



RADIO TEST REPORT

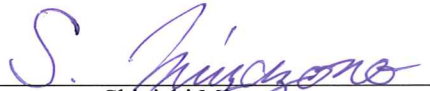
Test Report No. : 11025351H-A-R1

Applicant : Panasonic Corporation
Type of Equipment : Digital Wireless Stereo Earphones
Model No. : RP-BTS50
FCC ID : ACJ-RP-BTS50
Test regulation : FCC Part 15 Subpart C: 2015
Test Result : Complied

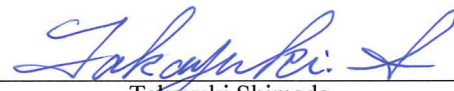
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3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. This test report covers Radio technical 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 11025351H-A. 11025351H-A is replaced with this report.

Date of test: November 22 and 30, 2015

Representative test engineer:


Shinichi Miyazono
Engineer
Consumer Technology Division

Approved by:


Takayuki Shimada
Engineer
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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13-EM-F0429

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SECTION 1: Customer information

Company Name : Panasonic Corporation
Address : 1-15 Matsuo-cho, Kadoma-shi, Osaka, 571-8504 Japan
Telephone Number : +81-6-6905-4787
Contact Person : Tsuyoshi Maruoka

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Wireless Stereo Earphones
Model No. : RP-BTS50
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.7 V
Receipt Date of Sample : November 11, 2015
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 No: RP-BTS50 (referred to as the EUT in this report) is the Digital Wireless Stereo Earphones.

General Specification

Clock frequency(ies) in the system : 26 MHz

Radio Specification

Bluetooth (Ver.4.1)

Equipment Type	Transceiver
Frequency of Operation	2402 - 2480 MHz
Bandwidth & Channel spacing	Bandwidth : 1 MHz Ch spacing : 1 MHz
Type of Modulation	FHSS
Antenna Type / Antenna Gain	Chip antenna / 2 dBi
Power Supply (inner)	DC 1.35 V / 1.8 V
Operating temperature range	0 to +40 deg. C

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015
*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

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 EUT complies with FCC Part 15 Subpart B: 2015, final revised on June 12, 2015 and effective July 13, 2015

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	N/A	N/A *1)	-
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
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) IC: RSS-247 5.1 (1)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1)(iii) IC: RSS-247 5.1 (4)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.12	FCC: Section15.247(a)(b)(1) IC: RSS-247 5.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13	FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10		7.1 dB 364.006 MHz, QP, Horizontal	Complied
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line and during USB charging EUT can not transmit Radio frequency. *2) 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 a battery-operated device and test was performed with the full-charged battery.
This EUT provides stable voltage (DC 1.35 V / 1.8 V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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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

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	

Test distance	Radiated emission (+dB) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*)(+dB)		(10 m*)(+dB)	
	30 - 300 MHz	300 - 1000MHz	30 - 300 MHz	300 - 1000MHz
Horizontal	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)(+dB)		(1 m*)(+dB)	(0.5 m*)(+dB)	(10 m*)(+dB)
1 - 6GHz	6 - 18GHz	10 - 26.5 GHz	26.5 - 40GHz	1 - 18 GHz
5.1 dB	5.3 dB	5.1 dB	5.1 dB	5.3 dB

*Measurement distance

Radiated emission test

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

3.5 Test Location

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Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	-	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.6 shielded room	-	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	-	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	-	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	-	3.1 x 5.0 x 2.7	N/A	-	-
No.9 measurement room	-	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	-	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

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
20dB 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
<p>*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 test items based on Bluetooth Core specification. *EUT has the power settings by the software as follows; Power settings: BDR: Ext.=31, Int.=31 EDR: Ext.=31, Int.=31 Software: RP-BTS50_PSR, Ver2.1 *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.</p>		

4.2 Configuration and peripherals



*Setup was taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Wireless Stereo Earphones	RP-BTS50	01 *1) 02 *2)	Panasonic Corporation	EUT

*1) Used for Radiated emission test

*2) Used for Antenna Terminal Conducted test

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Jig Cable	0.15	Unshielded	Unshielded	*1)

*1) The use of a jig does not influence on the test result.

SECTION 5: 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 m 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	30 MHz to 300 MHz	300 MHz to 1 GHz	Above 1 GHz
Antenna Type	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 m (below 10 GHz), 1 m*2) (above 10 GHz)		3 m (below 10 GHz), 1 m*2) (above 10 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: $20 \times \log(3.0 \text{ m} / 1.0 \text{ m}) = 9.5 \text{ dB}$

- 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.

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

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

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20dB Bandwidth	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	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak Average *3)	-	Power Meter (Sensor: 80MHz)
Carrier Frequency Separation	3 MHz	30 kHz	100 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	9.1 kHz	27 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) Peak hold was applied as Worst-case measurement.
*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 = 9.1 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

20dB Bandwidth and Carrier Frequency Separation

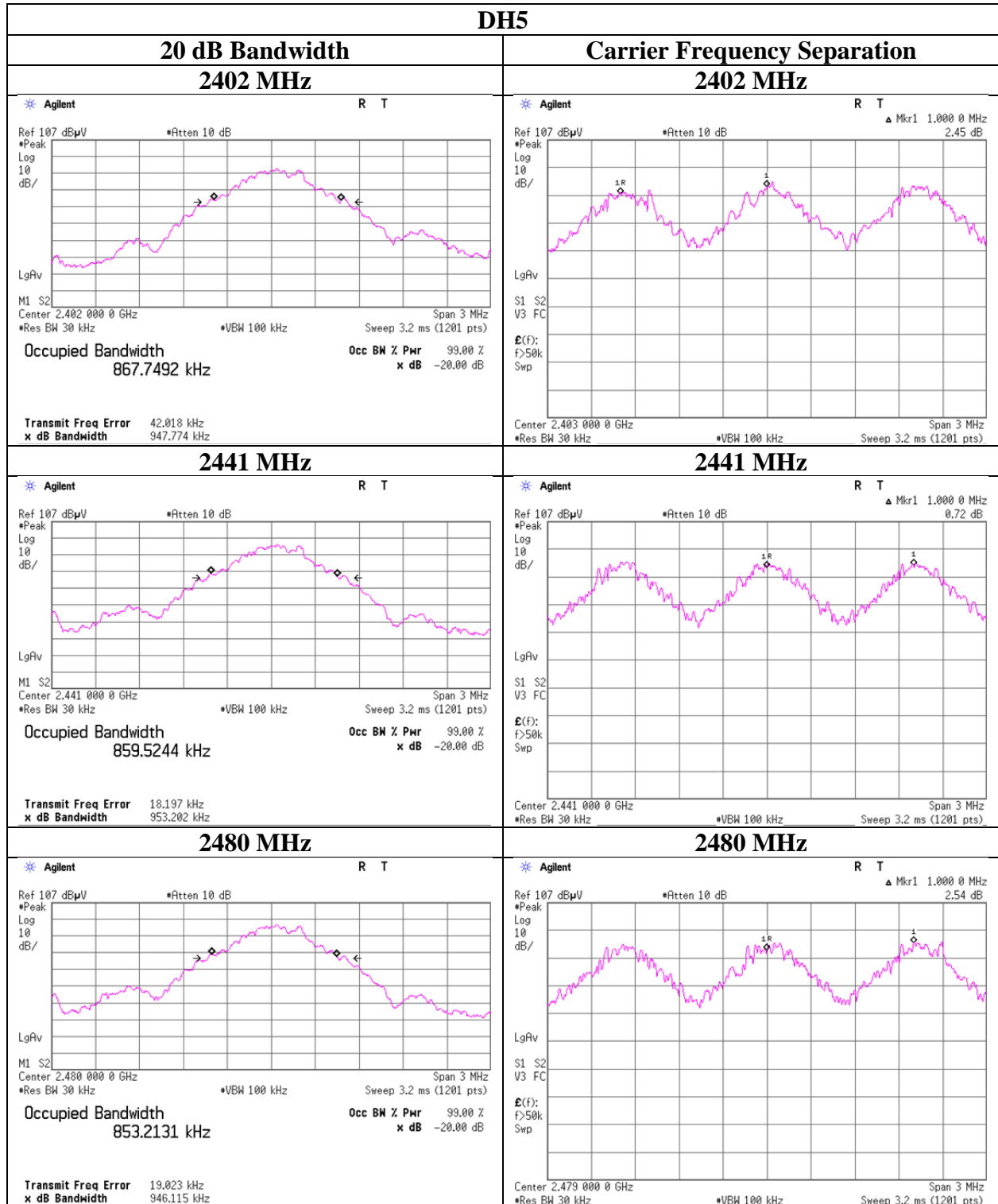
Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11025351H
Date November 30, 2015
Temperature / Humidity 21 deg. C / 37 % RH
Engineer Shinichi Miyazono
Mode Tx, Hopping Off

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.948	1.000	≥ 0.632
DH5	2441.0	0.953	1.000	≥ 0.635
DH5	2480.0	0.946	1.000	≥ 0.631
3DH5	2402.0	1.256	1.000	≥ 0.837
3DH5	2441.0	1.257	1.000	≥ 0.838
3DH5	2480.0	1.279	1.000	≥ 0.853

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



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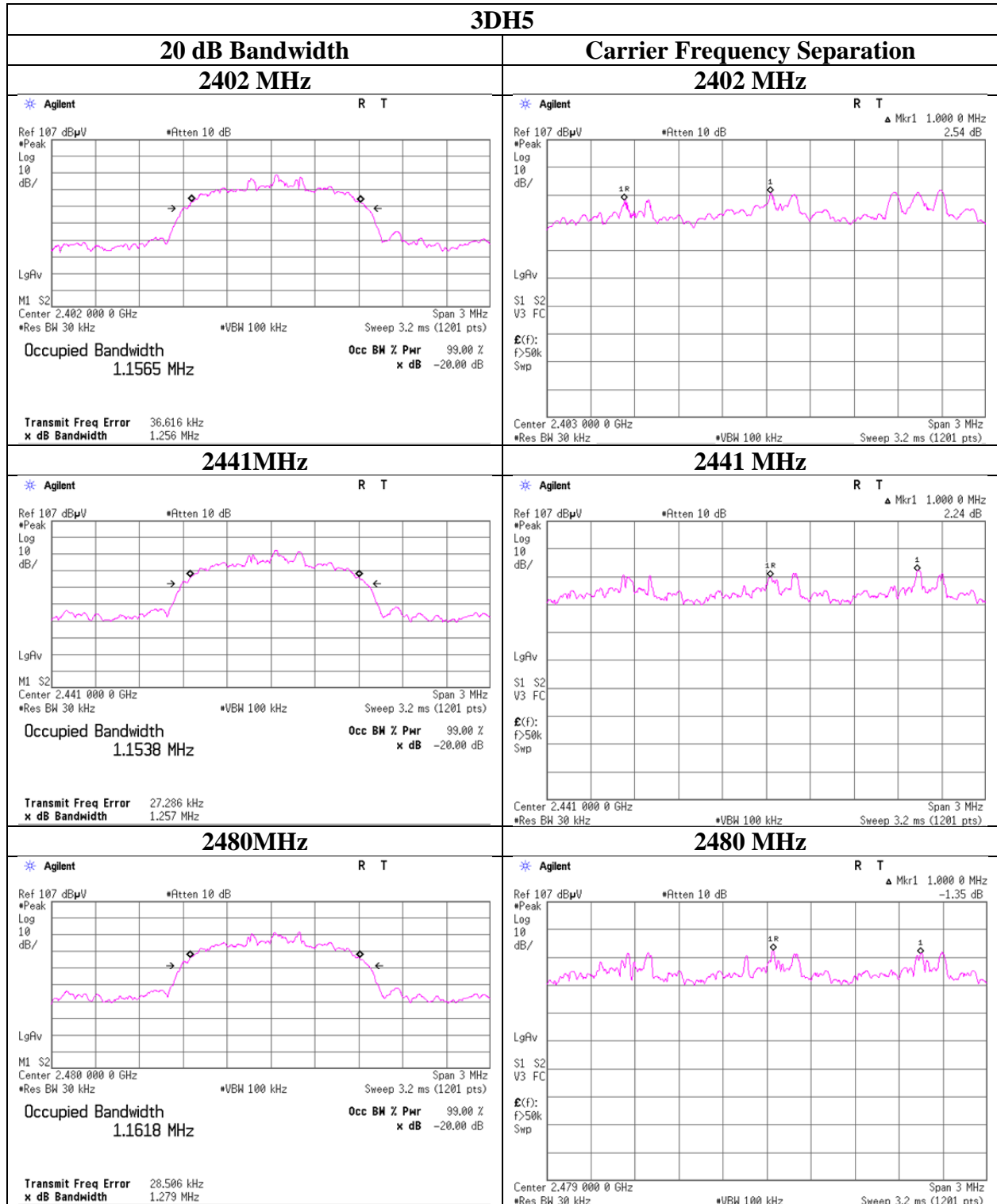
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20dB Bandwidth and Carrier Frequency Separation



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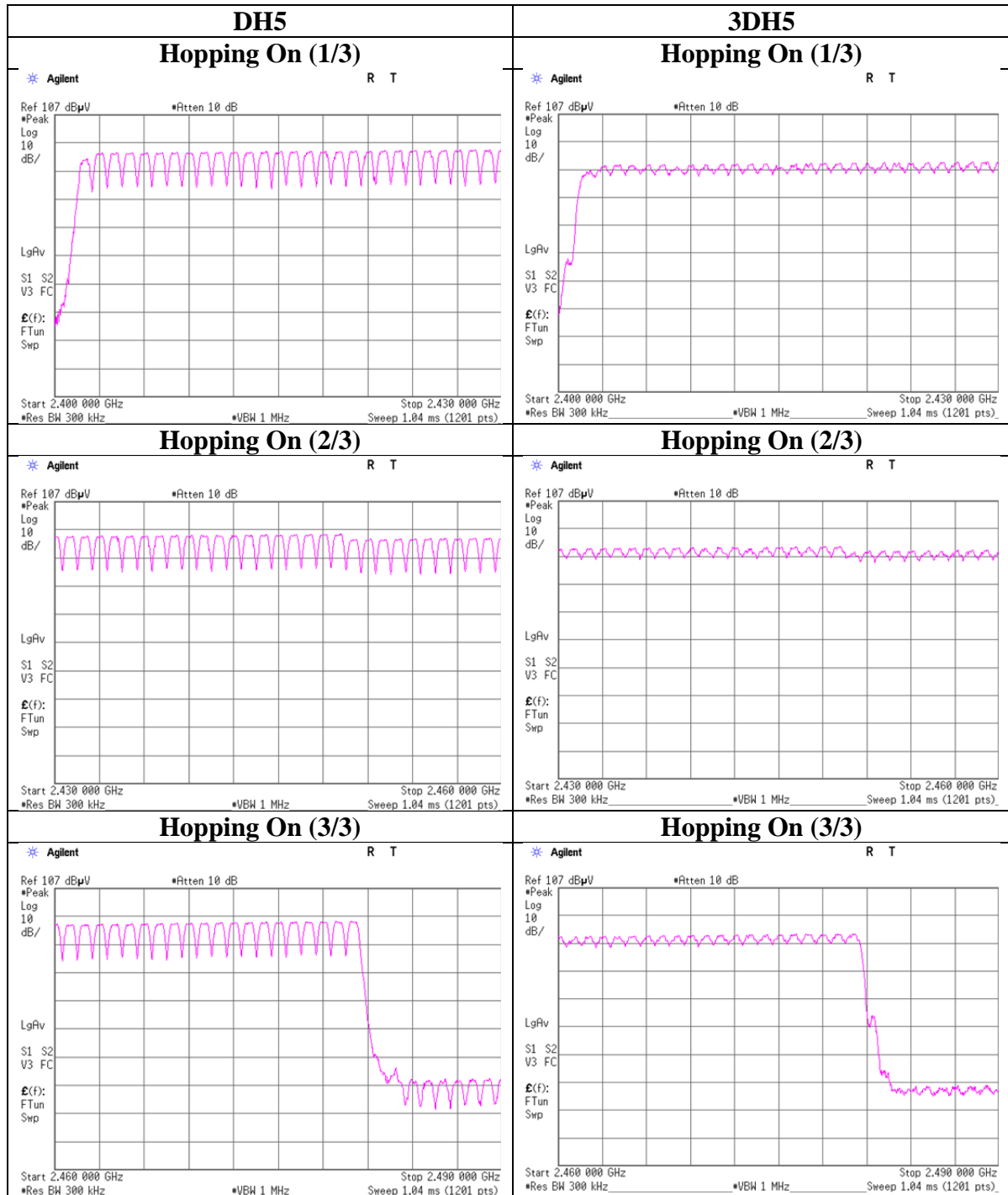
Number of Hopping Frequency

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11025351H
Date November 30, 2015
Temperature / Humidity 21 deg. C / 37 % RH
Engineer Shinichi Miyazono
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



Dwell time

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping On

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8 (32 Hopping x 0.4) second period	Length of transmission [msec]	Result [msec]	Limit [msec]
DH1	50.6 times / 5 sec. x 31.6 sec. = 320 times	0.423	135	400
DH3	25.0 times / 5 sec. x 31.6 sec. = 158 times	1.687	267	400
DH5	16.6 times / 5 sec. x 31.6 sec. = 105 times	2.932	308	400
3DH1	50.4 times / 5 sec. x 31.6 sec. = 319 times	0.436	139	400
3DH3	25.2 times / 5 sec. x 31.6 sec. = 160 times	1.690	270	400
3DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.944	318	400

Sample Calculation

Result = Number of transmission x Length of transmission

*Average data of 5 tests.(except Inquiry)

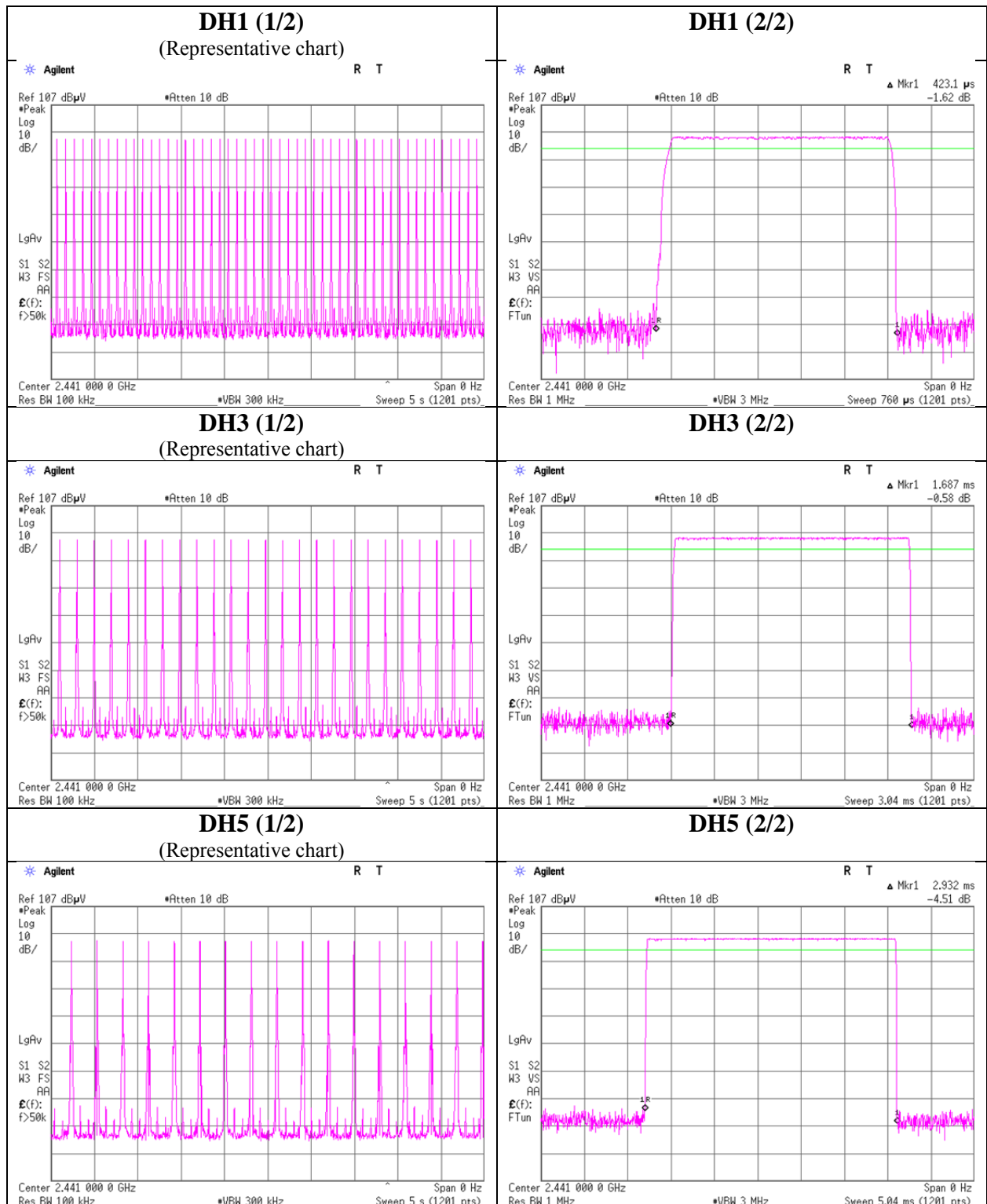
Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	51	50	51	51	50.6
DH3	25	25	25	25	25	25
DH5	17	17	17	16	16	16.6
3DH1	50	51	50	51	50	50.4
3DH3	26	25	25	25	25	25.2
3DH5	17	17	17	17	17	17

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



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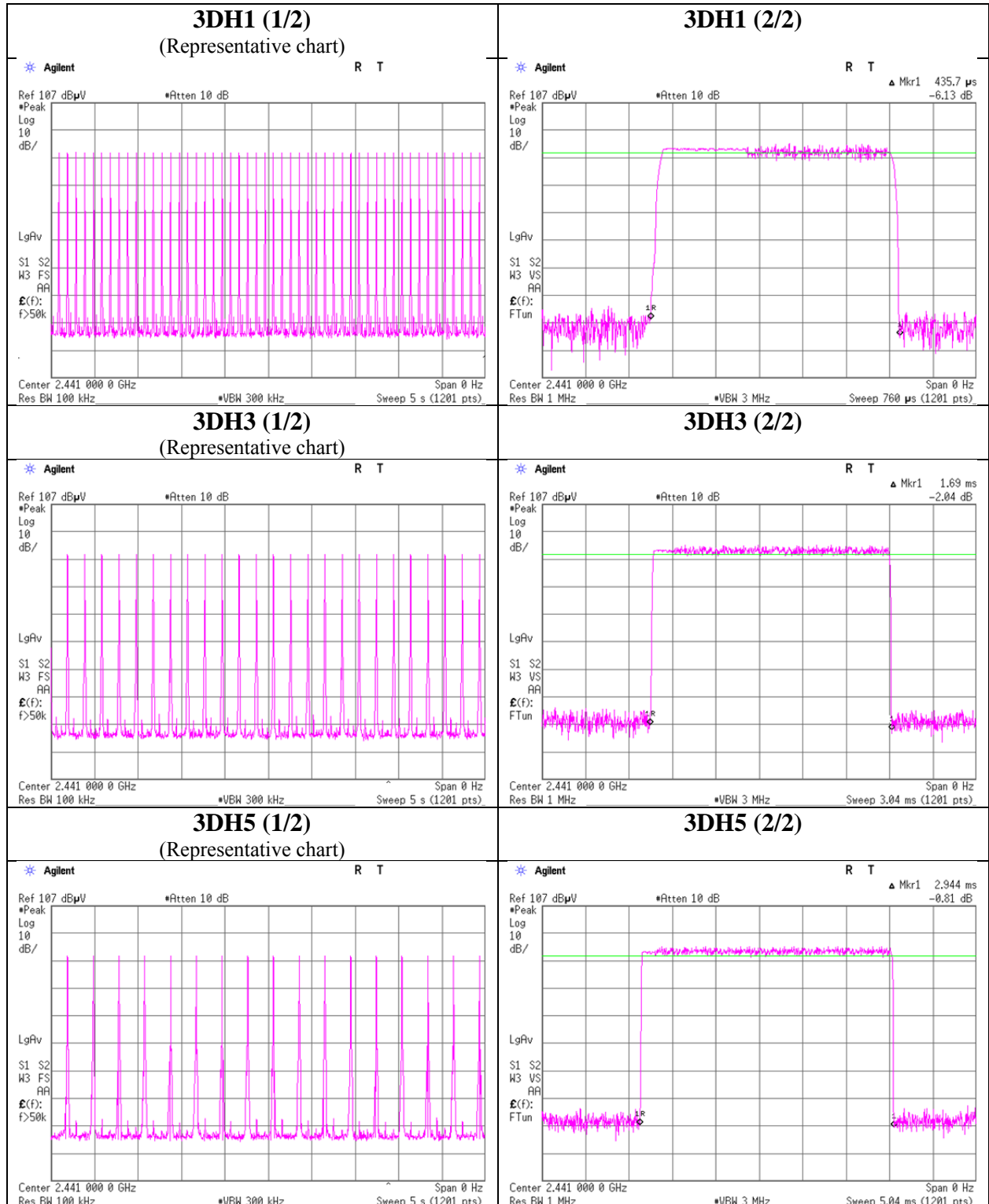
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Dwell time



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Maximum Peak Output Power

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11025351H
Date November 30, 2015
Temperature / Humidity 21 deg. C / 37 % RH
Engineer Shinichi Miyazono
Mode Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-14.45	0.50	9.53	-4.42	0.36	20.96	125	25.38
DH5	2441.0	-11.43	0.50	9.54	-1.39	0.73	20.96	125	22.35
DH5	2480.0	-11.28	0.50	9.54	-1.24	0.75	20.96	125	22.20
2DH5	2402.0	-16.97	0.50	9.53	-6.94	0.20	20.96	125	27.90
2DH5	2441.0	-14.42	0.50	9.54	-4.38	0.36	20.96	125	25.34
2DH5	2480.0	-14.25	0.50	9.54	-4.21	0.38	20.96	125	25.17
3DH5	2402.0	-16.66	0.50	9.53	-6.63	0.22	20.96	125	27.59
3DH5	2441.0	-13.67	0.50	9.54	-3.63	0.43	20.96	125	24.59
3DH5	2480.0	-13.55	0.50	9.54	-3.51	0.45	20.96	125	24.47

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + 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: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

Average Output Power
(Reference data for RF Exposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11025351H
Date : November 30, 2015
Temperature / Humidity : 21 deg. C / 37 % RH
Engineer : Shinichi Miyazono
Mode : Tx, Hopping Off

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Frame power)		Duty factor [dB]	Result (Burst power)	
					[dBm]	[mW]		[dBm]	[mW]
DH5	2402.0	-17.03	0.50	9.53	-7.00	0.20	1.07	-5.93	0.26
DH5	2441.0	-13.40	0.50	9.54	-3.36	0.46	1.07	-2.29	0.59
DH5	2480.0	-13.18	0.50	9.54	-3.14	0.49	1.07	-2.07	0.62
2DH5	2402.0	-23.01	0.50	9.53	-12.98	0.05	1.06	-11.92	0.06
2DH5	2441.0	-19.51	0.50	9.54	-9.47	0.11	1.06	-8.41	0.14
2DH5	2480.0	-19.22	0.50	9.54	-9.18	0.12	1.06	-8.12	0.15
3DH5	2402.0	-23.02	0.50	9.53	-12.99	0.05	1.06	-11.93	0.06
3DH5	2441.0	-19.52	0.50	9.54	-9.48	0.11	1.06	-8.42	0.14
3DH5	2480.0	-19.26	0.50	9.54	-9.22	0.12	1.06	-8.16	0.15

Sample Calculation:

Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

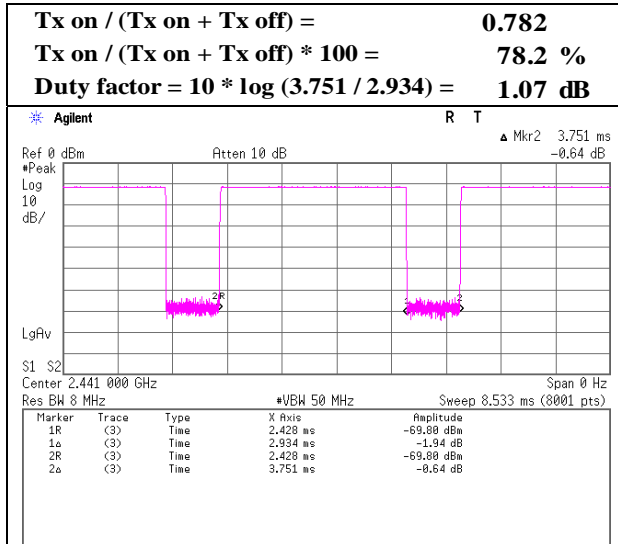
Result (Burst power) = Frame power + Duty factor

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

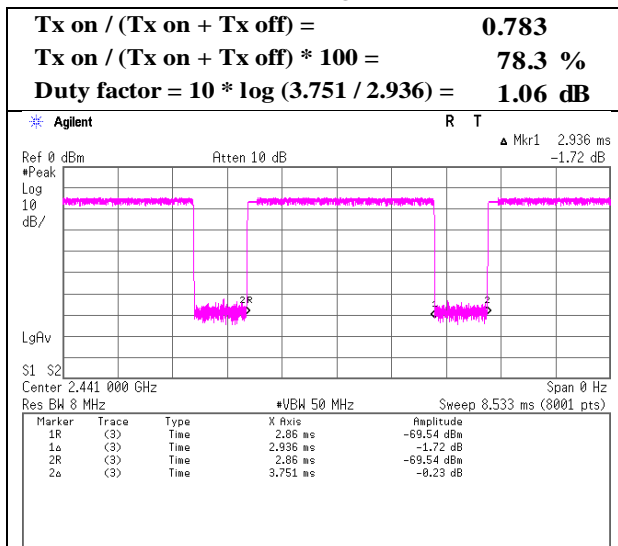
Burst Rate Confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off

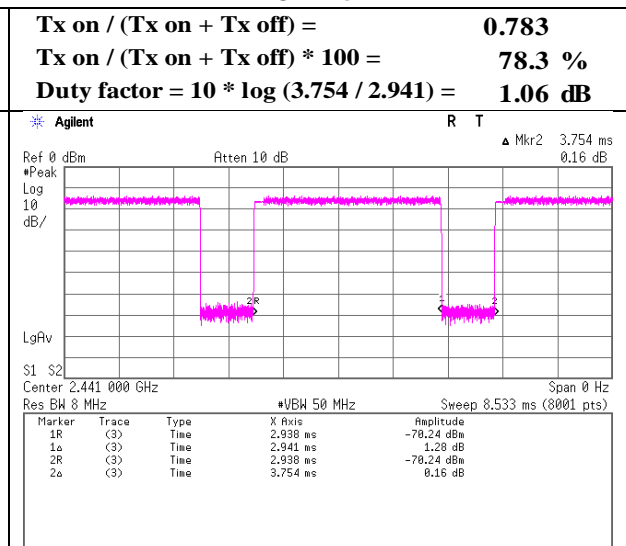
DH5



2DH5



3DH5



Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
 (1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	184.006	QP	29.9	16.2	8.9	32.2	22.8	43.5	20.7	
Hori	344.008	QP	32.7	15.9	10.3	32.0	26.9	46.0	19.1	
Hori	364.006	QP	44.1	16.4	10.4	32.0	38.9	46.0	7.1	
Hori	372.007	QP	37.6	16.7	10.4	32.0	32.7	46.0	13.3	
Hori	432.009	QP	37.0	17.6	10.8	32.1	33.3	46.0	12.7	
Hori	440.009	QP	35.4	17.6	10.9	32.1	31.8	46.0	14.2	
Hori	2390.000	PK	42.0	26.9	3.3	32.0	40.2	73.9	33.7	
Hori	4804.000	PK	45.0	31.8	5.5	31.3	51.0	73.9	22.9	
Hori	7206.000	PK	42.4	36.0	6.7	32.0	53.1	73.9	20.8	Floor Noise
Hori	9608.000	PK	43.0	38.2	7.5	32.4	56.3	73.9	17.6	Floor Noise
Hori	2390.000	AV	29.9	26.9	3.3	32.0	28.1	53.9	25.8	
Hori	4804.000	AV	37.6	31.8	5.5	31.3	43.6	53.9	10.3	
Hori	7206.000	AV	32.0	36.0	6.7	32.0	42.7	53.9	11.2	Floor Noise
Hori	9608.000	AV	31.6	38.2	7.5	32.4	44.9	53.9	9.0	Floor Noise
Vert	360.010	QP	33.7	16.3	10.4	32.0	28.4	46.0	17.6	
Vert	364.007	QP	36.8	16.4	10.4	32.0	31.6	46.0	14.4	
Vert	368.009	QP	34.2	16.6	10.4	32.0	29.2	46.0	16.8	
Vert	444.012	QP	29.7	17.7	10.9	32.1	26.2	46.0	19.8	
Vert	552.010	QP	32.1	18.7	11.5	32.1	30.2	46.0	15.8	
Vert	572.011	QP	33.1	19.0	11.6	32.1	31.6	46.0	14.4	
Vert	2390.000	PK	29.9	26.9	3.3	32.0	28.1	73.9	45.8	
Vert	4804.000	PK	44.8	31.8	5.5	31.3	50.8	73.9	23.1	
Vert	7206.000	PK	43.2	36.0	6.7	32.0	53.9	73.9	20.0	Floor Noise
Vert	9608.000	PK	43.8	38.2	7.5	32.4	57.1	73.9	16.8	Floor Noise
Vert	2390.000	AV	42.7	26.9	3.3	32.0	40.9	53.9	13.0	
Vert	4804.000	AV	36.7	31.8	5.5	31.3	42.7	53.9	11.2	
Vert	7206.000	AV	31.0	36.0	6.7	32.0	41.7	53.9	12.2	Floor Noise
Vert	9608.000	AV	31.7	38.2	7.5	32.4	45.0	53.9	8.9	Floor Noise

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

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

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

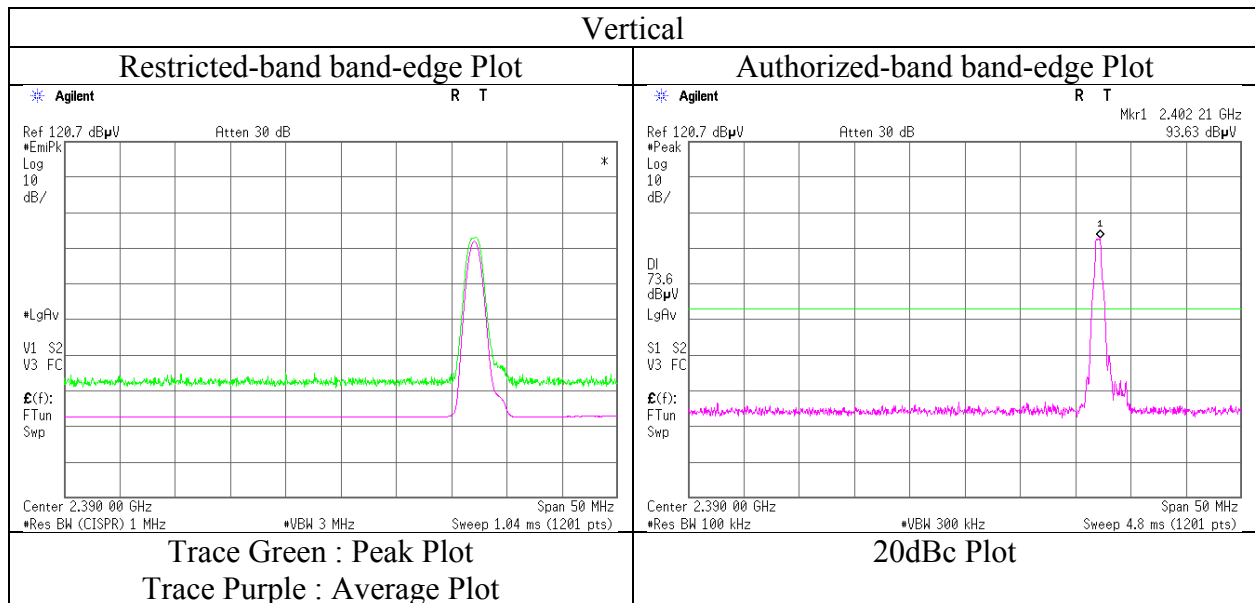
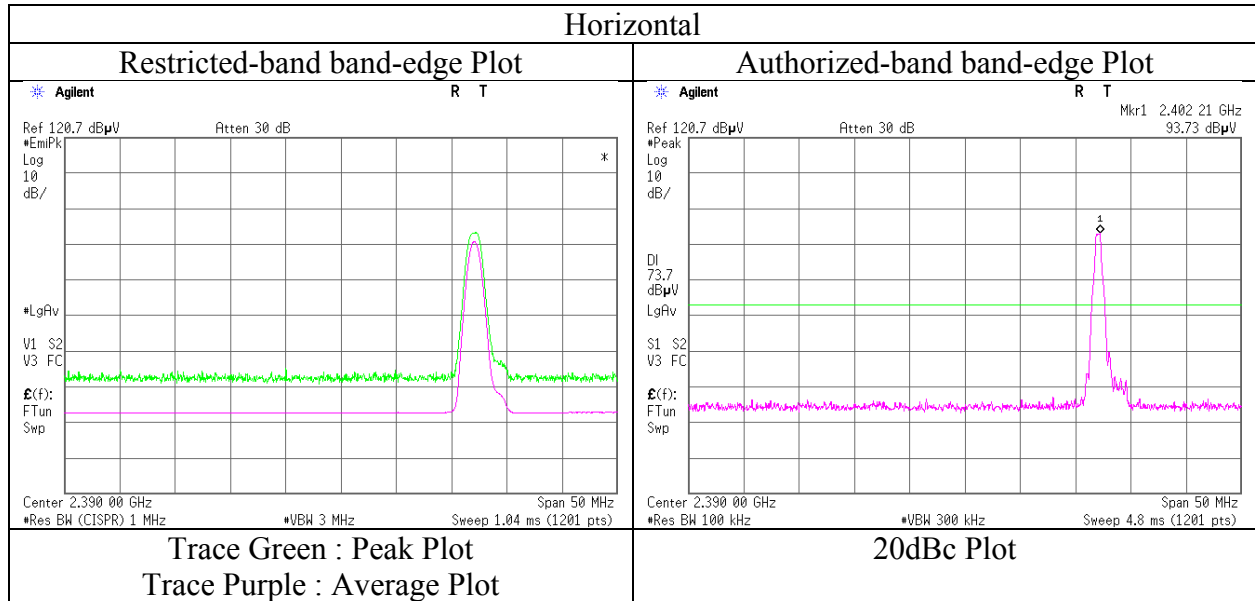
20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	93.7	26.9	3.3	32.0	91.9	-	-	Carrier
Hori	2400.000	PK	41.4	26.9	3.3	32.0	39.6	71.9	32.3	
Vert	2402.000	PK	93.6	26.9	3.3	32.0	91.8	-	-	Carrier
Vert	2400.000	PK	41.1	26.9	3.3	32.0	39.3	71.8	32.5	

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11025351H
Date	November 21, 2015
Temperature / Humidity	20 deg. C / 52 % RH
Engineer	Takafumi Noguchi
	(1-26.5GHz)
Mode	Tx, Hopping Off, DH5 2402 MHz



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

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Ise EMC Lab.

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
(1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	196.003	QP	30.5	16.5	9.0	32.1	23.9	43.5	19.6	
Hori	384.006	QP	28.2	17.0	10.5	32.0	23.7	46.0	22.3	
Hori	472.008	QP	29.2	17.8	11.1	32.1	26.0	46.0	20.0	
Hori	512.008	QP	27.2	18.1	11.2	32.1	24.4	46.0	21.6	
Hori	552.011	QP	26.4	18.7	11.5	32.1	24.5	46.0	21.5	
Hori	560.010	QP	24.7	18.8	11.5	32.1	22.9	46.0	23.1	
Hori	4882.000	PK	45.7	31.9	5.5	31.3	51.8	73.9	22.1	
Hori	7323.000	PK	42.3	36.0	6.8	32.0	53.1	73.9	20.8	Floor Noise
Hori	9764.000	PK	42.5	38.2	7.5	32.5	55.7	73.9	18.2	Floor Noise
Hori	4882.000	AV	38.7	31.9	5.5	31.3	44.8	53.9	9.1	
Hori	7323.000	AV	30.7	36.0	6.8	32.0	41.5	53.9	12.4	Floor Noise
Hori	9764.000	AV	30.8	38.2	7.5	32.5	44.0	53.9	9.9	Floor Noise
Vert	196.001	QP	24.5	16.5	9.0	32.1	17.9	43.5	25.6	
Vert	384.007	QP	27.9	17.0	10.5	32.0	23.4	46.0	22.6	
Vert	472.008	QP	32.0	17.8	11.1	32.1	28.8	46.0	17.2	
Vert	512.010	QP	33.1	18.1	11.2	32.1	30.3	46.0	15.7	
Vert	524.009	QP	33.8	18.3	11.3	32.1	31.3	46.0	14.7	
Vert	552.009	QP	34.8	18.7	11.5	32.1	32.9	46.0	13.1	
Vert	4882.000	PK	46.0	31.9	5.5	31.3	52.1	73.9	21.8	
Vert	7323.000	PK	42.2	36.0	6.8	32.0	53.0	73.9	20.9	Floor Noise
Vert	9764.000	PK	42.8	38.2	7.5	32.5	56.0	73.9	17.9	Floor Noise
Vert	4882.000	AV	39.2	31.9	5.5	31.3	45.3	53.9	8.6	
Vert	7323.000	AV	30.9	36.0	6.8	32.0	41.7	53.9	12.2	Floor Noise
Vert	9764.000	AV	30.9	38.2	7.5	32.5	44.1	53.9	9.8	Floor Noise

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

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

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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
(1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	196.001	QP	33.1	16.5	9.0	32.1	26.5	43.5	17.0	
Hori	344.005	QP	29.8	15.9	10.3	32.0	24.0	46.0	22.0	
Hori	384.006	QP	30.8	17.0	10.5	32.0	26.3	46.0	19.7	
Hori	396.007	QP	31.9	17.3	10.6	32.0	27.8	46.0	18.2	
Hori	452.010	QP	31.5	17.7	11.0	32.1	28.1	46.0	17.9	
Hori	532.009	QP	28.6	18.4	11.4	32.1	26.3	46.0	19.7	
Hori	2483.500	PK	48.0	26.9	3.3	32.0	46.2	73.9	27.7	
Hori	4960.000	PK	45.5	32.1	5.4	31.2	51.8	73.9	22.1	
Hori	7440.000	PK	42.1	36.0	6.7	32.1	52.7	73.9	21.2	Floor Noise
Hori	9920.000	PK	42.4	38.2	7.6	32.5	55.7	73.9	18.2	Floor Noise
Hori	2483.500	AV	32.9	26.9	3.3	32.0	31.1	53.9	22.8	
Hori	4960.000	AV	37.8	32.1	5.4	31.2	44.1	53.9	9.8	
Hori	7440.000	AV	30.5	36.0	6.7	32.1	41.1	53.9	12.8	Floor Noise
Hori	9920.000	AV	30.6	38.2	7.6	32.5	43.9	53.9	10.0	Floor Noise
Vert	196.002	QP	26.1	16.5	9.0	32.1	19.5	43.5	24.0	
Vert	452.009	QP	30.9	17.7	11.0	32.1	27.5	46.0	18.5	
Vert	492.007	QP	32.4	17.9	11.2	32.1	29.4	46.0	16.6	
Vert	524.011	QP	33.6	18.3	11.3	32.1	31.1	46.0	14.9	
Vert	532.010	QP	33.7	18.4	11.4	32.1	31.4	46.0	14.6	
Vert	540.009	QP	31.8	18.5	11.4	32.1	29.6	46.0	16.4	
Vert	2483.500	PK	47.9	26.9	3.3	32.0	46.1	73.9	27.8	
Vert	4960.000	PK	44.2	32.1	5.4	31.2	50.5	73.9	23.4	
Vert	7440.000	PK	42.3	36.0	6.7	32.1	52.9	73.9	21.0	Floor Noise
Vert	9920.000	PK	41.3	38.2	7.6	32.5	54.6	73.9	19.3	Floor Noise
Vert	2483.500	AV	33.0	26.9	3.3	32.0	31.2	53.9	22.7	
Vert	4960.000	AV	36.6	32.1	5.4	31.2	42.9	53.9	11.0	
Vert	7440.000	AV	30.5	36.0	6.7	32.1	41.1	53.9	12.8	Floor Noise
Vert	9920.000	AV	30.6	38.2	7.6	32.5	43.9	53.9	10.0	Floor Noise

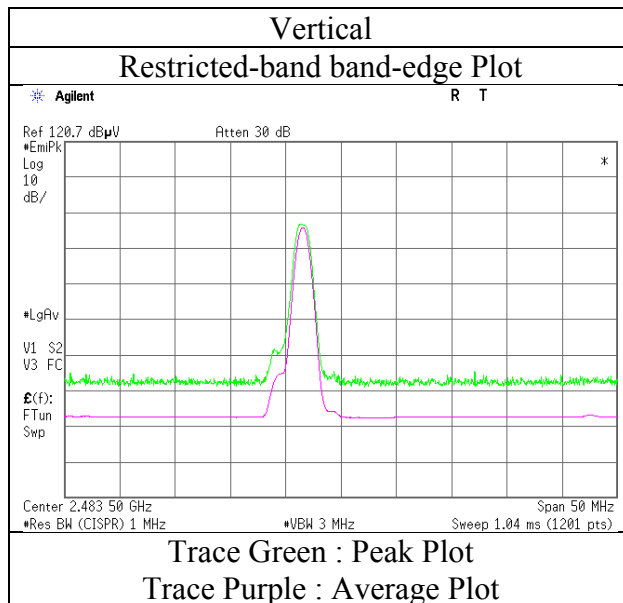
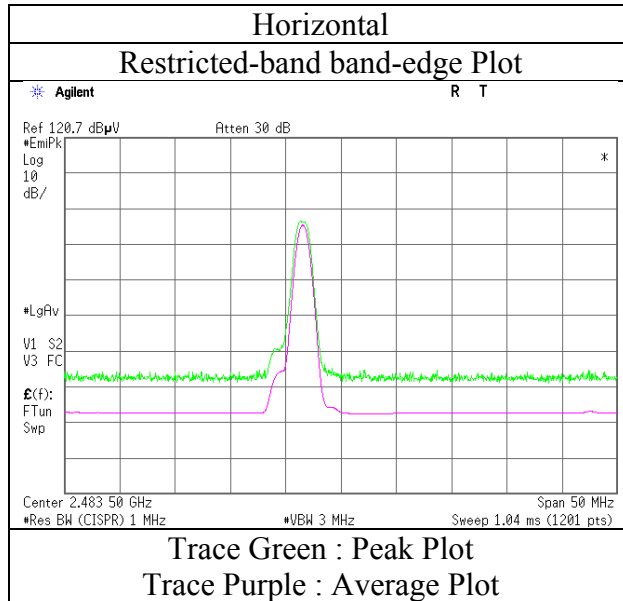
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

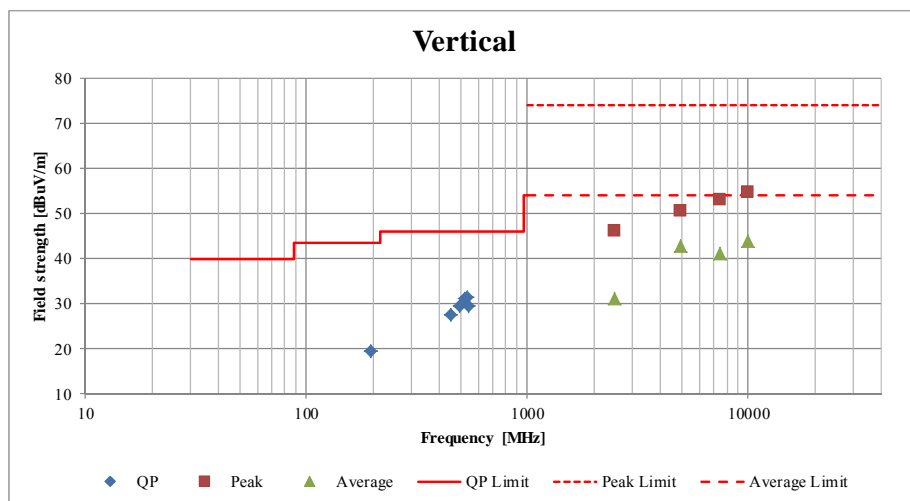
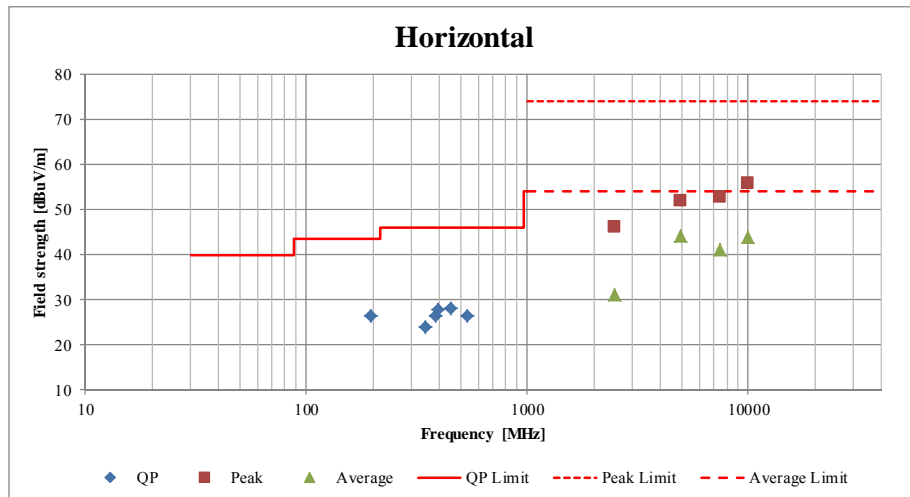
Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11025351H
Date	November 21, 2015
Temperature / Humidity	20 deg. C / 52 % RH
Engineer	Takafumi Noguchi
	(1-26.5GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11025351H	
Date	November 21, 2015	November 22, 2015
Temperature / Humidity	20 deg. C / 52 % RH	20 deg. C / 50 % RH
Engineer	Takafumi Noguchi	Kazuya Yoshioka
	(1-26.5GHz)	(Below 1GHz)
Mode	Tx, Hopping Off, DH5 2480 MHz	



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
(1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	188.003	QP	29.3	16.3	8.9	32.2	22.3	43.5	21.2	
Hori	464.007	QP	31.6	17.8	11.0	32.1	28.3	46.0	17.7	
Hori	472.010	QP	31.7	17.8	11.1	32.1	28.5	46.0	17.5	
Hori	480.009	QP	32.9	17.8	11.1	32.1	29.7	46.0	16.3	
Hori	492.008	QP	29.2	17.9	11.2	32.1	26.2	46.0	19.8	
Hori	500.011	QP	28.2	18.0	11.2	32.1	25.3	46.0	20.7	
Hori	2390.000	PK	42.8	26.9	3.3	32.0	41.0	73.9	32.9	
Hori	4804.000	PK	43.0	31.8	5.5	31.3	49.0	73.9	24.9	
Hori	7206.000	PK	41.8	36.0	6.7	32.0	52.5	73.9	21.4	Floor Noise
Hori	9608.000	PK	43.8	38.2	7.5	32.4	57.1	73.9	16.8	Floor Noise
Hori	2390.000	AV	29.9	26.9	3.3	32.0	28.1	53.9	25.8	
Hori	4804.000	AV	31.0	31.8	5.5	31.3	37.0	53.9	16.9	
Hori	7206.000	AV	31.0	36.0	6.7	32.0	41.7	53.9	12.2	Floor Noise
Hori	9608.000	AV	31.7	38.2	7.5	32.4	45.0	53.9	8.9	Floor Noise
Vert	188.002	QP	22.4	16.3	8.9	32.2	15.4	43.5	28.1	
Vert	464.010	QP	37.4	17.8	11.0	32.1	34.1	46.0	11.9	
Vert	472.008	QP	39.5	17.8	11.1	32.1	36.3	46.0	9.7	
Vert	480.002	QP	40.1	17.8	11.1	32.1	36.9	46.0	9.1	
Vert	492.010	QP	37.8	17.9	11.2	32.1	34.8	46.0	11.2	
Vert	512.011	QP	35.5	18.1	11.2	32.1	32.7	46.0	13.3	
Vert	2390.000	PK	41.8	26.9	3.3	32.0	40.0	73.9	33.9	
Vert	4804.000	PK	42.5	31.8	5.5	31.3	48.5	73.9	25.4	
Vert	7206.000	PK	42.3	36.0	6.7	32.0	53.0	73.9	20.9	Floor Noise
Vert	9608.000	PK	42.9	38.2	7.5	32.4	56.2	73.9	17.7	Floor Noise
Vert	2390.000	AV	29.9	26.9	3.3	32.0	28.1	53.9	25.8	
Vert	4804.000	AV	31.2	31.8	5.5	31.3	37.2	53.9	16.7	
Vert	7206.000	AV	30.9	36.0	6.7	32.0	41.6	53.9	12.3	Floor Noise
Vert	9608.000	AV	31.7	38.2	7.5	32.4	45.0	53.9	8.9	Floor Noise

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

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

Distance factor: 10 GHz - 26.5 GHz $20\log(3.0\text{ m} / 1.0\text{ m}) = 9.5\text{ dB}$

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2402.000	PK	87.0	26.9	3.3	32.0	85.2	-	-	Carrier
Hori	2400.000	PK	37.0	26.9	3.3	32.0	35.2	65.2	30.0	
Vert	2402.000	PK	87.8	26.9	3.3	32.0	86.0	-	-	Carrier
Vert	2400.000	PK	37.7	26.9	3.3	32.0	35.9	66.0	30.1	

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

UL Japan, Inc.

Ise EMC Lab.

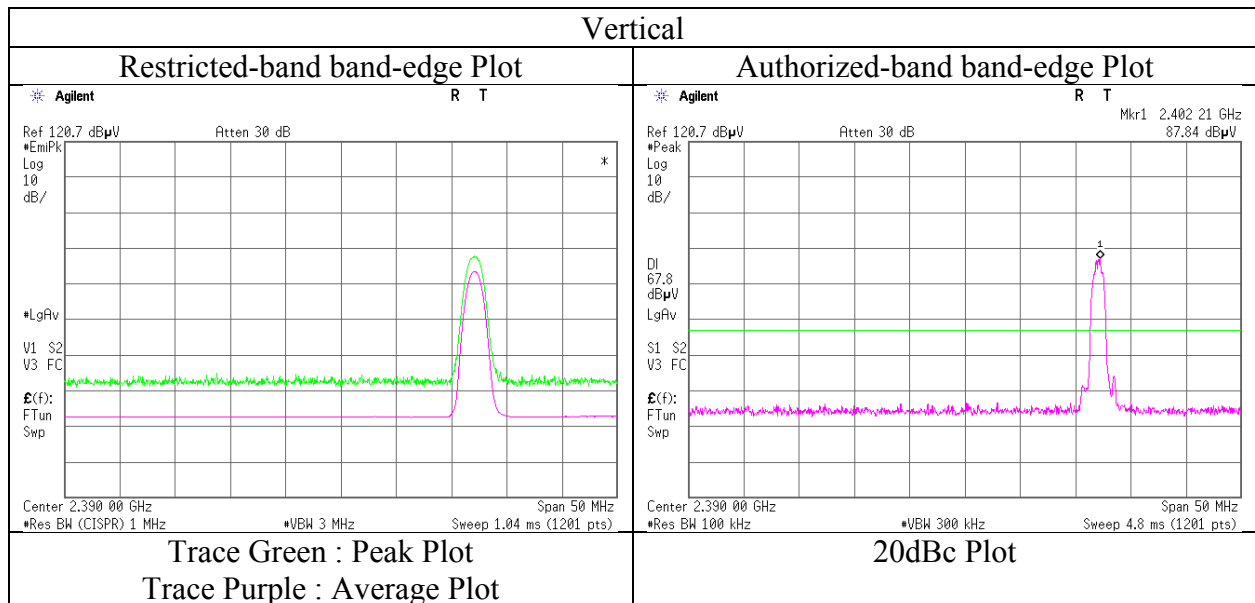
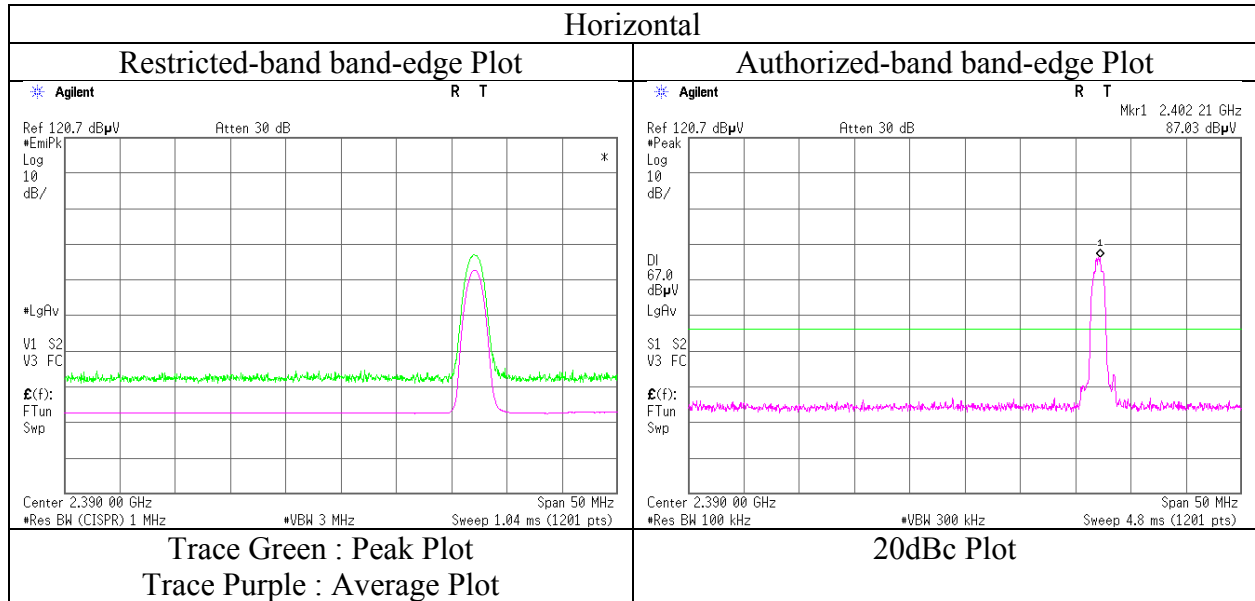
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Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11025351H
Date	November 21, 2015
Temperature / Humidity	20 deg. C / 52 % RH
Engineer	Takafumi Noguchi (1-26.5GHz)
Mode	Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
 (1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2441 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	192.002	QP	30.7	16.4	9.0	32.1	24.0	43.5	19.5	
Hori	392.002	QP	30.7	17.2	10.6	32.0	26.5	46.0	19.5	
Hori	400.007	QP	29.8	17.4	10.6	32.0	25.8	46.0	20.2	
Hori	404.007	QP	32.8	17.4	10.6	32.0	28.8	46.0	17.2	
Hori	412.002	QP	34.5	17.5	10.7	32.1	30.6	46.0	15.4	
Hori	424.003	QP	28.8	17.5	10.8	32.1	25.0	46.0	21.0	
Hori	4882.000	PK	42.7	31.9	4.7	31.3	48.0	73.9	25.9	
Hori	7323.000	PK	42.7	36.0	6.8	32.0	53.5	73.9	20.4	Floor Noise
Hori	9764.000	PK	42.3	38.2	7.5	32.5	55.5	73.9	18.4	Floor Noise
Hori	4882.000	AV	32.4	31.9	4.7	31.3	37.7	53.9	16.2	
Hori	7323.000	AV	30.7	36.0	6.8	32.0	41.5	53.9	12.4	Floor Noise
Hori	9764.000	AV	30.8	38.2	7.5	32.5	44.0	53.9	9.9	Floor Noise
Vert	520.004	QP	30.8	18.3	11.3	32.1	28.3	46.0	17.7	
Vert	532.011	QP	31.5	18.4	11.4	32.1	29.2	46.0	16.8	
Vert	540.011	QP	31.7	18.5	11.4	32.1	29.5	46.0	16.5	
Vert	552.005	QP	32.7	18.7	11.5	32.1	30.8	46.0	15.2	
Vert	560.011	QP	32.5	18.8	11.5	32.1	30.7	46.0	15.3	
Vert	580.011	QP	29.0	19.1	11.6	32.1	27.6	46.0	18.4	
Vert	4882.000	PK	43.4	31.9	4.7	31.3	48.7	73.9	25.2	
Vert	7323.000	PK	41.7	36.0	6.0	32.0	51.7	73.9	22.2	Floor Noise
Vert	9764.000	PK	42.3	38.2	6.9	32.5	54.9	73.9	19.0	Floor Noise
Vert	4882.000	AV	31.9	31.9	4.7	31.3	37.2	53.9	16.7	
Vert	7323.000	AV	30.7	36.0	6.0	32.0	40.7	53.9	13.2	Floor Noise
Vert	9764.000	AV	30.8	38.2	6.9	32.5	43.4	53.9	10.5	Floor Noise

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

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

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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 11025351H
Date : November 21, 2015 November 22, 2015
Temperature / Humidity : 20 deg. C / 52 % RH 20 deg. C / 50 % RH
Engineer : Takafumi Noguchi Kazuya Yoshioka
 (1-26.5GHz) (Below 1GHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	364.004	QP	34.6	16.4	10.4	32.0	29.4	46.0	16.6	
Hori	376.007	QP	33.5	16.8	10.5	32.0	28.8	46.0	17.2	
Hori	384.008	QP	37.4	17.0	10.5	32.0	32.9	46.0	13.1	
Hori	392.008	QP	34.5	17.2	10.6	32.0	30.3	46.0	15.7	
Hori	460.006	QP	33.2	17.7	11.0	32.1	29.8	46.0	16.2	
Hori	464.006	QP	33.2	17.8	11.0	32.1	29.9	46.0	16.1	
Hori	2483.500	PK	43.4	26.9	3.3	32.0	41.6	73.9	32.3	
Hori	4960.000	PK	43.1	32.1	5.4	31.2	49.4	73.9	24.5	
Hori	7440.000	PK	42.5	36.0	6.7	32.1	53.1	73.9	20.8	Floor Noise
Hori	9920.000	PK	42.2	38.2	7.6	32.5	55.5	73.9	18.4	Floor Noise
Hori	2483.500	AV	31.0	26.9	3.3	32.0	29.2	53.9	24.7	
Hori	4960.000	AV	32.4	32.1	5.4	31.2	38.7	53.9	15.2	
Hori	7440.000	AV	30.6	36.0	6.7	32.1	41.2	53.9	12.7	Floor Noise
Hori	9920.000	AV	30.6	38.2	7.6	32.5	43.9	53.9	10.0	Floor Noise
Vert	464.008	QP	37.4	17.8	11.0	32.1	34.1	46.0	11.9	
Vert	480.009	QP	36.3	17.8	11.1	32.1	33.1	46.0	12.9	
Vert	504.008	QP	34.6	18.0	11.2	32.1	31.7	46.0	14.3	
Vert	512.010	QP	35.8	18.1	11.2	32.1	33.0	46.0	13.0	
Vert	520.011	QP	35.8	18.3	11.3	32.1	33.3	46.0	12.7	
Vert	528.010	QP	34.0	18.4	11.3	32.1	31.6	46.0	14.4	
Vert	2483.500	PK	45.6	26.9	3.3	32.0	43.8	73.9	30.1	
Vert	4960.000	PK	41.9	32.1	5.4	31.2	48.2	73.9	25.7	
Vert	7440.000	PK	41.4	36.0	6.7	32.1	52.0	73.9	21.9	Floor Noise
Vert	9920.000	PK	42.1	38.2	7.6	32.5	55.4	73.9	18.5	Floor Noise
Vert	2483.500	AV	32.9	26.9	3.3	32.0	31.1	53.9	22.8	
Vert	4960.000	AV	31.2	32.1	5.4	31.2	37.5	53.9	16.4	
Vert	7440.000	AV	30.4	36.0	6.7	32.1	41.0	53.9	12.9	Floor Noise
Vert	9920.000	AV	30.6	38.2	7.6	32.5	43.9	53.9	10.0	Floor Noise

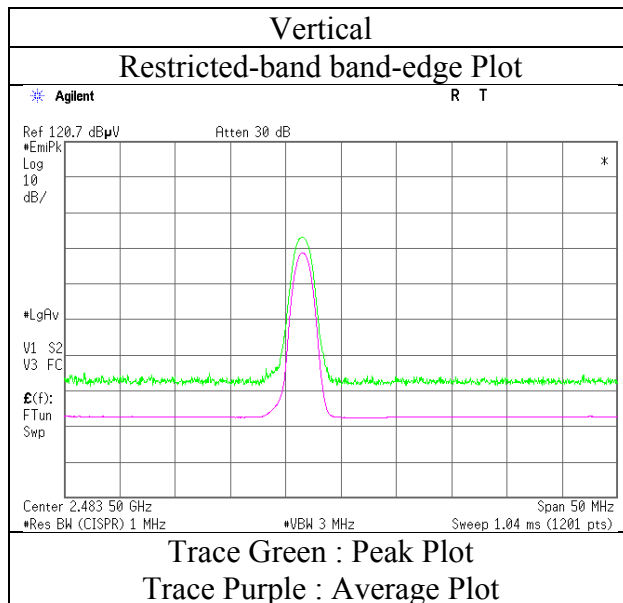
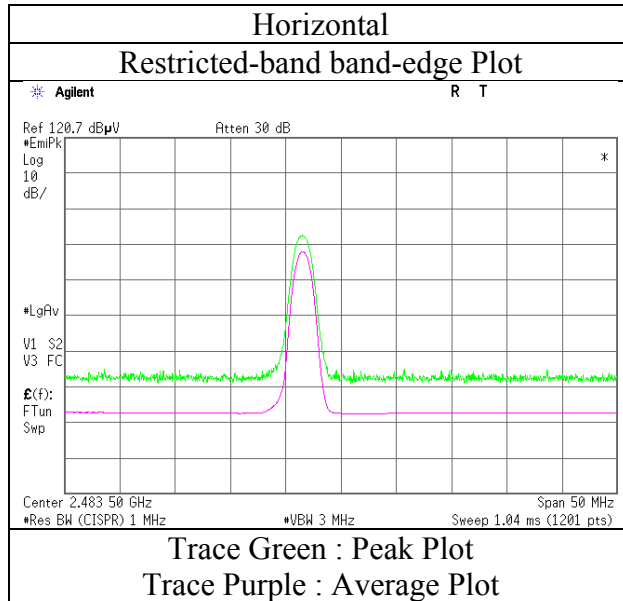
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier)

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

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

Radiated Spurious Emission (Reference Plot for band-edge)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11025351H
Date	November 21, 2015
Temperature / Humidity	20 deg. C / 52 % RH
Engineer	Takafumi Noguchi
	(1-26.5GHz)
Mode	Tx, Hopping Off, 3DH5 2480 MHz

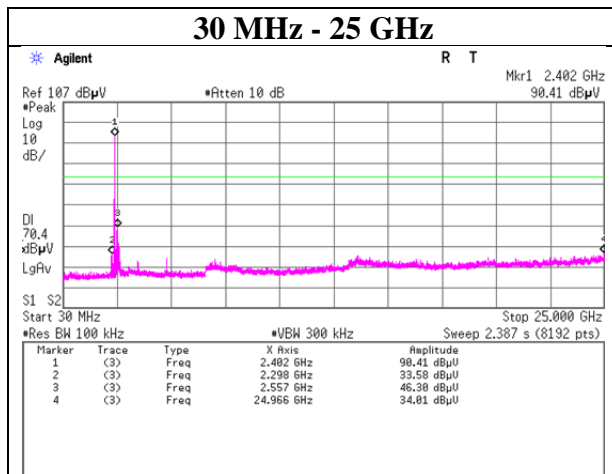
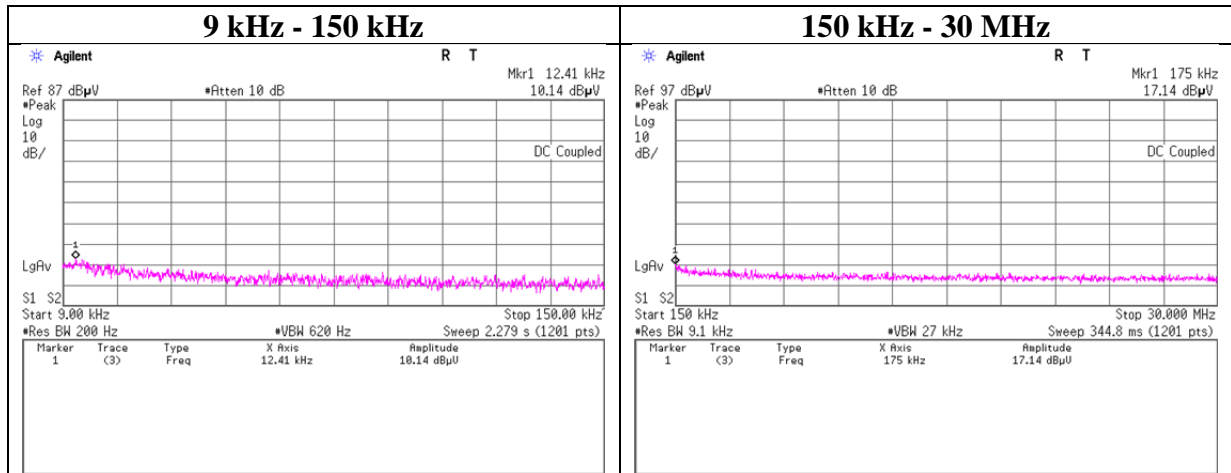


* Final result of restricted band edge was shown in tabular data.

Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, DHS

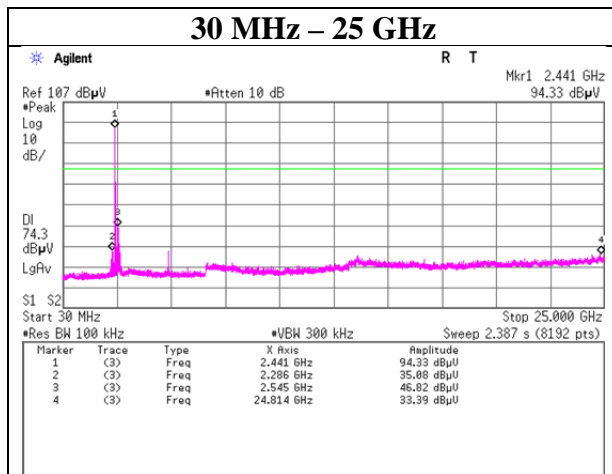
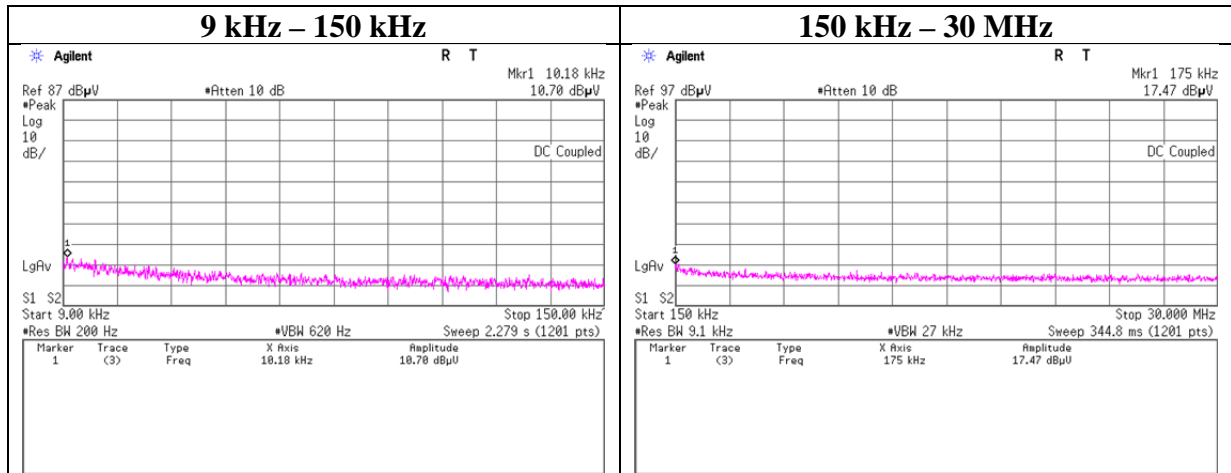
2402 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, DHS

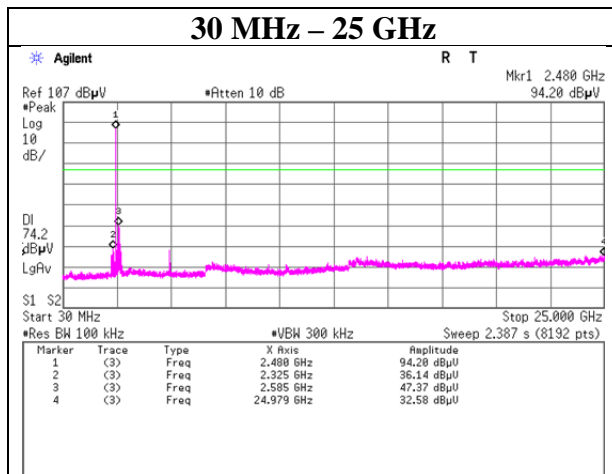
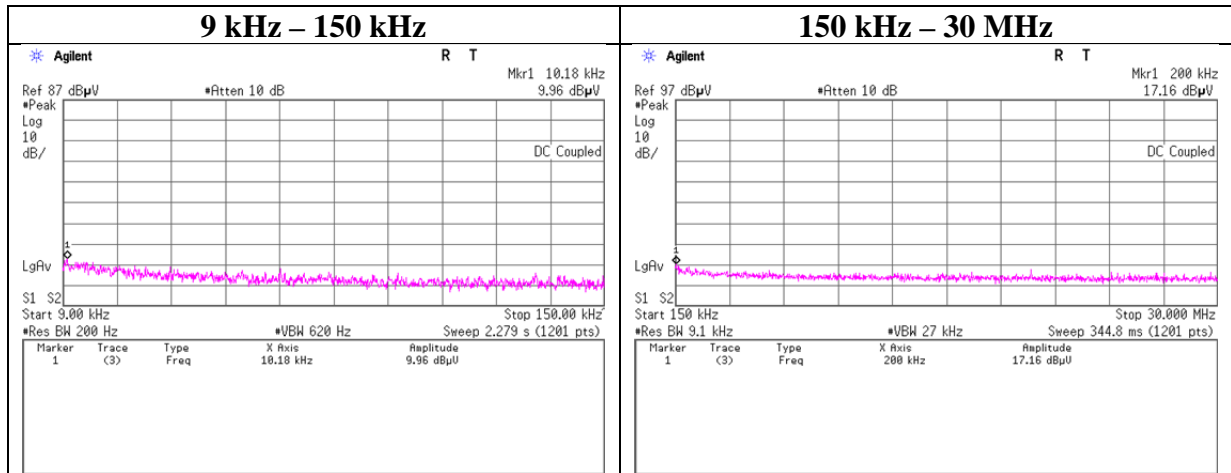
2441 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, DHS

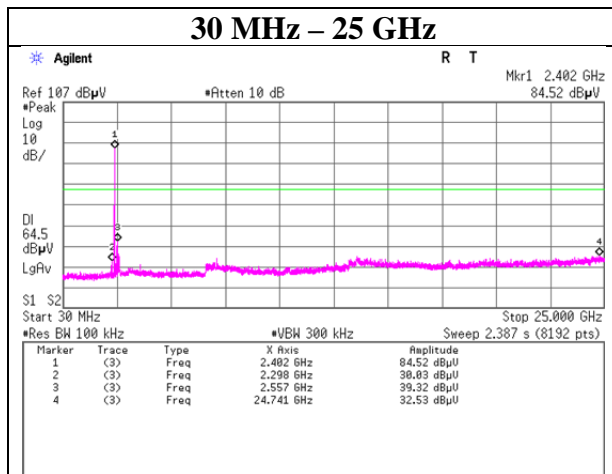
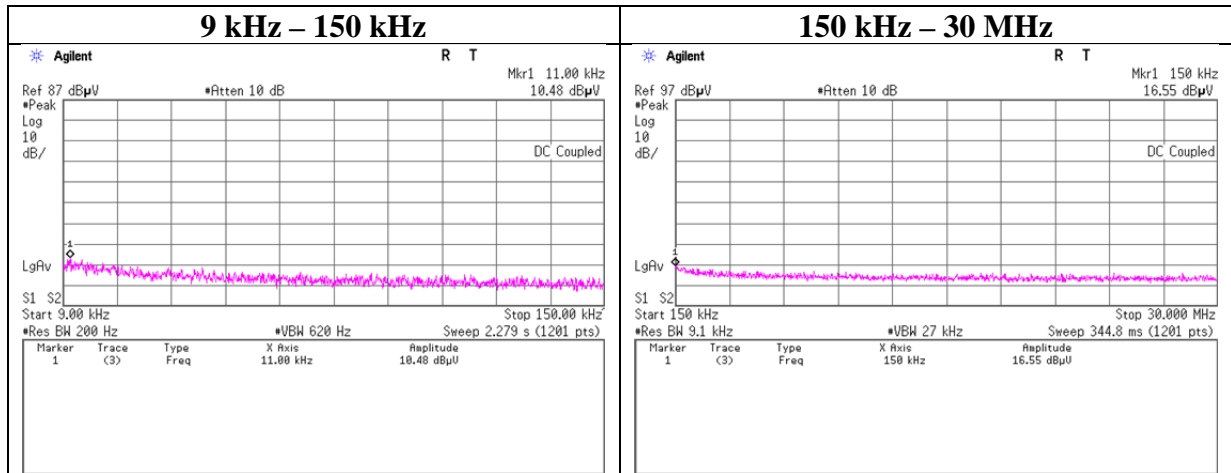
2480 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, 3DH5

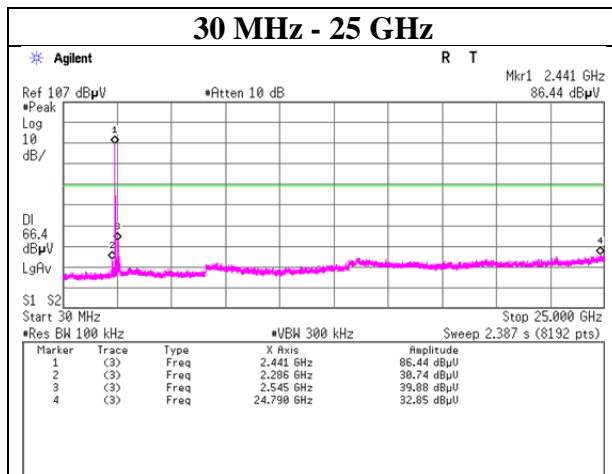
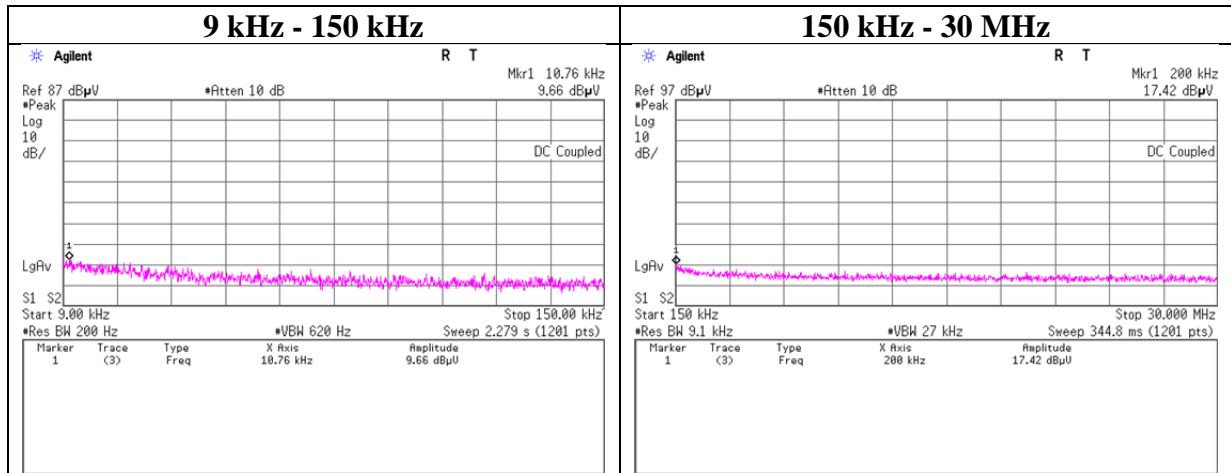
2402 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, 3DH5

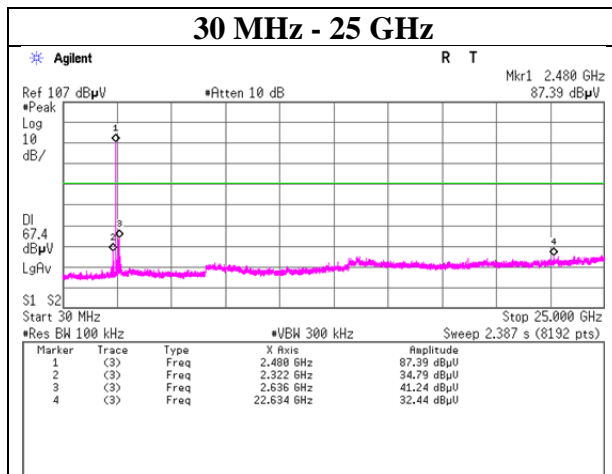
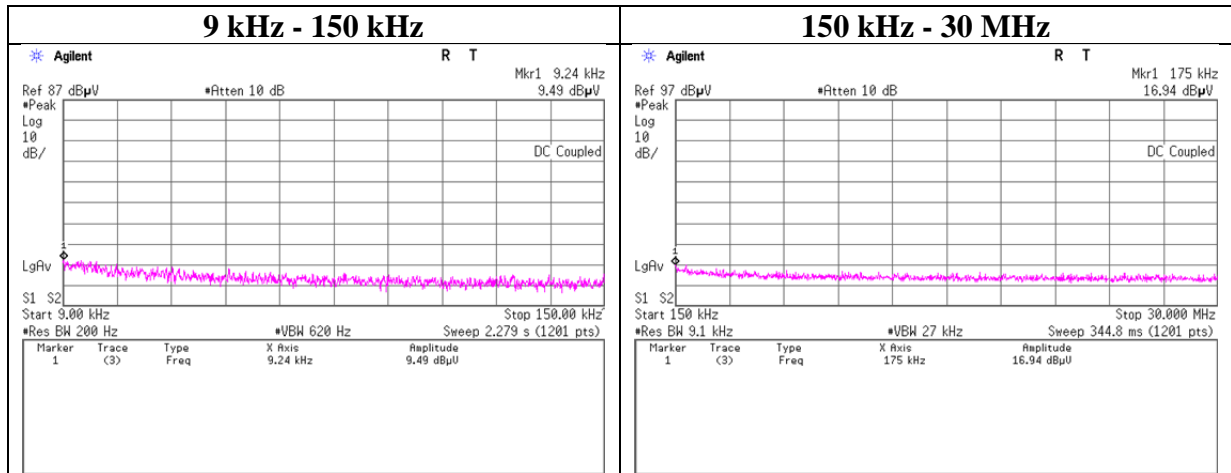
2441 MHz



Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx, Hopping Off, 3DH5

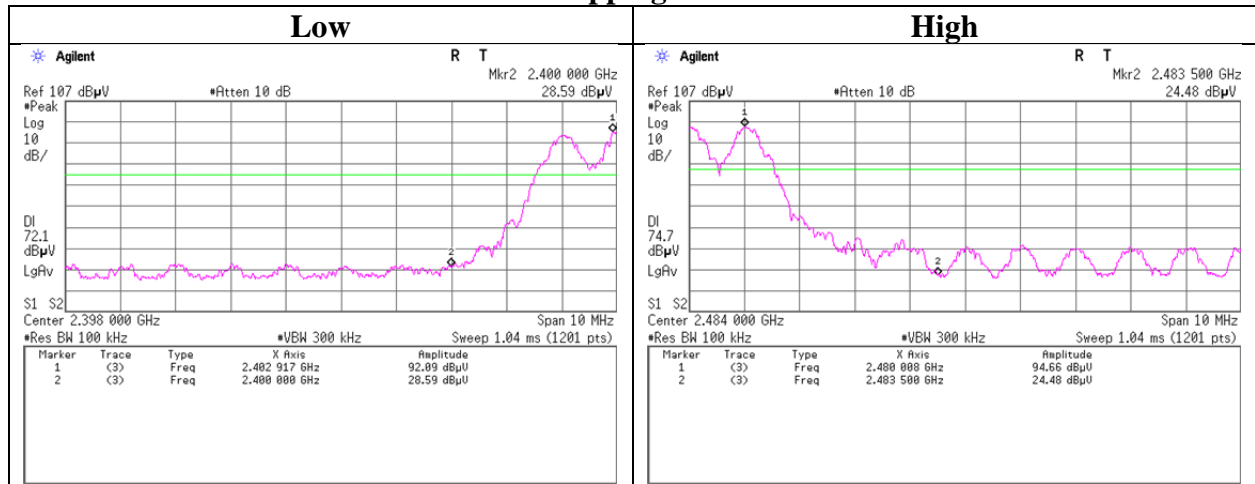
2480 MHz



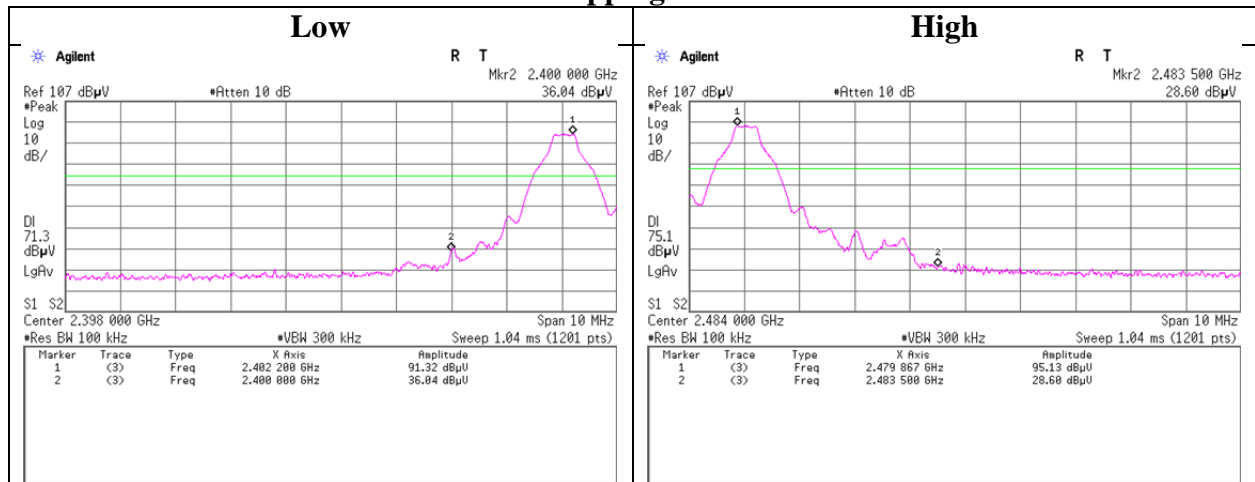
Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx DHS

Hopping On



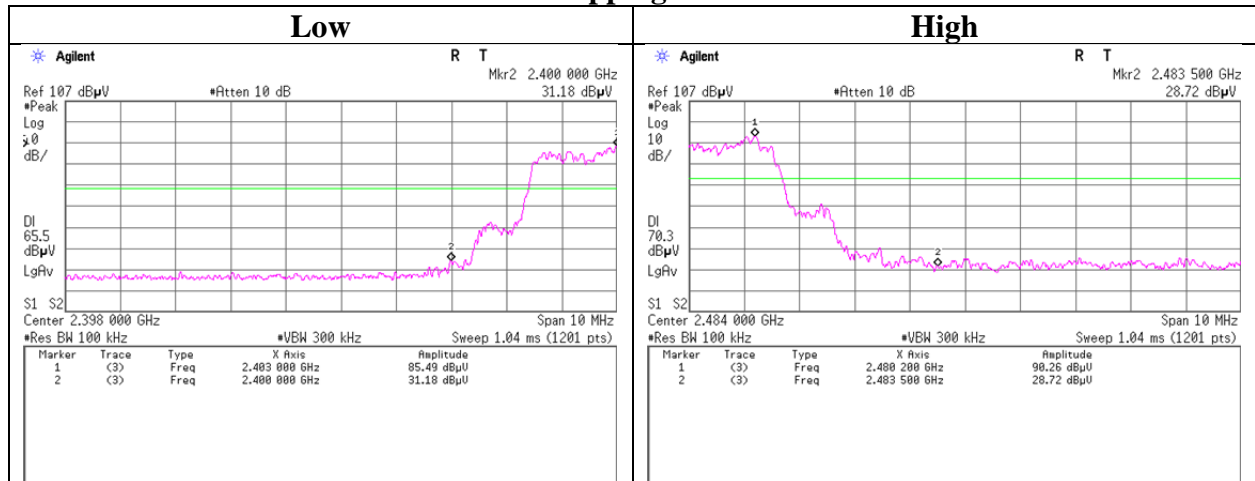
Hopping Off



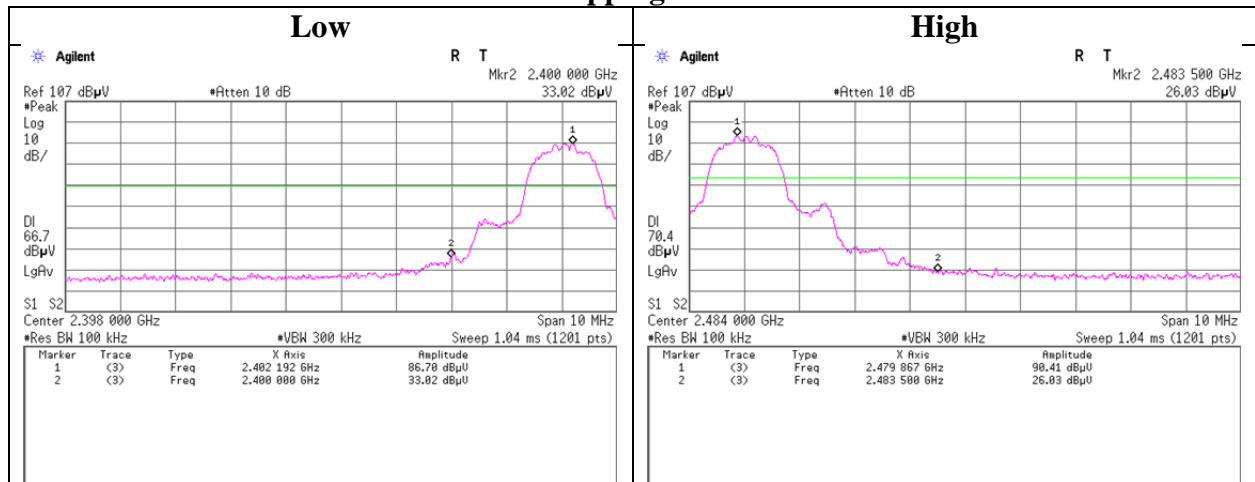
Conducted Emission Band Edge compliance

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx 3DH5

Hopping On



Hopping Off

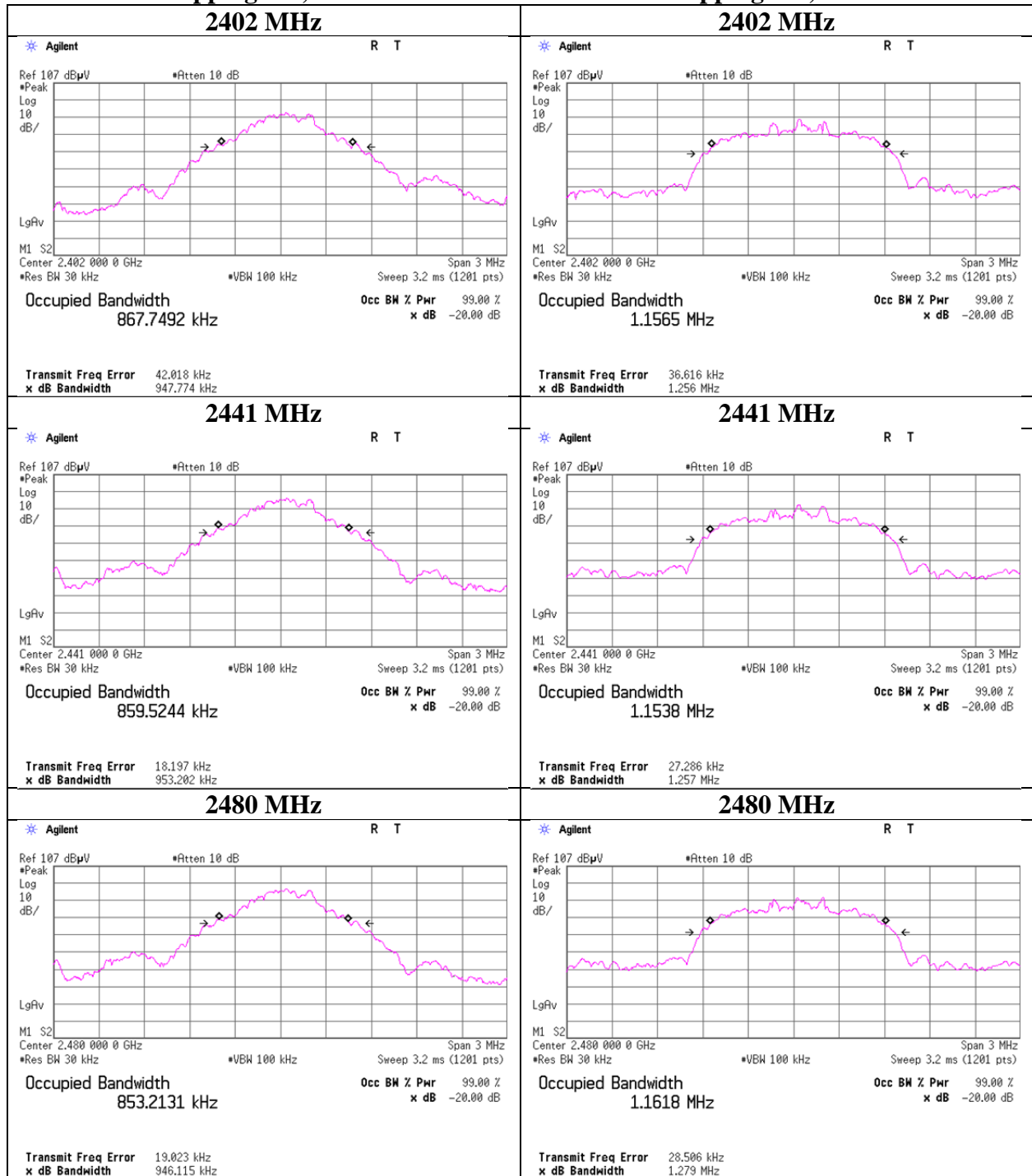


99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx Hopping Off

Hopping Off, DH5

Hopping Off, 3DH5



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Ise EMC Lab.

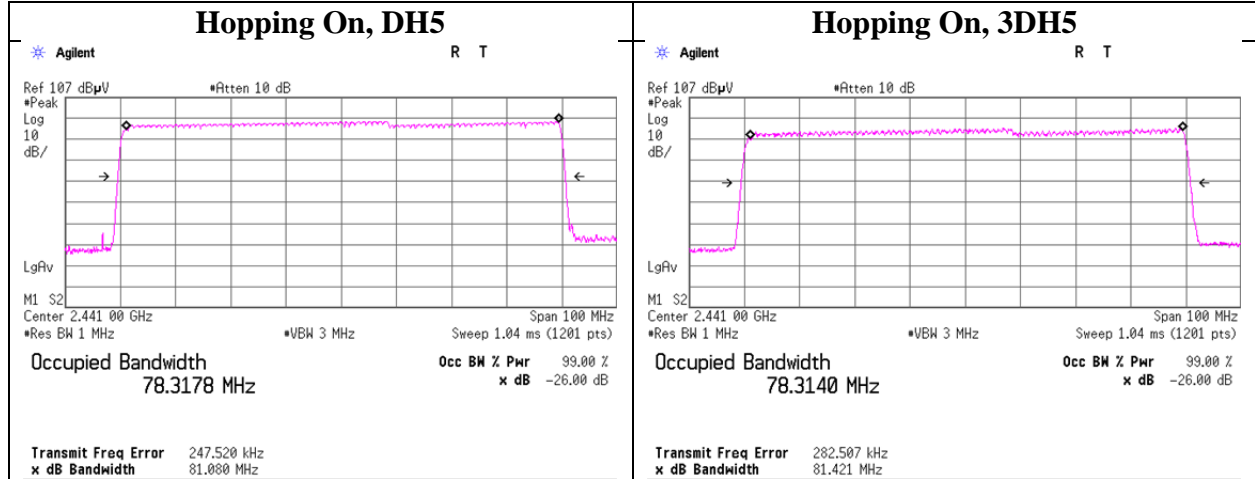
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11025351H
Date	November 30, 2015
Temperature / Humidity	21 deg. C / 37 % RH
Engineer	Shinichi Miyazono
Mode	Tx Hopping On



APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/10/01 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2015/01/13 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2015/05/18 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2015/05/18 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2015/05/21 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2015/03/19 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2015/05/19 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2015/01/16 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2015/09/16 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2015/09/02 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2015/10/11 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2015/10/11 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2015/07/13 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2015/04/08 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2015/03/10 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2015/01/13 * 12
MBM-10	Barometer	Sunoh	SBR121	832	AT	2013/12/17 * 36
MMM-12	DIGITAL HiTESTER	Hioki	3805	060500120	AT	2015/02/05 * 12
MSA-15	Spectrum Analyzer	Agilent	E4440A	MY46187105	AT	2015/11/11 * 12
MAT-90	Attenuator	Weinschel Associates	WA56-10	56100306	AT	2015/06/01 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2015/04/01 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2015/04/01 * 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: RE: Radiated Emission test
AT: Antenna Terminal Conducted test**

UL Japan, Inc.

Ise EMC Lab.

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