



RADIO TEST REPORT

Test Report No. : 10114553H-B

Applicant : **Panasonic Corporation**
Type of Equipment : **Digital Wireless Stereo Headphones**
Model No. : **RP-BTD10**
FCC ID : **ACJ-RP-BTD10**
Test regulation : **FCC Part 15 Subpart C: 2013**
Test Result : **Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: November 21 to 23, 2013

Representative test engineer: *T. Shimada*
Takumi Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by: *M. Nishiyama*
Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/ma rk1/index.jsp#nvlap>

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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 : +81-6-6906-2739
Facsimile Number : +81-6-6906-8405
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 Headphones
Model No. : RP-BTD10
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC5.0V, Li-Ion 3.6V
Receipt Date of Sample : November 15, 2013
Country of Mass-production : China
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system : Crystal (BT): 26MHz
Headphone Micon : 8MHz

Radio Specification

[Bluetooth (Ver. 3.0 with EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : FHSS
Power Supply (radio part input) : DC 3.6V/4.2V
Antenna type : ChipAntenna
Antenna Gain : 3dBi

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2013, final revised on September 30, 2013 and effective October 30, 2013

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: 2013, final revised on September 30, 2013 and effective October 30, 2013.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	N/A *1)	N/A	-
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-210 A8.1 (b)	See data.	Complied	Conducted
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-210 A8.1 (a)		Complied	Conducted
Number of Hopping Frequency	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)		Complied	Conducted
Dwell time	FCC: FCC Public Notice DA 00-705 ----- IC: -	FCC: Section15.247(a)(1)(iii) ----- IC: RSS-210 A8.1 (d)		Complied	Conducted
Maximum Peak Output Power	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.8	FCC: Section15.247(a)(b)(1) ----- IC: RSS-210 A8.4 (2)		Complied	Conducted
Spurious Emission & Band Edge Compliance	FCC: FCC Public Notice DA 00-705 ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 6 and 7.2.3		8.7dB 4804.000MHz, PK, Hori.	Complied

*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.

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

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

FCC 15.31 (e)

DC4.2V: This EUT provides stable voltage (DC4.2V) constantly to RF Part regardless of input voltage.

DC3.6V: This test was performed with the New Battery (DC 3.6V) and the constant voltage was supplied to the EUT during the tests.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	-	Conducted

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

3.4 Uncertainty

EMI

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

Test room (semi-anechoic chamber)	Radiated emission (10m*)(±dB)		
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz
No.1	4.0dB	5.1dB	4.7dB
No.2	-	-	-
No.3	-	-	-
No.4	-	-	-

*10m = Measurement distance

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

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

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

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

Radiated emission test(3m)

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.5 Test Location

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

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	-	6.2 x 4.7 x 3.0m	2.4 x 3.4m	-

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

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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Facsimile : +81 596 24 8124

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

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation, 20dB Bandwidth,	Tx (Hopping on) DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Number of Hopping Frequency	Tx (Hopping on) DH5, 3DH5 Inquiry	-
Dwell time	Tx (Hopping on), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5 Inquiry	-
Maximum Peak Output Power	Tx (Hopping off) DH5, 2DH5, 3DH5 Inquiry	2402MHz 2441MHz 2480MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2441MHz 2480MHz
<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) *We removed 2DH mode (2 Mb/s EDR: pi/4DQPSK) except power measurement by using 3DH mode (3 Mb/s EDR:8DPSK) as a representative. *EUT has the power settings by the software as follows; Power settings: BDR: 100, EDR: 100 Software: CSR BlueTest3 *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

A

*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 Headphones	RP-BTD10	8: RE 11:AT	Panasonic	EUT

RE: Radiated Spurious Emission test
AT: Antenna Terminal Conducted tests

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Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

SECTION 5: Radiated Spurious Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

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

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

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

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz *1)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz)		3m (below 10GHz), 1m*2) (above 10GHz)

*1) Although 00-705 accepts VBW=10Hz 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 : 30M-25GHz
Test data : APPENDIX
Test result : Pass

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Facsimile : +81 596 24 8124

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

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.
*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)
*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**

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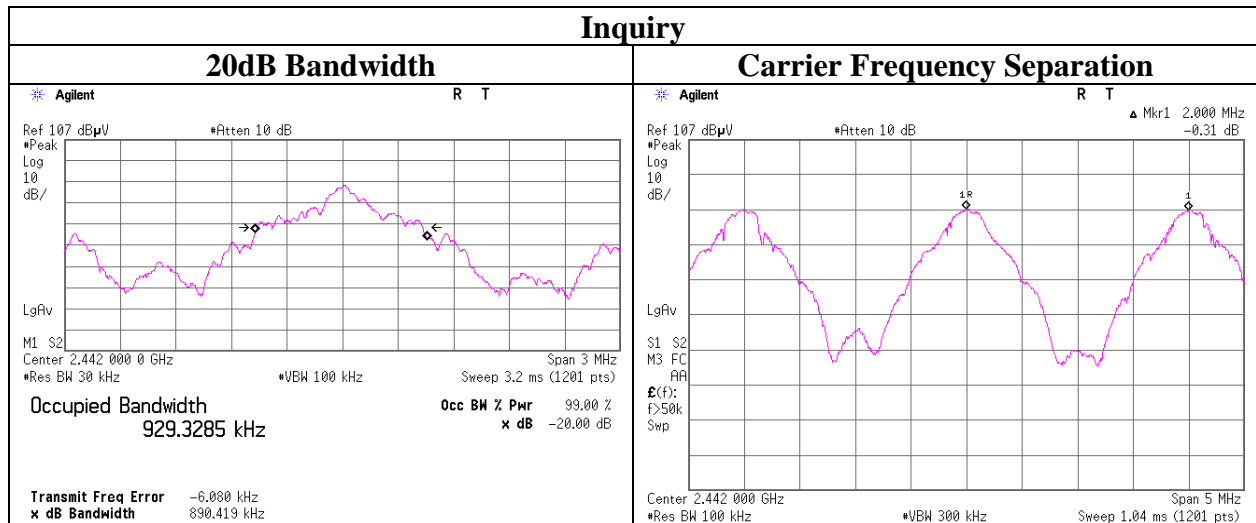
APPENDIX 1: Data of EMI test

20dB Bandwidth and Carrier Frequency Separation

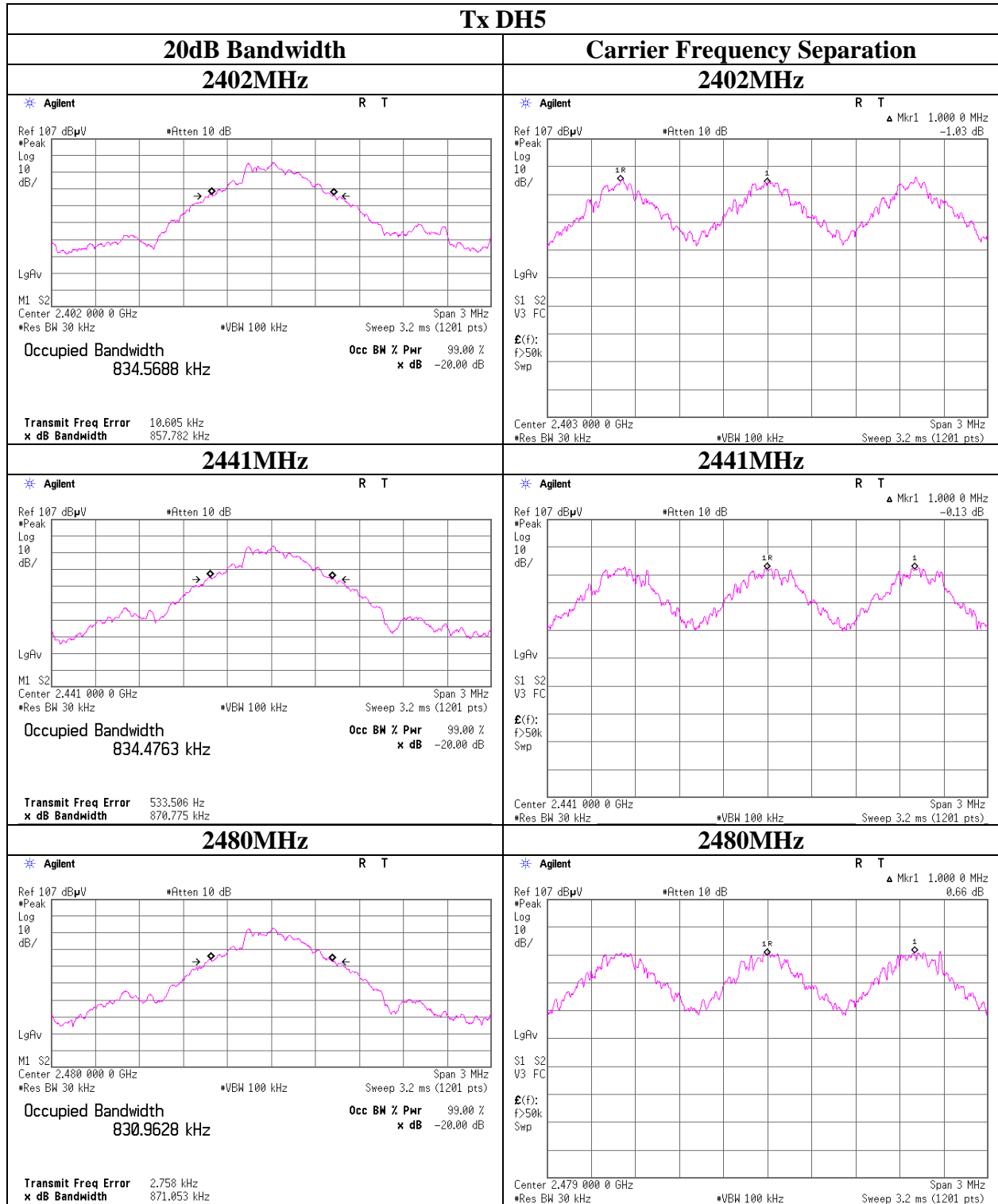
Test place : Head Office EMC Lab. No.3 Measurement Room
Report No. : 10114553H
Date : 11/21/2013
Temperature/ Humidity : 24 deg. C / 47% RH
Engineer : Takumi Shimada
Mode : Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.858	1.000	≧ 0.572
DH5	2441.0	0.871	1.000	≧ 0.581
DH5	2480.0	0.871	1.000	≧ 0.581
3DH5	2402.0	1.279	1.000	≧ 0.853
3DH5	2441.0	1.288	1.000	≧ 0.859
3DH5	2480.0	1.266	1.000	≧ 0.844
Inquiry	2442.0	0.890	2.000	≧ 0.594

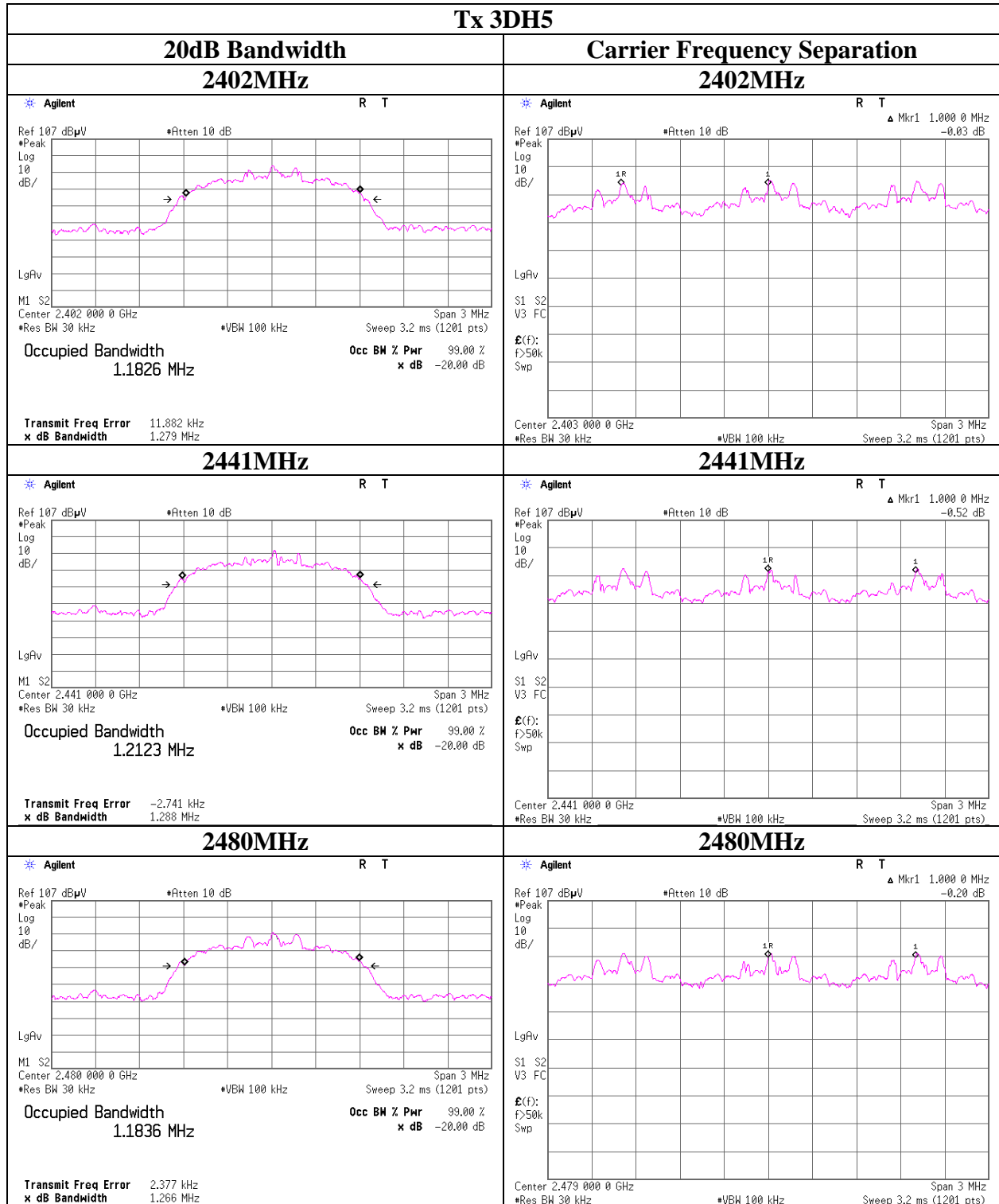
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).
No limit applies to 20dB Bandwidth.



20dB Bandwidth and Carrier Frequency Separation



20dB Bandwidth and Carrier Frequency Separation

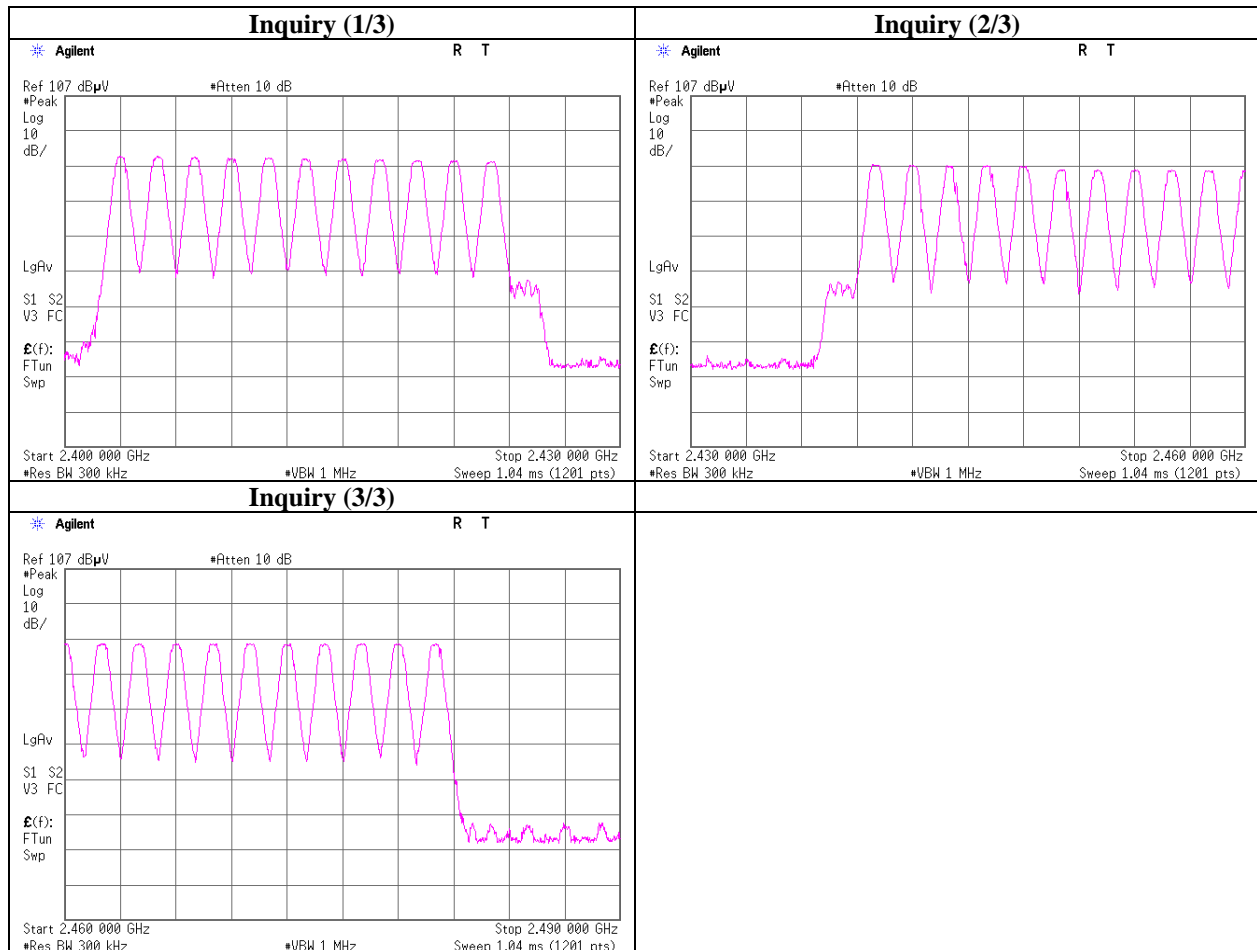


Number of Hopping Frequency

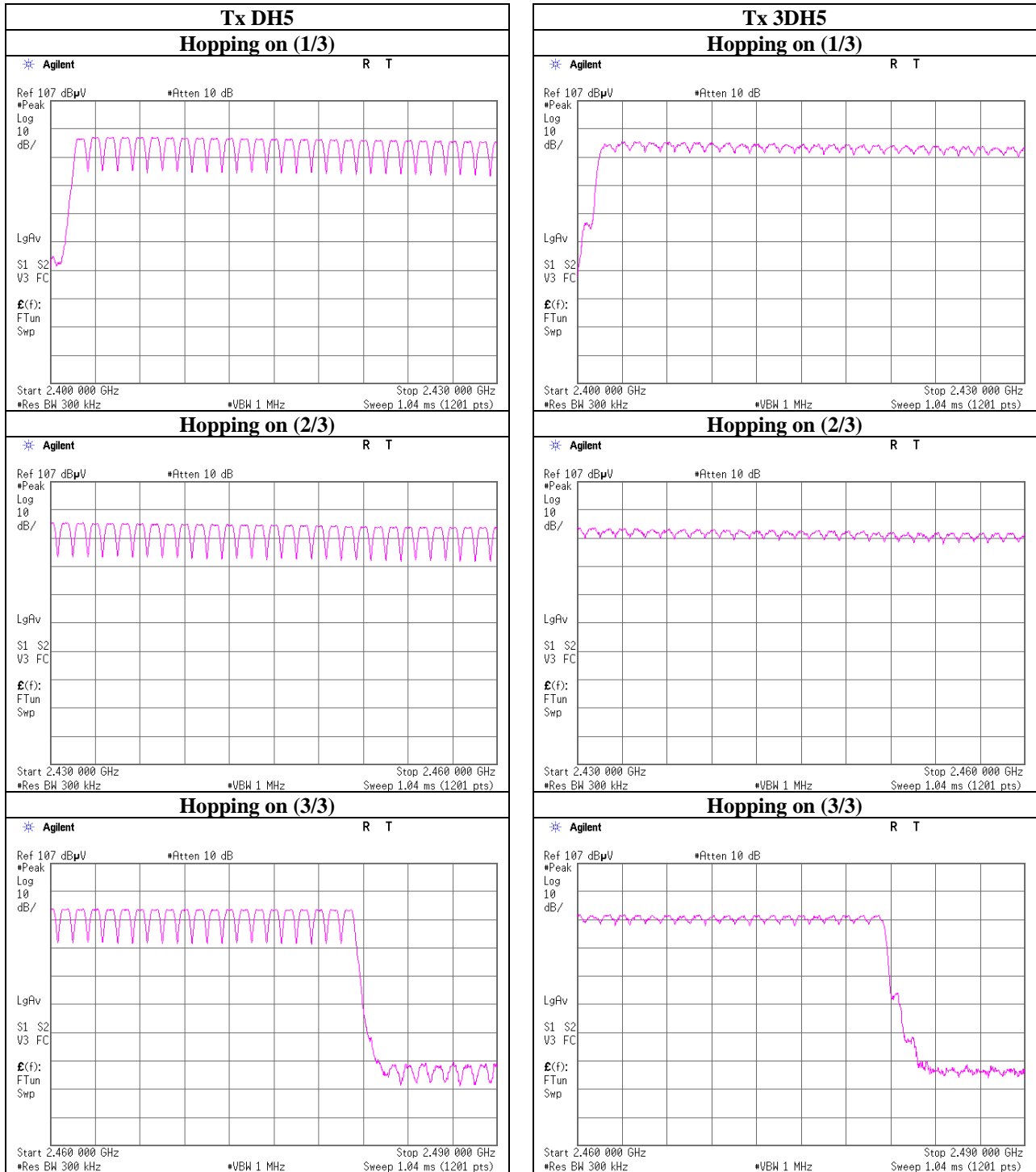
Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Number of channel [times]	Limit [times]
DH5	79	>= 15
3DH5	79	>= 15
Inquiry	32	>= 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	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/22/2013
Temperature/ Humidity	22 deg. C / 45% RH
Engineer	Takumi Shimada
Mode	Tx (Hopping on) DH5/3DH5/Inquiry

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.0 times / 5 sec. x 31.6 sec. = 316 times	0.438	138	400
DH3	26.0 times / 5 sec. x 31.6 sec. = 165 times	1.695	280	400
DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.961	320	400
3DH1	51.0 times / 5 sec. x 31.6 sec. = 323 times	0.448	145	400
3DH3	25.0 times / 5 sec. x 31.6 sec. = 158 times	1.705	269	400
3DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.961	320	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.131	167	400

Sample Calculation

Result = Number of transmission x Length of transmission time

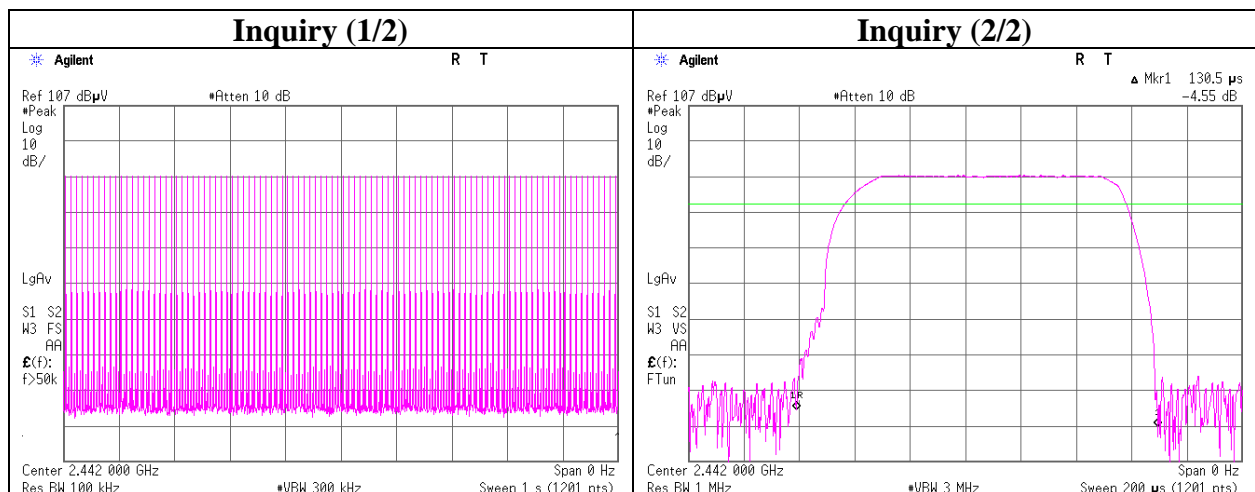
*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	50	50	50	50	50	50
DH3	26	26	26	26	26	26
DH5	17	17	17	17	17	17
3DH1	51	51	51	51	51	51
3DH3	25	25	25	25	25	25
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 $N=79$.



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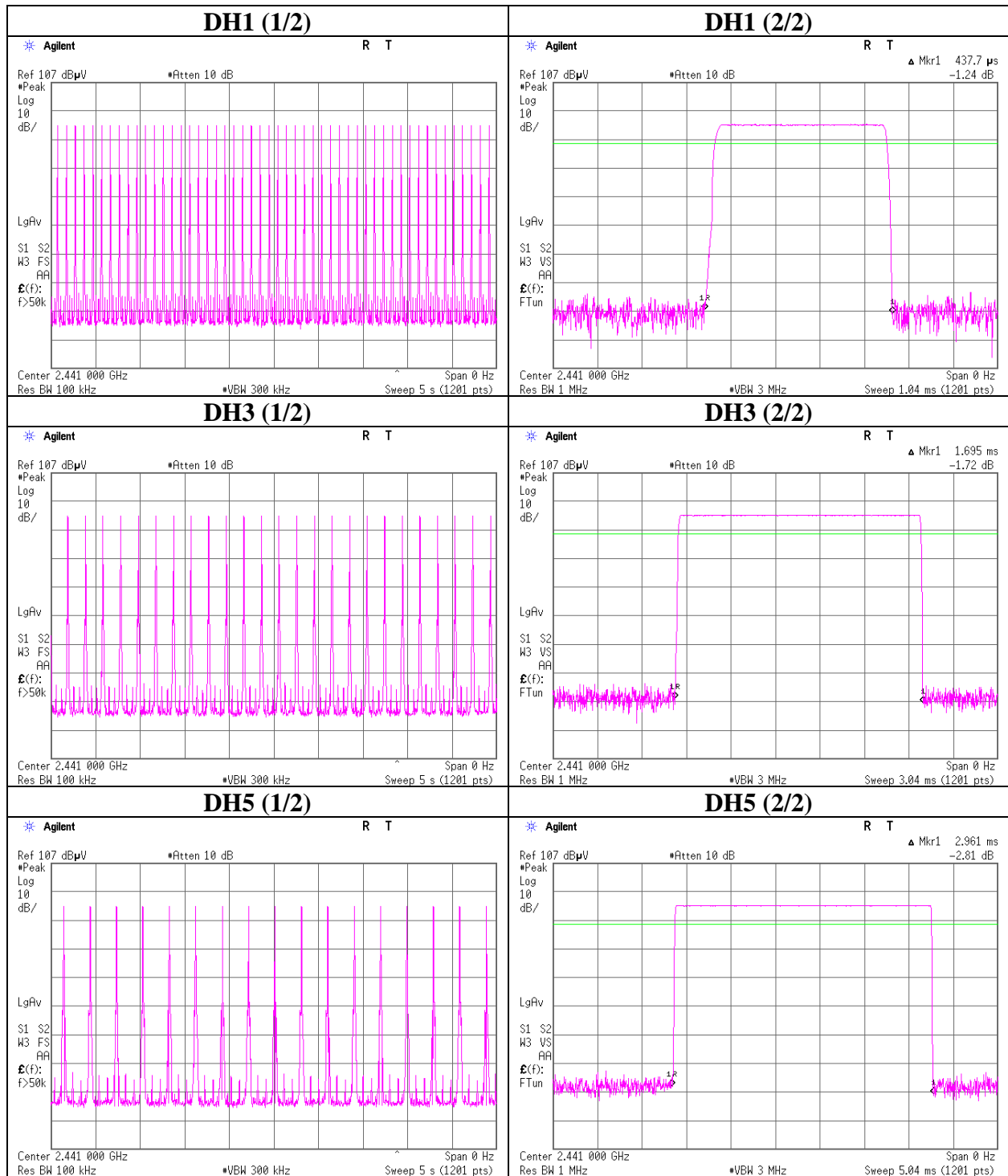
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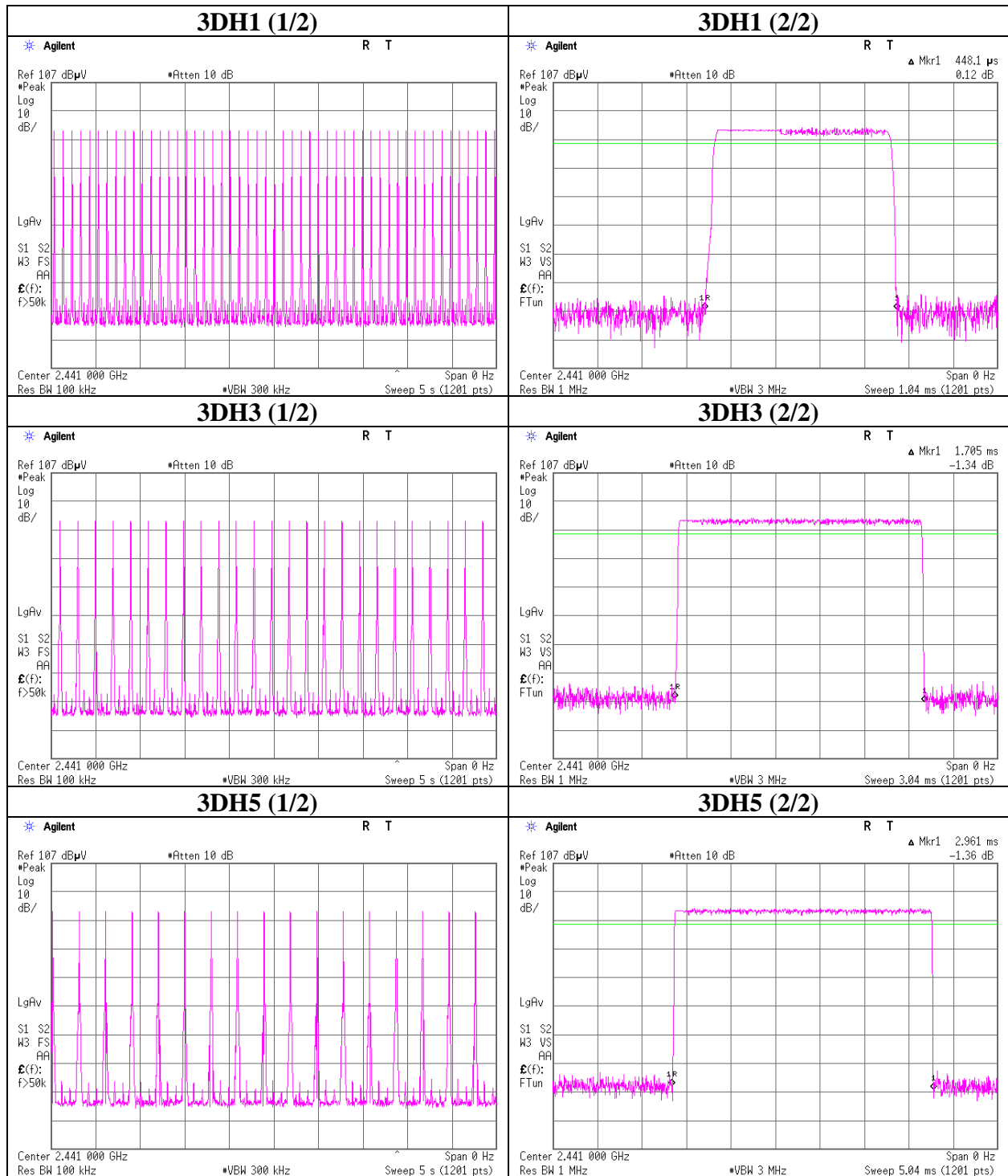
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Dwell time



Dwell time



Maximum Peak Output Power

Test place Head Office EMC Lab. No.3 Measurement Room
Report No. 10114553H
Date 11/21/2013
Temperature/ Humidity 24 deg. C / 47% RH
Engineer Takumi Shimada
Mode Tx (Hopping off) DH5/2DH5/3DH5/Inquiry

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-12.94	0.81	9.97	-2.16	0.61	20.96	125	23.12
DH5	2441.0	-14.54	0.90	9.97	-3.67	0.43	20.96	125	24.63
DH5	2480.0	-15.70	0.88	9.97	-4.85	0.33	20.96	125	25.81
2DH5	2402.0	-13.91	0.81	9.97	-3.13	0.49	20.96	125	24.09
2DH5	2441.0	-15.49	0.90	9.97	-4.62	0.35	20.96	125	25.58
2DH5	2480.0	-16.74	0.88	9.97	-5.89	0.26	20.96	125	26.85
3DH5	2402.0	-13.86	0.81	9.97	-3.08	0.49	20.96	125	24.04
3DH5	2441.0	-15.44	0.90	9.97	-4.57	0.35	20.96	125	25.53
3DH5	2480.0	-16.70	0.88	9.97	-5.85	0.26	20.96	125	26.81
Inquiry	2441.0	-16.76	0.90	9.97	-5.89	0.26	20.96	125	26.85

Sample Calculation:

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

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

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

Average Output Power (Reference data for SAR testing)

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm]	[mW]
DH5	2402.0	-4.36	0.81	0.00	-3.55	0.44
DH5	2441.0	-6.05	0.90	0.00	-5.15	0.31
DH5	2480.0	-7.42	0.88	0.00	-6.54	0.22
2DH5	2402.0	-7.25	0.81	0.00	-6.44	0.23
2DH5	2441.0	-8.91	0.90	0.00	-8.01	0.16
2DH5	2480.0	-10.42	0.88	0.00	-9.54	0.11
3DH5	2402.0	-7.22	0.81	0.00	-6.41	0.23
3DH5	2441.0	-8.87	0.90	0.00	-7.97	0.16
3DH5	2480.0	-10.38	0.88	0.00	-9.50	0.11
Inquiry	2441.0	-17.52	0.90	0.00	-16.62	0.02

Sample Calculation:

Result = Reading + Cable Loss

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C / 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
(Above 1GHz) (Below 1GHz)
Mode Tx, DH5 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2298.021	PK	48.1	27.9	3.0	32.4	46.6	73.9	27.3	
Hori	2390.000	PK	40.5	28.2	3.1	32.4	39.4	73.9	34.5	
Hori	2506.014	PK	47.9	28.5	3.2	32.3	47.3	73.9	26.7	
Hori	4804.000	PK	60.8	30.5	5.3	31.4	65.2	73.9	8.7	
Hori	7206.000	PK	47.0	35.8	6.7	32.3	57.2	73.9	16.7	
Hori	9608.000	PK	42.1	39.0	7.3	33.0	55.4	73.9	18.5	
Hori	2298.021	AV	41.8	27.9	3.0	32.4	40.3	53.9	13.6	
Hori	2390.000	AV	29.1	28.2	3.1	32.4	28.0	53.9	25.9	
Hori	2506.014	AV	41.5	28.5	3.2	32.3	40.9	53.9	13.0	
Vert	499.998	QP	35.3	18.1	11.2	32.0	32.6	46.0	13.4	
Vert	507.997	QP	35.1	18.2	11.2	32.0	32.5	46.0	13.5	
Vert	511.996	QP	35.2	18.3	11.2	32.0	32.7	46.0	13.3	
Vert	519.998	QP	36.7	18.4	11.3	32.1	34.3	46.0	11.7	
Vert	528.000	QP	34.3	18.5	11.3	32.1	32.0	46.0	14.0	
Vert	539.998	QP	34.1	18.7	11.4	32.1	32.1	46.0	13.9	
Vert	2298.021	PK	46.1	27.9	3.0	32.4	44.6	73.9	29.3	
Vert	2390.000	PK	41.3	28.2	3.1	32.4	40.2	73.9	33.7	
Vert	2506.014	PK	45.8	28.5	3.2	32.3	45.2	73.9	28.7	
Vert	4804.000	PK	50.2	30.5	5.3	31.4	54.6	73.9	19.3	
Vert	7206.000	PK	47.2	35.8	6.7	32.3	57.4	73.9	16.5	
Vert	9608.000	PK	43.2	39.0	7.3	33.0	56.5	73.9	17.4	
Vert	2298.021	AV	39.2	27.9	3.0	32.4	37.7	53.9	16.2	
Vert	2390.000	AV	29.6	28.2	3.1	32.4	28.5	53.9	25.4	
Vert	2506.014	AV	39.0	28.5	3.2	32.3	38.4	53.9	15.5	

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

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013
Temperature/ Humidity 23 deg. C / 39% RH
Engineer Takumi Shimada
Mode Tx, DH5 2402MHz

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	96.2	28.2	3.1	32.4	95.1	-	-	Carrier
Hori	2400.000	PK	49.6	28.2	3.1	32.4	48.5	75.1	26.6	
Vert	2402.000	PK	93.8	28.2	3.1	32.4	92.7	-	-	Carrier
Vert	2400.000	PK	48.8	28.2	3.1	32.4	47.7	72.7	25.0	

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit dBuV/m	Margin [dB]	Remark
Hori	4804.000	AV	45.2	30.5	5.3	31.4	-23.9	25.7	53.9	28.2	
Hori	7206.000	AV	37.5	35.8	6.7	32.3	-23.9	23.8	53.9	30.1	
Hori	9608.000	AV	30.7	39.0	7.3	33.0	-23.9	20.1	53.9	33.8	
Vert	4804.000	AV	44.5	30.5	5.3	31.4	-23.9	25.0	53.9	28.9	
Vert	7206.000	AV	38.9	35.8	6.7	32.3	-23.9	25.2	53.9	28.7	
Vert	9608.000	AV	30.6	39.0	7.3	33.0	-23.9	20.0	53.9	33.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz))
- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C / 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
(Above 1GHz) (Below 1GHz)
Mode Tx, DH5 2441MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2337.000	PK	49.3	28.0	3.1	32.4	48.0	73.9	25.9	
Hori	2545.042	PK	47.3	28.5	3.2	32.3	46.7	73.9	27.2	
Hori	4882.000	PK	51.3	30.6	5.3	31.4	55.8	73.9	18.1	
Hori	7323.000	PK	49.6	36.0	6.8	32.4	60.0	73.9	13.9	
Hori	9764.000	PK	43.1	39.4	7.3	33.0	56.8	73.9	17.1	
Hori	2337.000	AV	43.2	28.0	3.1	32.4	41.9	53.9	12.0	
Hori	2545.042	AV	41.3	28.5	3.2	32.3	40.7	53.9	13.2	
Vert	499.998	QP	34.5	18.1	11.2	32.0	31.8	46.0	14.2	
Vert	507.997	QP	33.8	18.2	11.2	32.0	31.2	46.0	14.8	
Vert	511.996	QP	34.8	18.3	11.2	32.0	32.3	46.0	13.7	
Vert	519.998	QP	35.2	18.4	11.3	32.1	32.8	46.0	13.2	
Vert	528.000	QP	32.7	18.5	11.3	32.1	30.4	46.0	15.6	
Vert	539.998	QP	33.3	18.7	11.4	32.1	31.3	46.0	14.7	
Vert	2337.000	PK	47.3	28.0	3.1	32.4	46.0	73.9	27.9	
Vert	2545.042	PK	45.2	28.5	3.2	32.3	44.6	73.9	29.3	
Vert	4882.000	PK	51.8	30.6	5.3	31.4	56.3	73.9	17.6	
Vert	7323.000	PK	49.1	36.0	6.8	32.4	59.5	73.9	14.4	
Vert	9764.000	PK	42.5	39.4	7.3	33.0	56.2	73.9	17.7	
Vert	2337.000	AV	40.9	28.0	3.1	32.4	39.6	53.9	14.3	
Vert	2545.042	AV	39.2	28.5	3.2	32.3	38.6	53.9	15.3	

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

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

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4882.000	AV	46.3	30.6	5.3	31.4	-23.9	26.9	53.9	27.0	
Hori	7323.000	AV	41.5	36.0	6.8	32.4	-23.9	28.0	53.9	25.9	
Hori	9764.000	AV	30.5	39.4	7.3	33.0	-23.9	20.3	53.9	33.6	
Vert	4882.000	AV	46.1	30.6	5.3	31.4	-23.9	26.7	53.9	27.2	
Vert	7323.000	AV	41.1	36.0	6.8	32.4	-23.9	27.6	53.9	26.3	
Vert	9764.000	AV	30.9	39.4	7.3	33.0	-23.9	20.7	53.9	33.2	

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

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

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C / 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
 (Above 1GHz) (Below 1GHz)
Mode Tx, DH5 2480MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2376.090	PK	46.5	28.1	3.1	32.4	45.3	73.9	28.6	
Hori	2483.500	PK	42.3	28.4	3.1	32.3	41.5	73.9	32.4	
Hori	2558.003	PK	46.6	28.6	3.2	32.3	46.1	73.9	27.8	
Hori	4960.000	PK	55.4	30.7	5.4	31.4	60.1	73.9	13.8	
Hori	7440.000	PK	49.8	36.2	6.7	32.4	60.3	73.9	13.6	
Hori	9920.000	PK	40.3	39.8	7.4	33.1	54.4	73.9	19.5	
Hori	2376.090	AV	34.9	28.1	3.1	32.4	33.7	53.9	20.2	
Hori	2483.500	AV	30.2	28.4	3.1	32.3	29.4	53.9	24.5	
Hori	2558.003	AV	35.0	28.6	3.2	32.3	34.5	53.9	19.4	
Vert	499.998	QP	35.3	18.1	11.2	32.0	32.6	46.0	13.4	
Vert	507.997	QP	35.1	18.2	11.2	32.0	32.5	46.0	13.5	
Vert	511.996	QP	35.2	18.3	11.2	32.0	32.7	46.0	13.3	
Vert	519.998	QP	36.0	18.4	11.3	32.1	33.6	46.0	12.4	
Vert	528.000	QP	34.3	18.5	11.3	32.1	32.0	46.0	14.0	
Vert	539.998	QP	34.1	18.7	11.4	32.1	32.1	46.0	13.9	
Vert	2376.090	PK	45.2	28.1	3.1	32.4	44.0	73.9	29.9	
Vert	2483.500	PK	41.0	28.4	3.1	32.3	40.2	73.9	33.7	
Vert	2558.003	PK	44.2	28.6	3.2	32.3	43.7	73.9	30.2	
Vert	4960.000	PK	50.8	30.7	5.4	31.4	55.5	73.9	18.4	
Vert	7440.000	PK	46.7	36.2	6.7	32.4	57.2	73.9	16.7	
Vert	9920.000	PK	40.6	39.8	7.4	33.1	54.7	73.9	19.2	
Vert	2376.090	AV	32.6	28.1	3.1	32.4	31.4	53.9	22.5	
Vert	2483.500	AV	30.4	28.4	3.1	32.3	29.6	53.9	24.3	
Vert	2558.003	AV	32.8	28.6	3.2	32.3	32.3	53.9	21.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4960.000	AV	44.2	30.7	5.4	31.4	-23.9	25.0	53.9	28.9	
Hori	7440.000	AV	36.8	36.2	6.7	32.4	-23.9	23.4	53.9	30.5	
Hori	9920.000	AV	30.1	39.8	7.4	33.1	-23.9	20.3	53.9	33.6	
Vert	4960.000	AV	39.0	30.7	5.4	31.4	-23.9	19.8	53.9	34.1	
Vert	7440.000	AV	34.3	36.2	6.7	32.4	-23.9	20.9	53.9	33.0	
Vert	9920.000	AV	30.0	39.8	7.4	33.1	-23.9	20.2	53.9	33.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C / 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
(Above 1GHz) (Below 1GHz)
Mode Tx, 3DH5 2402MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2323.909	PK	45.9	28.0	3.1	32.4	44.6	73.9	29.3	
Hori	2390.000	PK	38.7	28.2	3.1	32.4	37.6	73.9	36.3	
Hori	2506.081	PK	44.9	28.5	3.2	32.3	44.3	73.9	29.6	
Hori	4804.000	PK	48.3	30.5	5.3	31.4	52.7	73.9	21.2	
Hori	7206.000	PK	44.4	35.8	6.7	32.3	54.6	73.9	19.3	
Hori	9608.000	PK	41.3	39.0	7.3	33.0	54.6	73.9	19.3	
Hori	2323.909	AV	36.0	28.0	3.1	32.4	34.7	53.9	19.2	
Hori	2390.000	AV	29.4	28.2	3.1	32.4	28.3	53.9	25.6	
Hori	2506.081	AV	35.6	28.5	3.2	32.3	35.0	53.9	18.9	
Vert	499.998	QP	35.3	18.1	11.2	32.0	32.6	46.0	13.4	
Vert	507.997	QP	35.1	18.2	11.2	32.0	32.5	46.0	13.5	
Vert	511.996	QP	35.2	18.3	11.2	32.0	32.7	46.0	13.3	
Vert	519.998	QP	36.0	18.4	11.3	32.1	33.6	46.0	12.4	
Vert	528.000	QP	34.3	18.5	11.3	32.1	32.0	46.0	14.0	
Vert	539.998	QP	34.1	18.7	11.4	32.1	32.1	46.0	13.9	
Vert	2324.056	PK	45.2	28.0	3.1	32.4	43.9	73.9	30.0	
Vert	2390.000	PK	41.9	28.2	3.1	32.4	40.8	73.9	33.1	
Vert	2505.952	PK	45.7	28.5	3.2	32.3	45.1	73.9	28.8	
Vert	4804.000	PK	46.4	30.5	5.3	31.4	50.8	73.9	23.1	
Vert	7206.000	PK	40.8	35.8	6.7	32.3	51.0	73.9	22.9	
Vert	9608.000	PK	41.0	39.0	7.3	33.0	54.3	73.9	19.6	
Vert	2324.056	AV	34.5	28.0	3.1	32.4	33.2	53.9	20.7	
Vert	2390.000	AV	29.5	28.2	3.1	32.4	28.4	53.9	25.5	
Vert	2505.952	AV	36.9	28.5	3.2	32.3	36.3	53.9	17.6	

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

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013
Temperature/ Humidity 23 deg. C / 39% RH
Engineer Takumi Shimada
Mode Tx, 3DH5 2402MHz

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	95.3	28.2	3.1	32.4	94.2	-	-	Carrier
Hori	2400.000	PK	46.3	28.2	3.1	32.4	45.2	74.2	29.0	
Vert	2402.000	PK	97.7	28.2	3.1	32.4	96.6	-	-	Carrier
Vert	2400.000	PK	47.3	28.2	3.1	32.4	46.2	76.6	30.4	

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4804.000	AV	38.8	30.5	5.3	31.4	-23.9	19.3	53.9	34.6	
Hori	7206.000	AV	33.0	35.8	6.7	32.3	-23.9	19.3	53.9	34.6	
Hori	9608.000	AV	30.1	39.0	7.3	33.0	-23.9	19.5	53.9	34.4	
Vert	4804.000	AV	37.4	30.5	5.3	31.4	-23.9	17.9	53.9	36.0	
Vert	7206.000	AV	31.3	35.8	6.7	32.3	-23.9	17.6	53.9	36.3	
Vert	9608.000	AV	30.1	39.0	7.3	33.0	-23.9	19.5	53.9	34.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz))
- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C / 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
(Above 1GHz) (Below 1GHz)
Mode Tx, 3DH5 2441MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2337.057	PK	46.8	28.0	3.1	32.4	45.5	73.9	28.4	
Hori	2545.182	PK	45.0	28.5	3.2	32.3	44.4	73.9	29.5	
Hori	4882.000	PK	50.7	30.6	5.3	31.4	55.2	73.9	18.7	
Hori	7323.000	PK	46.1	36.0	6.8	32.4	56.5	73.9	17.4	
Hori	9764.000	PK	44.1	39.4	7.3	33.0	57.8	73.9	16.1	
Hori	2337.057	AV	38.1	28.0	3.1	32.4	36.8	53.9	17.1	
Hori	2545.182	AV	39.6	28.5	3.2	32.3	39.0	53.9	14.9	
Vert	499.998	QP	35.3	18.1	11.2	32.0	32.6	46.0	13.4	
Vert	507.997	QP	35.1	18.2	11.2	32.0	32.5	46.0	13.5	
Vert	511.996	QP	35.2	18.3	11.2	32.0	32.7	46.0	13.3	
Vert	519.998	QP	36.7	18.4	11.3	32.1	34.3	46.0	11.7	
Vert	528.000	QP	34.3	18.5	11.3	32.1	32.0	46.0	14.0	
Vert	539.998	QP	34.1	18.7	11.4	32.1	32.1	46.0	13.9	
Vert	2337.000	PK	45.8	28.0	3.1	32.4	44.5	73.9	29.4	
Vert	2545.012	PK	45.3	28.5	3.2	32.3	44.7	73.9	29.2	
Vert	4882.000	PK	48.7	30.6	5.3	31.4	53.2	73.9	20.7	
Vert	7323.000	PK	45.2	36.0	6.8	32.4	55.6	73.9	18.3	
Vert	9764.000	PK	42.7	39.4	7.3	33.0	56.4	73.9	17.5	
Vert	2337.000	AV	36.7	28.0	3.1	32.4	35.4	53.9	18.5	
Vert	2545.012	AV	36.0	28.5	3.2	32.3	35.4	53.9	18.5	

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

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

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4882.000	AV	42.3	30.6	5.3	31.4	-23.9	22.9	53.9	31.0	
Hori	7323.000	AV	34.8	36.0	6.8	32.4	-23.9	21.3	53.9	32.6	
Hori	9764.000	AV	30.5	39.4	7.3	33.0	-23.9	20.3	53.9	33.6	
Vert	4882.000	AV	39.9	30.6	5.3	31.4	-23.9	20.5	53.9	33.4	
Vert	7323.000	AV	33.9	36.0	6.8	32.4	-23.9	20.4	53.9	33.5	
Vert	9764.000	AV	30.5	39.4	7.3	33.0	-23.9	20.3	53.9	33.6	

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

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

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

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10114553H
Date 11/22/2013 11/23/2013
Temperature/ Humidity 23 deg. C/ 39% RH 22 deg. C / 31% RH
Engineer Takumi Shimada Keisuke Kawamura
(Above 1GHz) (Below 1GHz)
Mode Tx, 3DH5 2480MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	499.998	QP	31.7	18.1	11.2	32.0	29.0	46.0	17.0	
Hori	507.997	QP	30.7	18.2	11.2	32.0	28.1	46.0	17.9	
Hori	511.996	QP	29.8	18.3	11.2	32.0	27.3	46.0	18.7	
Hori	519.998	QP	30.6	18.4	11.3	32.1	28.2	46.0	17.8	
Hori	528.000	QP	29.2	18.5	11.3	32.1	26.9	46.0	19.1	
Hori	539.998	QP	30.1	18.7	11.4	32.1	28.1	46.0	17.9	
Hori	2375.000	PK	46.0	28.1	3.1	32.4	44.8	73.9	29.1	
Hori	2483.500	PK	44.7	28.4	3.1	32.3	43.9	73.9	30.0	
Hori	2557.973	PK	46.1	28.6	3.2	32.3	45.6	73.9	28.3	
Hori	4960.000	PK	51.3	30.7	4.7	31.4	55.3	73.9	18.6	
Hori	7440.000	PK	46.1	36.2	5.9	32.4	55.8	73.9	18.1	
Hori	9920.000	PK	40.8	39.8	7.4	33.1	54.9	73.9	19.0	
Hori	2375.000	AV	36.4	28.1	3.1	32.4	35.2	53.9	18.7	
Hori	2483.500	AV	33.0	28.4	3.1	32.3	32.2	53.9	21.7	
Hori	2557.973	AV	37.2	28.6	3.2	32.3	36.7	53.9	17.2	
Vert	499.998	QP	34.5	18.1	11.2	32.0	31.8	46.0	14.2	
Vert	507.997	QP	33.8	18.2	11.2	32.0	31.2	46.0	14.8	
Vert	511.996	QP	34.8	18.3	11.2	32.0	32.3	46.0	13.7	
Vert	519.998	QP	35.2	18.4	11.3	32.1	32.8	46.0	13.2	
Vert	528.000	QP	32.7	18.5	11.3	32.1	30.4	46.0	15.6	
Vert	539.998	QP	33.3	18.7	11.4	32.1	31.3	46.0	14.7	
Vert	2376.090	PK	45.9	28.1	3.1	32.4	44.7	73.9	29.2	
Vert	2483.500	PK	43.4	28.4	3.1	32.3	42.6	73.9	31.3	
Vert	2558.003	PK	44.8	28.6	3.2	32.3	44.3	73.9	29.6	
Vert	4960.000	PK	49.1	30.7	5.4	31.4	53.8	73.9	20.1	
Vert	7440.000	PK	45.2	36.2	6.7	32.4	55.7	73.9	18.2	
Vert	9920.000	PK	40.3	39.8	7.4	33.1	54.4	73.9	19.5	
Vert	2376.090	AV	36.4	28.1	3.1	32.4	35.2	53.9	18.7	
Vert	2483.500	AV	32.1	28.4	3.1	32.3	31.3	53.9	22.6	
Vert	2558.003	AV	34.1	28.6	3.2	32.3	33.6	53.9	20.3	

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

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

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4960.000	AV	43.6	30.7	4.7	31.4	-23.9	23.7	53.9	30.2	
Hori	7440.000	AV	33.9	36.2	6.7	32.4	-23.9	20.5	53.9	33.4	
Hori	9920.000	AV	30.1	39.8	7.4	33.1	-23.9	20.3	53.9	33.6	
Vert	4960.000	AV	40.7	30.7	5.4	31.4	-23.9	21.5	53.9	32.4	
Vert	7440.000	AV	33.5	36.2	6.7	32.4	-23.9	20.1	53.9	33.8	
Vert	9920.000	AV	30.1	39.8	7.4	33.1	-23.9	20.3	53.9	33.6	

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

- Gain(Amplifier) + Dwell time factor (Refer to dwell time data sheet)

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

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

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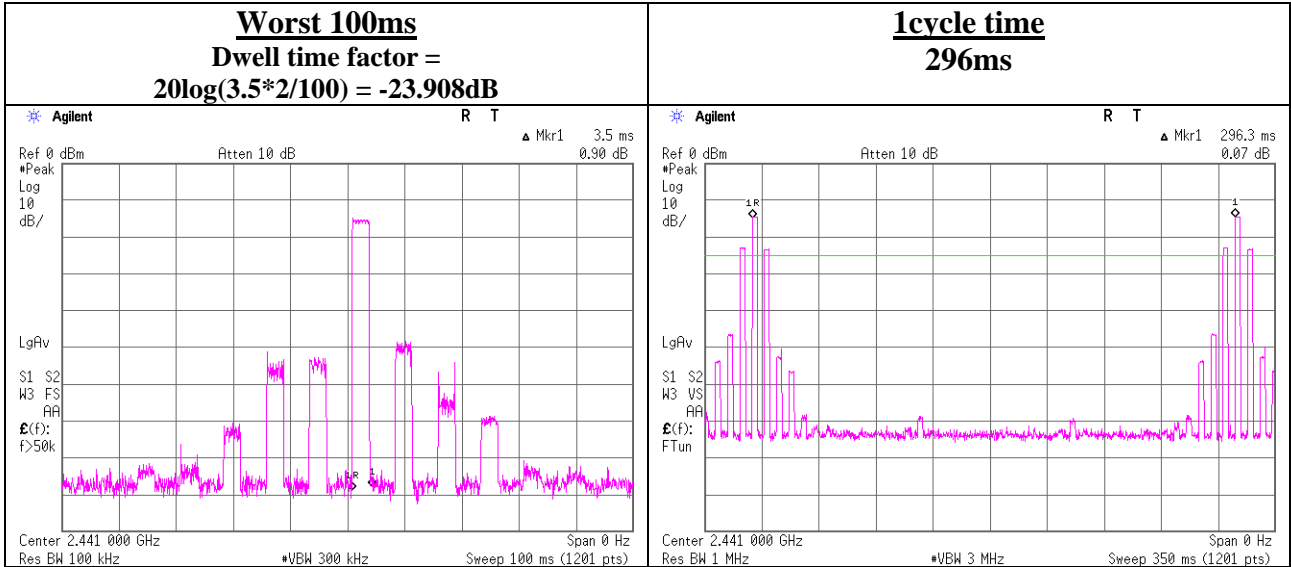
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

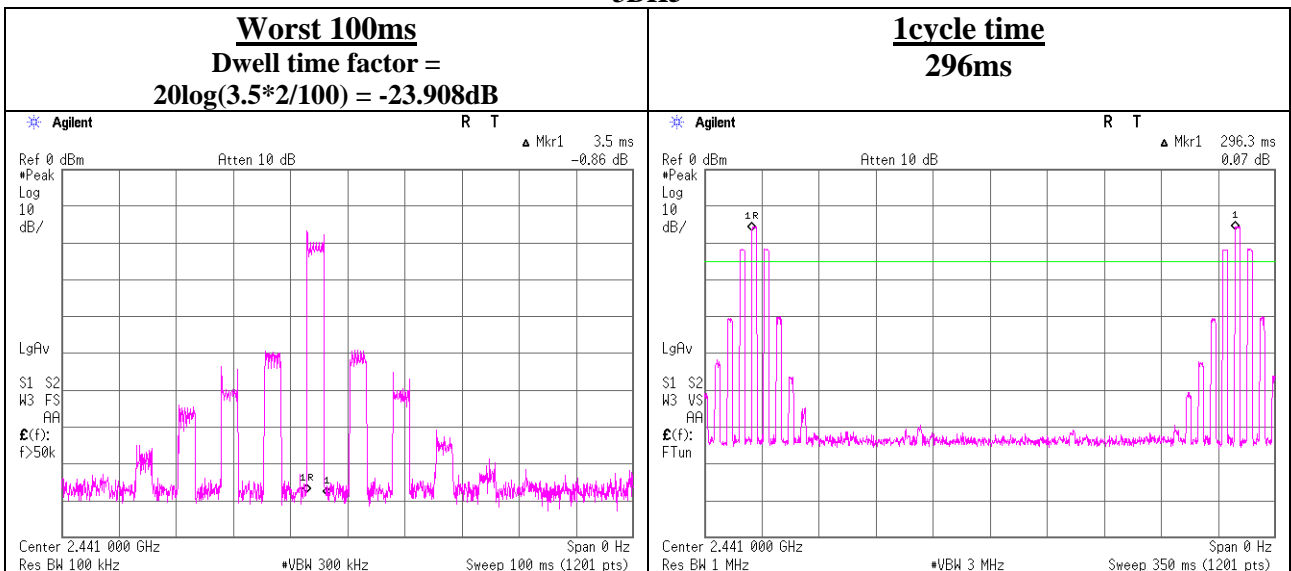
Dwell time factor

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/22/2013
Temperature/ Humidity	22 deg. C / 45% RH
Engineer	Takumi Shimada
Mode	Tx (Hopping on) DH5/3DH5

DH5



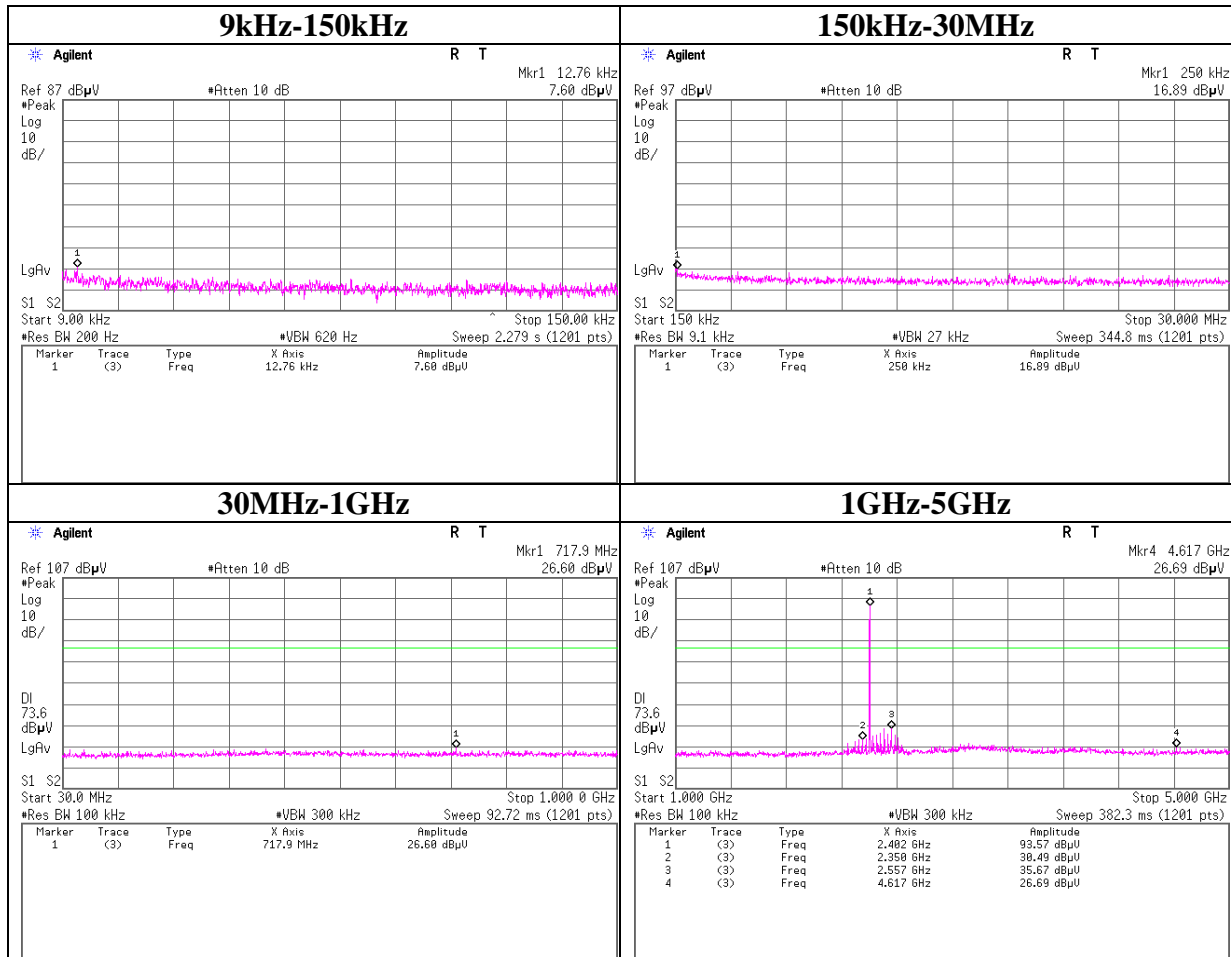
3DH5



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

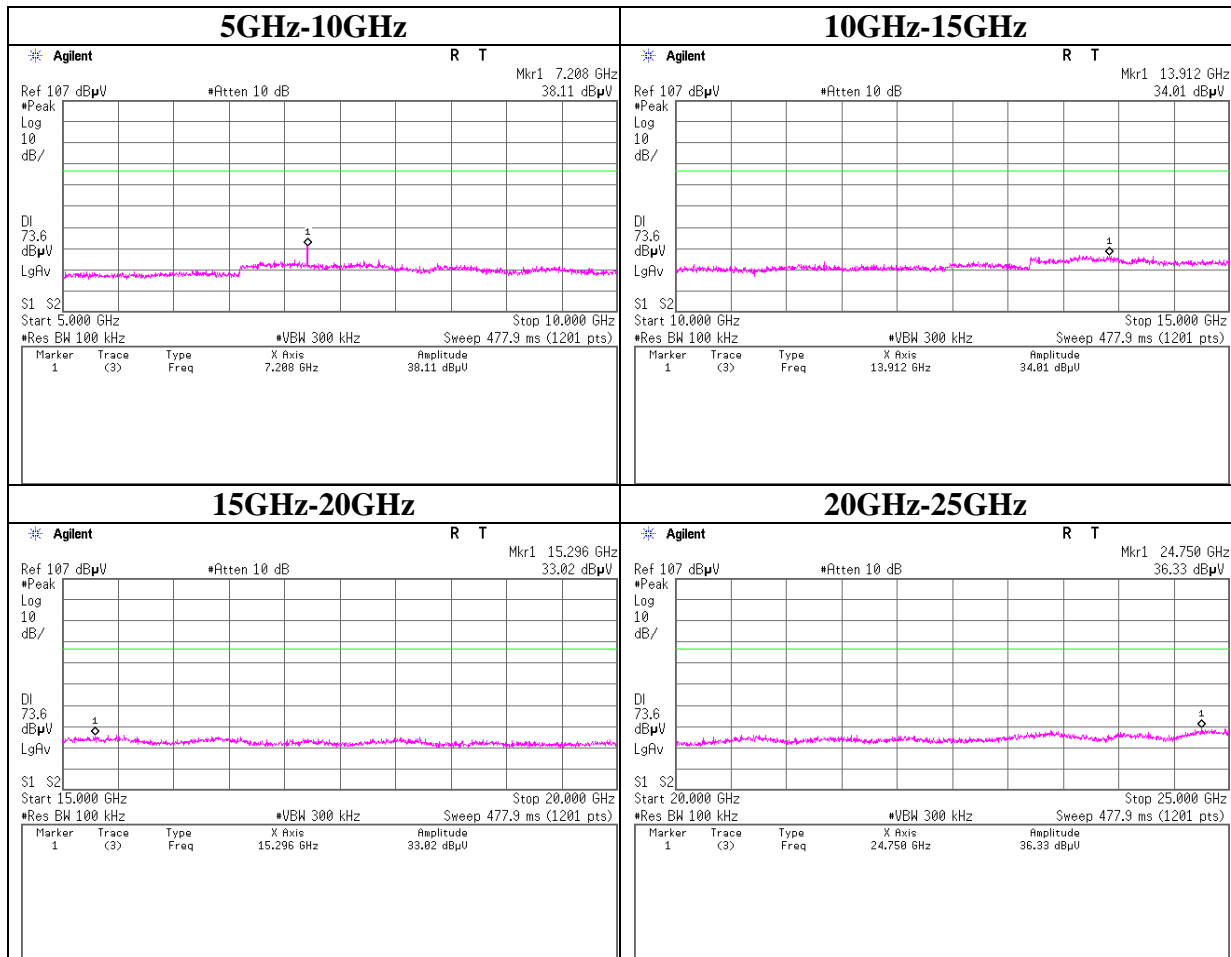
Tx DH5 2402MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

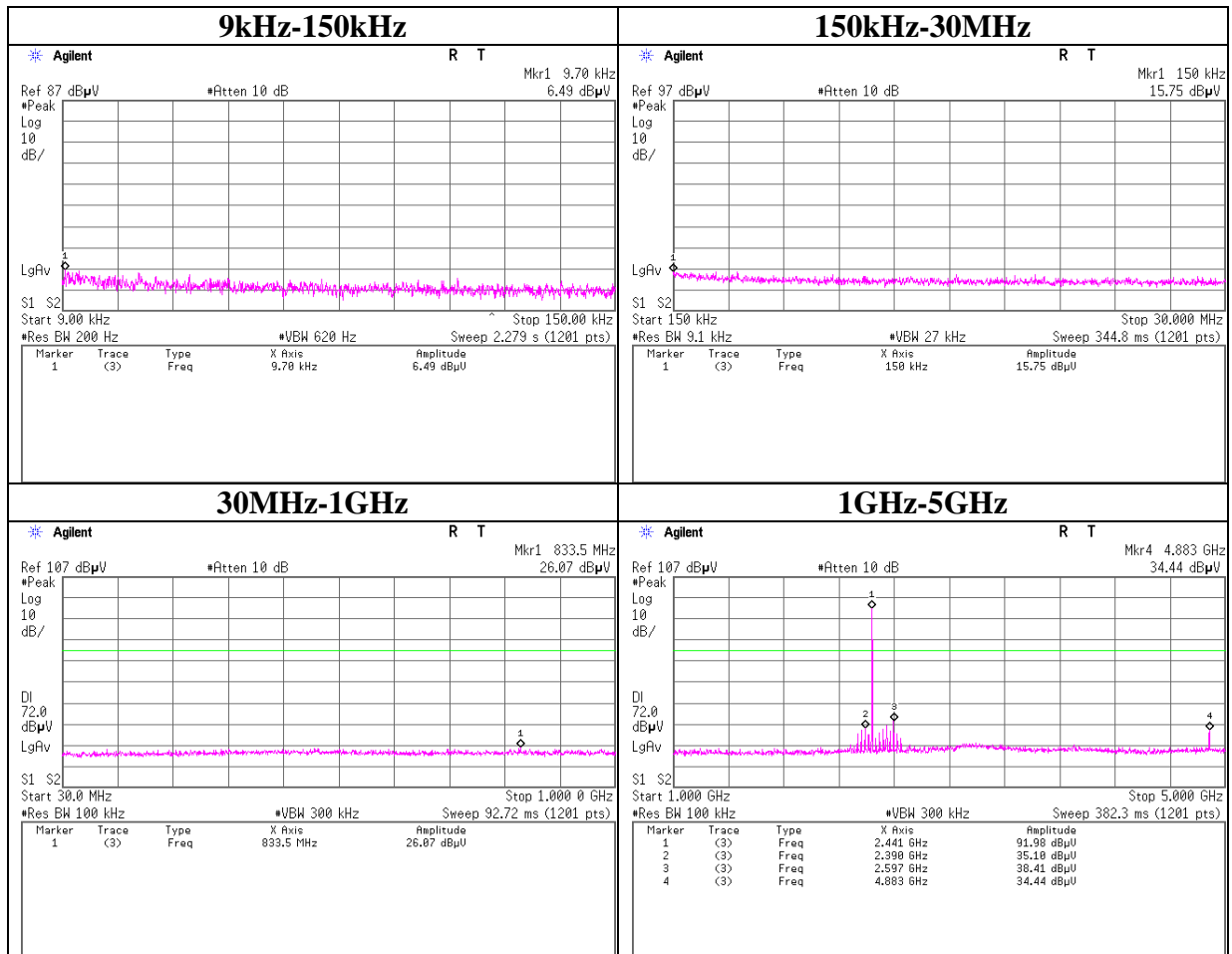
Tx DH5 2402MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

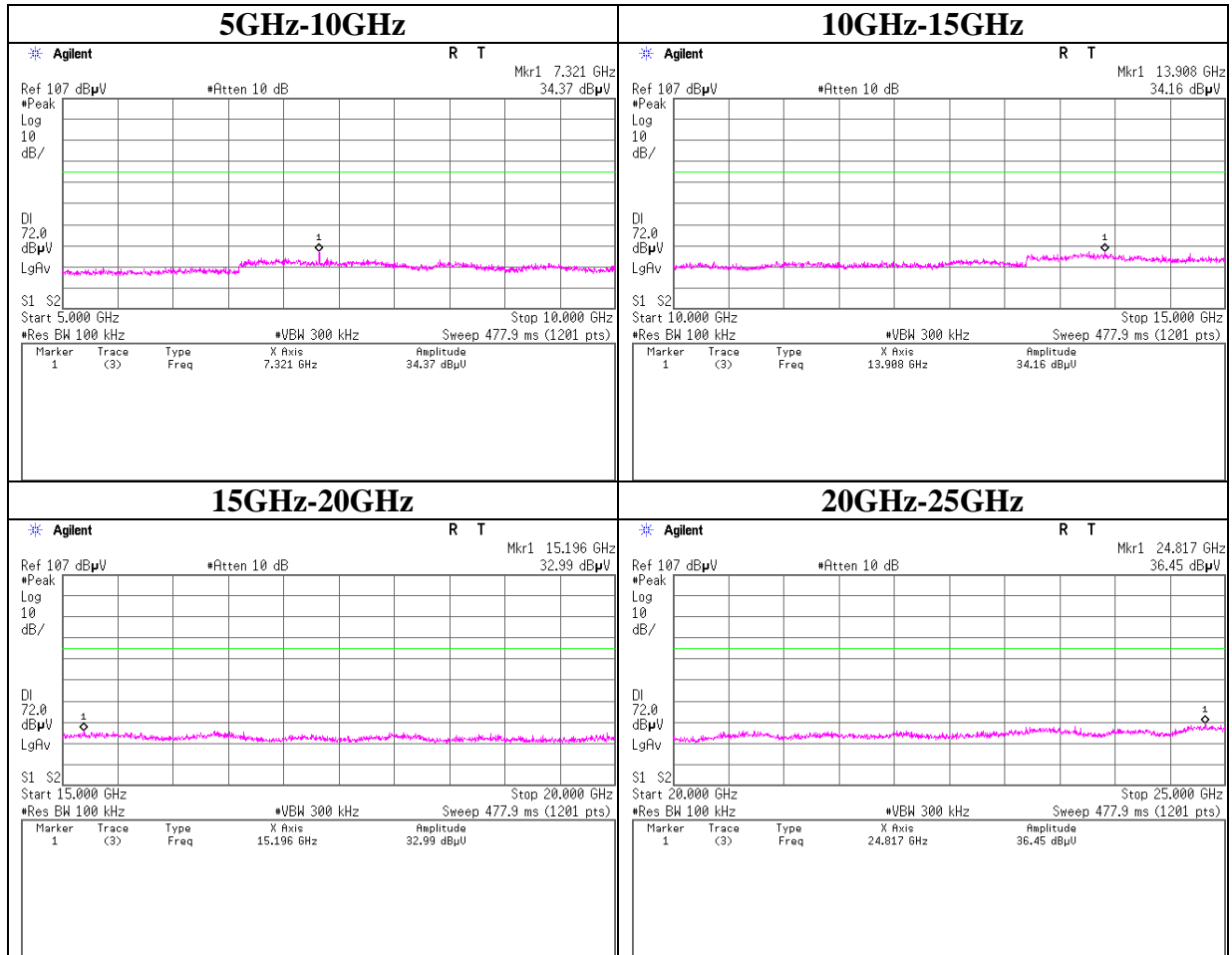
Tx DH5 2441MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

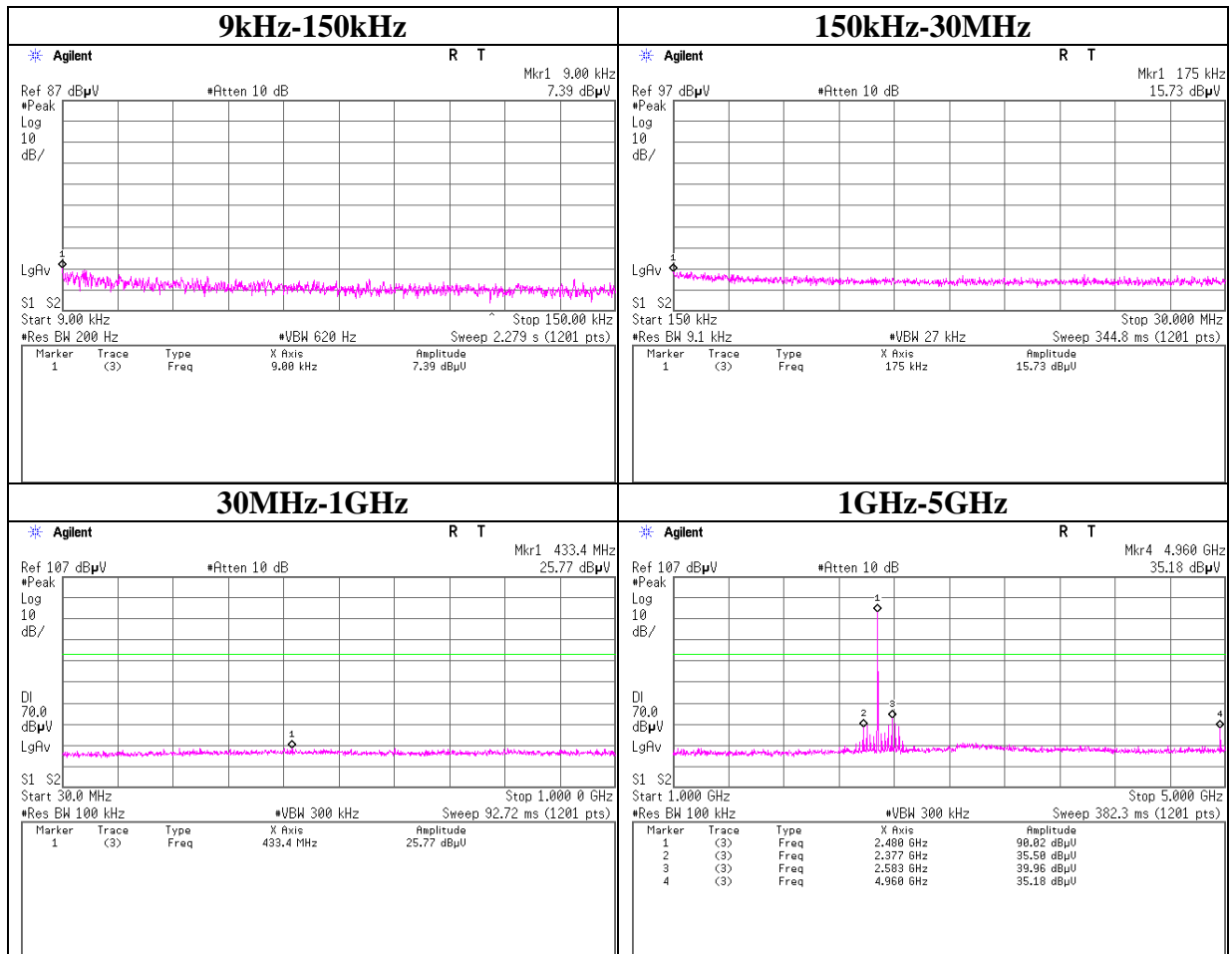
Tx DH5 2441MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

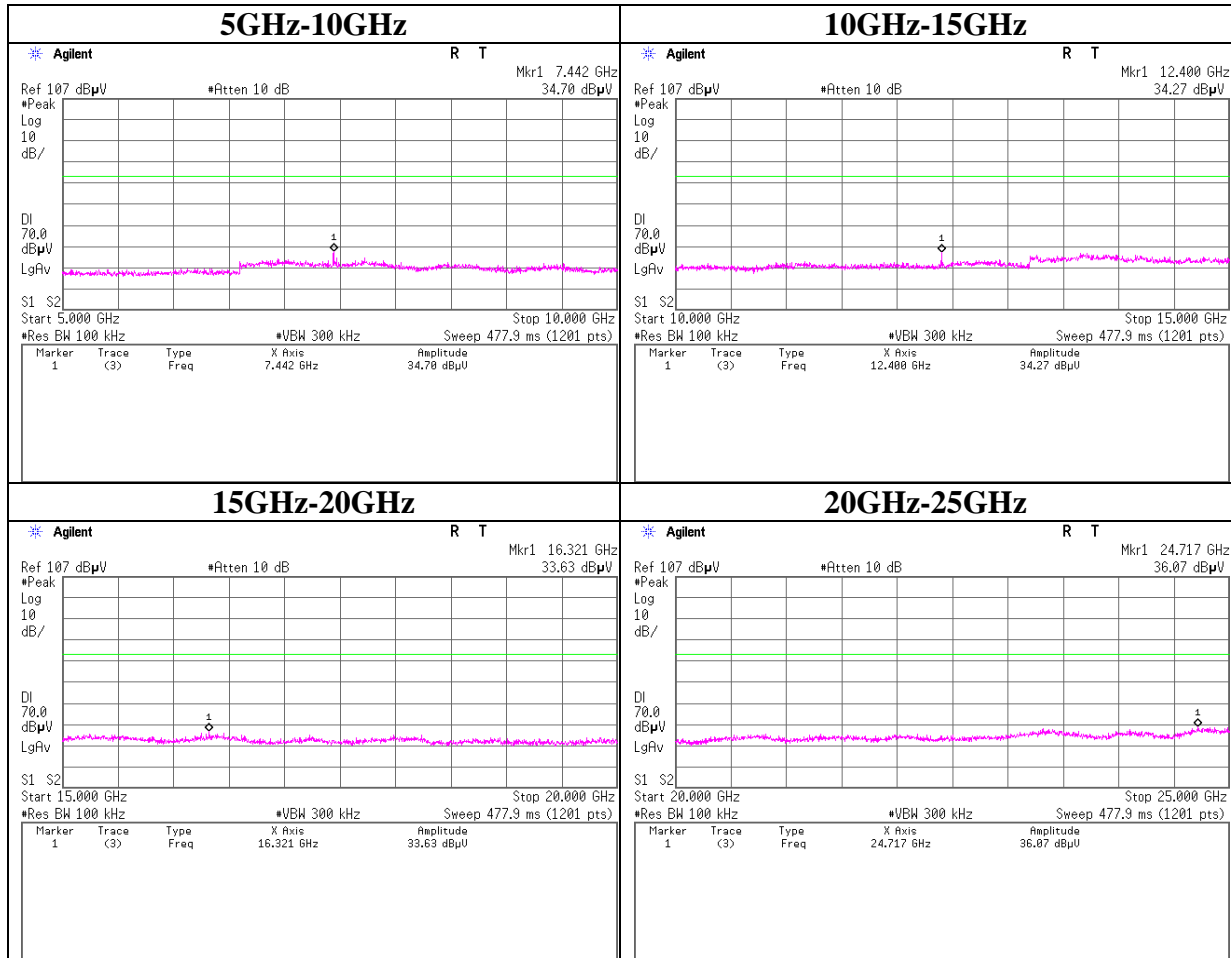
Tx DH5 2480MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

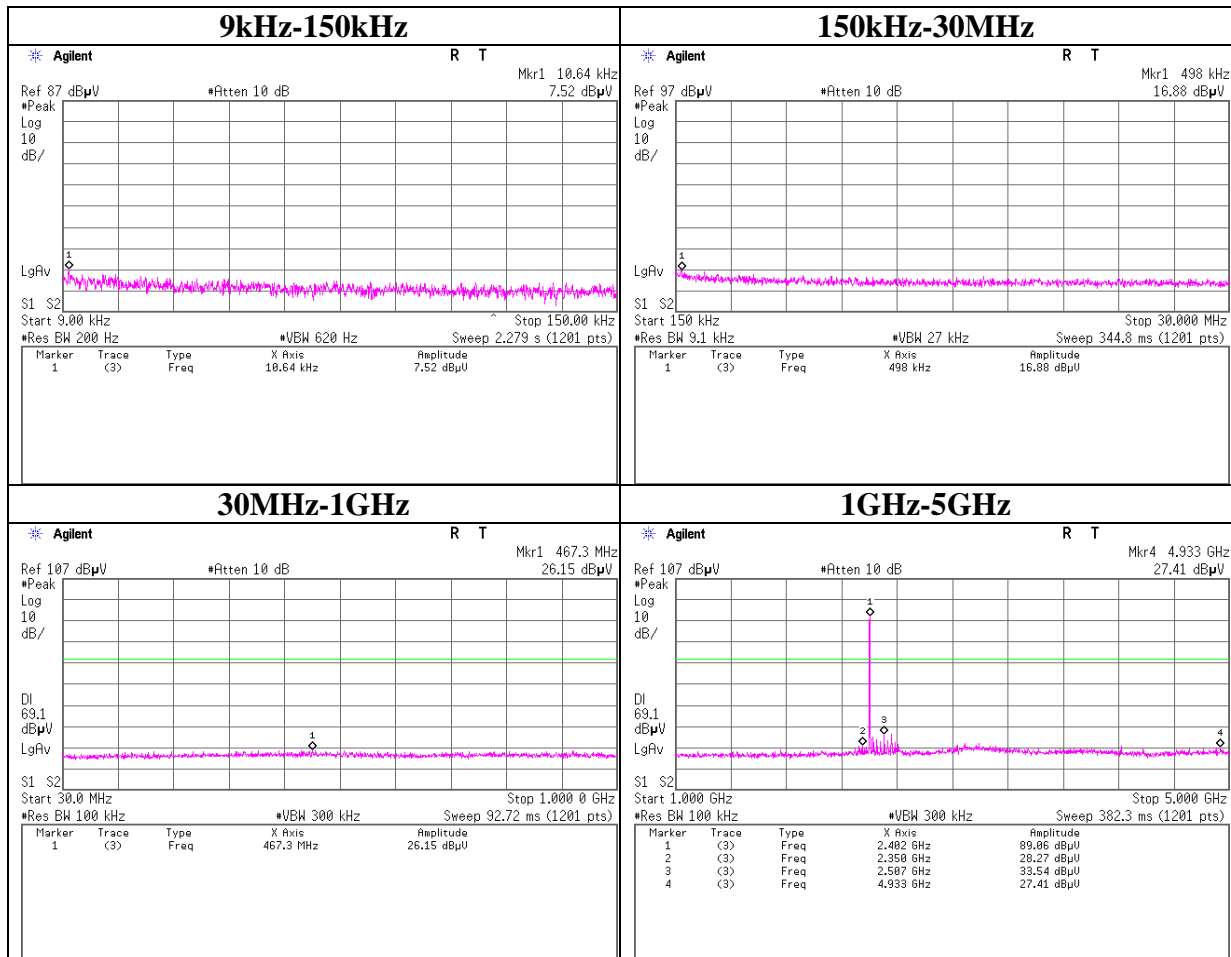
Tx DH5 2480MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

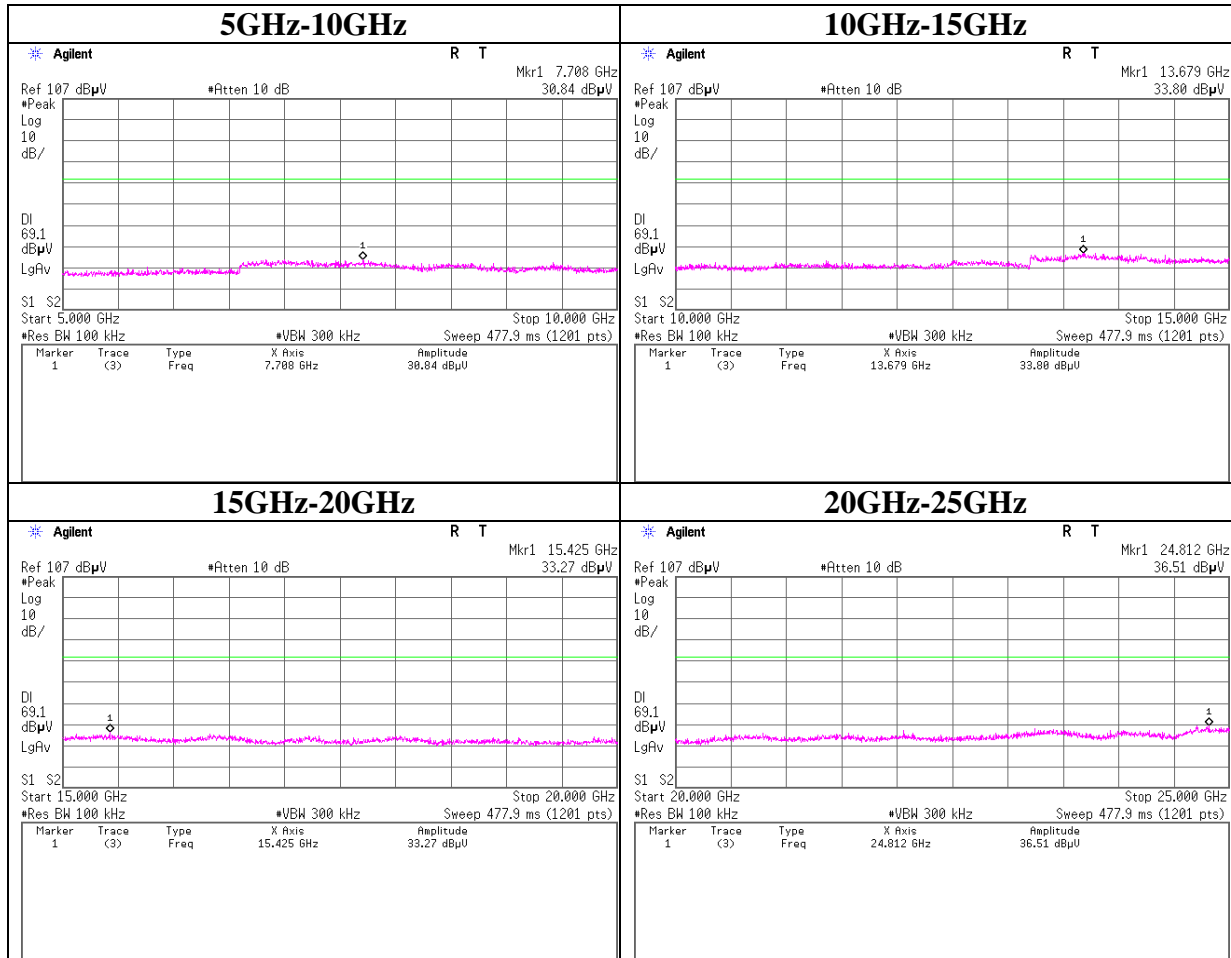
Tx 3DH5 2402MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

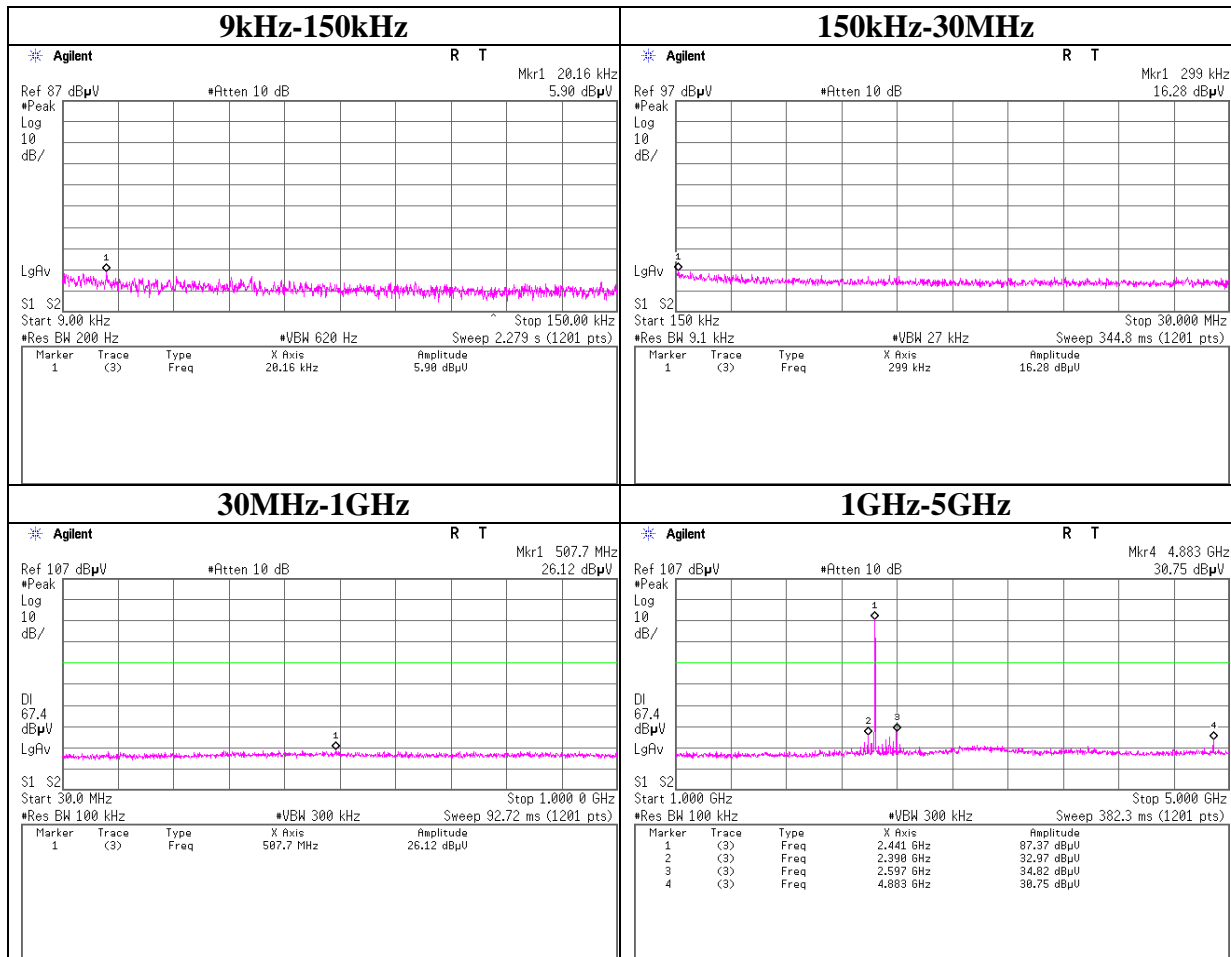
Tx 3DH5 2402MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

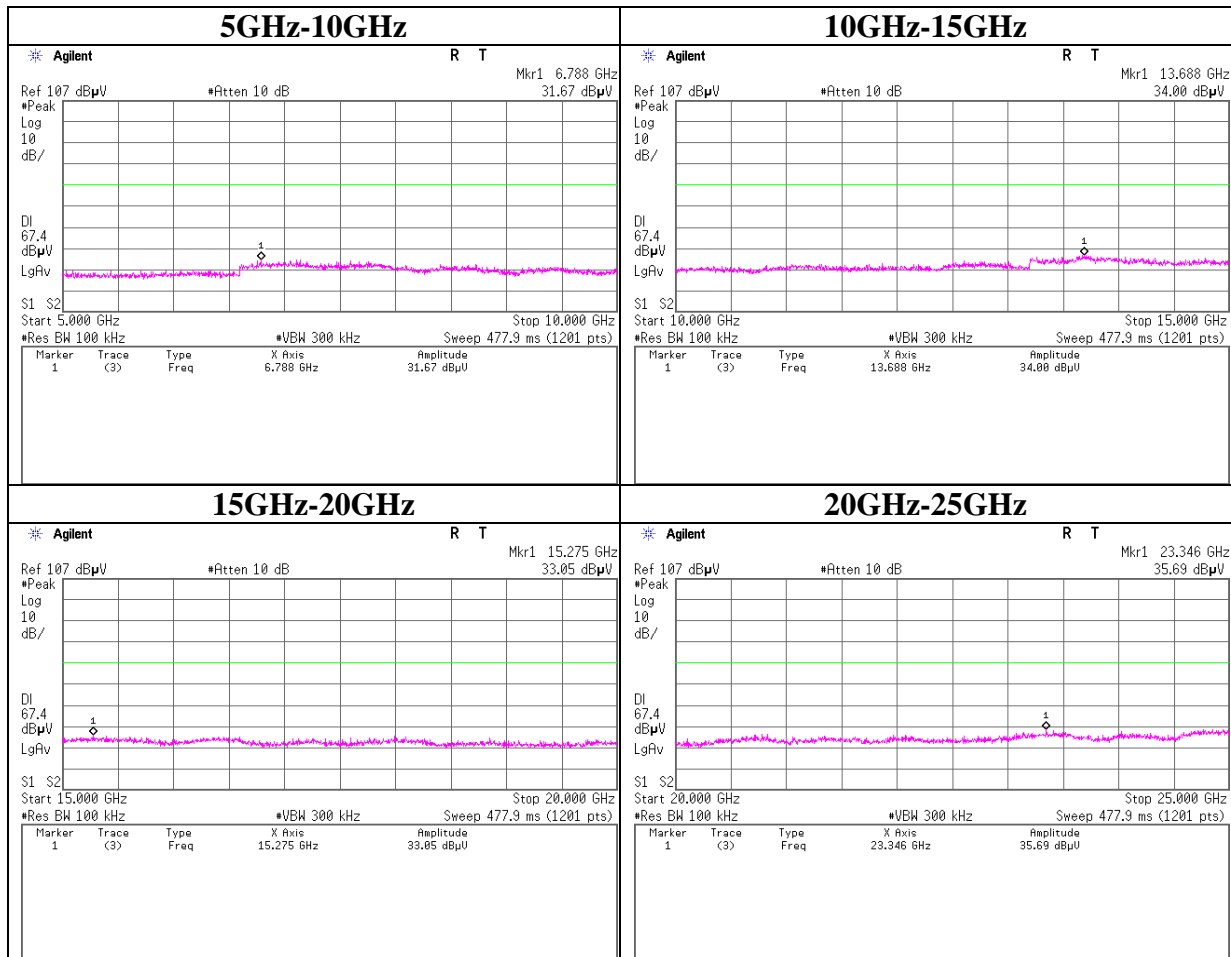
Tx 3DH5 2441MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

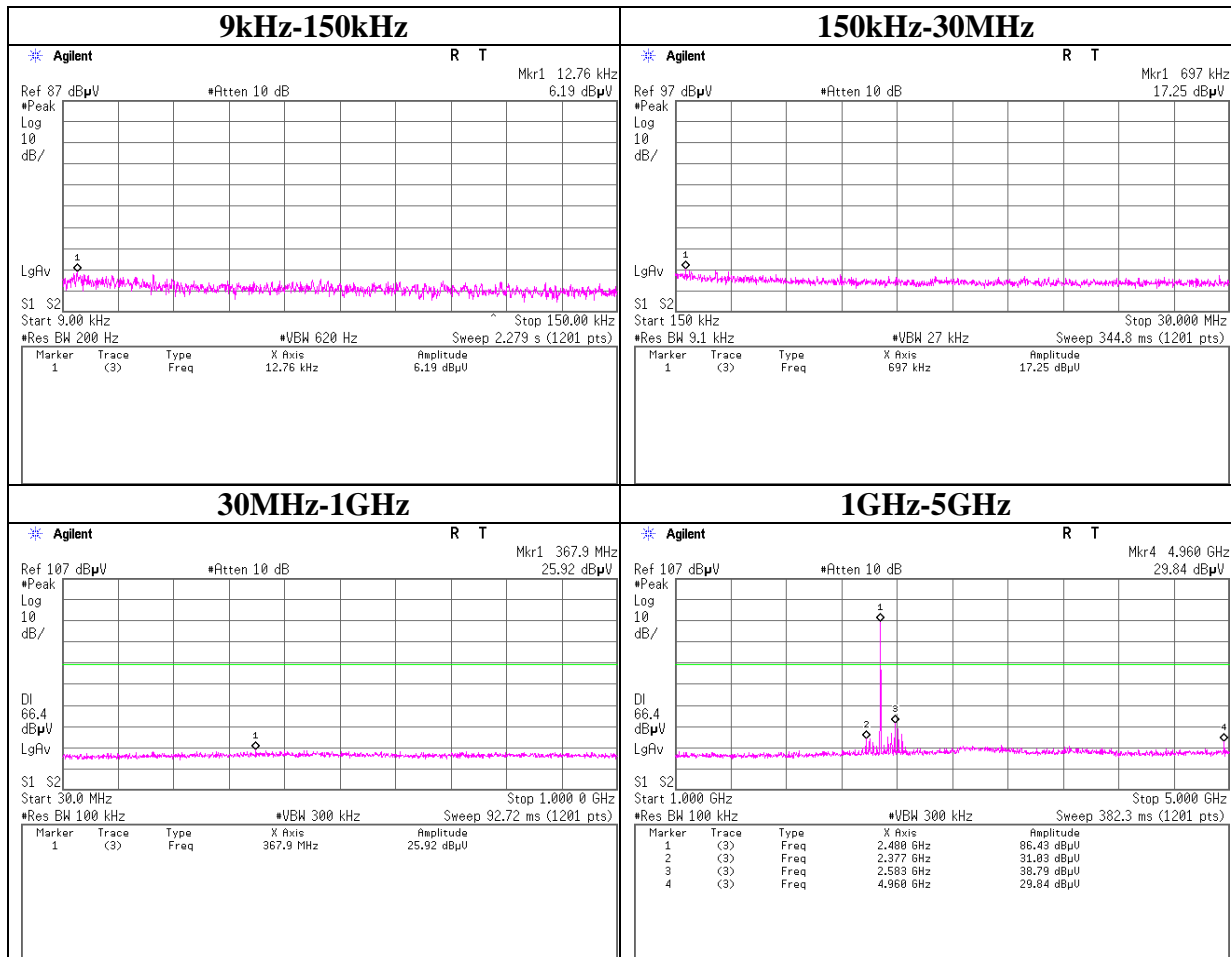
Tx 3DH5 2441MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

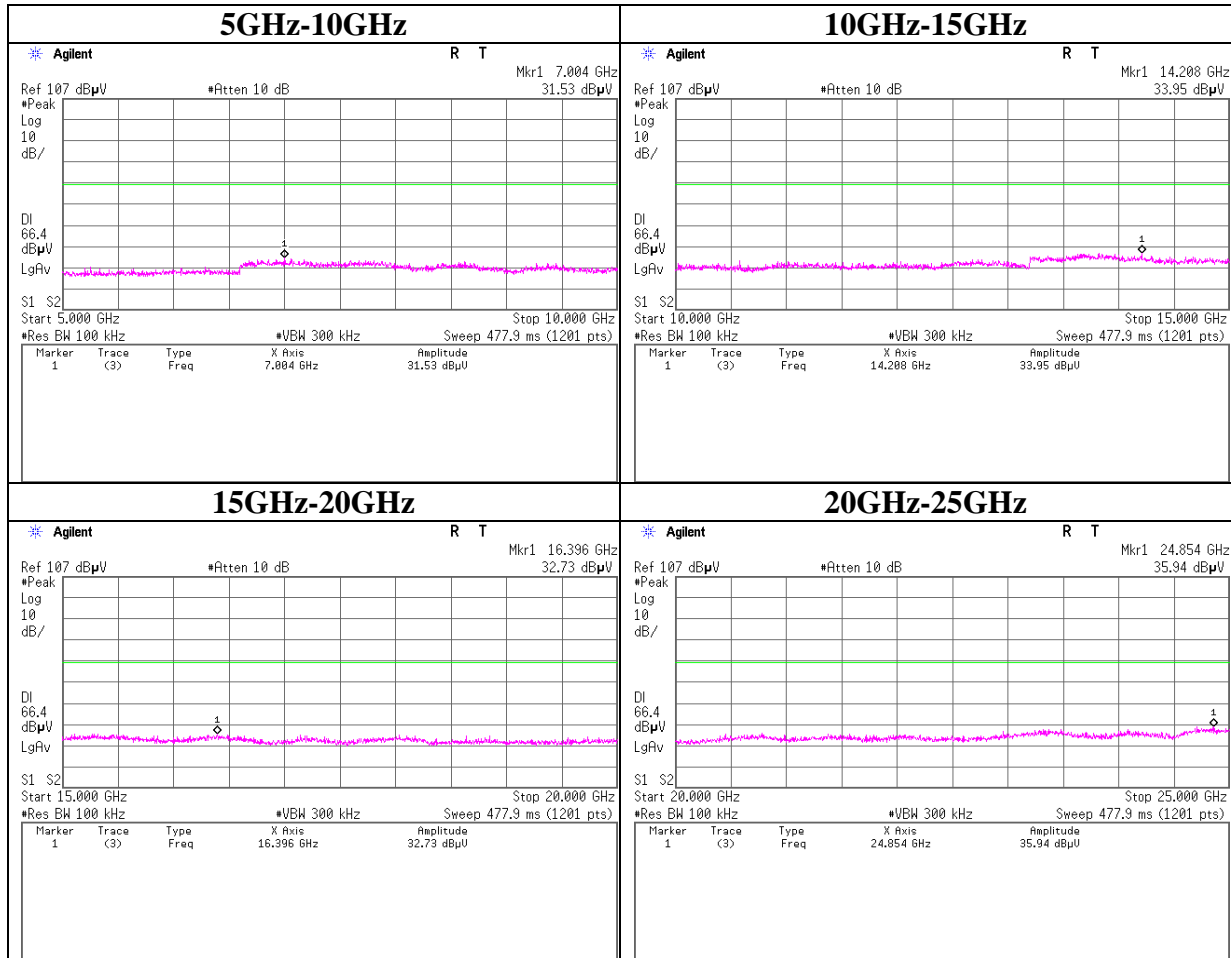
Tx 3DH5 2480MHz



Conducted Spurious Emission

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

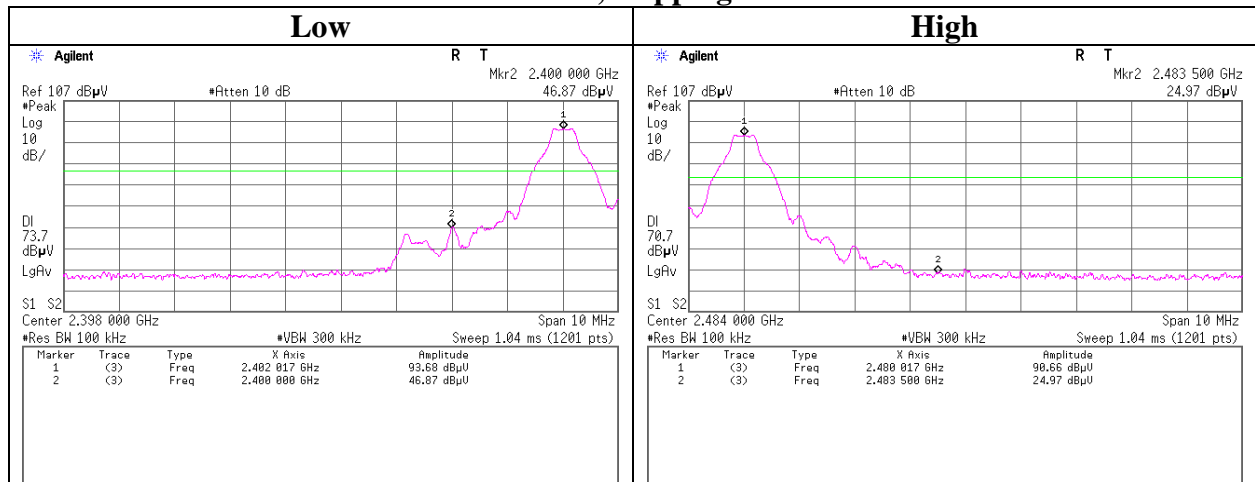
Tx 3DH5 2480MHz



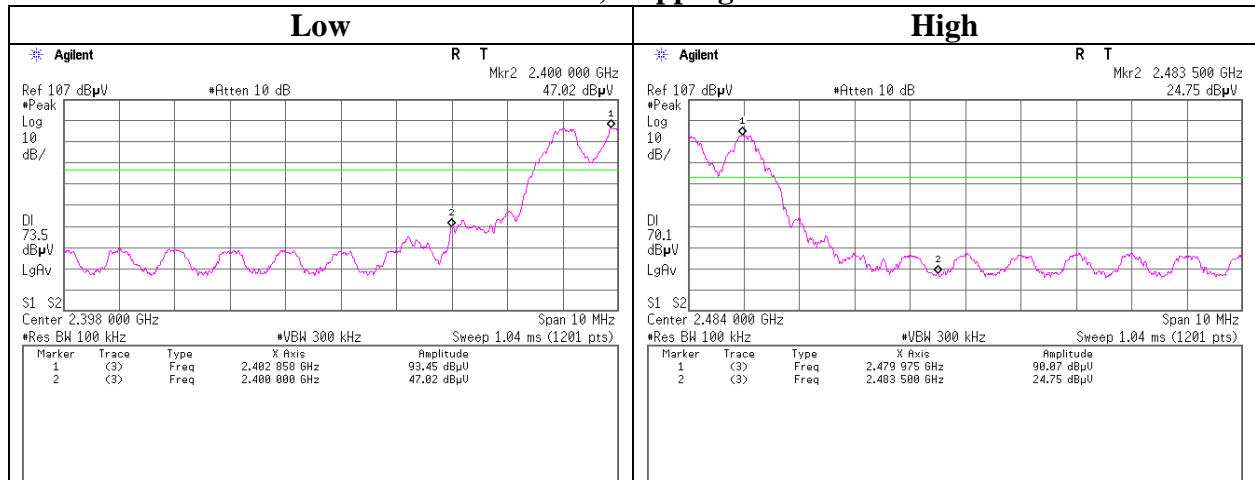
Conducted Emission Band Edge compliance

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

Tx DH5, Hopping off



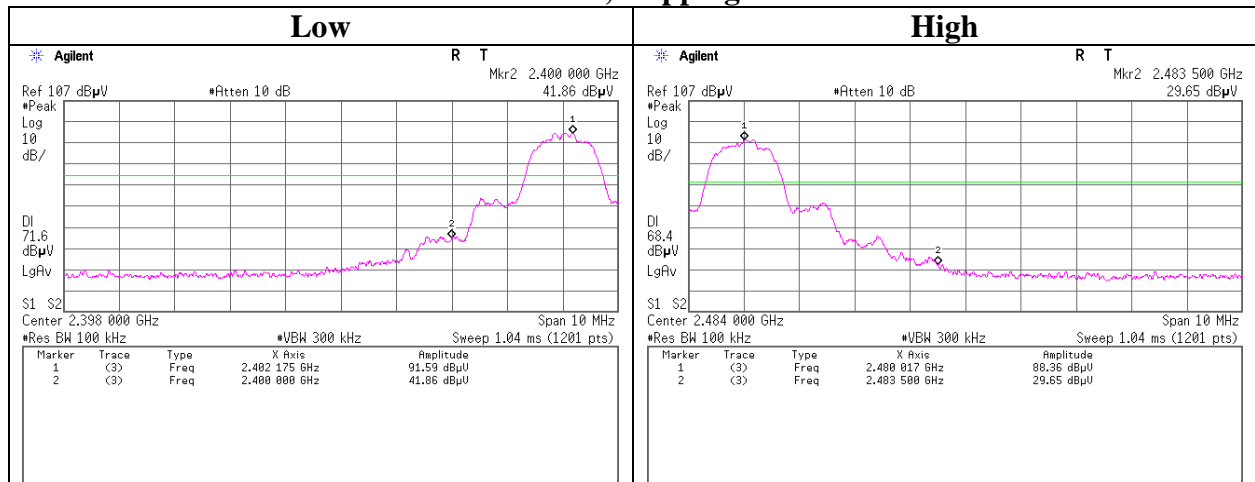
Tx DH5, Hopping on



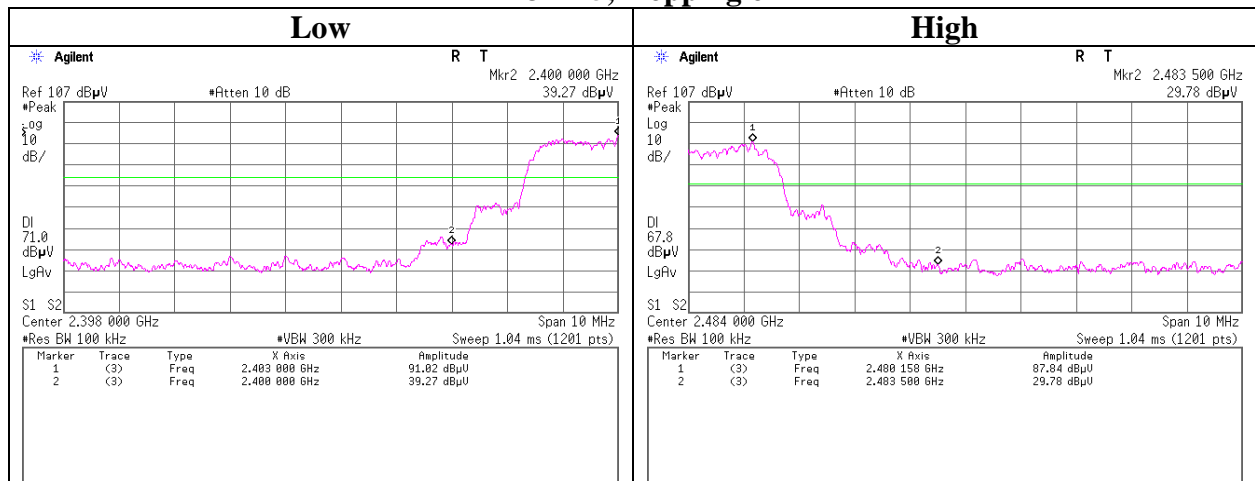
Conducted Emission Band Edge compliance

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

Tx 3DH5, Hopping off



Tx 3DH5, Hopping on

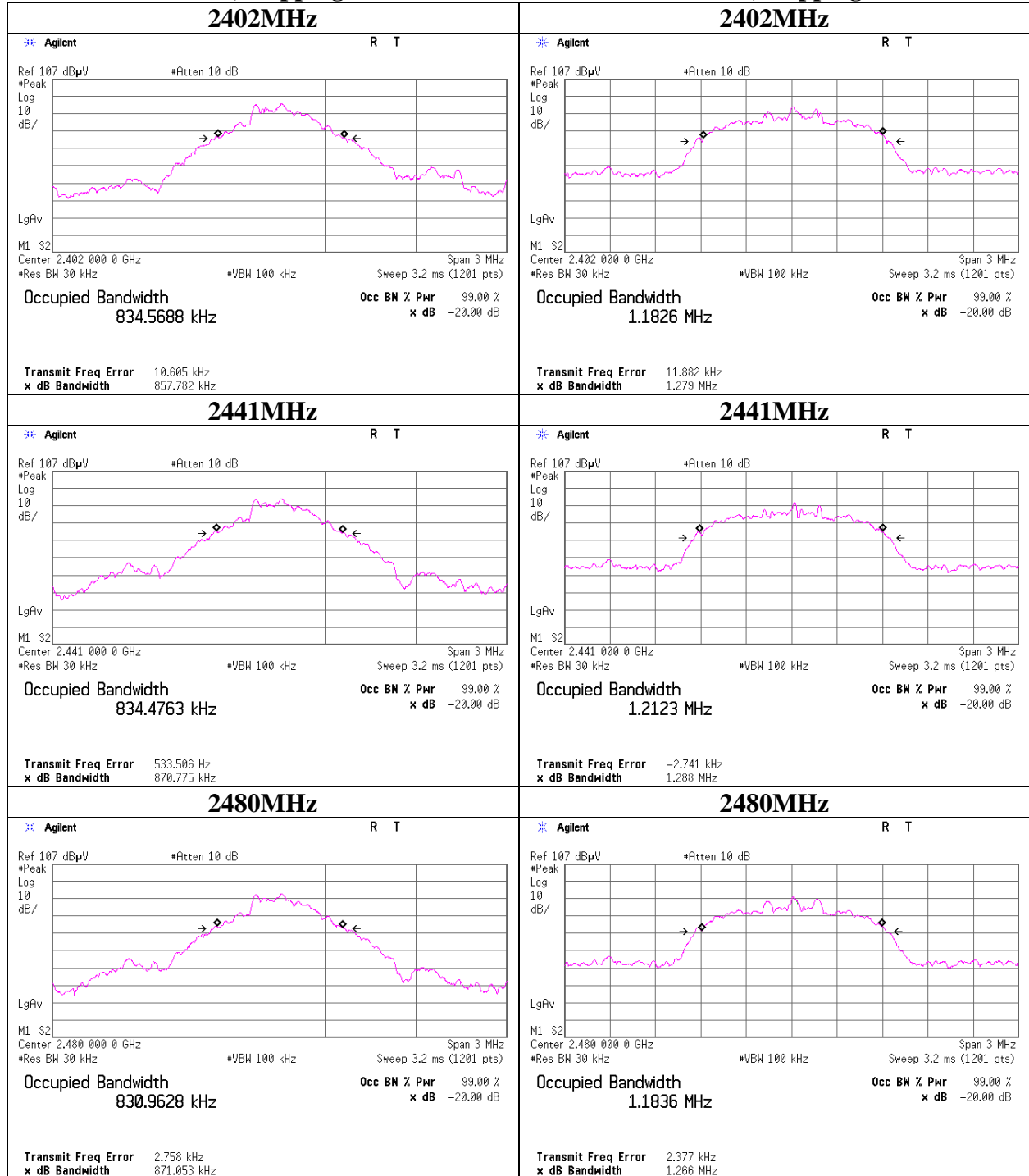


99%Occupied Bandwidth

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada

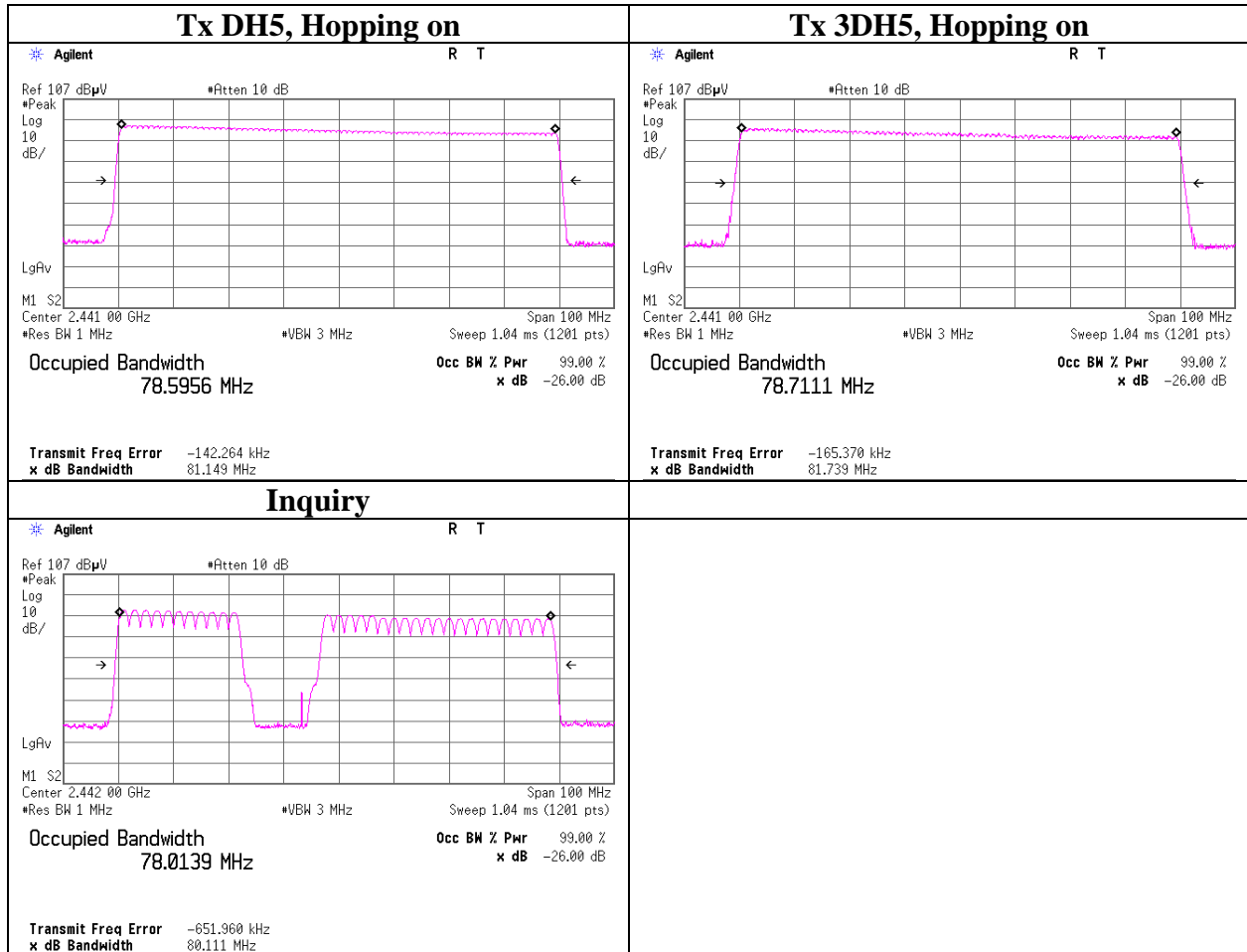
Tx DH5, Hopping off

Tx 3DH5, Hopping off



99% Occupied Bandwidth

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10114553H
Date	11/21/2013
Temperature/ Humidity	24 deg. C / 47% RH
Engineer	Takumi Shimada



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2013/02/22 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2013/10/15 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2013/10/15 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2013/06/05 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2012/12/25 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2013/06/14 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2013/09/27 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2013/09/01 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2013/10/13 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2013/10/13 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2013/07/23 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 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

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124