	0.0	5.7	40.0	34.3	100	343	
Vert.	225.629	QP	23.2	16.6	9.4	31.7	0.0	17.5	46.0	28.5	100	122	
Vert.	518.521	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	187	
Vert.	938.207	QP	23.1	22.5	10.0	31.1	0.0	24.5	46.0	21.5	100	250	
Vert.	1464.587	PK	44.2	24.7	12.9	35.1	2.4	49.1	73.9	24.8	171	235	
Vert.	4882.000	PK	43.8	31.6	6.0	33.8	2.4	50.0	73.9	23.9	100	181	
Vert.	7323.000	PK	43.4	36.9	7.3	33.9	2.4	56.1	73.9	17.8	150	0	
Vert.	9764.000	PK	44.1	38.1	8.0	34.3	2.4	58.3	73.9	15.6	150	0	
Vert.	12205.000	PK	44.3	39.6	9.4	33.7	2.4	62.0	73.9	11.9	150	0	
Vert.	1464.587	AV	31.5	24.7	12.9	35.1	2.4	36.4	53.9	17.5	171	235	
Vert.	4882.000	AV	30.7	31.6	6.0	33.8	2.4	36.9	53.9	17.0	100	181	
Vert.	7323.000	AV	30.4	36.9	7.3	33.9	2.4	43.1	53.9	10.8	150	0	
Vert.	9764.000	AV	31.3	38.1	8.0	34.3	2.4	45.5	53.9	8.4	150	0	
Vert.	12205.000	AV	31.4	39.6	9.4	33.7	2.4	49.1	53.9	4.8	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission

Test place : Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber
Report No. : 11251380S-A-R3
Date : May 29, 2016 June 1, 2016 June 2, 2016
Temperature / Humidity : 24 deg. C / 56 % RH 24 deg.C / 48 %RH 25 deg.C / 35 %RH
Engineer : Kenichi Adachi Shinichi Takano Shinichi Takano
(1-13 GHz, No.2) (above 13 GHz, No.1) (below 1 GHz, No.1)
Mode : Tx, Hopping Off, DH5 2480 MHz, Type- TX

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	181.218	QP	23.3	16.2	8.9	31.8	0.0	16.6	43.5	26.9	150	18	
Hori.	890.035	QP	23.2	22.2	9.8	31.4	0.0	23.8	46.0	22.2	100	12	
Hori.	1488.013	PK	44.2	24.7	12.9	35.0	2.4	49.2	73.9	24.7	169	167	
Hori.	2483.500	PK	44.2	27.9	13.8	34.3	2.4	54.0	73.9	19.9	188	137	
Hori.	4960.000	PK	41.4	31.9	6.0	33.8	2.4	47.9	73.9	26.0	135	235	
Hori.	7440.000	PK	41.3	37.0	7.4	34.0	2.4	54.1	73.9	19.8	150	0	
Hori.	9920.000	PK	42.2	38.2	8.1	34.4	2.4	56.5	73.9	17.4	150	0	
Hori.	12400.000	PK	42.3	39.5	9.4	33.5	2.4	60.1	73.9	13.8	150	0	
Hori.	1488.013	AV	32.4	24.7	12.9	35.0	2.4	37.4	53.9	16.5	169	167	
Hori.	2483.500	AV	32.1	27.9	13.8	34.3	2.4	41.9	53.9	12.0	188	137	
Hori.	4960.000	AV	29.2	31.9	6.0	33.8	2.4	35.7	53.9	18.2	135	235	
Hori.	7440.000	AV	29.2	37.0	7.4	34.0	2.4	42.0	53.9	11.9	150	0	
Hori.	9920.000	AV	29.7	38.2	8.1	34.4	2.4	44.0	53.9	9.9	150	0	
Hori.	12400.000	AV	29.8	39.5	9.4	33.5	2.4	47.6	53.9	6.3	150	0	
Vert.	36.189	QP	23.6	15.2	7.2	31.8	0.0	14.2	40.0	25.8	100	234	
Vert.	78.391	QP	23.4	5.9	8.2	31.8	0.0	5.7	40.0	34.3	100	352	
Vert.	225.665	QP	23.2	16.6	9.4	31.7	0.0	17.5	46.0	28.5	100	34	
Vert.	518.205	QP	23.3	17.7	7.9	31.9	0.0	17.0	46.0	29.0	100	98	
Vert.	937.518	QP	23.1	22.5	9.9	31.1	0.0	24.4	46.0	21.6	100	126	
Vert.	1488.013	PK	44.1	24.7	12.9	35.0	2.4	49.1	73.9	24.8	172	239	
Vert.	2483.500	PK	42.5	27.9	13.8	34.3	2.4	52.3	73.9	21.6	136	137	
Vert.	4960.000	PK	41.3	31.9	6.0	33.8	2.4	47.8	73.9	26.1	100	183	
Vert.	7440.000	PK	41.5	37.0	7.4	34.0	2.4	54.3	73.9	19.6	150	0	
Vert.	9920.000	PK	42.2	38.2	8.1	34.4	2.4	56.5	73.9	17.4	150	0	
Vert.	12400.000	PK	42.3	39.5	9.4	33.5	2.4	60.1	73.9	13.8	150	0	
Vert.	1488.013	AV	31.2	24.7	12.9	35.0	2.4	36.2	53.9	17.7	172	239	
Vert.	2483.500	AV	30.4	27.9	13.8	34.3	2.4	40.2	53.9	13.7	136	137	
Vert.	4960.000	AV	29.1	31.9	6.0	33.8	2.4	35.6	53.9	18.3	100	183	
Vert.	7440.000	AV	29.2	37.0	7.4	34.0	2.4	42.0	53.9	11.9	150	0	
Vert.	9920.000	AV	29.6	38.2	8.1	34.4	2.4	43.9	53.9	10.0	150	0	
Vert.	12400.000	AV	29.7	39.5	9.4	33.5	2.4	47.5	53.9	6.4	150	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

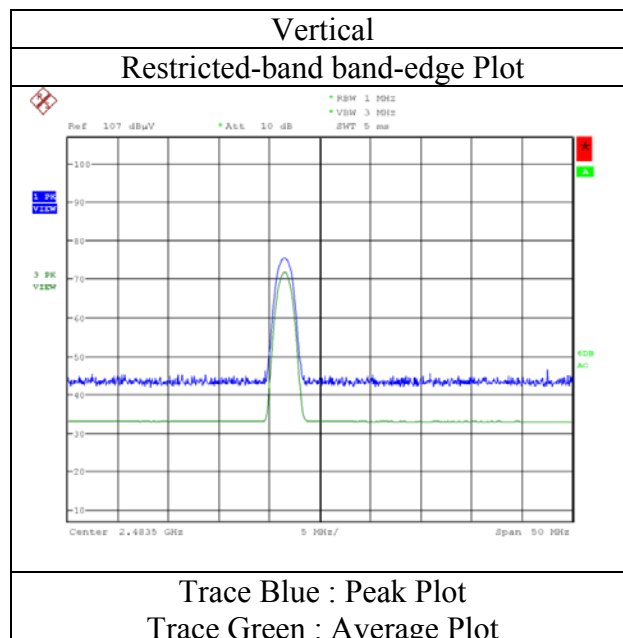
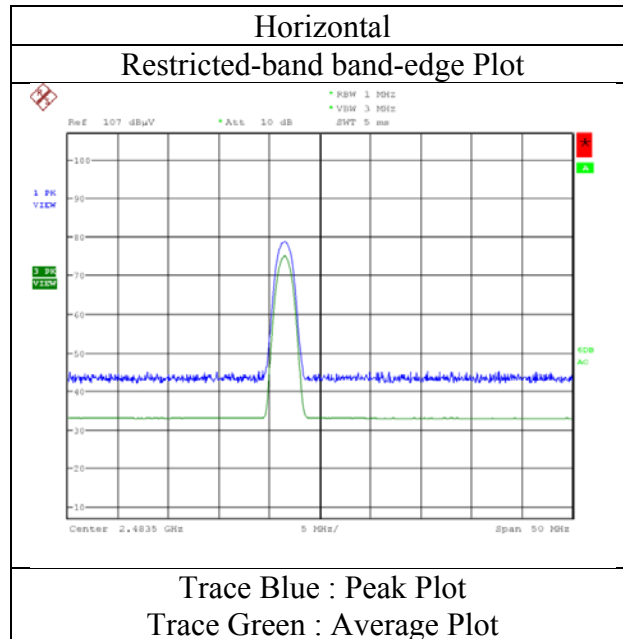
Distance factor : 1 GHz - 13 GHz : $20\log(3.95\text{ m} / 3.0\text{ m}) = 2.4\text{ dB}$

13 GHz - 40 GHz : $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* These results have sufficient margin without taking account Dwell time factor.

Radiated Spurious Emission

Test place	Shonan EMC Lab. No.2 Semi Anechoic Chamber
Report No.	11251380S-A-R3
Date	May 29, 2016
Temperature / Humidity	24 deg. C / 56 % RH
Engineer	Kenichi Adachi
Mode	Tx, Hopping Off, 3DH5 2480 MHz, Type-TX

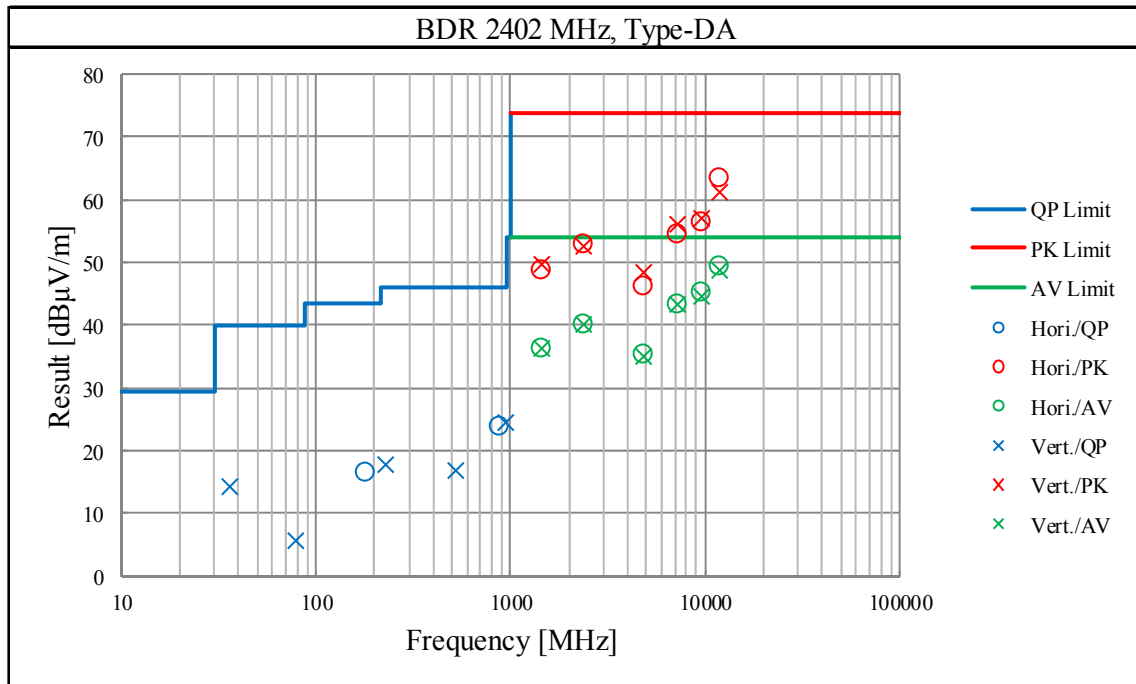


* Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission **(Plot data, Worst case)**

(Reference)

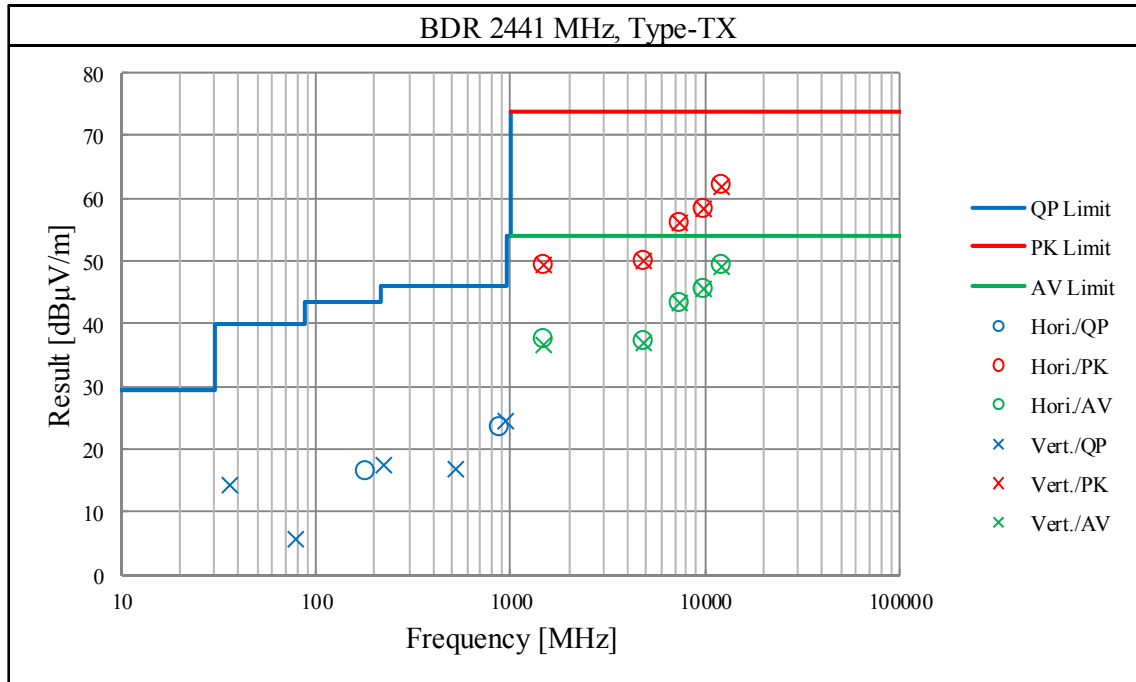
Test place	Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber		
Report No.	11251380S-A-R3		
Date	May 27, 2016	June 1, 2016	June 2, 2016
Temperature / Humidity	24 deg. C / 40 % RH	24 deg. C / 48 % RH	25 deg. C / 35 % RH
Engineer	Hikaru Shirasawa	Shinichi Takano	Shinichi Takano
	(1-13 GHz, No.2)	(above 13 GHz, No.1)	(below 1 GHz, No.1)
Mode	Tx, Hopping Off, DH5 2402 MHz, Type-DA		



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

Radiated Spurious Emission **(Plot data, Worst case)**

Test place	Shonan EMC Lab. No.2 & No.1 Semi Anechoic Chamber		
Report No.	11251380S-A-R3		
Date	May 29, 2016	June 1, 2016	June 2, 2016
Temperature / Humidity	24 deg. C / 56 % RH	24 deg.C / 48 %RH	25 deg.C / 35 %RH
Engineer	Kenichi Adachi	Shinichi Takano	Shinichi Takano
	(1-13 GHz, No.2)	(above 13 GHz, No.1)	(below 1 GHz, No.1)
Mode	Tx, Hopping Off, DH5 2441 MHz, Type-TX		

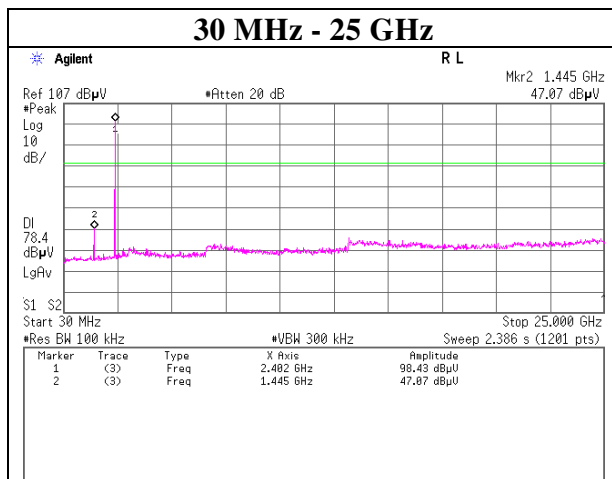
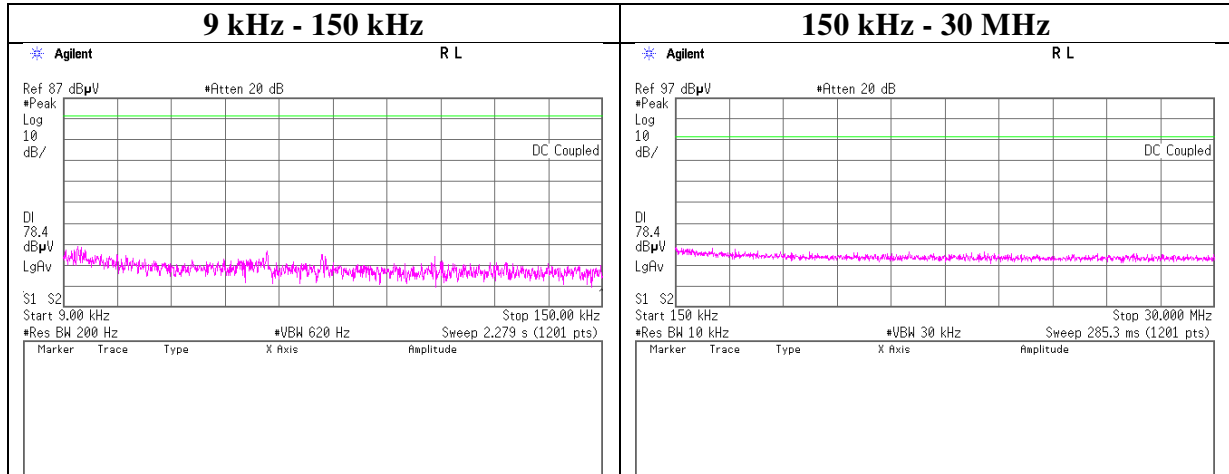


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping Off, DH5

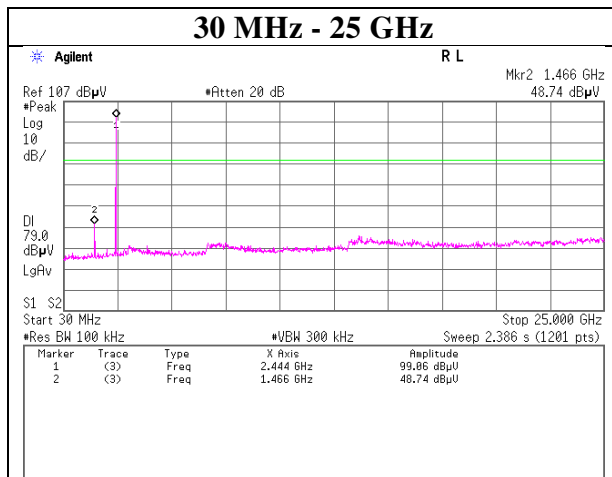
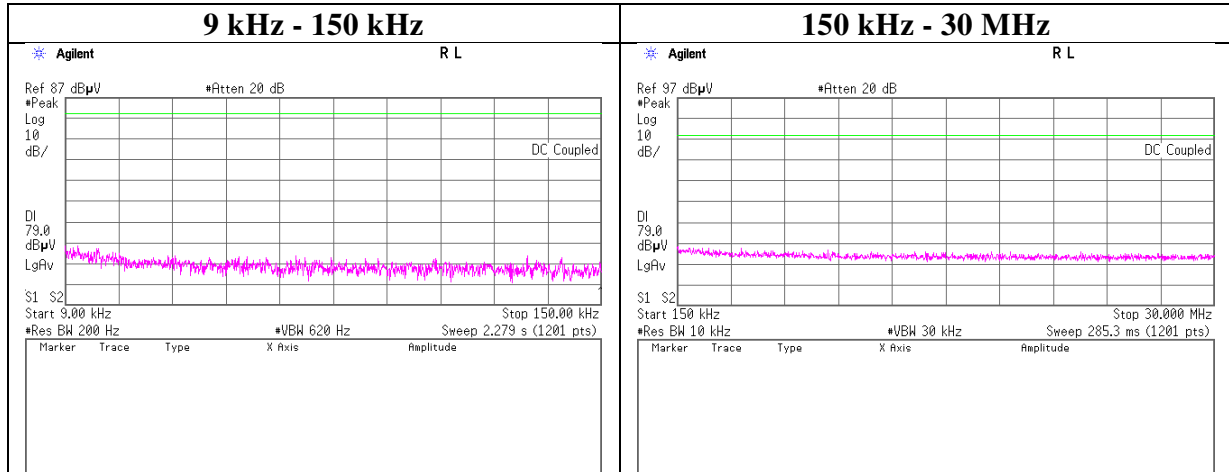
2402 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping Off, DH5

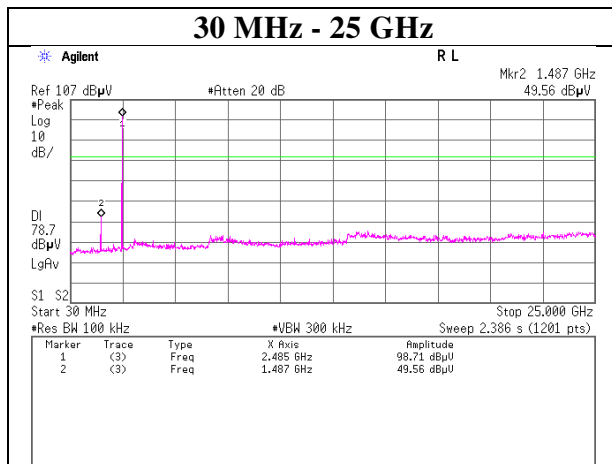
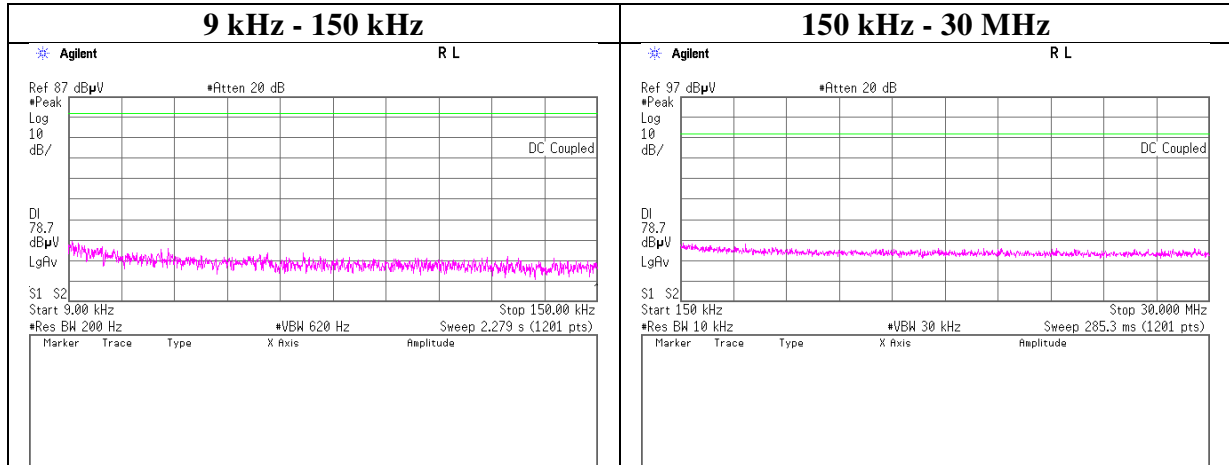
2441 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping Off, DH5

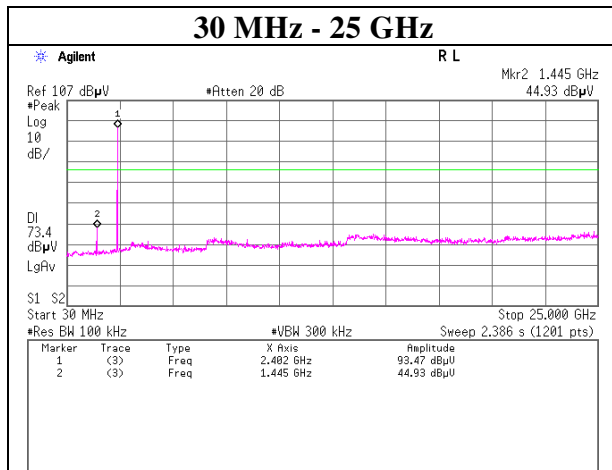
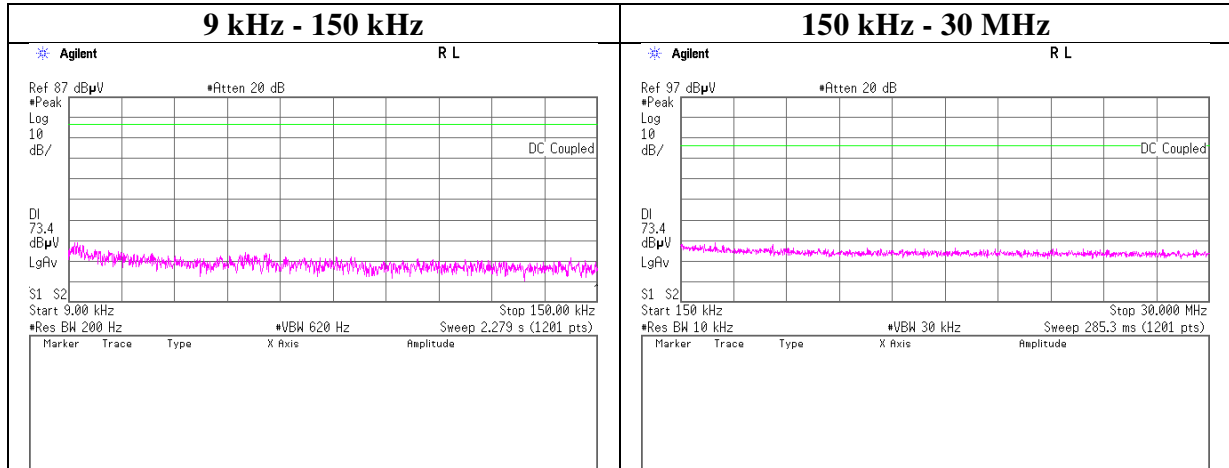
2480 MHz



Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, 3DH5

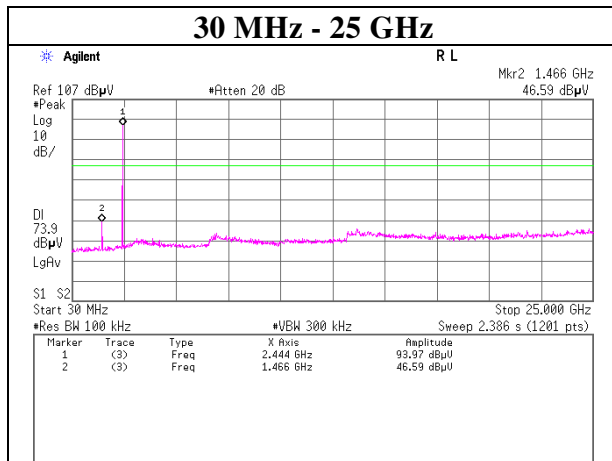
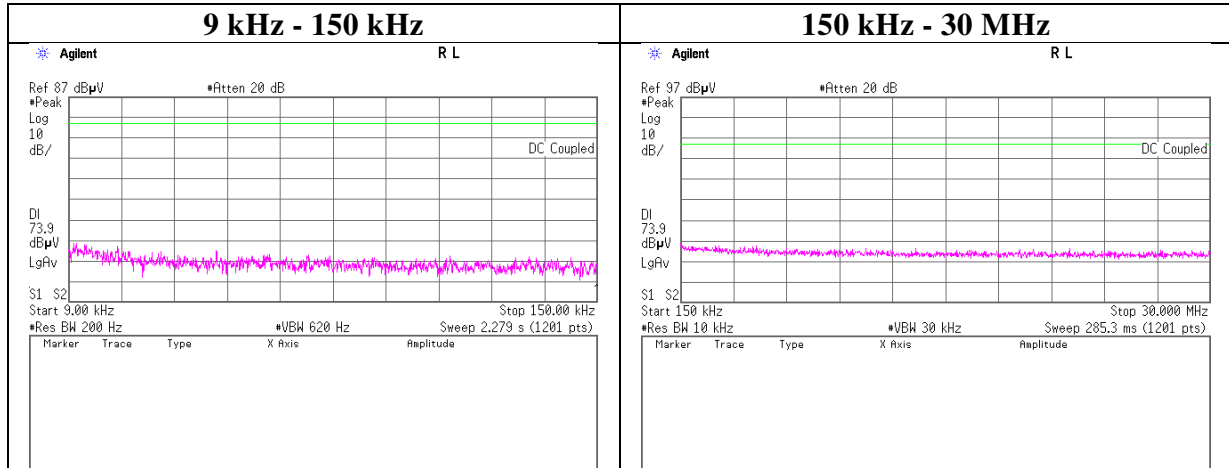
2402 MHz



Conducted Spurious Emission

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping Off, 3DH5

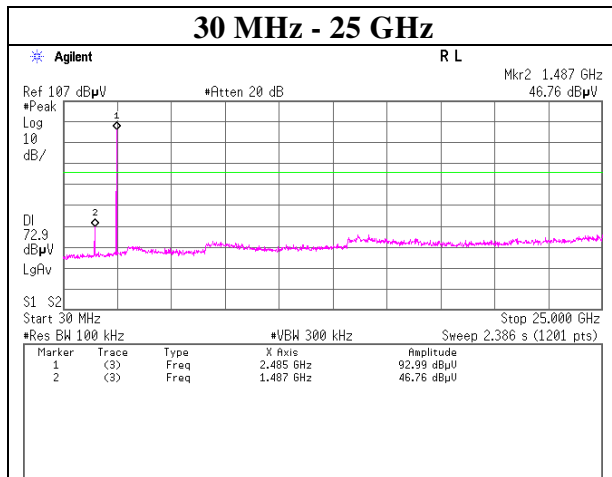
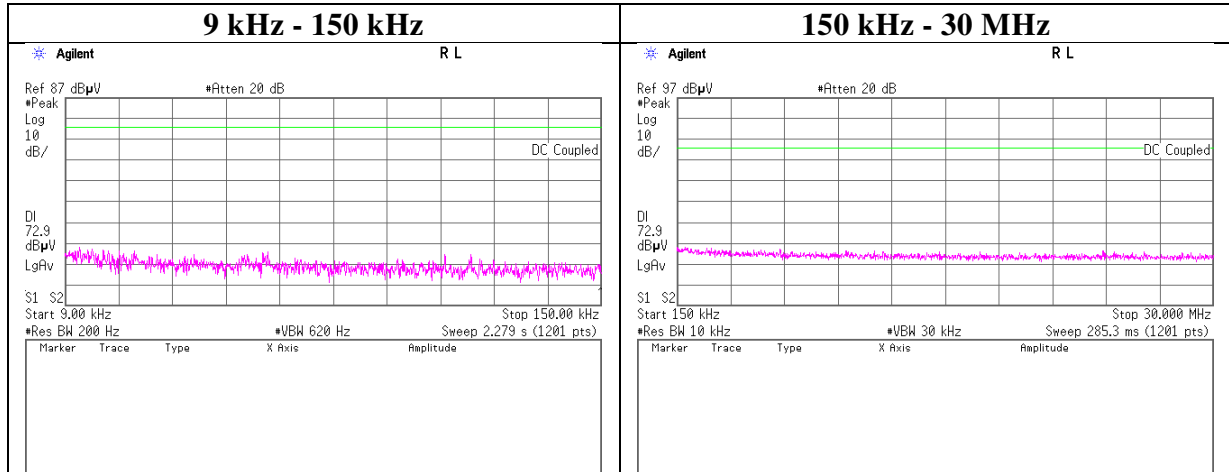
2441 MHz



Conducted Spurious Emission

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off, 3DH5

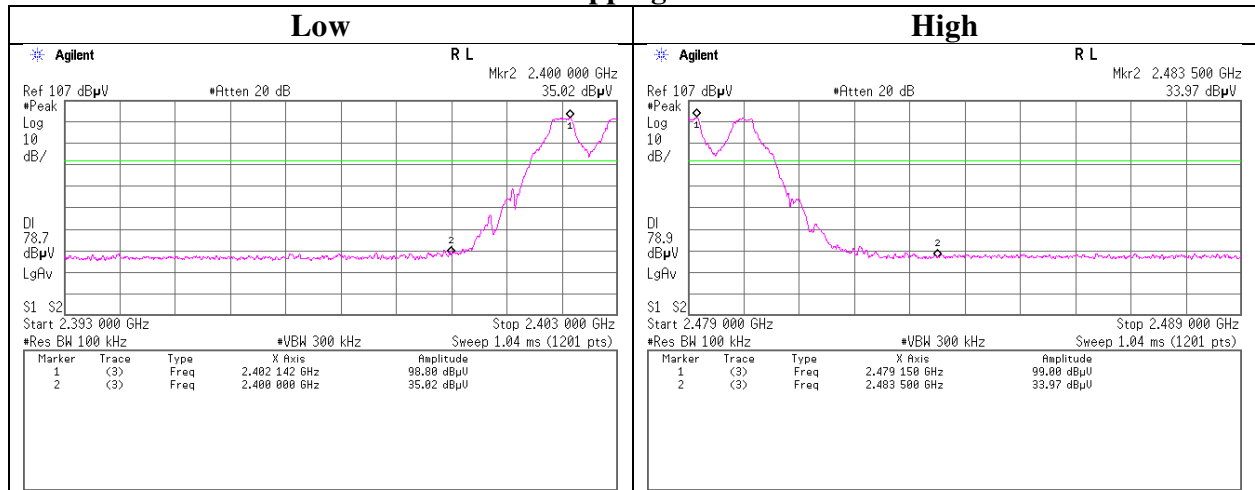
2480 MHz



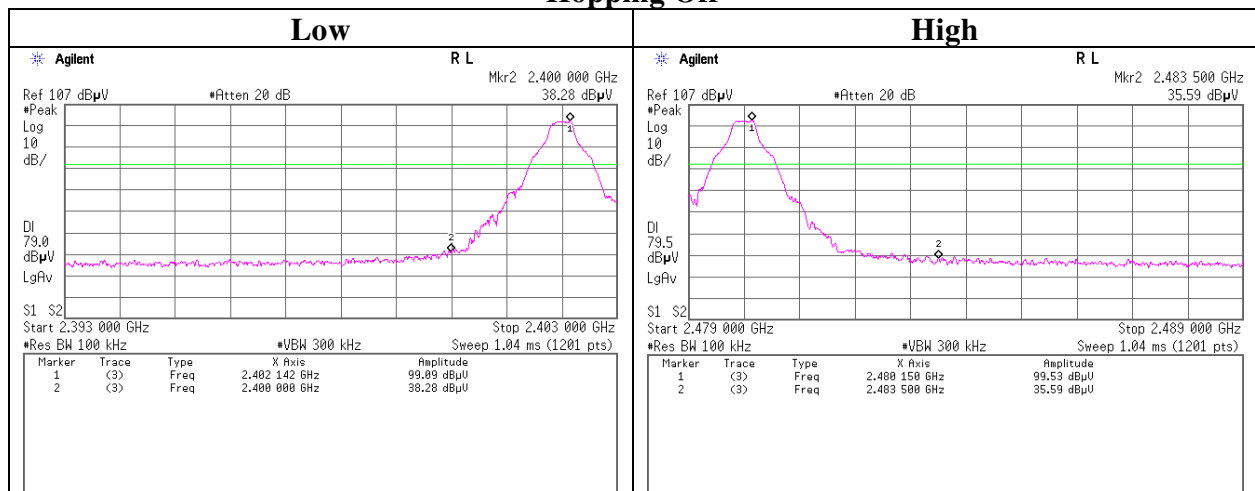
Conducted Emission Band Edge compliance

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping On, Off, DH5

Hopping On



Hopping Off



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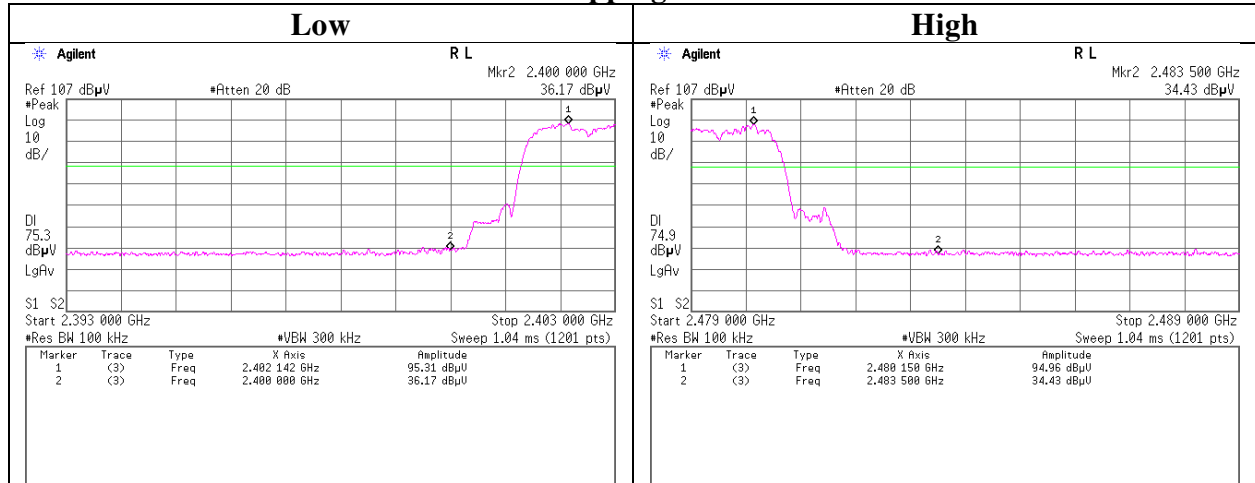
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

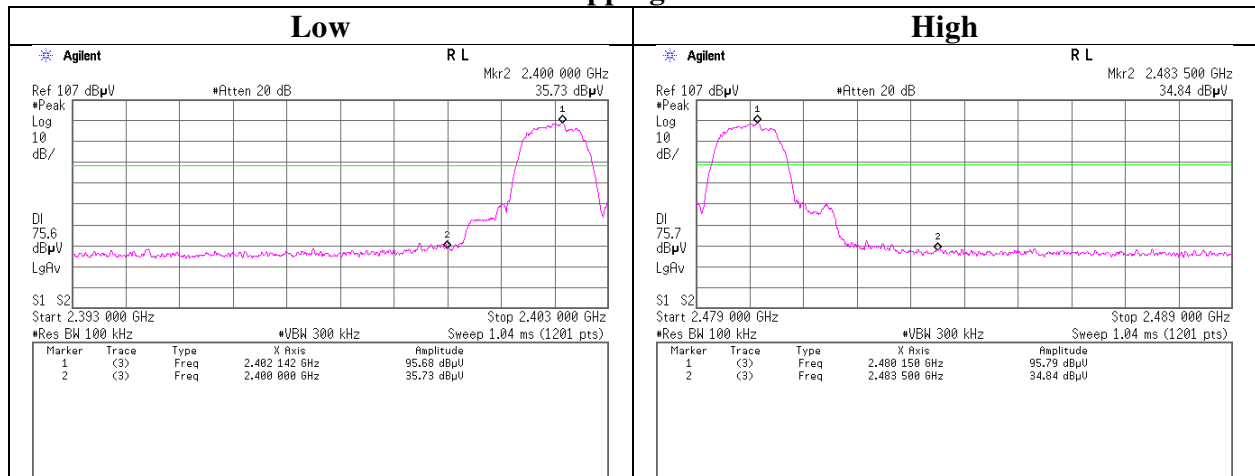
Conducted Emission Band Edge compliance

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping On, Off, 3DH5

Hopping On



Hopping Off



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Telephone : +81 463 50 6400

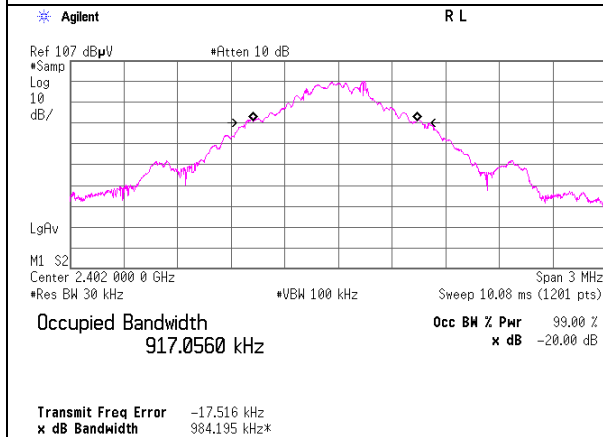
Facsimile : +81 463 50 6401

99 %Occupied Bandwidth

Test place : Shonan EMC Lab. No.5 Shielded Room
Report No. : 11251380S-A-R3
Date : April 22, 2016
Temperature / Humidity : 26 deg.C / 51 % RH
Engineer : Shinichi Takano
Mode : Tx, Hopping Off

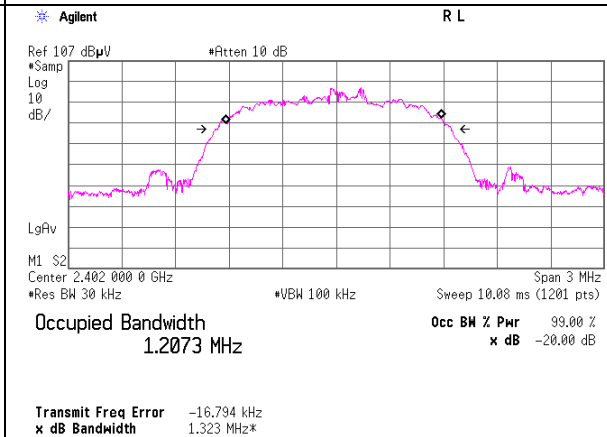
Hopping Off, DH5

2402 MHz

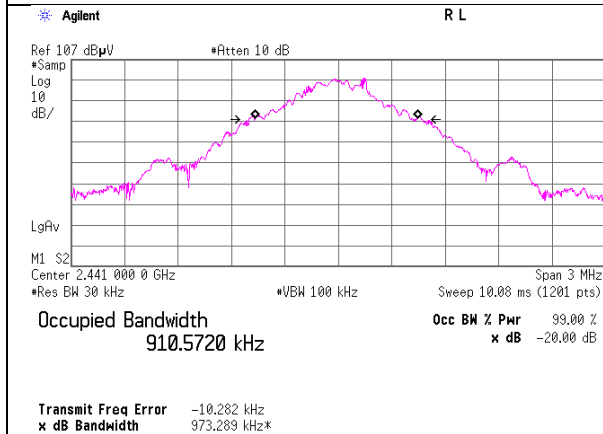


Hopping Off, 3DH5

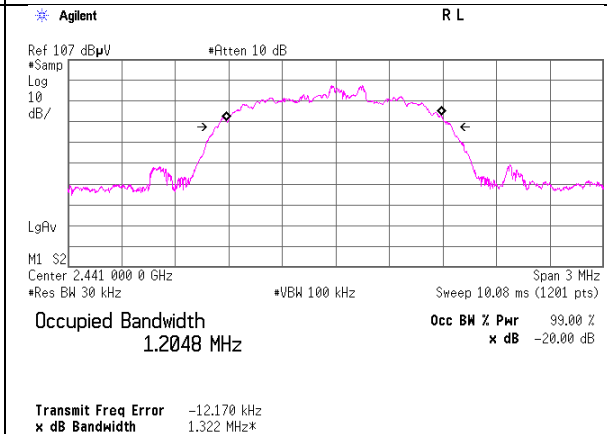
2402 MHz



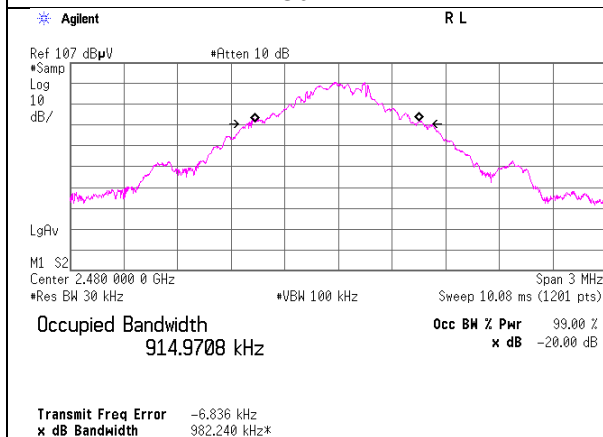
2441 MHz



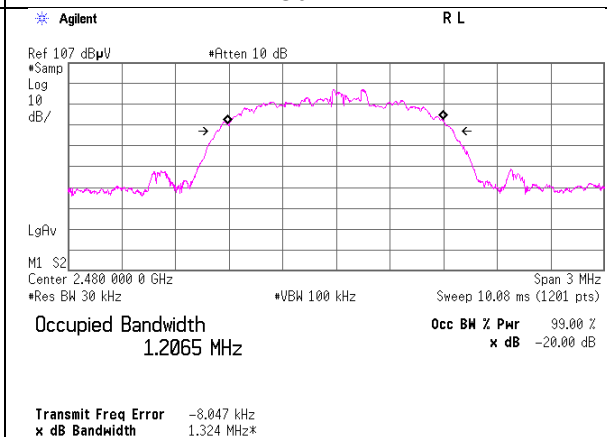
2441 MHz



2480 MHz



2480 MHz



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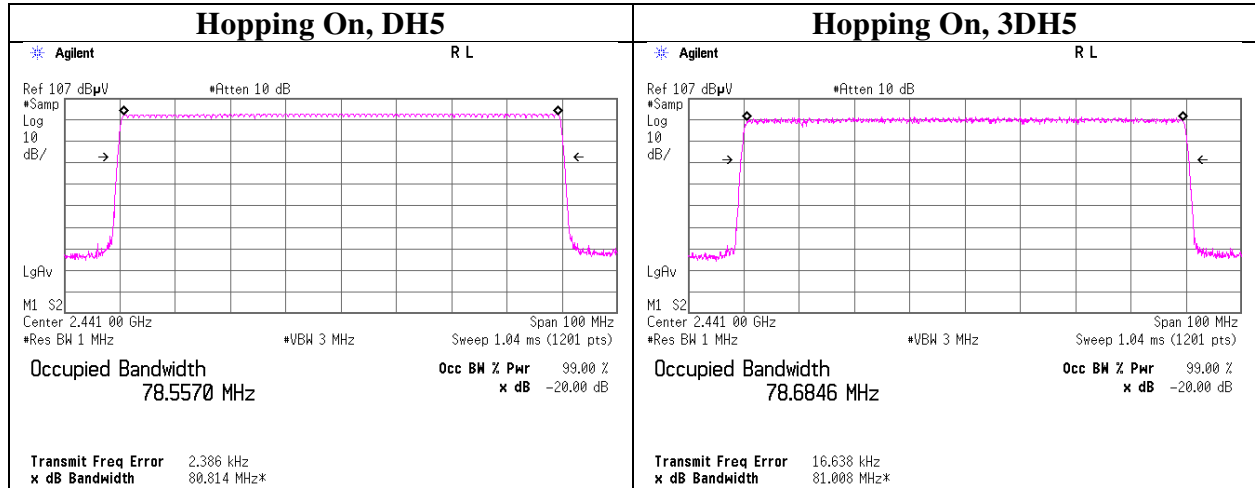
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99 % Occupied Bandwidth

Test place	Shonan EMC Lab. No.5 Shielded Room
Report No.	11251380S-A-R3
Date	April 22, 2016
Temperature / Humidity	26 deg.C / 51 % RH
Engineer	Shinichi Takano
Mode	Tx, Hopping Off



APPENDIX 2: Test instruments

Test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SRENT-05	Spectrum Analyzer	KEYSIGHT	E4440A	MY46187752	AT	2015/10/05 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2016/04/18 * 12
SCC-G32	Coaxial Cable	Junkosha	MWX241-02000KMS KMS	OCT-09-13-00 5	AT	2015/10/08 * 12
SCC-H14	Microwave cable	RS Pro	R-132G7210 100CO	-	AT	2016/04/18 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2016/04/01 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2016/04/01 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2015/12/07 * 12
SAEC-02(SVSW R)	Semi-Anechoic Chamber	TDK	SAEC-02(SVSWR)	2	RE	2015/07/09 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2015/08/10 * 12
SCC-G05	Coaxial Cable	Junkosha	J12J102207-00	APR-30-15-03 7	RE	2016/05/24 * 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
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2016/04/18 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2016/04/22 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2016/05/11 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2016/03/23 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2015/09/04 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2015/10/22 * 12
SJM-09	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,R FI,MF)	-	RE	-
STS-02	Digital Hitester	Hioki	3805-50	080997819	RE	2016/03/22 * 12
SAJ-02	Antenna Tilt Jig	Intelligent System Engineering Co., Ltd	Antenna Tilt Jig	T-S002	RE	Pre Check
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2015/07/13 * 12
KAF-02	Pre Amplifier	Hewlett Packard	8449B	3008A01268	RE	2016/04/22 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2016/04/22 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2016/05/11 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2015/08/10 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2015/10/22 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2016/03/28 * 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: June 15 and 16, 2016

Radiated Emissions test: May 27 to June 2, 2016

Antenna Terminal Conducted test: April 22, 2016

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Test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2016/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2016/03/23 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2016/03/08 * 12
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2016/02/19 * 12
KAT6-04	Attenuator	INMET	18N-6dB	-	RE	2015/12/18 * 12
SAT3-09	Attenuator	JFW	50HF-003N	-	RE	2015/08/31 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2015/10/11 * 12
SCC-A1/A3/A5/ A7/A8/A13/SRS E-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2016/04/22 * 12
SCC-A2/A4/A6/ A7/A8/A13/SRS E-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2016/04/22 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0888	RE	2015/10/11 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2015/11/06 * 12
SCC-A12/A13/S RSE-01	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-269(RF Selector)	CE	2016/04/22 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE	2016/02/08 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2016/09/23 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	CE	2015/12/07 * 12
STM-01	Terminator	TME	CT-01 BP	-	CE	2015/12/18 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	CE	2015/11/06 * 12
KJM-09	Measure	KOMELON	KMC-36	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF I,MF)	-	CE	-
STS-01	Digital Hitester	Hioki	3805-50	080997812	CE	2015/11/18 * 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: June 15 and 16, 2016

Radiated Emissions test: May 27 to June 2, 2016

Antenna Terminal Conducted test: April 22, 2016

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