




# RADIO TEST REPORT


**Test Report No. : 32GE0033-HO-01-A-R1**

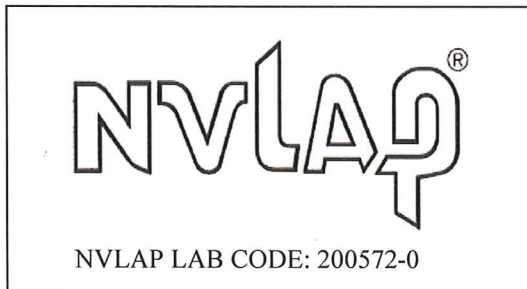
**Applicant** : **Panasonic Corporation of North America**  
**Type of Equipment** : **MULTIMEDIA SYSTEM**  
**Model No.** : **UN-W700**  
**FCC ID** : **ACJ-UN-W700**  
**Test regulation** : **FCC Part 15 Subpart C: 2012**  
**Test Result** : **Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This report is a revised version of 32GE0033-HO-01-A. 32GE0033-HO-01-A is replaced with this report.

**Date of test:** May 18 to 24, 2012

**Representative test engineer:**   
Katsunori Okai  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by:**   
Takahiro Hatakeda  
Leader of WiSE Japan,  
UL Verification Service



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/mar1/index.jsp#nvlap>

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**SECTION 1: Customer information**

Company Name : Panasonic Corporation of North America  
Address : One Panasonic Way, 4B-8, Secaucus, NJ 07094  
Telephone Number : +1-201-348-7758  
Facsimile Number : +1-201-392-4564  
Contact Person : Richard Mullen

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

**2.1 Identification of E.U.T.**

Type of Equipment : MULTIMEDIA SYSTEM  
Model No. : UN-W700  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC5.0V  
Receipt Date of Sample : May 17, 2012  
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**

**General Specification**

Operation Clock	32.768kHz, 19.2MHz, 24.576MHz, 26MHz, 38.4MHz
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**Radio Specification**

**Specification of Wireless LAN (IEEE802.11b/g/n-20) and Bluetooth (Ver.2.1 + EDR)**

Type of radio	Wireless LAN (IEEE802.11b/g/n-20)	Bluetooth
Equipment Type	Transceiver	
Frequency of Operation	Lower frequency=2412MHz Upper frequency=2462MHz	Lower frequency=2402MHz Upper frequency=2480MHz
Bandwidth & Channel spacing	Bandwidth: 20MHz Ch spacing: 5MHz	Bandwidth: 1MHz Ch spacing: 1MHz
Type of Modulation	11b: DSSS 11g, n-20: OFDM	FHSS
Antenna Type	Chip Antenna	
Antenna Connector Type	None	
Antenna Gain	Max 3.0dBi	
Power Supply	DC 3.7V	
Operating temperature range	+0 to +35 deg. C.	

\*This test report applies for Bluetooth (Ver.2.1 + EDR).

\*Wireless LAN (IEEE802.11b/g/n-20) and Bluetooth (Ver.2.1 + EDR) do not transmit simultaneously.

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2012, final revised on March 30, 2012 and effective April 30, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.247 Operation within the bands 902-928MHz,  
2400-2483.5MHz, and 5725-5850MHz

### **3.2 Procedures and results**

Item	Test Procedure	Specification	Worst Margin	Results	Remarks	
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	QP 12.6dB, 0.35123MHz, L AV 15.4dB, 0.35123MHz, L	Complied	-	
Carrier Frequency Separation	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-210 A8.1 (b)	See data.	Complied	Conducted	
20dB Bandwidth	FCC: FCC Public Notice DA 00-705 IC: -	FCC: Section15.247(a)(1) ----- IC: RSS-210 A8.1 (a)		-	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		13.3dB 2400.000MHz, AV, Hori.	Complied	Conducted/ Radiated

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

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

#### **FCC 15.31 (e)**

This EUT provides stable voltage (DC1.8, 2.7, 3.7V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

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

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### 3.3 Addition to standard

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

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

### 3.4 Uncertainty

#### EMI

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

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

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	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	4.2dB

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

Power meter (+dB)	
Below 1GHz	Above 1GHz
1.0dB	1.0dB

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	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

#### Conducted Emission test

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

#### Radiated emission test(3m)

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

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### 3.5 Test Location

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	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	4.75 x 5.4 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 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 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.

## **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)

<b>Test Item</b>	<b>Mode</b>	<b>Tested frequency</b>
Conducted Emission, Spurious Emission (Conducted/Radiated)	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation, 20dB Bandwidth	Tx (Hopping on) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Number of Hopping Frequency	Tx (Hopping on) DH5, 3DH5	-
Dwell time	Tx (Hopping on), -DH1, DH3, DH5 -3DH1, 3DH3, 3DH5	-
Maximum Peak Output Power	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Band Edge Compliance (Conducted)	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2480MHz
99% Occupied Bandwidth	Tx DH5, 3DH5 -Hopping on -Hopping off	2402MHz 2441MHz 2480MHz
<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)</p> <p>*EUT has the power settings by the software as follows;  Power settings: 0dBm  Software: BTTEST v.1.00.03</p> <p>*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>		

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## **SECTION 5: Conducted Emission**

### **Test Procedure and conditions**

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

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

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

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber .

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

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## **SECTION 6: 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

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

\*1) Although 00-705 accepts VBW=10Hz for AV measurements, 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-26.5GHz  
**Test data** : APPENDIX  
**Test result** : Pass

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## **SECTION 7: Antenna Terminal Conducted Tests**

### **Test Procedure**

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

<b>Test</b>	<b>Span</b>	<b>RBW</b>	<b>VBW</b>	<b>Sweep time</b>	<b>Detector</b>	<b>Trace</b>	<b>Instrument used</b>
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	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Carrier Frequency Separation	3MHz	30kHz	100kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Number of Hopping Frequency	30MHz	300kHz	1MHz	Auto	Peak	Max Hold	Spectrum Analyzer
Dwell Time	Zero Span	100kHz, 1MHz	300kHz, 3MHz	As necessary capture the entire dwell time per hopping channel	Peak	Max Hold	Spectrum Analyzer
Conducted Spurious Emission *1)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				
	30MHz to 25GHz (Less or equal to 5GHz)	100kHz	300kHz				
Conducted Spurious Emission Band Edge compliance	10MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer

\*1) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

**Test data** : APPENDIX  
**Test result** : Pass

**APPENDIX 1: Data of EMI test**

**Conducted Emission**

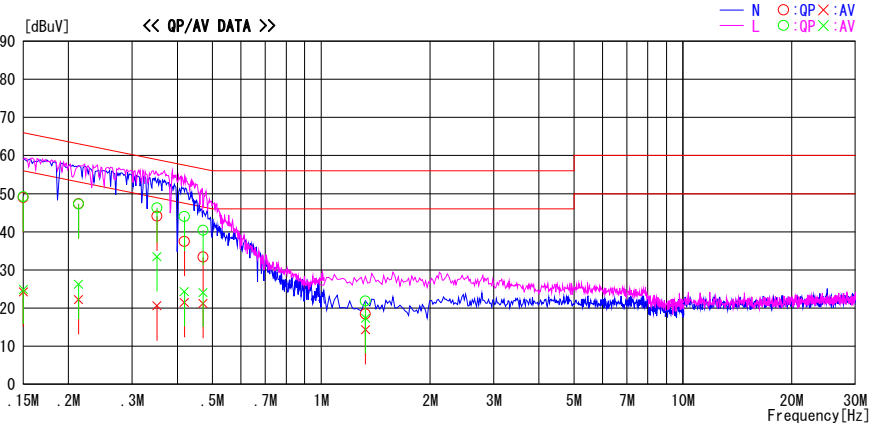
**DATA OF CONDUCTED EMISSION TEST**

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber  
 Date : 2012/05/24

Report No. : 32GE0033-HO-01  
 Temp./Humi. : 22deg. C / 33% RH  
 Engineer : Motoya Imura

Mode / Remarks : Tx DH5 2402MHz

LIMIT : FCC15.207 QP  
 FCC15.207 AV

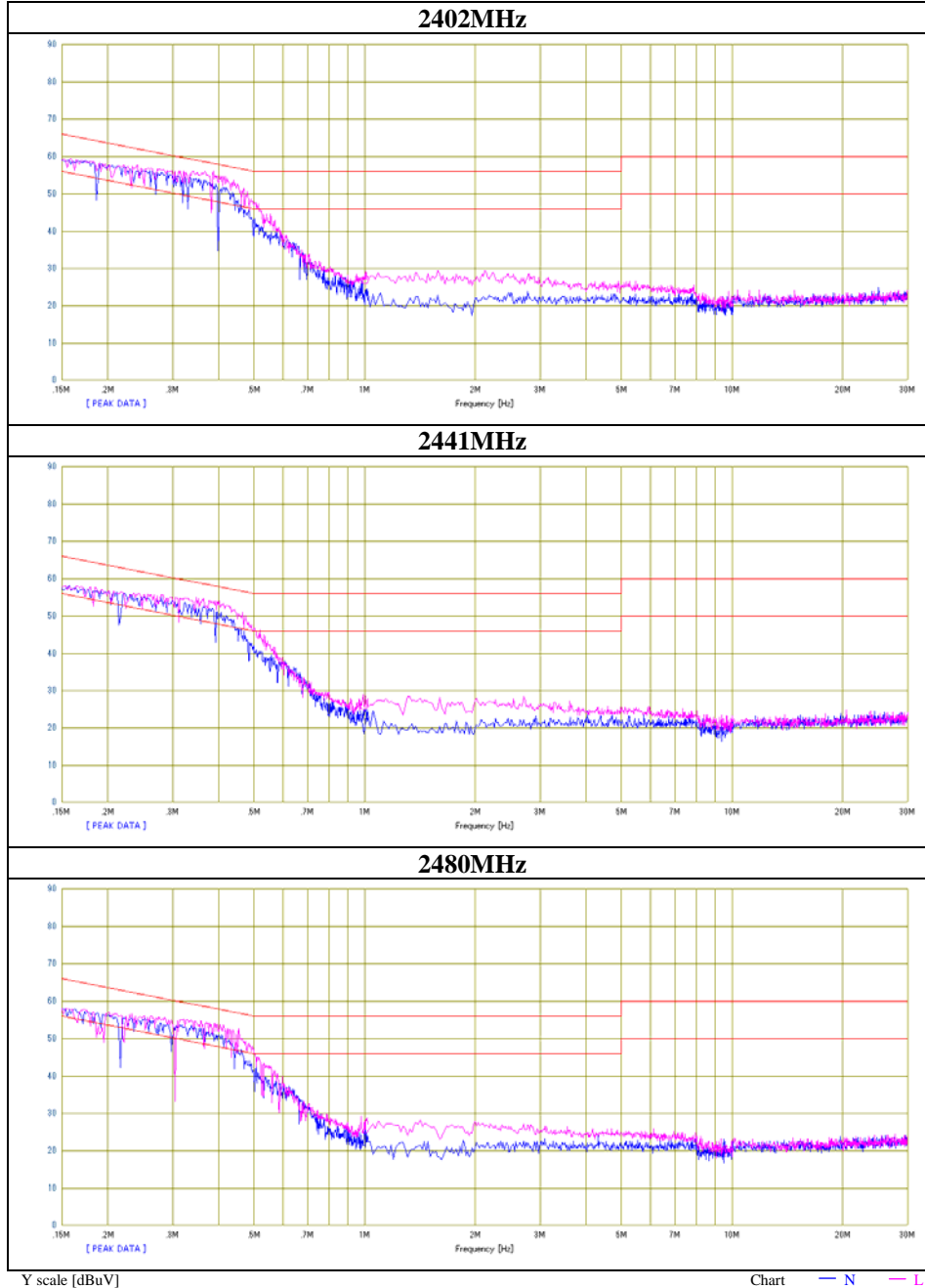


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	35.7	10.9	13.3	49.0	24.2	66.0	56.0	17.0	31.8	N	
0.21334	34.1	8.9	13.3	47.4	22.2	63.1	53.1	15.7	30.9	N	
0.35121	30.8	7.3	13.3	44.1	20.6	58.9	48.9	14.8	28.3	N	
0.41820	24.2	8.2	13.3	37.5	21.5	57.5	47.5	20.0	26.0	N	
0.47128	20.1	7.9	13.3	33.4	21.2	56.5	46.5	23.1	25.3	N	
1.32535	5.1	0.9	13.4	18.5	14.3	56.0	46.0	37.5	31.7	N	
0.15000	35.9	11.6	13.3	49.2	24.9	66.0	56.0	16.8	31.1	L	
0.21340	34.0	12.9	13.3	47.3	26.2	63.1	53.1	15.8	26.9	L	
0.35123	33.0	20.2	13.3	46.3	33.5	58.9	48.9	12.6	15.4	L	
0.41823	30.7	11.0	13.3	44.0	24.3	57.5	47.5	13.5	23.2	L	
0.47120	27.1	10.8	13.3	40.4	24.1	56.5	46.5	16.1	22.4	L	
1.32535	8.4	3.9	13.4	21.8	17.3	56.0	46.0	34.2	28.7	L	

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

## Conducted Emission

Test place : Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Report No. : 32GE0033-HO-01  
Date : 5/24/2012  
Temperature/ Humidity : 22 deg. C / 33% RH  
Engineer : Motoya Imura  
Mode : Tx DH5



## Conducted Emission

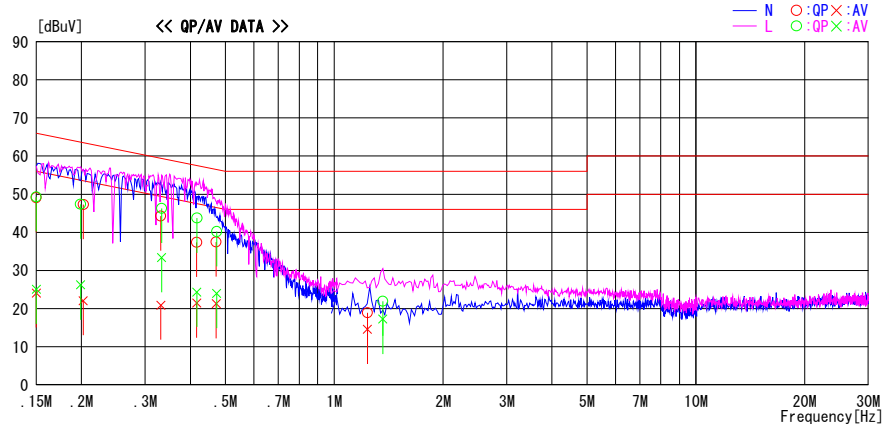
### DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber  
Date : 2012/05/24

Report No. : 32GE0033-HO-01  
 Temp./Humi. : 22deg. C / 33% RH  
 Engineer : Motoya Imura

Mode / Remarks : Tx 3DH5 2402MHz

LIMIT : FCC15.207 QP  
 FCC15.207 AV

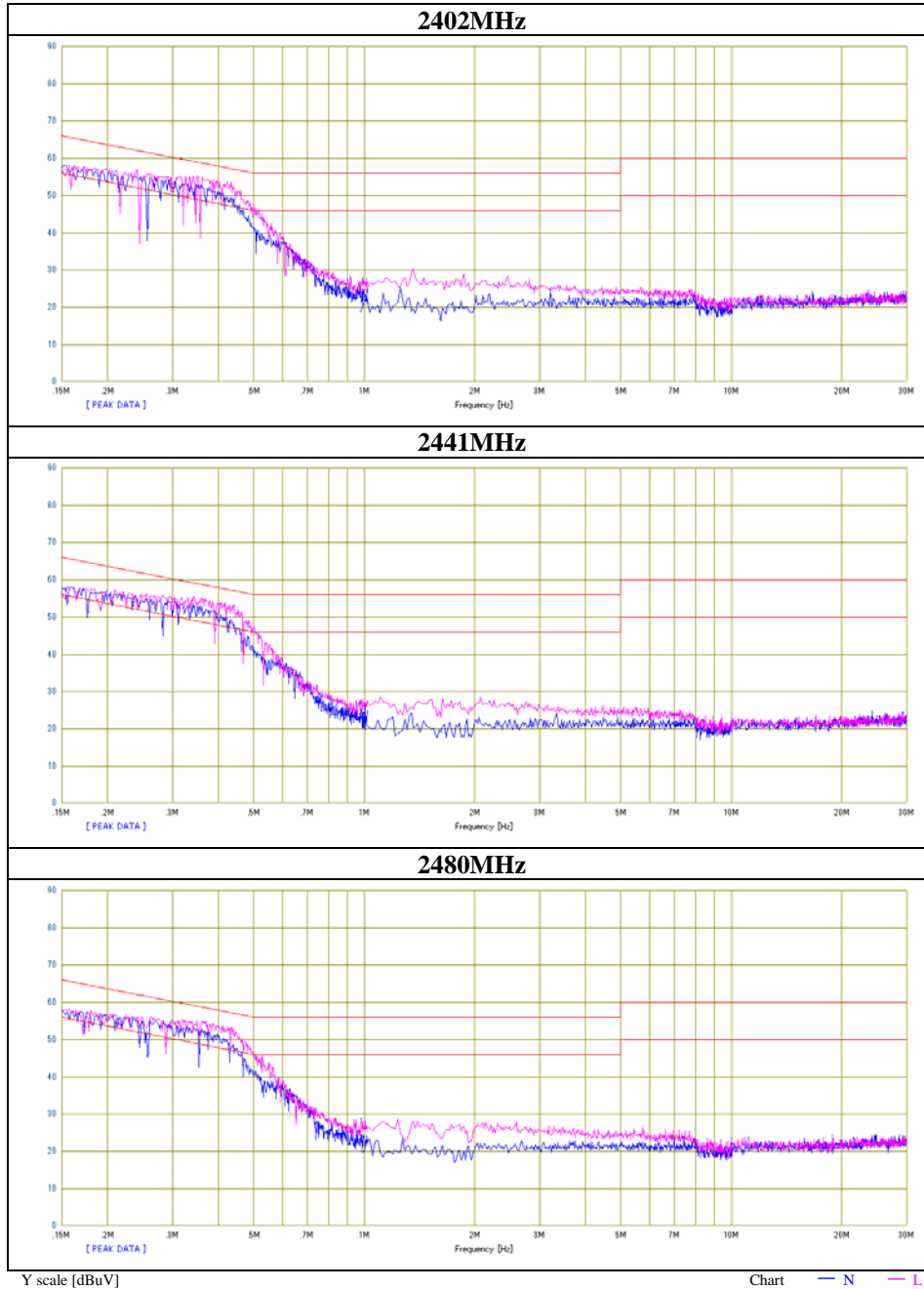


Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	35.8	10.8	13.3	49.1	24.1	66.0	56.0	16.9	31.9	N	
0.20230	34.0	8.8	13.3	47.3	22.1	63.5	53.5	16.2	31.4	N	
0.33132	31.0	7.6	13.3	44.3	20.9	59.4	49.4	15.1	28.5	N	
0.41701	24.1	8.2	13.3	37.4	21.5	57.5	47.5	20.1	26.0	N	
0.47183	24.2	8.0	13.3	37.5	21.3	56.5	46.5	19.0	25.2	N	
1.23617	5.5	1.2	13.4	18.9	14.6	56.0	46.0	37.1	31.4	N	
0.15000	36.0	11.8	13.3	49.3	25.1	66.0	56.0	16.7	30.9	L	
0.19882	34.1	12.9	13.3	47.4	26.2	63.7	53.7	16.3	27.5	L	
0.33307	33.0	20.1	13.3	46.3	33.4	59.4	49.4	13.1	16.0	L	
0.41732	30.4	11.0	13.3	43.7	24.3	57.5	47.5	13.8	23.2	L	
0.47342	26.9	10.7	13.3	40.2	24.0	56.5	46.5	16.3	22.5	L	
1.36170	8.5	3.8	13.4	21.9	17.2	56.0	46.0	34.1	28.8	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F.(L1SN LOSS+ATT LOSS +CABLE LOSS)  
 Except for the above table : adequate margin data below the limits.

## Conducted Emission

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	32GE0033-HO-01
Date	5/24/2012
Temperature/ Humidity	22 deg. C / 33% RH
Engineer	Motoya Imura
Mode	Tx 3DH5



## 20dB Bandwidth and Carrier Frequency Separation

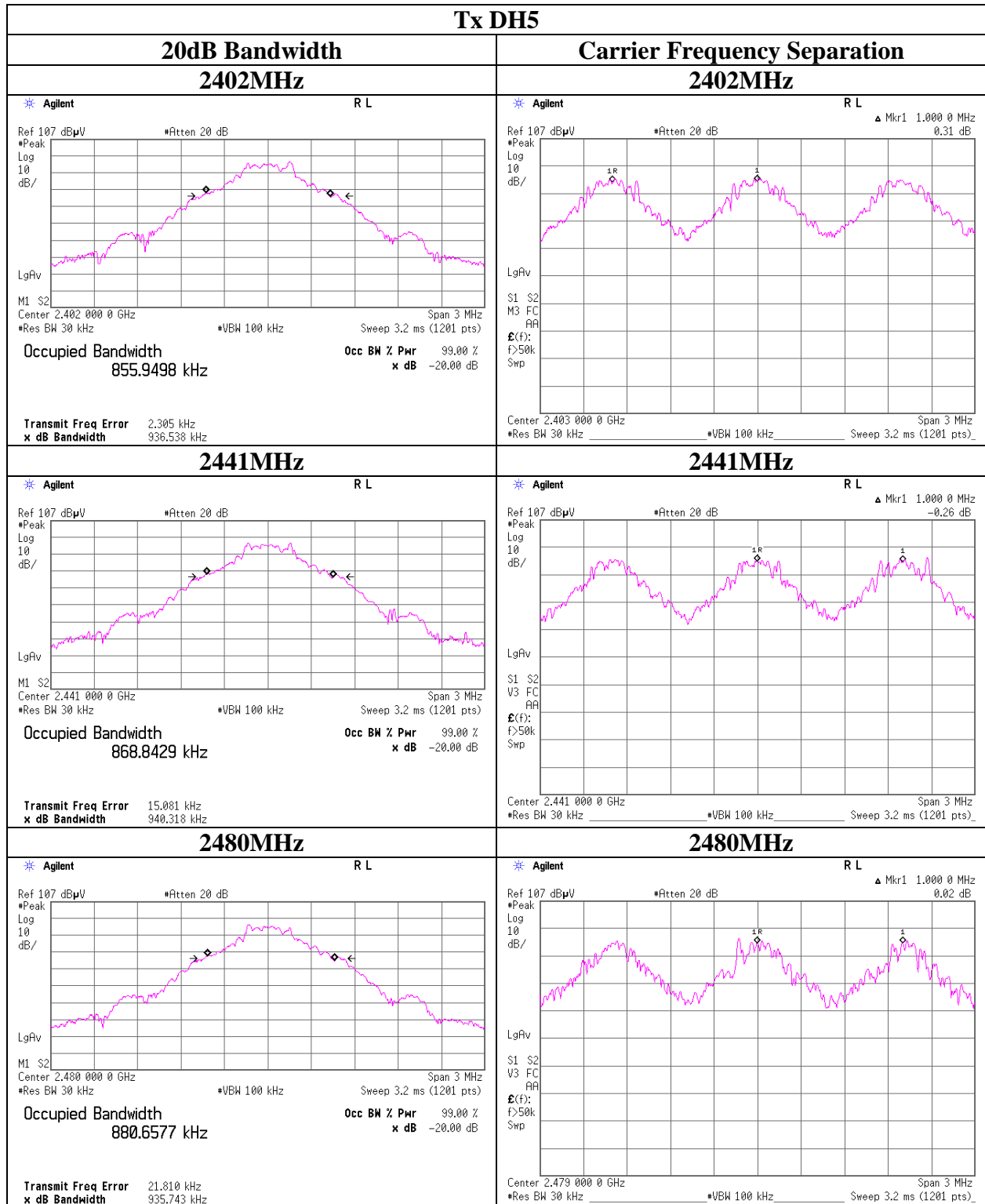
Test place : Head Office EMC Lab. No.11 Measurement Room  
Report No. : 32GE0033-HO-01  
Date : 5/18/2012  
Temperature/ Humidity : 25 deg. C / 37% RH  
Engineer : Katsunori Okai  
Mode : Tx (Hopping on) DH5/3DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.937	1.000	$\geq 0.625$
DH5	2441.0	0.940	1.000	$\geq 0.627$
DH5	2480.0	0.936	1.000	$\geq 0.624$
3DH5	2402.0	1.314	1.000	$\geq 0.876$
3DH5	2441.0	1.315	1.000	$\geq 0.877$
3DH5	2480.0	1.321	1.000	$\geq 0.881$

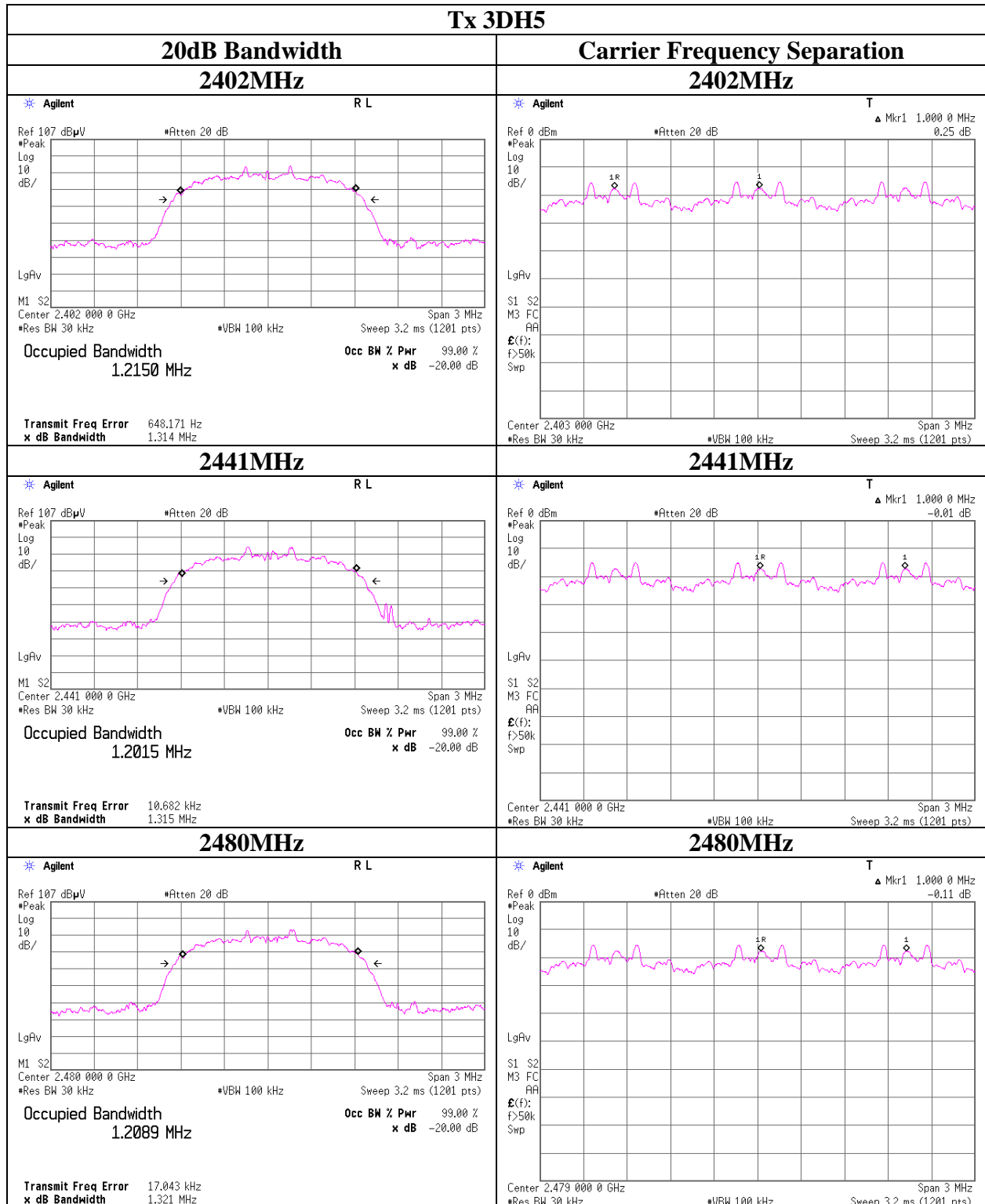
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

## 20dB Bandwidth and Carrier Frequency Separation



## 20dB Bandwidth and Carrier Frequency Separation

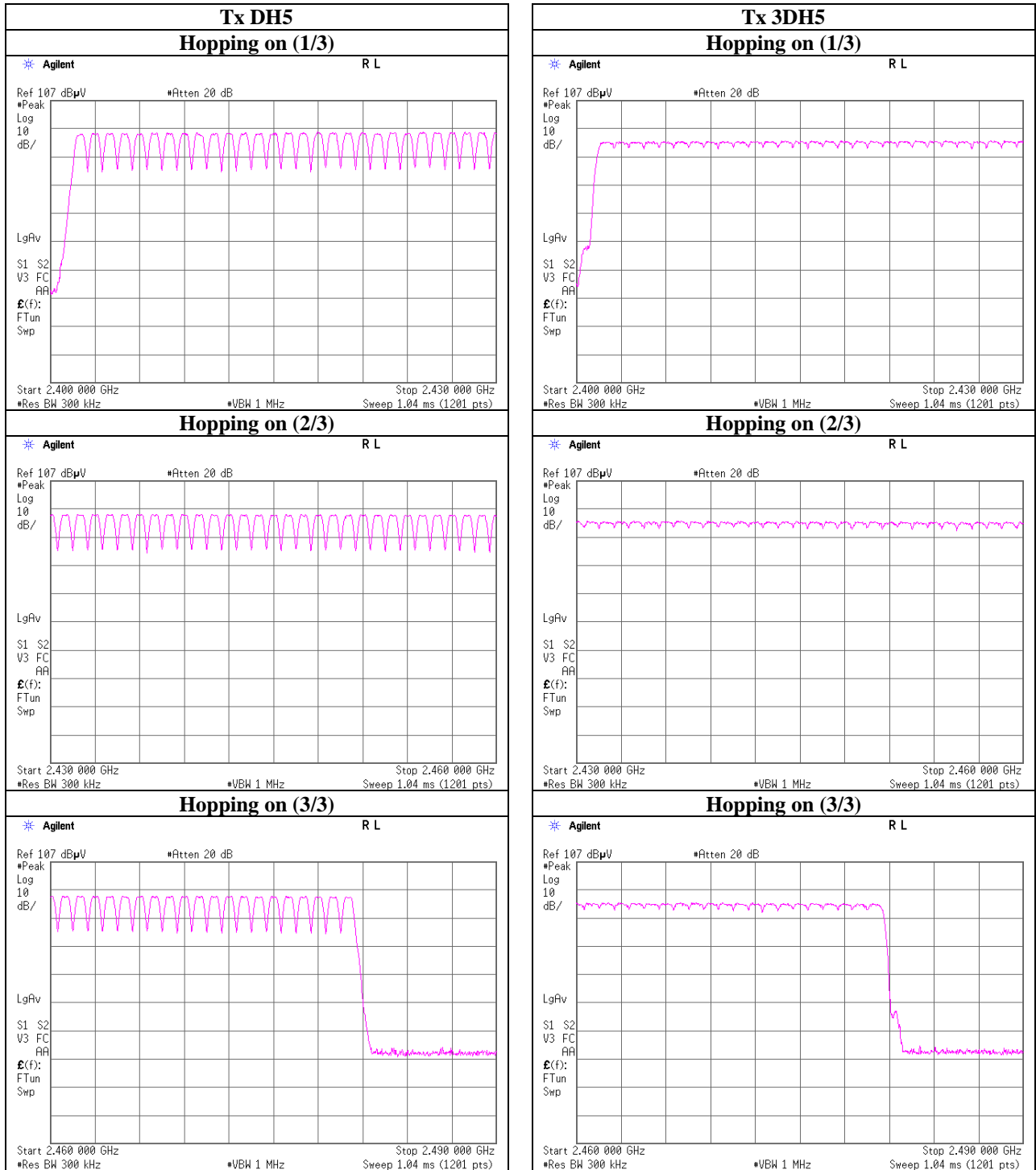


### Number of Hopping Frequency

Test place Head Office EMC Lab. No.11 Measurement Room  
Report No. 32GE0033-HO-01  
Date 5/18/2012  
Temperature/ Humidity 25 deg. C / 37% RH  
Engineer Katsunori Okai  
Mode Tx (Hopping on) DH5/3DH5

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

## Number of Hopping Frequency



### Dwell time

Test place : Head Office EMC Lab. No.11 Measurement Room  
 Report No. : 32GE0033-HO-01  
 Date : 5/18/2012  
 Temperature/ Humidity : 25 deg. C / 37% RH  
 Engineer : Katsunori Okai  
 Mode : Tx (Hopping on) DH5/3DH5

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period				Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.6 times	/	5 sec.	x 31.6 sec. = 320 times	0.393	126	400
DH3	26.2 times	/	5 sec.	x 31.6 sec. = 166 times	1.662	276	400
DH5	19.4 times	/	5 sec.	x 31.6 sec. = 123 times	2.906	357	400
3DH1	50.4 times	/	5 sec.	x 31.6 sec. = 319 times	0.400	127	400
3DH3	25.6 times	/	5 sec.	x 31.6 sec. = 162 times	1.657	268	400
3DH5	19.0 times	/	5 sec.	x 31.6 sec. = 121 times	2.915	353	400

Sample Calculation

Result = Number of transmission x Length of transmission time

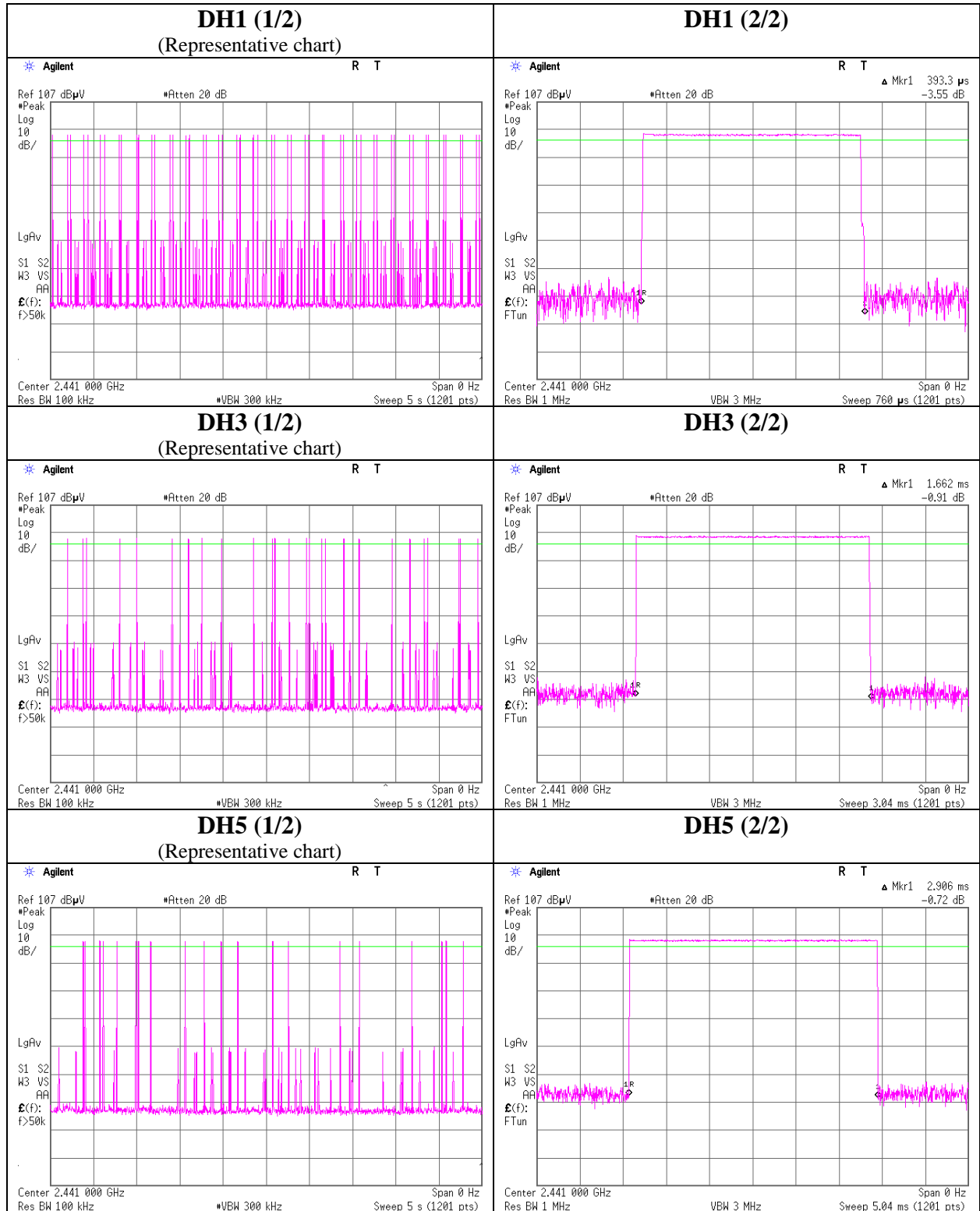
\*Average data of 5 tests.

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	51	51	51	50	50	50.6
DH3	26	27	28	25	25	26.2
DH5	20	19	19	19	20	19.4
3DH1	50	51	51	50	50	50.4
3DH3	27	25	25	27	24	25.6
3DH5	17	20	19	18	21	19

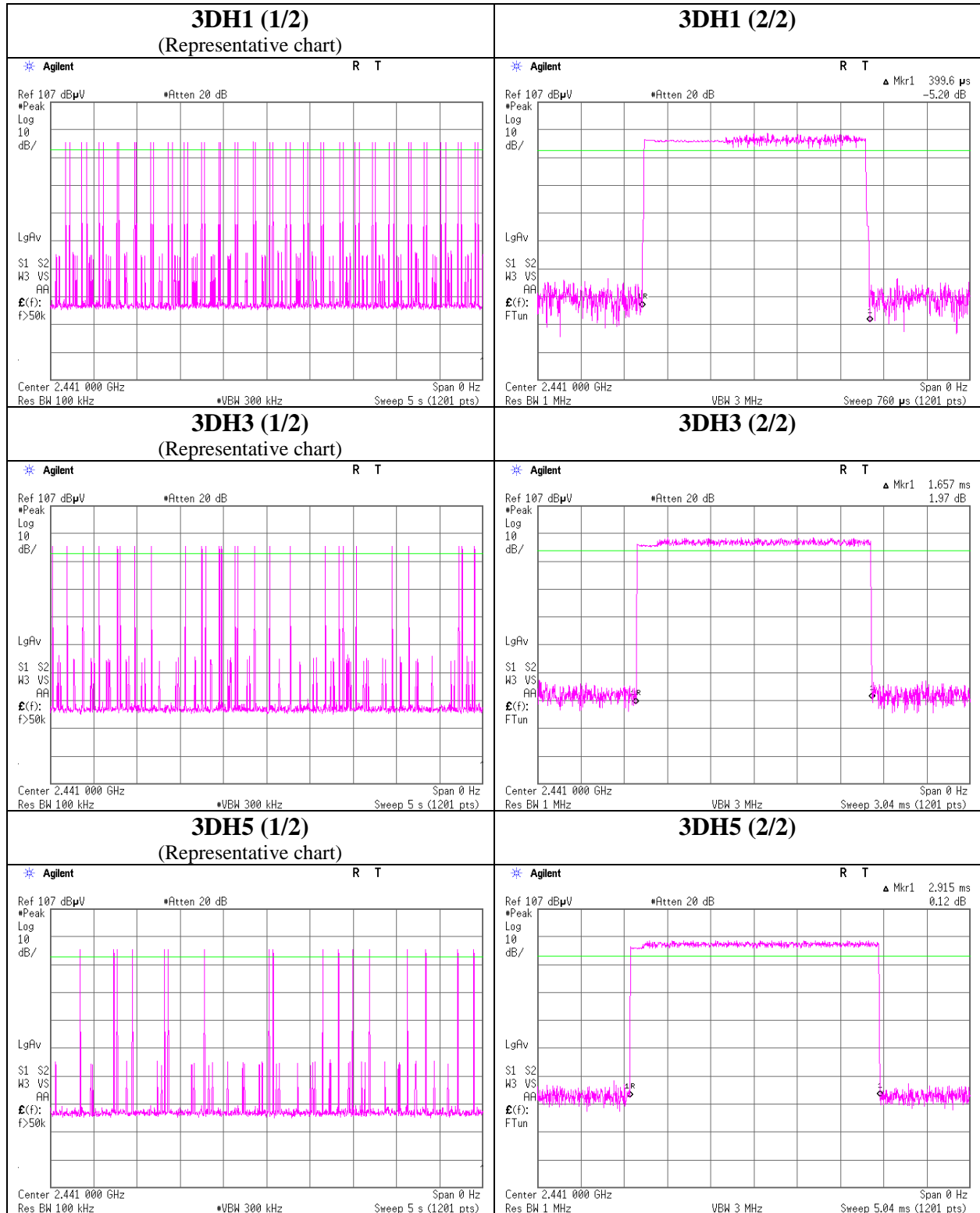
Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

**Dwell time**



**Dwell time**



## Maximum Peak Output Power

Test place Head Office EMC Lab. No.11 Measurement Room  
Report No. 32GE0033-HO-01  
Date 5/18/2012  
Temperature/ Humidity 25 deg. C / 37% RH  
Engineer Katsunori Okai  
Mode Tx (Hopping off) DH5/3DH5

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-11.23	2.33	10.00	1.10	1.29	20.96	125	19.86
DH5	2441.0	-10.88	2.34	10.00	1.46	1.40	20.96	125	19.50
DH5	2480.0	-11.18	2.35	10.00	1.17	1.31	20.96	125	19.79
3DH5	2402.0	-11.02	2.33	10.00	1.31	1.35	20.96	125	19.65
3DH5	2441.0	-10.84	2.34	10.00	1.50	1.41	20.96	125	19.46
3DH5	2480.0	-11.13	2.35	10.00	1.22	1.32	20.96	125	19.74

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.

**UL Japan, Inc.**

**Head Office EMC Lab.**

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## Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. 32GE0033-HO-01  
Date 5/19/2012  
Temperature/ Humidity 22 deg. C / 40% RH  
Engineer Satofumi Matsuyama  
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	39.623	QP	23.0	15.1	7.3	32.2	13.2	40.0	26.8	
Hori	105.158	QP	22.2	10.8	8.2	32.3	8.9	43.5	34.6	No signal.
Hori	177.636	QP	22.2	16.1	9.0	32.2	15.1	43.5	28.4	No signal.
Hori	420.019	QP	21.9	17.8	10.8	32.0	18.5	46.0	27.5	No signal.
Hori	617.457	QP	21.7	19.6	12.0	32.0	21.3	46.0	24.7	No signal.
Hori	866.868	QP	21.8	22.3	13.3	31.1	26.3	46.0	19.7	No signal.
Hori	2390.000	PK	44.2	26.4	2.2	32.4	40.4	73.9	33.5	
Hori	2400.000	PK	59.6	26.4	2.2	32.4	55.8	73.9	18.1	
Hori	4804.000	PK	40.6	30.4	3.9	31.4	43.5	73.9	30.4	No signal.
Hori	7206.000	PK	42.0	35.2	4.6	32.4	49.4	73.9	24.5	No signal.
Hori	9608.000	PK	41.5	38.1	5.5	33.0	52.1	73.9	21.8	No signal.
Hori	24020.000	PK	46.7	38.5	-1.8	31.1	52.3	73.9	21.6	No signal.
Hori	2390.000	AV	31.8	26.4	2.2	32.4	28.0	53.9	25.9	
Hori	2400.000	AV	39.4	26.4	2.2	32.4	35.6	53.9	18.3	
Hori	4804.000	AV	29.4	30.4	3.9	31.4	32.3	53.9	21.6	No signal.
Hori	7206.000	AV	30.5	35.2	4.6	32.4	37.9	53.9	16.0	No signal.
Hori	9608.000	AV	30.7	38.1	5.5	33.0	41.3	53.9	12.6	No signal.
Hori	24020.000	AV	28.8	38.5	-1.8	31.1	34.4	53.9	19.5	No signal.
Vert	39.602	QP	28.1	15.1	7.3	32.2	18.3	40.0	21.7	
Vert	105.686	QP	22.2	10.9	8.2	32.3	9.0	43.5	34.5	No signal.
Vert	177.756	QP	22.2	16.1	9.0	32.2	15.1	43.5	28.4	No signal.
Vert	422.092	QP	21.7	17.8	10.8	32.0	18.3	46.0	27.7	No signal.
Vert	617.401	QP	21.7	19.6	12.0	32.0	21.3	46.0	24.7	No signal.
Vert	865.638	QP	21.8	22.3	13.3	31.1	26.3	46.0	19.7	No signal.
Vert	2390.000	PK	44.7	26.4	2.2	32.4	40.9	73.9	33.0	
Vert	2400.000	PK	56.5	26.4	2.2	32.4	52.7	73.9	21.2	
Vert	4804.000	PK	40.2	30.4	3.9	31.4	43.1	73.9	30.8	No signal.
Vert	7206.000	PK	41.7	35.2	4.6	32.4	49.1	73.9	24.8	No signal.
Vert	9608.000	PK	41.2	38.1	5.5	33.0	51.8	73.9	22.1	No signal.
Vert	24020.000	PK	46.1	38.5	-1.8	31.1	51.7	73.9	22.2	No signal.
Vert	2390.000	AV	31.0	26.4	2.2	32.4	27.2	53.9	26.7	
Vert	2400.000	AV	36.3	26.4	2.2	32.4	32.5	53.9	21.4	
Vert	4804.000	AV	29.4	30.4	3.9	31.4	32.3	53.9	21.6	No signal.
Vert	7206.000	AV	30.5	35.2	4.6	32.4	37.9	53.9	16.0	No signal.
Vert	9608.000	AV	30.7	38.1	5.5	33.0	41.3	53.9	12.6	No signal.
Vert	24020.000	AV	28.8	38.5	-1.8	31.1	34.4	53.9	19.5	No signal.

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

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. : 32GE0033-HO-01  
 Date : 5/19/2012  
 Temperature/ Humidity : 22 deg. C / 40% RH  
 Engineer : Satofumi Matsuyama  
 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	40.502	QP	23.1	14.7	7.3	32.2	12.9	40.0	27.1	
Hori	105.118	QP	22.3	10.8	8.2	32.3	9.0	43.5	34.5	No signal.
Hori	176.722	QP	22.2	16.1	9.0	32.2	15.1	43.5	28.4	No signal.
Hori	422.502	QP	21.8	17.8	10.8	32.0	18.4	46.0	27.6	No signal.
Hori	617.281	QP	21.7	19.6	12.0	32.0	21.3	46.0	24.7	No signal.
Hori	866.168	QP	21.8	22.3	13.3	31.1	26.3	46.0	19.7	No signal.
Hori	2483.500	PK	48.1	26.5	2.2	32.3	44.5	73.9	29.4	
Hori	4960.000	PK	39.9	30.6	3.9	31.4	43.0	73.9	30.9	No signal.
Hori	7440.000	PK	42.3	35.1	4.7	32.6	49.5	73.9	24.4	No signal.
Hori	9920.000	PK	42.9	38.6	5.6	33.1	54.0	73.9	19.9	No signal.
Hori	24800.000	PK	48.2	39.0	-1.6	30.8	54.8	73.9	19.1	No signal.
Hori	2483.500	AV	33.5	26.5	2.2	32.3	29.9	53.9	24.0	
Hori	4960.000	AV	28.9	30.6	3.9	31.4	32.0	53.9	21.9	No signal.
Hori	7440.000	AV	30.3	35.1	4.7	32.6	37.5	53.9	16.4	No signal.
Hori	9920.000	AV	30.8	38.6	5.6	33.1	41.9	53.9	12.0	No signal.
Hori	24800.000	AV	35.9	39.0	-1.6	30.8	42.5	53.9	11.4	No signal.
Vert	40.522	QP	27.9	14.7	7.3	32.2	17.7	40.0	22.3	
Vert	105.046	QP	22.4	10.8	8.2	32.3	9.1	43.5	34.4	No signal.
Vert	177.116	QP	22.2	16.1	9.0	32.2	15.1	43.5	28.4	No signal.
Vert	422.837	QP	21.8	17.8	10.8	32.0	18.4	46.0	27.6	No signal.
Vert	617.452	QP	21.8	19.6	12.0	32.0	21.4	46.0	24.6	No signal.
Vert	866.203	QP	21.8	22.3	13.3	31.1	26.3	46.0	19.7	No signal.
Vert	2483.500	PK	43.6	26.5	2.2	32.3	40.0	73.9	33.9	
Vert	4960.000	PK	40.4	30.6	3.9	31.4	43.5	73.9	30.4	No signal.
Vert	7440.000	PK	41.7	35.1	4.7	32.6	48.9	73.9	25.0	No signal.
Vert	9920.000	PK	43.2	38.6	5.6	33.1	54.3	73.9	19.6	No signal.
Vert	24800.000	PK	47.6	39.0	-1.6	30.8	54.2	73.9	19.7	No signal.
Vert	2483.500	AV	31.3	26.5	2.2	32.3	27.7	53.9	26.2	
Vert	4960.000	AV	28.9	30.6	3.9	31.4	32.0	53.9	21.9	No signal.
Vert	7440.000	AV	30.3	35.1	4.7	32.6	37.5	53.9	16.4	No signal.
Vert	9920.000	AV	30.8	38.6	5.6	33.1	41.9	53.9	12.0	No signal.
Vert	24800.000	AV	35.9	39.0	-1.6	30.8	42.5	53.9	11.4	No signal.

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

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. 32GE0033-HO-01  
Date 5/19/2012 5/23/2012  
Temperature/ Humidity 22 deg. C / 40% RH 22 deg. C / 33% RH  
Engineer Satofumi Matsuyama Motoya Imura  
(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	39.623	QP	22.9	15.0	7.2	32.0	13.1	40.0	26.9	
Hori	113.720	QP	25.2	12.1	8.2	32.0	13.5	43.5	30.0	
Hori	284.134	QP	22.1	19.3	9.7	32.0	19.1	46.0	26.9	No signal.
Hori	420.020	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Hori	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Hori	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Hori	2390.000	PK	44.0	26.4	2.2	32.4	40.2	73.9	33.7	
Hori	2400.000	PK	60.6	26.4	2.2	32.4	56.8	73.9	17.1	
Hori	4804.000	PK	40.5	30.4	3.9	31.4	43.4	73.9	30.5	No signal.
Hori	7206.000	PK	41.8	35.2	4.6	32.4	49.2	73.9	24.7	No signal.
Hori	9608.000	PK	41.7	38.1	5.5	33.0	52.3	73.9	21.6	No signal.
Hori	24020.000	PK	46.2	38.5	-1.8	31.1	51.8	73.9	22.1	No signal.
Hori	2390.000	AV	31.3	26.4	2.2	32.4	27.5	53.9	26.4	
Hori	2400.000	AV	44.4	26.4	2.2	32.4	40.6	53.9	13.3	
Hori	4804.000	AV	29.4	30.4	3.9	31.4	32.3	53.9	21.6	No signal.
Hori	7206.000	AV	30.5	35.2	4.6	32.4	37.9	53.9	16.0	No signal.
Hori	9608.000	AV	30.7	38.1	5.5	33.0	41.3	53.9	12.6	No signal.
Hori	24020.000	AV	28.8	38.5	-1.8	31.1	34.4	53.9	19.5	No signal.
Vert	38.562	QP	27.9	15.3	7.2	32.0	18.4	40.0	21.6	
Vert	113.720	QP	22.9	12.1	8.2	32.0	11.2	43.5	32.3	
Vert	284.134	QP	22.4	19.3	9.7	32.0	19.4	46.0	26.6	No signal.
Vert	420.020	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Vert	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Vert	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Vert	2390.000	PK	43.7	26.4	2.2	32.4	39.9	73.9	34.0	
Vert	2400.000	PK	57.7	26.4	2.2	32.4	53.9	73.9	20.0	
Vert	4804.000	PK	40.7	30.4	3.9	31.4	43.6	73.9	30.3	No signal.
Vert	7206.000	PK	41.9	35.2	4.6	32.4	49.3	73.9	24.6	No signal.
Vert	9608.000	PK	41.4	38.1	5.5	33.0	52.0	73.9	21.9	No signal.
Vert	24020.000	PK	46.8	38.5	-1.8	31.1	52.4	73.9	21.5	No signal.
Vert	2390.000	AV	30.9	26.4	2.2	32.4	27.1	53.9	26.8	
Vert	2400.000	AV	42.0	26.4	2.2	32.4	38.2	53.9	15.7	
Vert	4804.000	AV	29.4	30.4	3.9	31.4	32.3	53.9	21.6	No signal.
Vert	7206.000	AV	30.5	35.2	4.6	32.4	37.9	53.9	16.0	No signal.
Vert	9608.000	AV	30.7	38.1	5.5	33.0	41.3	53.9	12.6	No signal.
Vert	24020.000	AV	28.8	38.5	-1.8	31.1	34.4	53.9	19.5	No signal.

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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. 32GE0033-HO-01  
Date 5/19/2012 5/23/2012  
Temperature/ Humidity 22 deg. C / 40% RH 22 deg. C / 33% RH  
Engineer Satofumi Matsuyama Motoya Imura  
(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	39.122	QP	22.9	15.1	7.2	32.0	13.2	40.0	26.8	
Hori	113.689	QP	25.2	12.1	8.2	32.0	13.5	43.5	30.0	
Hori	284.134	QP	22.2	19.3	9.7	32.0	19.2	46.0	26.8	No signal.
Hori	420.192	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Hori	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Hori	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Hori	4882.000	PK	40.9	30.5	3.8	31.4	43.8	73.9	30.1	No signal.
Hori	7323.000	PK	42.2	35.2	4.6	32.5	49.5	73.9	24.4	No signal.
Hori	9764.000	PK	42.7	38.3	5.5	33.0	53.5	73.9	20.4	No signal.
Hori	24410.000	PK	42.2	38.8	-1.7	30.9	48.4	73.9	25.5	No signal.
Hori	4882.000	AV	29.0	30.5	3.8	31.4	31.9	53.9	22.0	No signal.
Hori	7323.000	AV	30.1	35.2	4.6	32.5	37.4	53.9	16.5	No signal.
Hori	9764.000	AV	30.3	38.3	5.5	33.0	41.1	53.9	12.8	No signal.
Hori	24410.000	AV	30.3	38.8	-1.7	30.9	36.5	53.9	17.4	No signal.
Vert	39.061	QP	27.5	15.1	7.2	32.0	17.8	40.0	22.2	
Vert	113.689	QP	22.9	12.1	8.2	32.0	11.2	43.5	32.3	
Vert	284.134	QP	22.4	19.3	9.7	32.0	19.4	46.0	26.6	No signal.
Vert	420.192	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Vert	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Vert	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Vert	4882.000	PK	40.7	30.5	3.8	31.4	43.6	73.9	30.3	No signal.
Vert	7323.000	PK	42.5	35.2	4.6	32.5	49.8	73.9	24.1	No signal.
Vert	9764.000	PK	42.4	38.3	5.5	33.0	53.2	73.9	20.7	No signal.
Vert	24410.000	PK	42.7	38.8	-1.7	30.9	48.9	73.9	25.0	No signal.
Vert	4882.000	AV	29.0	30.5	3.8	31.4	31.9	53.9	22.0	No signal.
Vert	7323.000	AV	30.1	35.2	4.6	32.5	37.4	53.9	16.5	No signal.
Vert	9764.000	AV	30.3	38.3	5.5	33.0	41.1	53.9	12.8	No signal.
Vert	24410.000	AV	30.3	38.8	-1.7	30.9	36.5	53.9	17.4	No signal.

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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. 32GE0033-HO-01  
Date 5/19/2012 5/23/2012  
Temperature/ Humidity 22 deg. C / 40% RH 22 deg. C / 33% RH  
Engineer Satofumi Matsuyama Motoya Imura  
(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	39.152	QP	23.0	15.1	7.2	32.0	13.3	40.0	26.7	
Hori	118.243	QP	25.4	12.7	8.3	32.0	14.4	43.5	29.1	
Hori	284.134	QP	22.2	19.3	9.7	32.0	19.2	46.0	26.8	No signal.
Hori	420.192	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Hori	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Hori	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Hori	2483.500	PK	47.9	26.5	2.2	32.3	44.3	73.9	29.6	
Hori	4960.000	PK	40.5	30.6	3.9	31.4	43.6	73.9	30.3	No signal.
Hori	7440.000	PK	41.9	35.1	4.7	32.6	49.1	73.9	24.8	No signal.
Hori	9920.000	PK	43.1	38.6	5.6	33.1	54.2	73.9	19.7	No signal.
Hori	24800.000	PK	48.5	39.0	-1.6	30.8	55.1	73.9	18.8	No signal.
Hori	2483.500	AV	32.9	26.5	2.2	32.3	29.3	53.9	24.6	
Hori	4960.000	AV	28.9	30.6	3.9	31.4	32.0	53.9	21.9	No signal.
Hori	7440.000	AV	30.3	35.1	4.7	32.6	37.5	53.9	16.4	No signal.
Hori	9920.000	AV	30.8	38.6	5.6	33.1	41.9	53.9	12.0	No signal.
Hori	24800.000	AV	35.8	39.0	-1.6	30.8	42.4	53.9	11.5	No signal.
Vert	39.162	QP	27.6	15.1	7.2	32.0	17.9	40.0	22.1	
Vert	118.243	QP	22.9	12.7	8.3	32.0	11.9	43.5	31.6	
Vert	284.134	QP	22.4	19.3	9.7	32.0	19.4	46.0	26.6	No signal.
Vert	420.192	QP	22.0	17.9	10.6	32.0	18.5	46.0	27.5	No signal.
Vert	617.400	QP	21.9	20.8	11.7	32.1	22.3	46.0	23.7	No signal.
Vert	865.210	QP	22.1	24.0	12.9	31.4	27.6	46.0	18.4	No signal.
Vert	2483.500	PK	46.0	26.5	2.2	32.3	42.4	73.9	31.5	
Vert	4960.000	PK	40.1	30.6	3.9	31.4	43.2	73.9	30.7	No signal.
Vert	7440.000	PK	42.0	35.1	4.7	32.6	49.2	73.9	24.7	No signal.
Vert	9920.000	PK	42.8	38.6	5.6	33.1	53.9	73.9	20.0	No signal.
Vert	24800.000	PK	47.1	39.0	-1.6	30.8	53.7	73.9	20.2	No signal.
Vert	2483.500	AV	31.7	26.5	2.2	32.3	28.1	53.9	25.8	
Vert	4960.000	AV	28.9	30.6	3.9	31.4	32.0	53.9	21.9	No signal.
Vert	7440.000	AV	30.3	35.1	4.7	32.6	37.5	53.9	16.4	No signal.
Vert	9920.000	AV	30.8	38.6	5.6	33.1	41.9	53.9	12.0	No signal.
Vert	24800.000	AV	35.8	39.0	-1.6	30.8	42.4	53.9	11.5	No signal.

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).

\*The 10th harmonic was not seen so the result was its base noise level.  
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

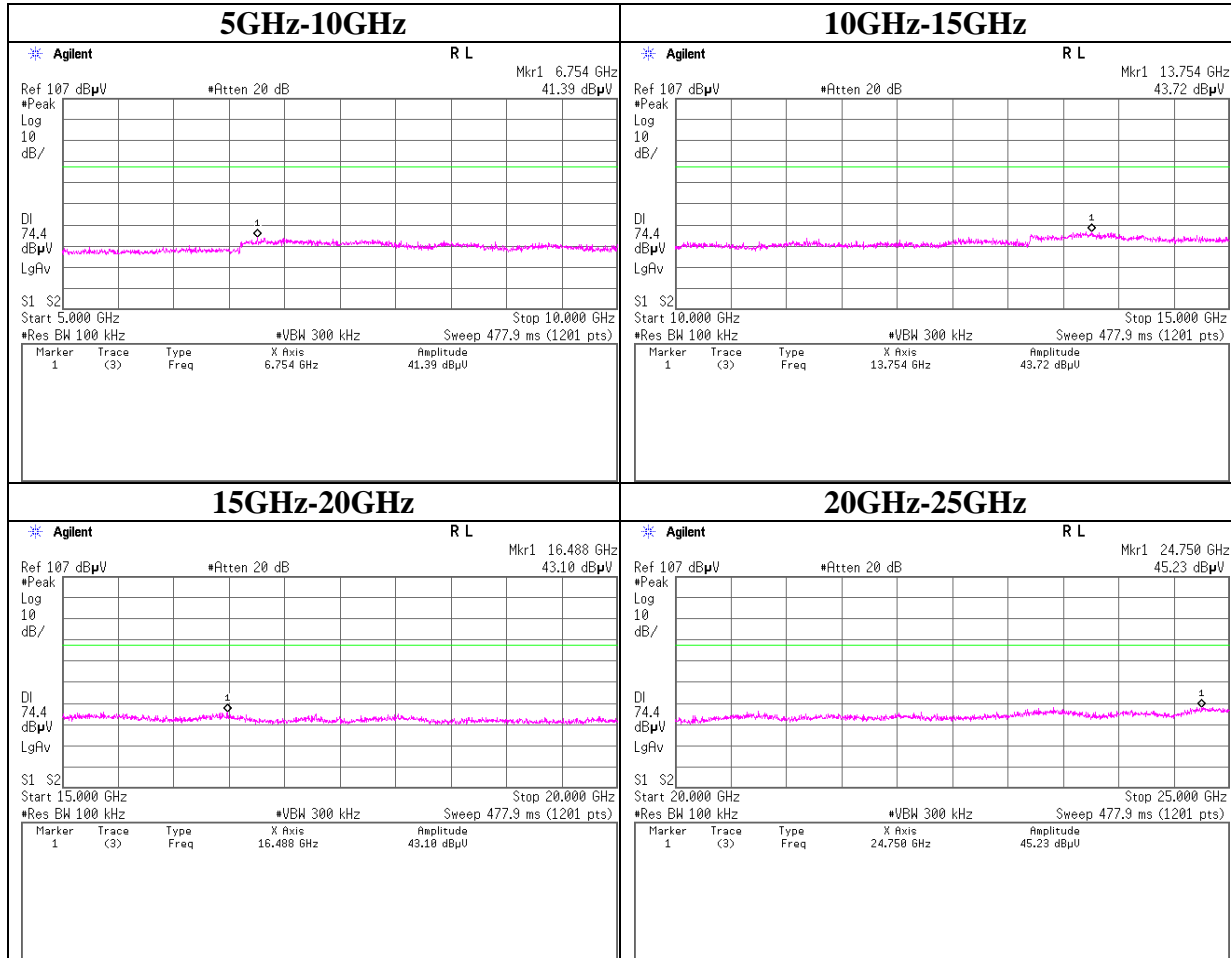
## Conducted Spurious Emission

### Tx DH5 2402MHz



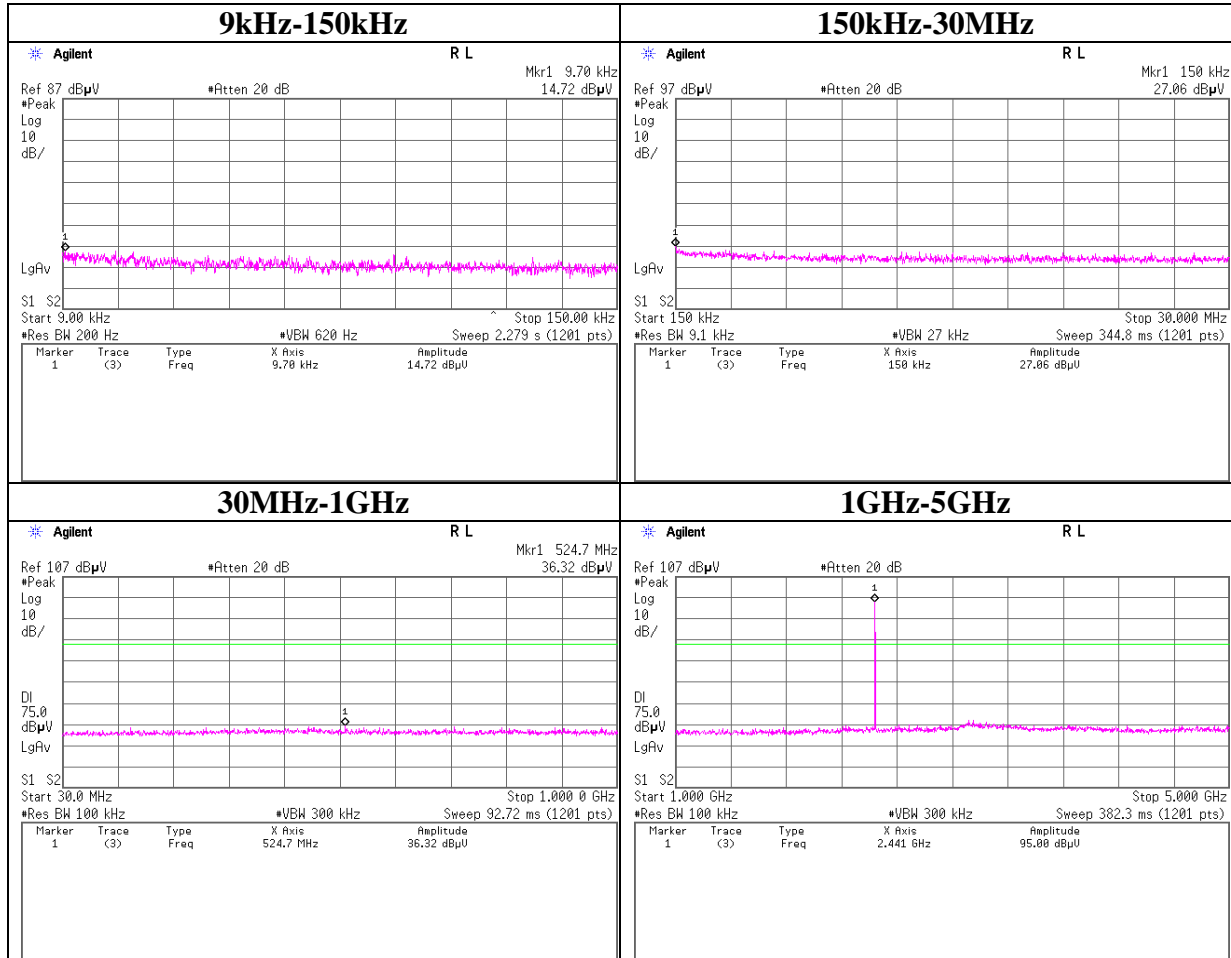
## Conducted Spurious Emission

### Tx DH5 2402MHz



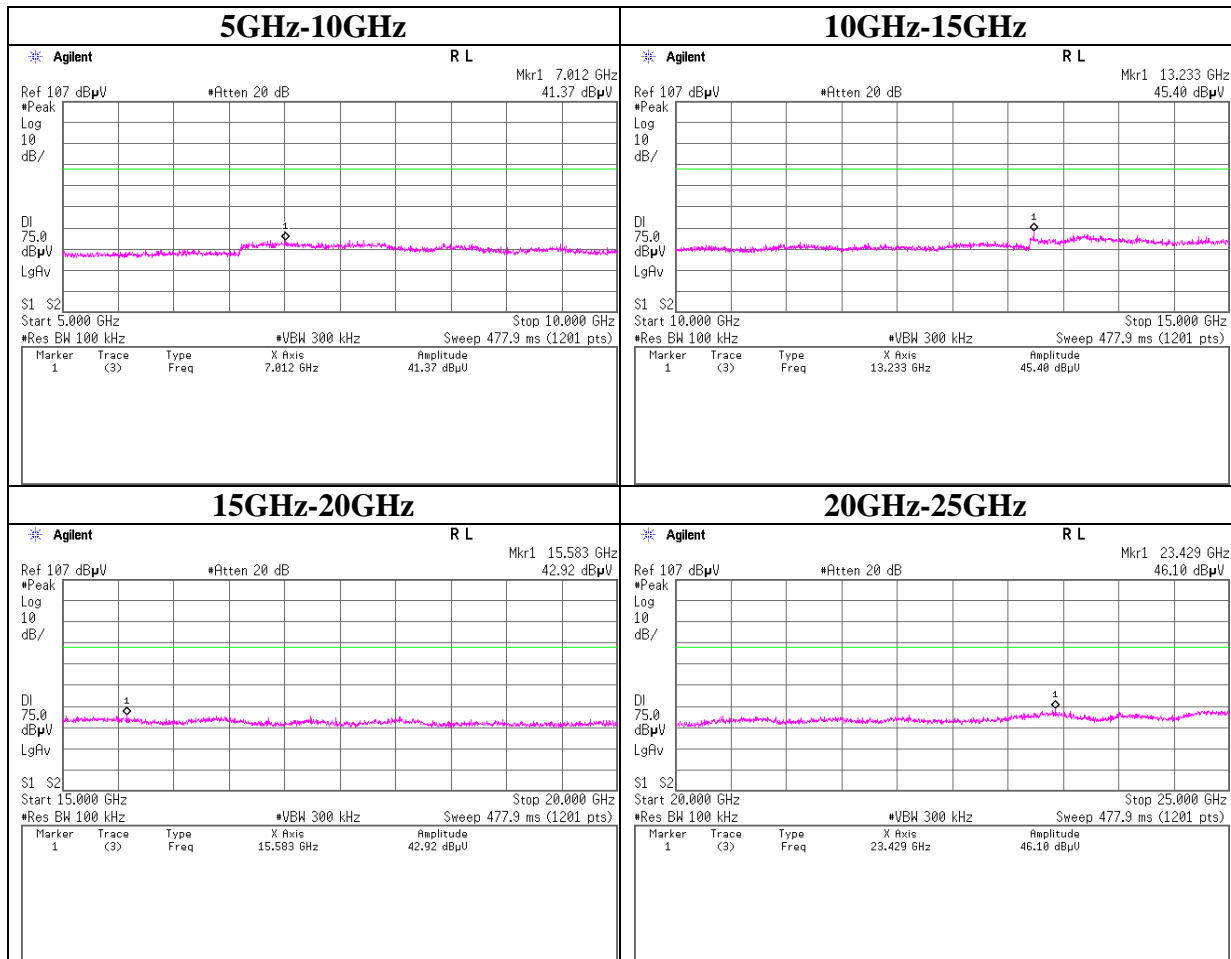
**Conducted Spurious Emission**

**Tx DH5 2441MHz**



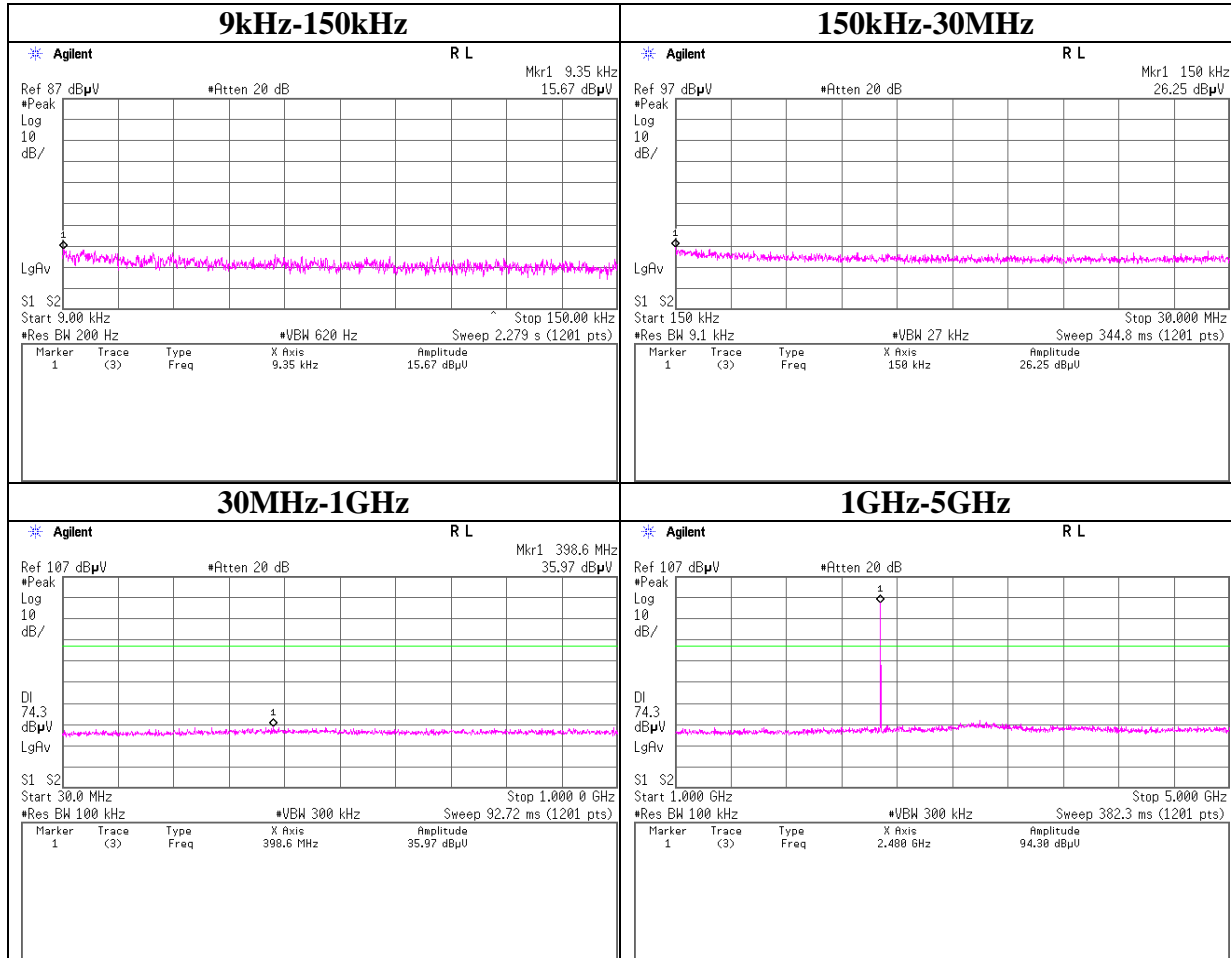
## Conducted Spurious Emission

### Tx DH5 2441MHz



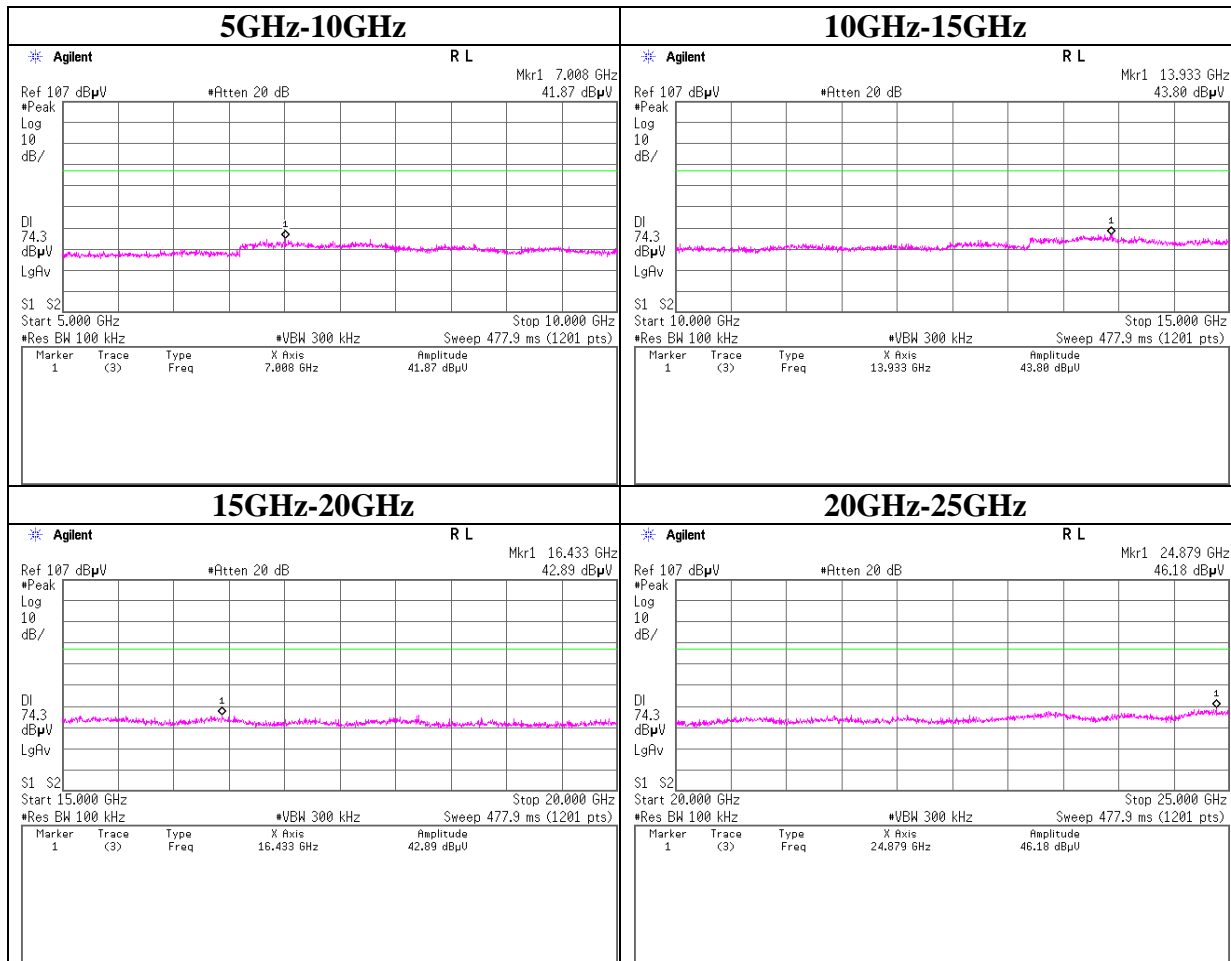
## Conducted Spurious Emission

### Tx DH5 2480MHz



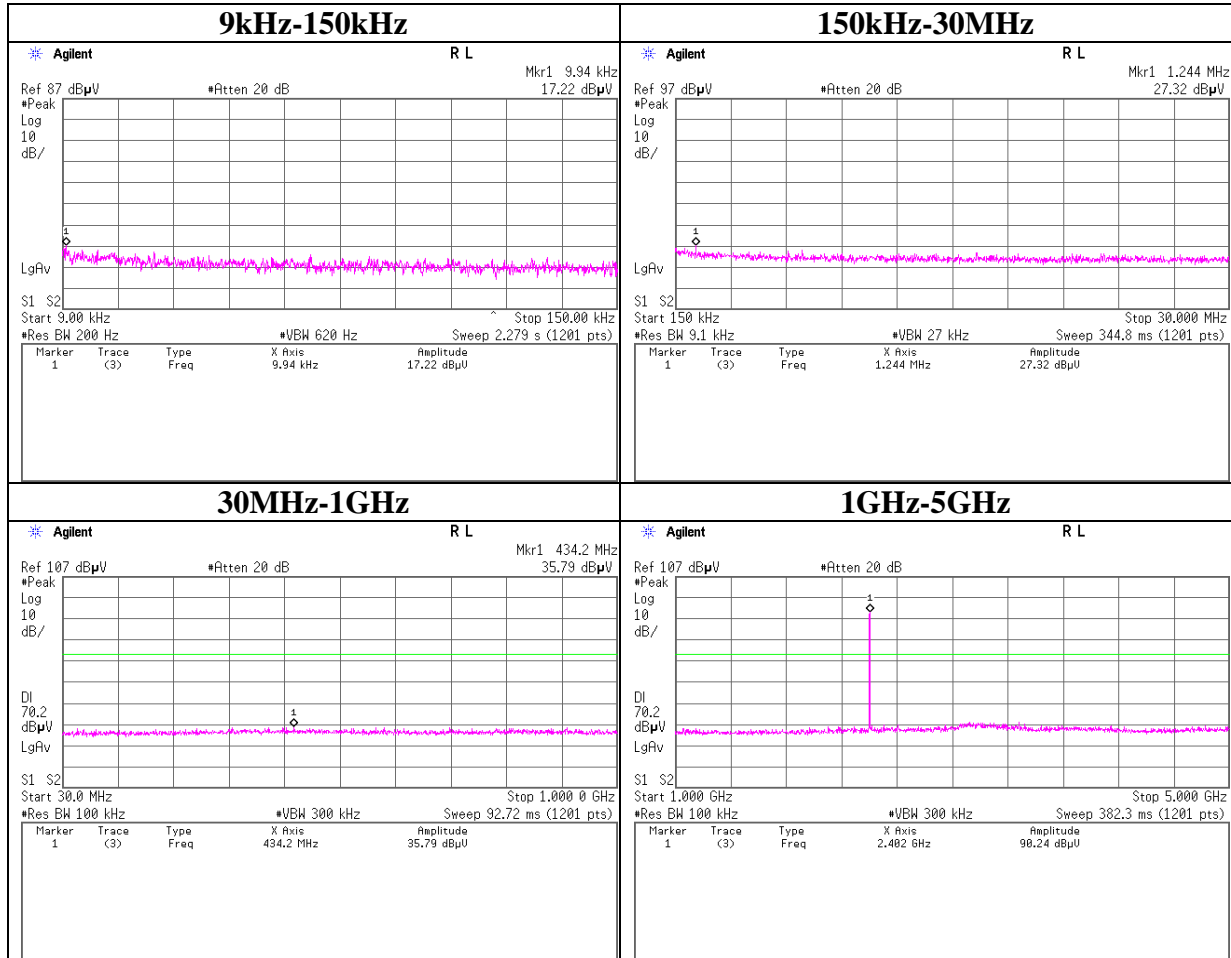
## Conducted Spurious Emission

### Tx DH5 2480MHz



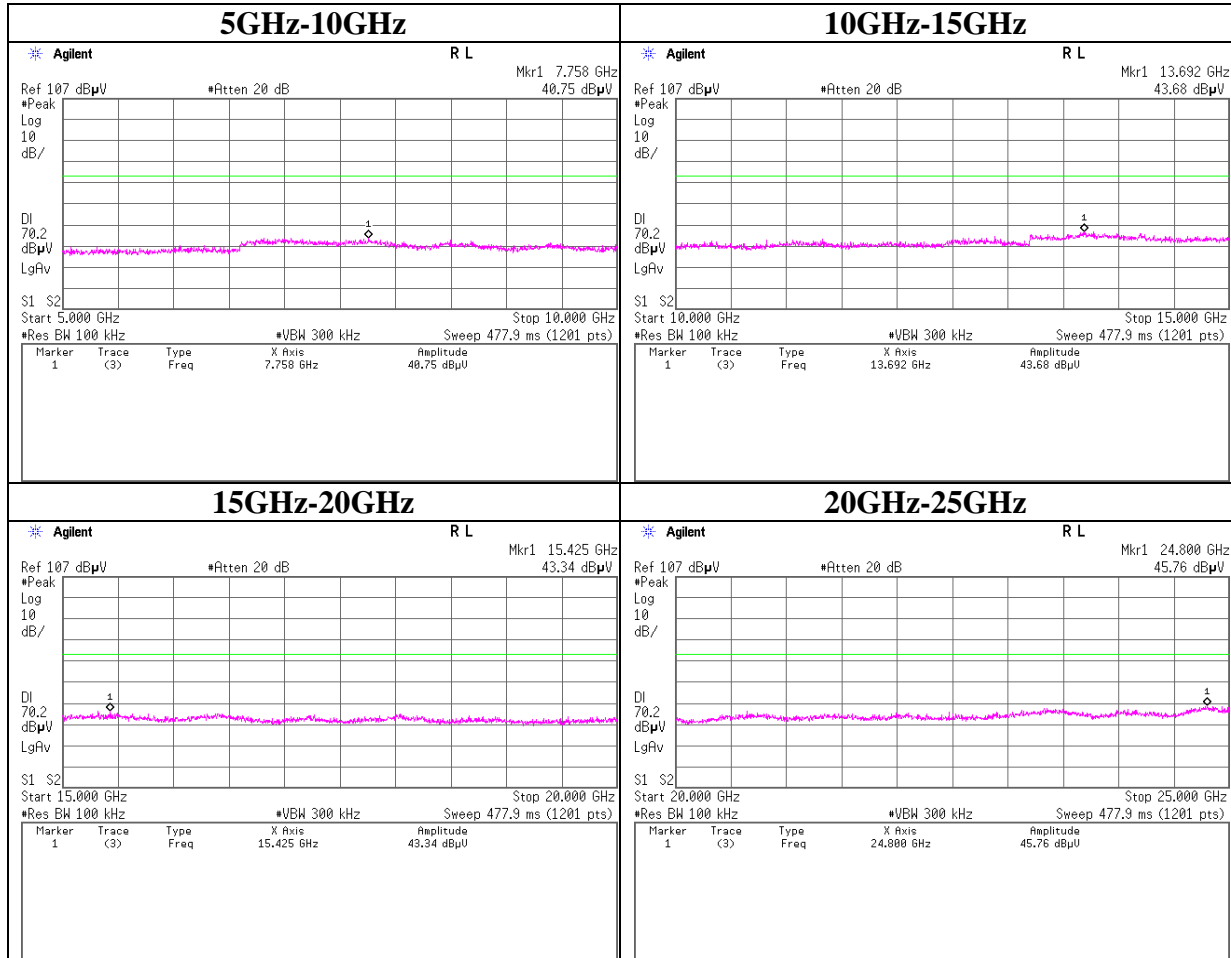
**Conducted Spurious Emission**

**Tx 3DH5 2402MHz**



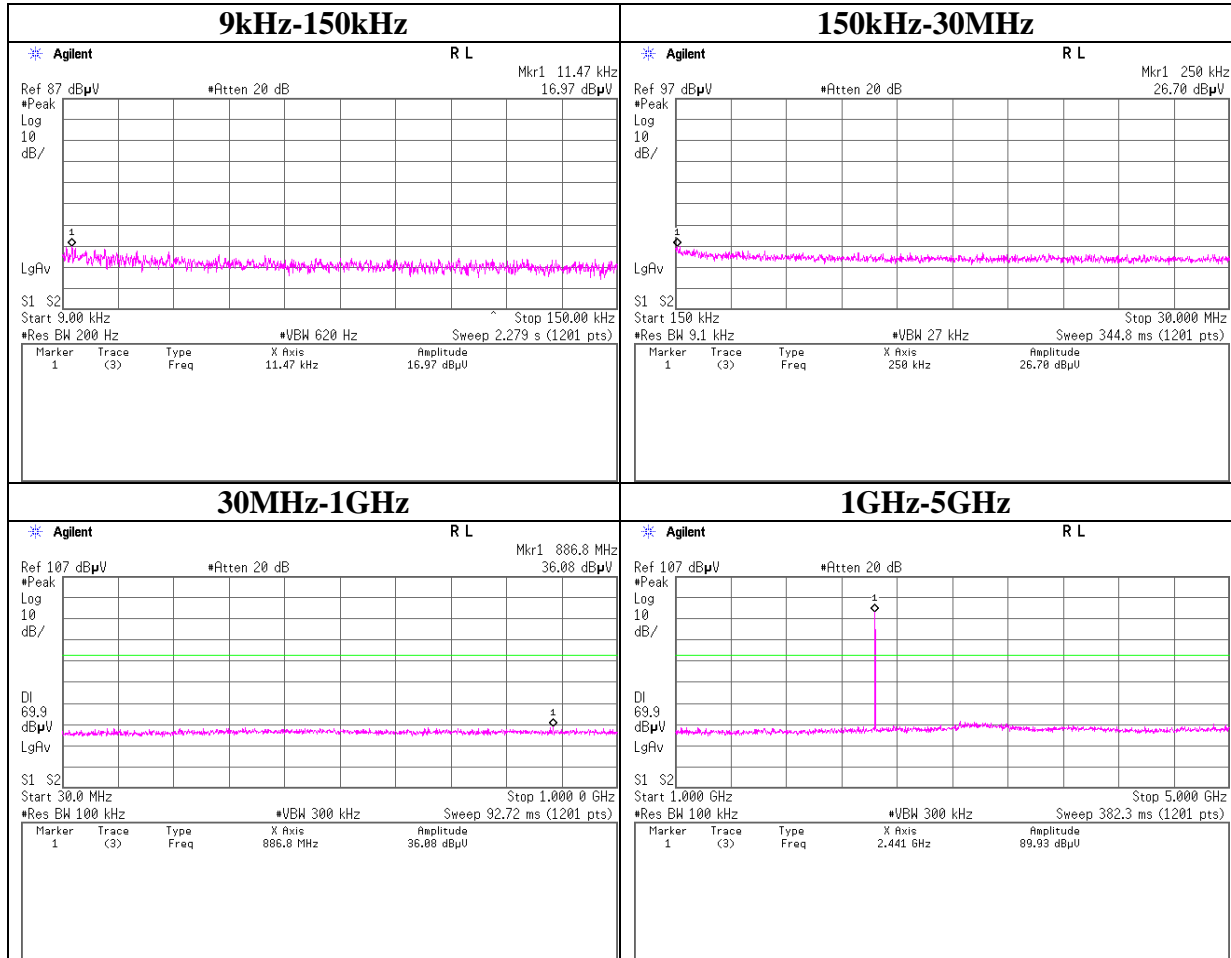
## Conducted Spurious Emission

### Tx 3DH5 2402MHz



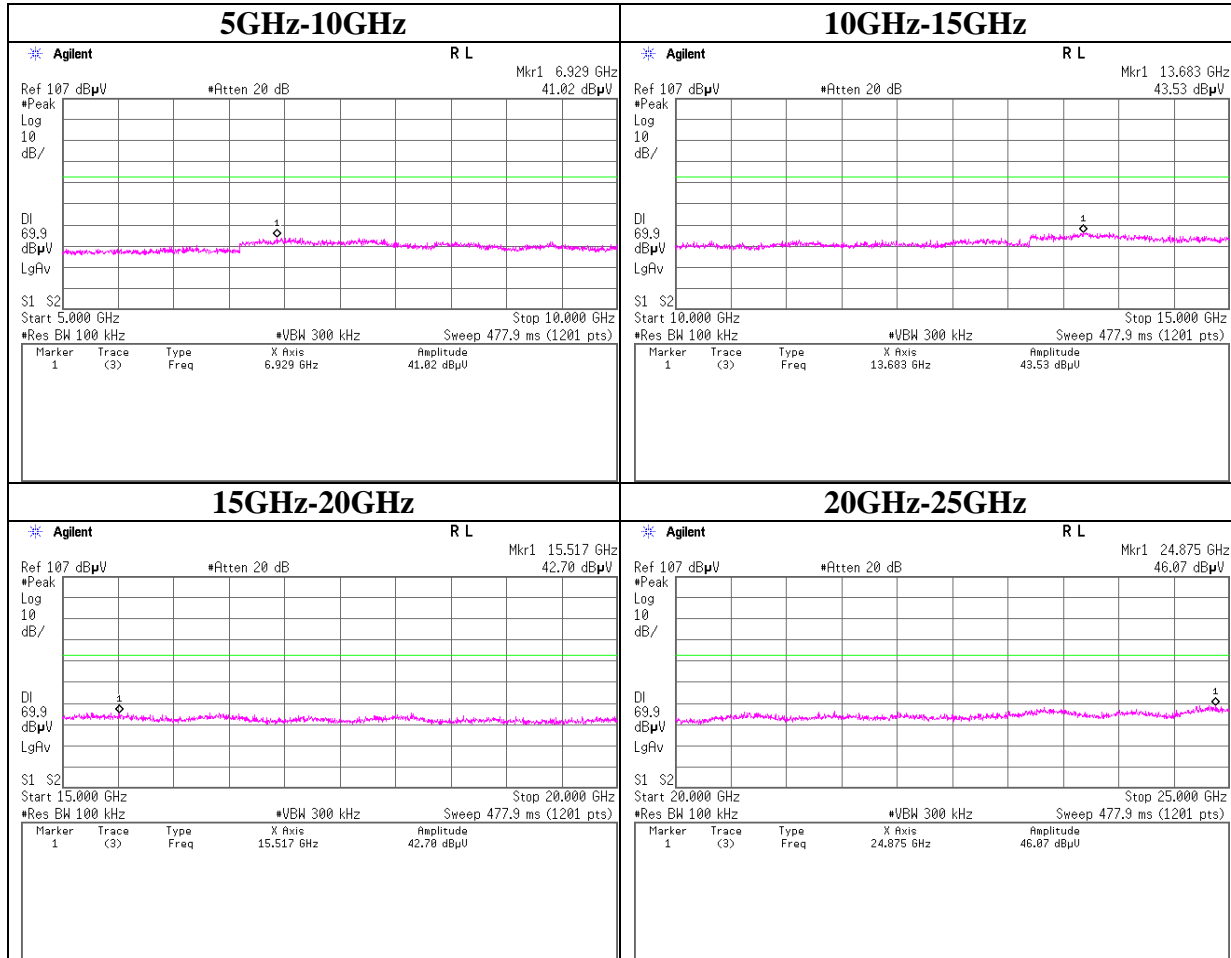
**Conducted Spurious Emission**

**Tx 3DH5 2441MHz**



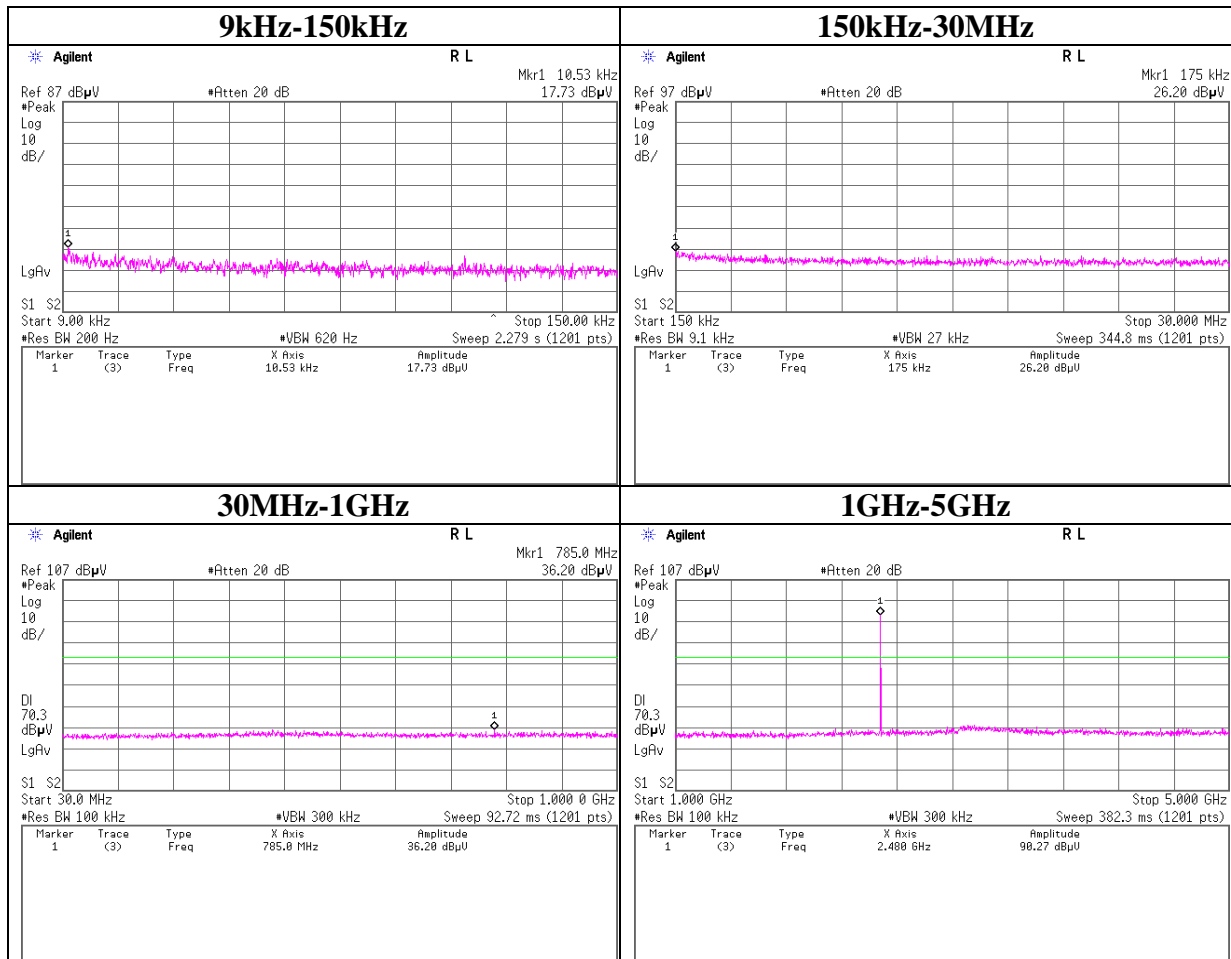
## Conducted Spurious Emission

### Tx 3DH5 2441MHz



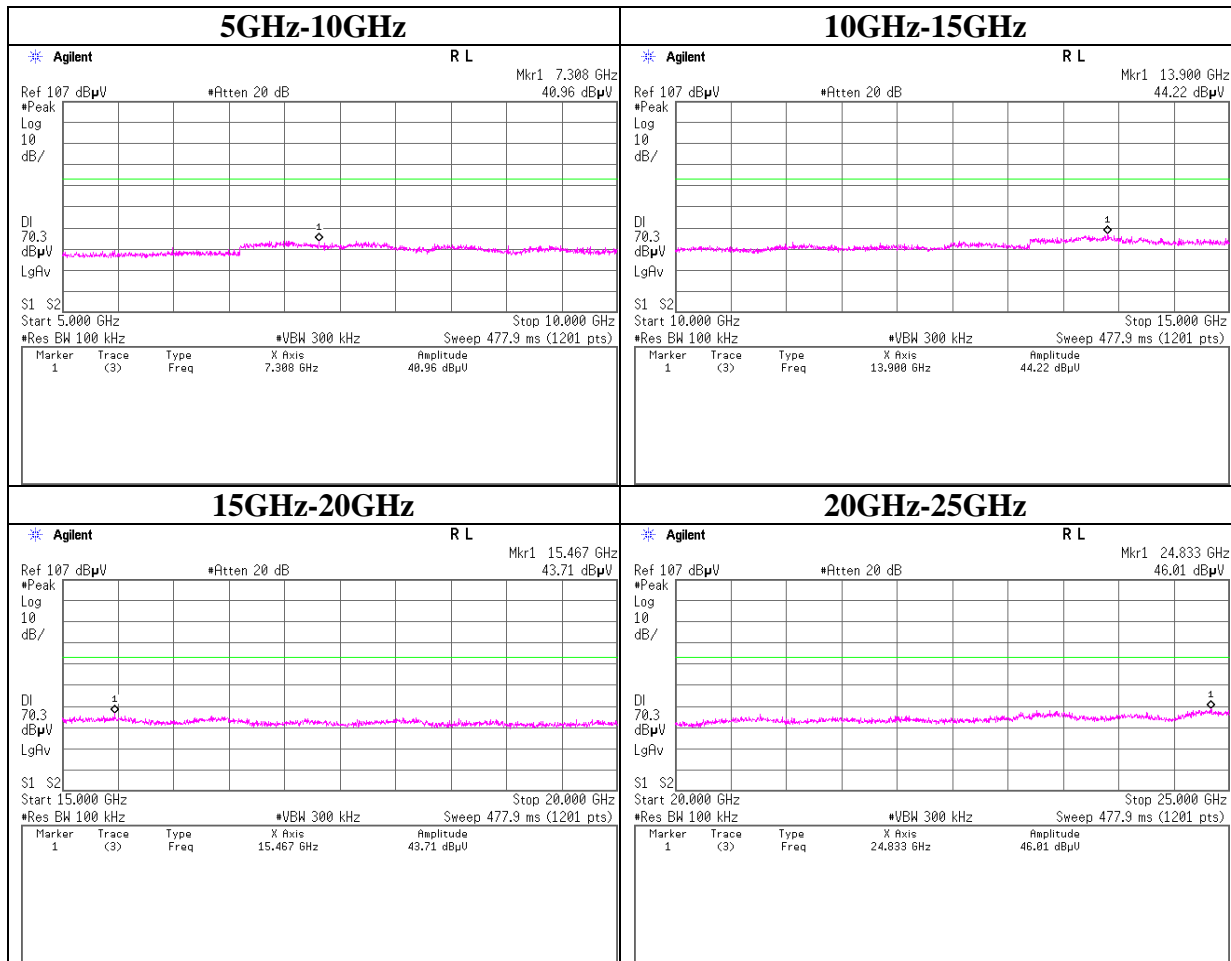
## Conducted Spurious Emission

### Tx 3DH5 2480MHz



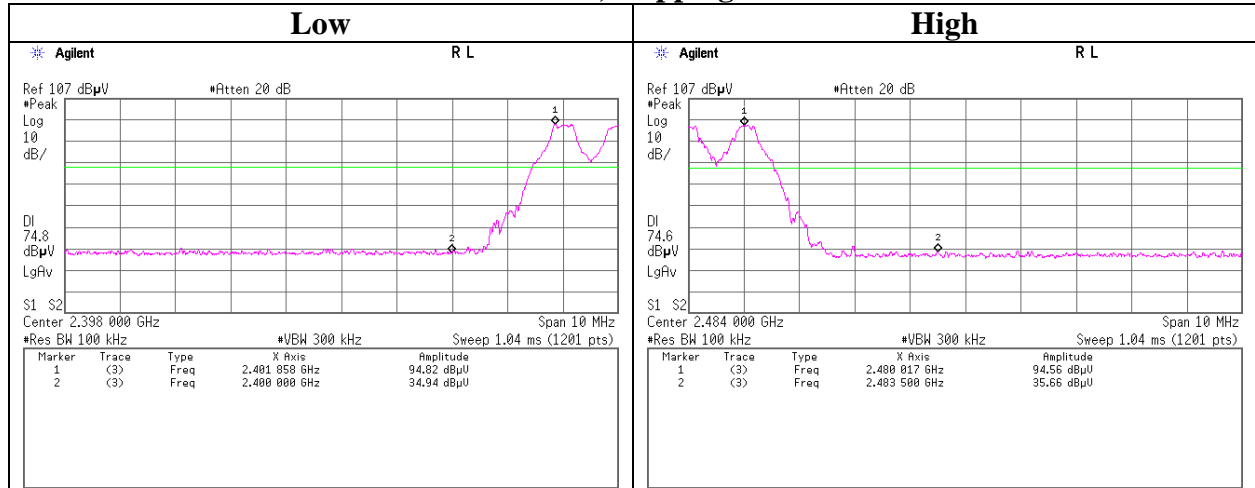
## Conducted Spurious Emission

### Tx 3DH5 2480MHz

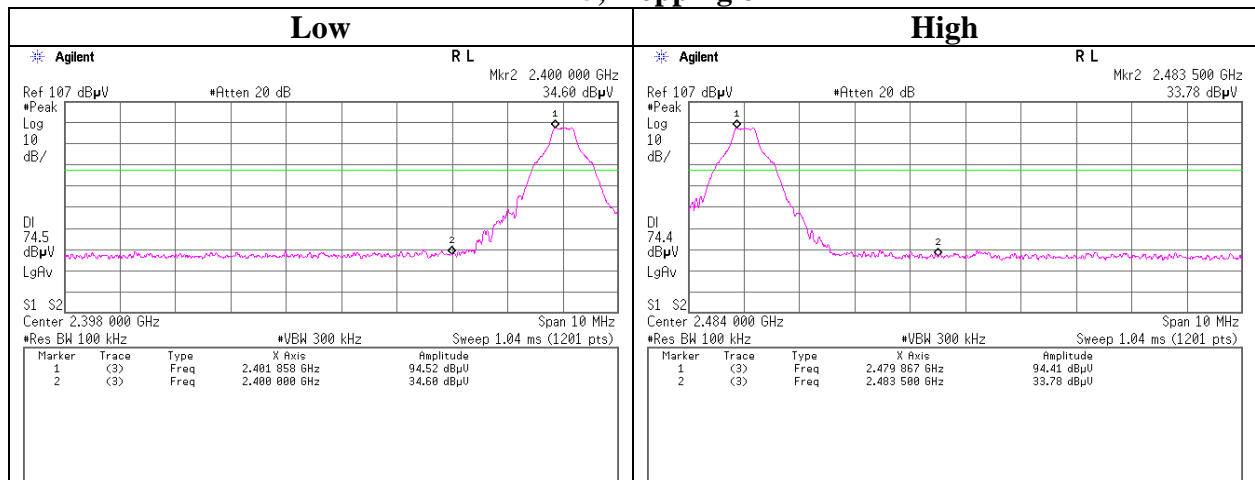


**Conducted Emission Band Edge compliance**

**Tx DH5, Hopping on**

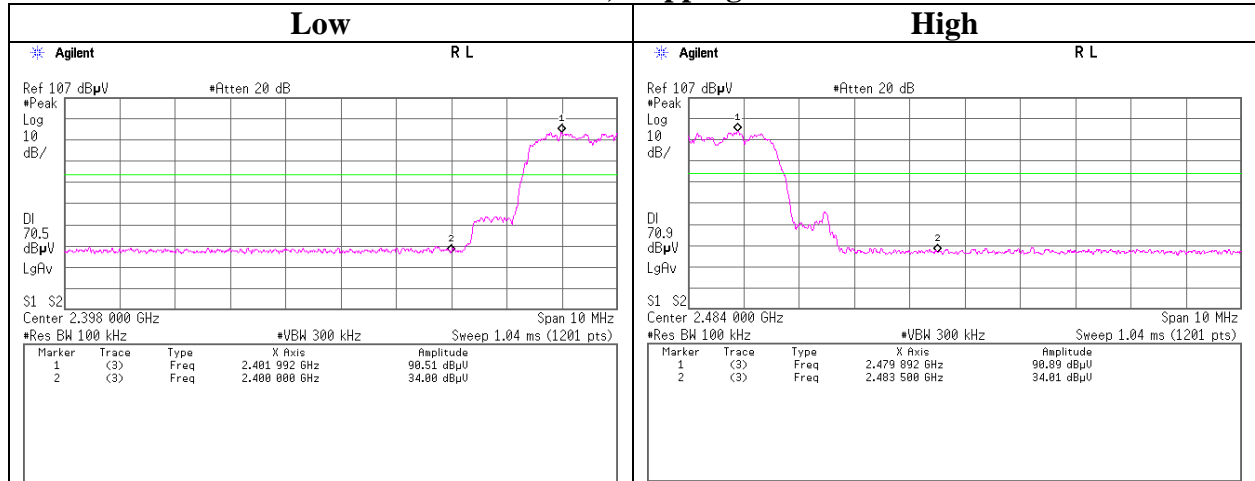


**Tx DH5, Hopping off**

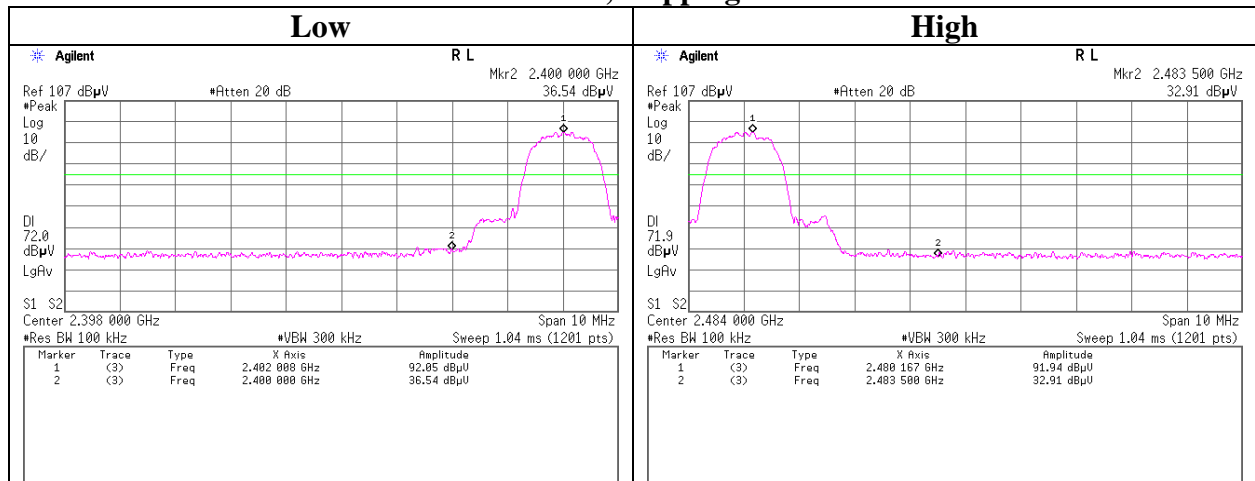


**Conducted Emission Band Edge compliance**

**Tx 3DH5, Hopping on**



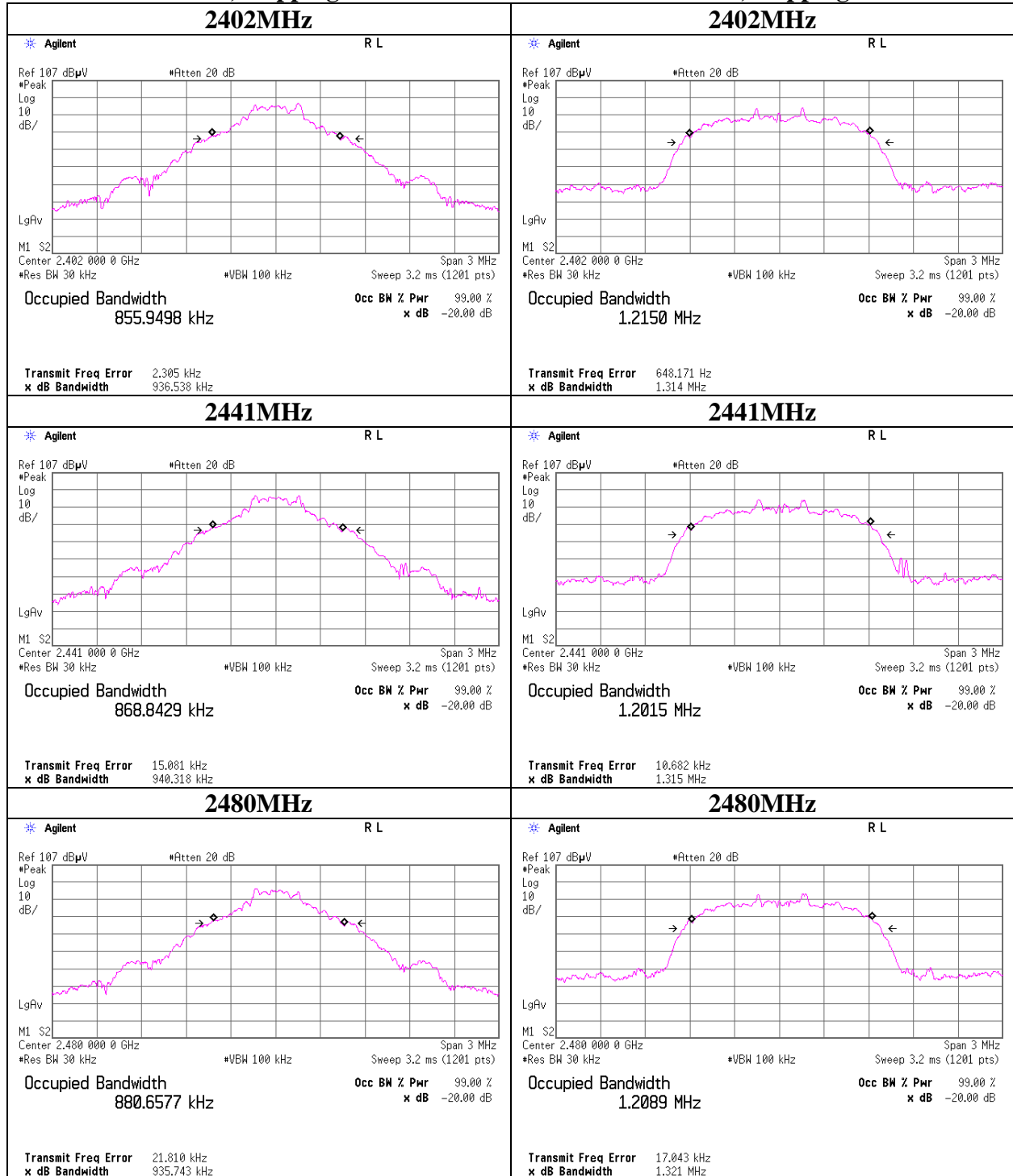
**Tx 3DH5, Hopping off**



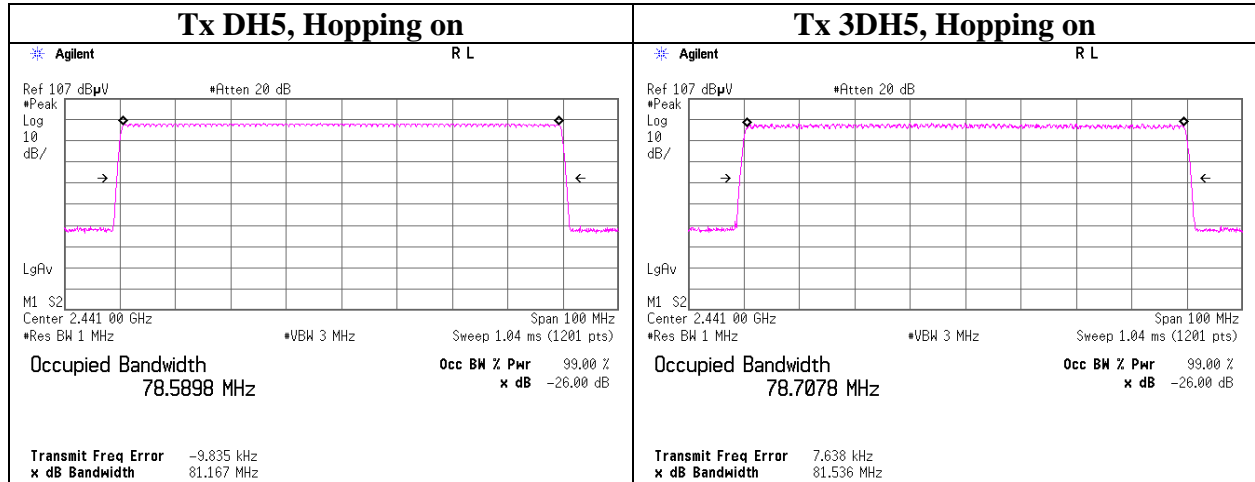
**99% Occupied Bandwidth**

**Tx DH5, Hopping off**

**Tx 3DH5, Hopping off**



### 99% Occupied Bandwidth



## APPENDIX 2: Test instruments

### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2011/09/13 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2011/09/13 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE/AT	2011/11/23 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2011/07/15 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2011/05/23 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2011/09/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2011/05/21 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2011/05/16 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/29 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE/CE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE/CE	2011/11/23 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE/CE	2012/04/05 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2011/11/16 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2011/11/16 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2012/03/15 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2012/03/05 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE	2012/02/06 * 12
MAT-67	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(5m)/421-010(1m)/sucoform141-PE(1m)/RFM-E121(Switcher)	-/04178	CE	2011/07/04 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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

**UL Japan, Inc.**

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