



RADIO TEST REPORT

Test Report No. : 33CE0031-HO-02-A-R1

Applicant : Towada Audio Co., LTD
Type of Equipment : BTUnit1
Model No. : BTU1
FCC ID : RH5BTU1347
Test regulation : FCC Part 15 Subpart C: 2012
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.
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6. This report is a revised version of 33CE0031-HO-02-A. 33CE0031-HO-02-A is replaced with this report.

Date of test: December 5 to 11, 2012

Representative test engineer:

Keisuke Kawamura
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 33CE0031-HO-02-A

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SECTION 1: Customer information

Company Name : Towada Audio Co., LTD
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017-0201, Japan
Telephone Number : +81-186-29-3737
Facsimile Number : +81-186-29-2906
Contact Person : Hiroyuki Yanagisawa

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

2.1 Identification of E.U.T.

Type of Equipment : BTUnit1
Model No. : BTU1
Serial No. : Refer to Clause 4.2
Rating : DC5.0V
Receipt Date of Sample : December 9, 2012
Country of Mass-production : Japan
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

Clock frequency(ies) in the system : CPU: 26MHz

Radio Specification

[Bluetooth (Ver. 2.0 without EDR function)]

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : FHSS
Power Supply (inner) : DC1.8V / 1.5V
Antenna type : Internal Antenna
Antenna Gain : -2.0dBd (0.14dBi)

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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 August 13, 2012 and effective September 12, 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	N/A	N/A *1)	-
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	3.2dB 1652.656MHz, AV, Vertical	Complied	Conducted/ Radiated

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

*1)The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

* 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 / 1.5V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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						
	(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	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	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

Radiated emission test(3m)

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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 8116 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	4.75 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
*Inquiry mode was not able to function on test tool.

Details of Operating Mode(s)

Test Item	Mode	Tested frequency
Spurious Emission (Conducted/Radiated)	Tx (Hopping off) DH5, 3DH5	2402MHz 2441MHz 2480MHz
Carrier Frequency Separation	Tx (Hopping on) DH5, 3DH5	2402MHz 2441MHz 2480MHz
20dB Bandwidth	Tx (Hopping off) 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
*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) *EUT has the power settings by the software as follows; Power settings: BDR: 46 EDR: 48 Software: RF Test Tool for Bluetooth Device Ver1.2.4 *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.		

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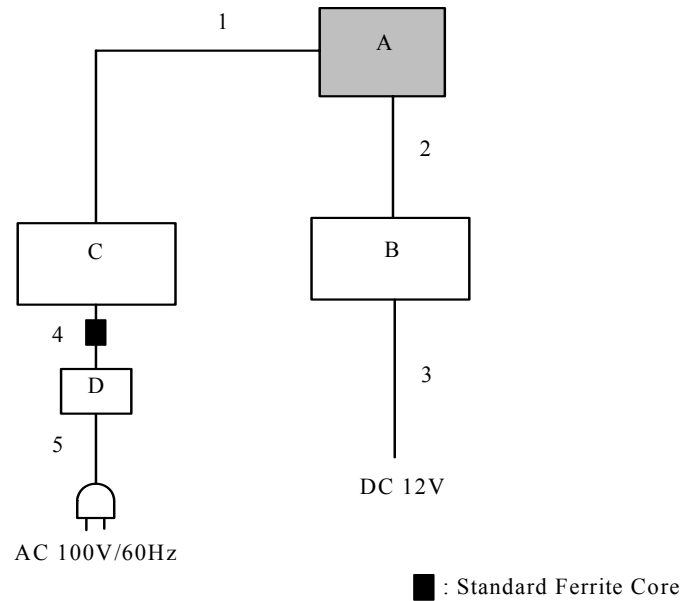
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4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	BTUnit1	BTU1	347-2033-000	Towada Audio Co., LTD	EUT
B	Test Jig	-	-	-	-
C	Laptop PC	NT9500Pro	370001805	EPSON	-
D	AC Adaptor	ADP-90SB AB	VXW0608004824	DELTA ELECTRONICS, INC.	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	0.8	Shielded	Shielded	-
2	Signal Cable	4.0	Unshielded	Unshielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	2.0	Unshielded	Unshielded	-

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-26.5GHz
Test data	: APPENDIX
Test result	: Pass

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SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
20dB Bandwidth	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	20MHz	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

20dB Bandwidth and Carrier Frequency Separation

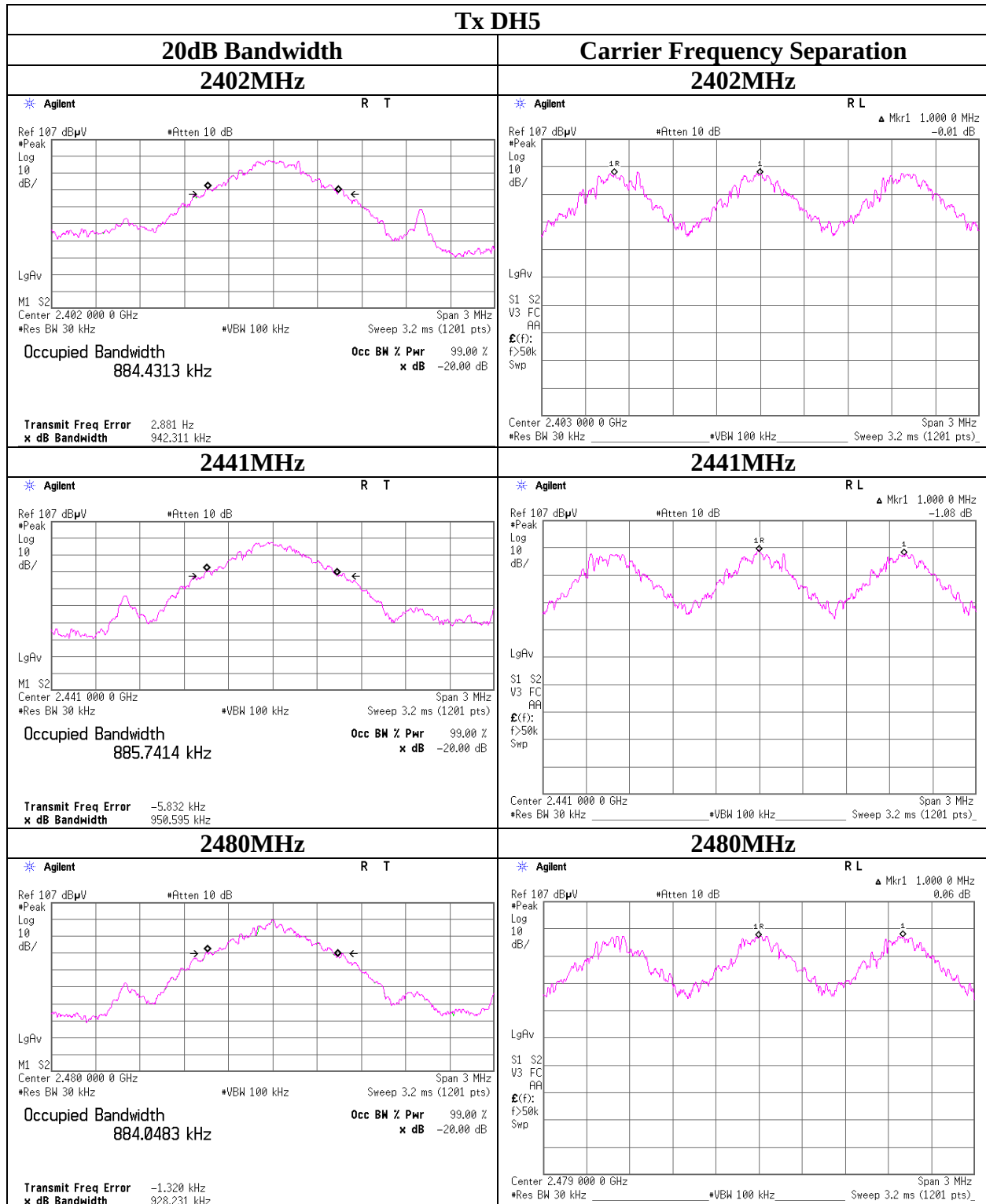
Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 33CE0031-HO-02-A
Date 12/05/2012
Temperature/ Humidity 20 deg. C / 39% RH
Engineer Keisuke Kawamura
Mode Tx (Hopping on) DH5/3DH5

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency separation [MHz]
DH5	2402.0	0.942	1.000	≥ 0.628
DH5	2441.0	0.951	1.000	≥ 0.634
DH5	2480.0	0.928	1.000	≥ 0.619
3DH5	2402.0	1.290	1.000	≥ 0.860
3DH5	2441.0	1.278	1.000	≥ 0.852
3DH5	2480.0	1.309	1.015	≥ 0.873

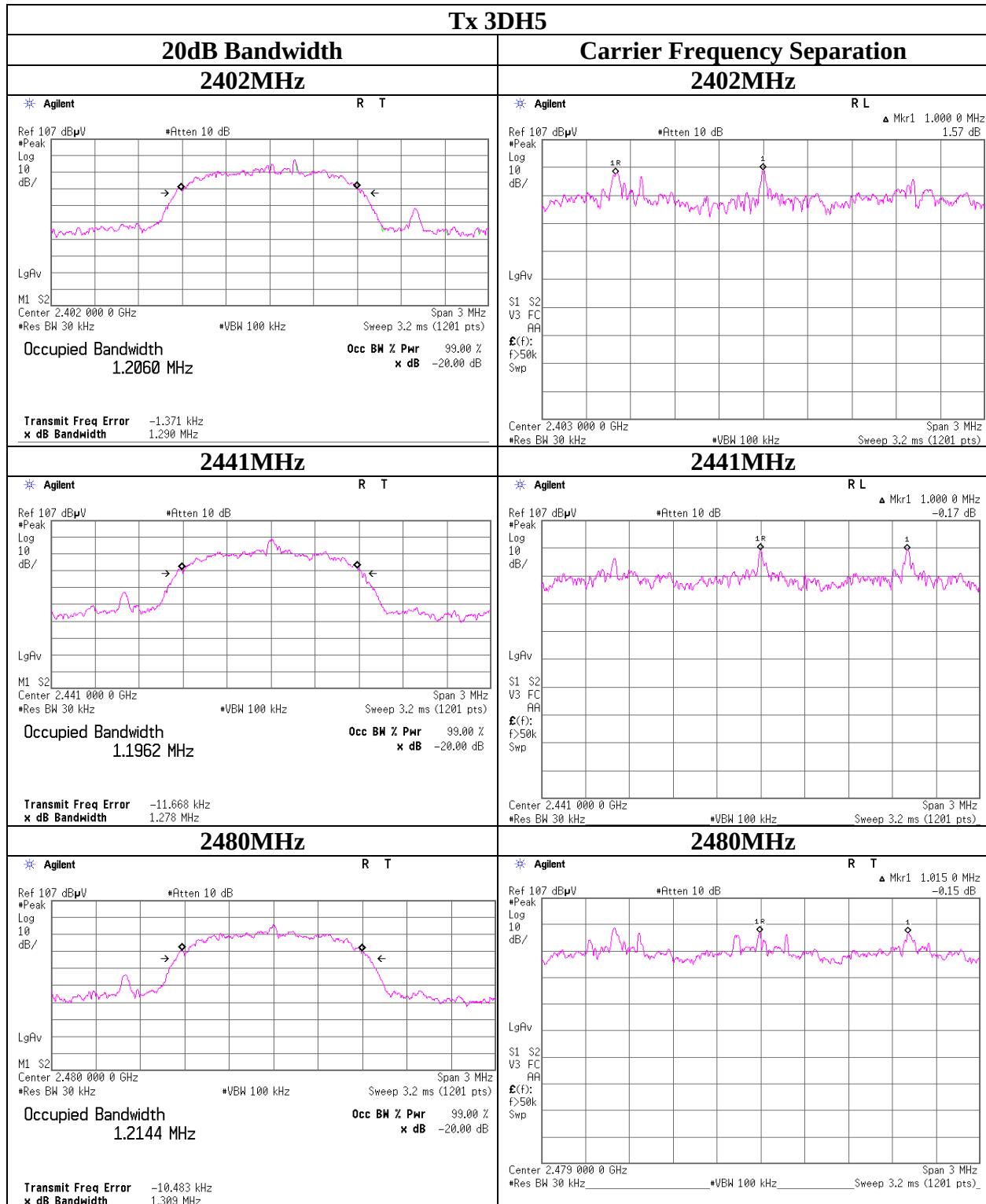
Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

20dB Bandwidth and Carrier Frequency Separation



20dB Bandwidth and Carrier Frequency Separation



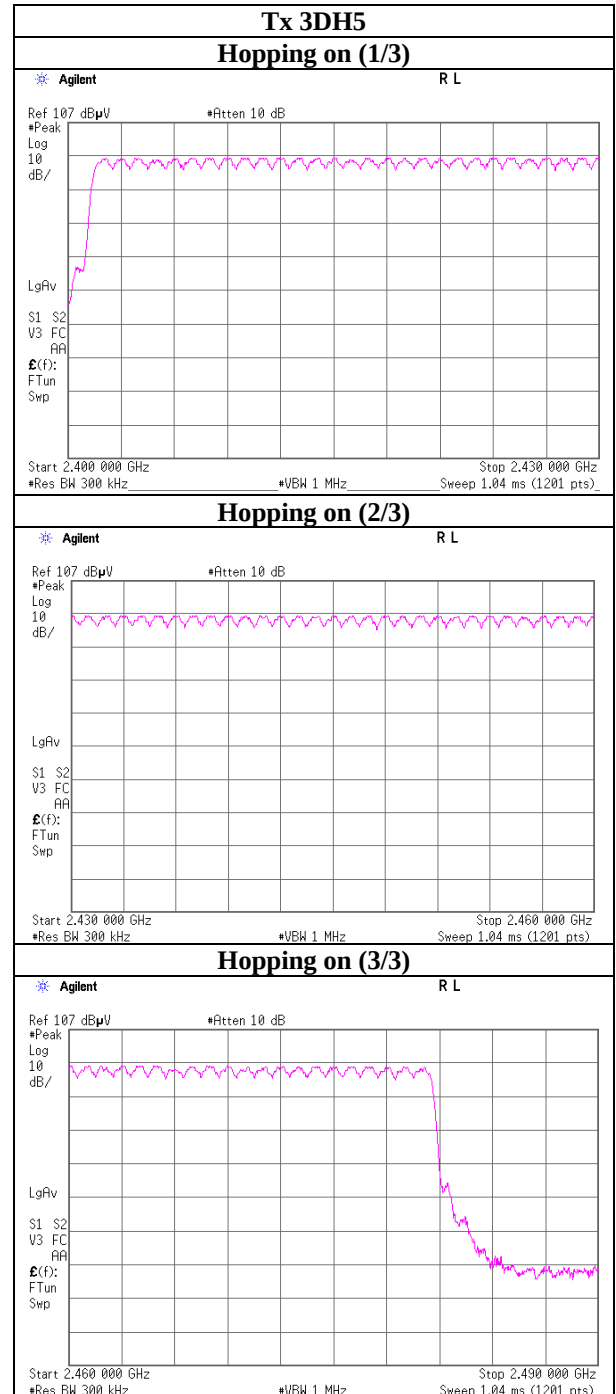
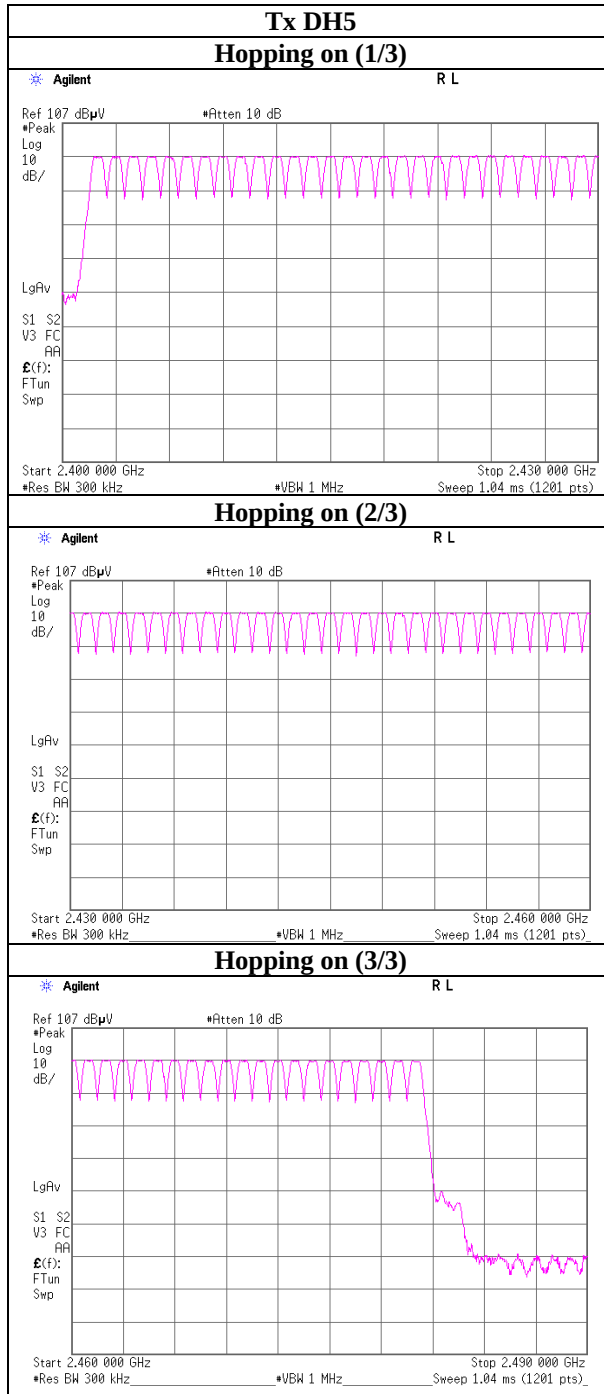
Number of Hopping Frequency

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 33CE0031-HO-02-A
Date 12/05/2012
Temperature/ Humidity 20 deg. C / 39% RH
Engineer Keisuke Kawamura
Mode Tx (Hopping on) DH5/3DH5

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

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

Number of Hopping Frequency



Dwell time

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 33CE0031-HO-02-A
Date 12/11/2012
Temperature/ Humidity 22 deg. C / 23% RH
Engineer Tomohisa Nakagawa
Mode Tx (Hopping on) DH5/3DH5

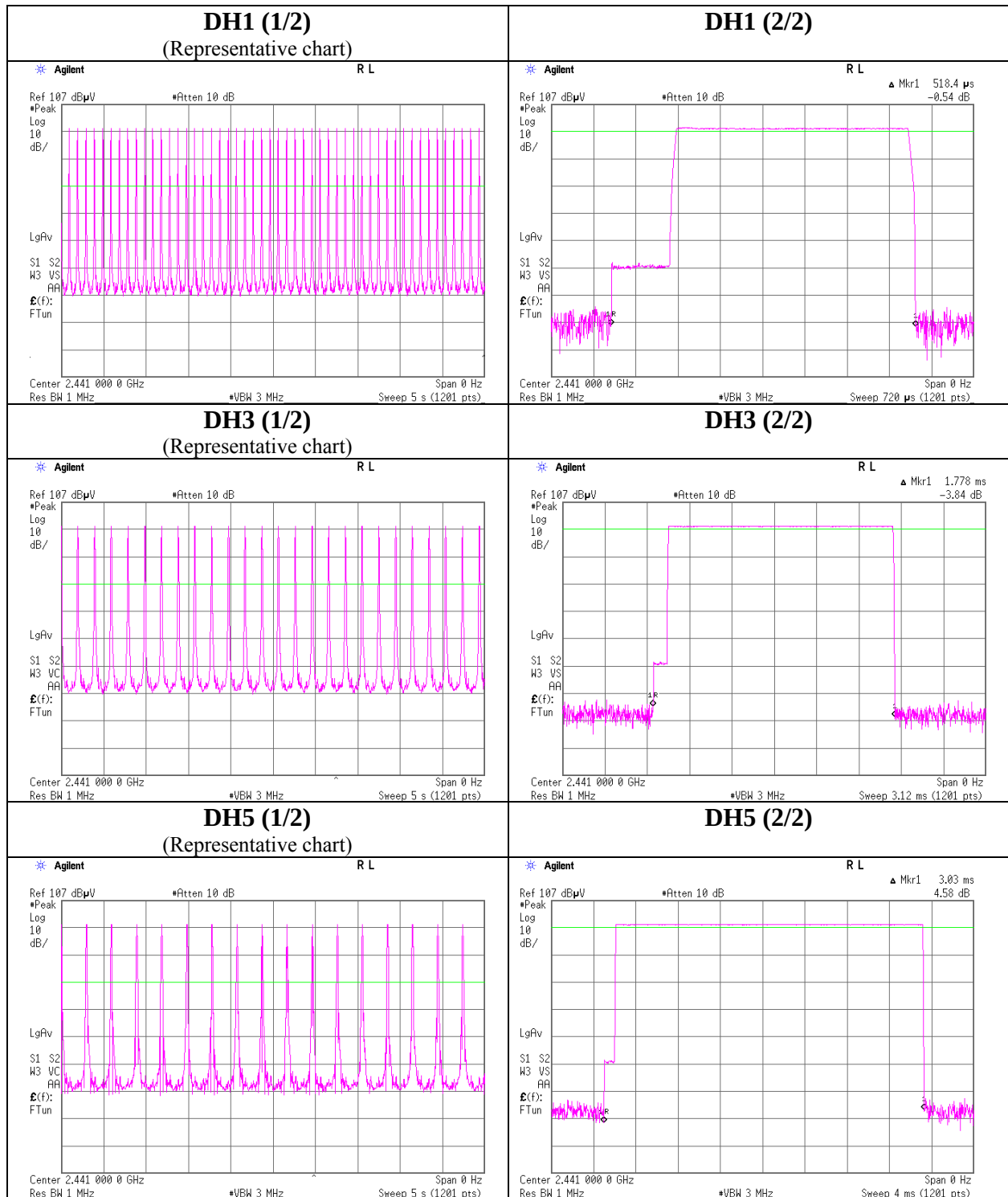
Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period				Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.518	164	400
DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.778	293	400
DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	3.030	327	400
3DH1	50.0 times	/	5 sec.	x 31.6 sec. = 316 times	0.535	169	400
3DH3	26.0 times	/	5 sec.	x 31.6 sec. = 165 times	1.789	295	400
3DH5	17.0 times	/	5 sec.	x 31.6 sec. = 108 times	3.047	329	400

Sample Calculation

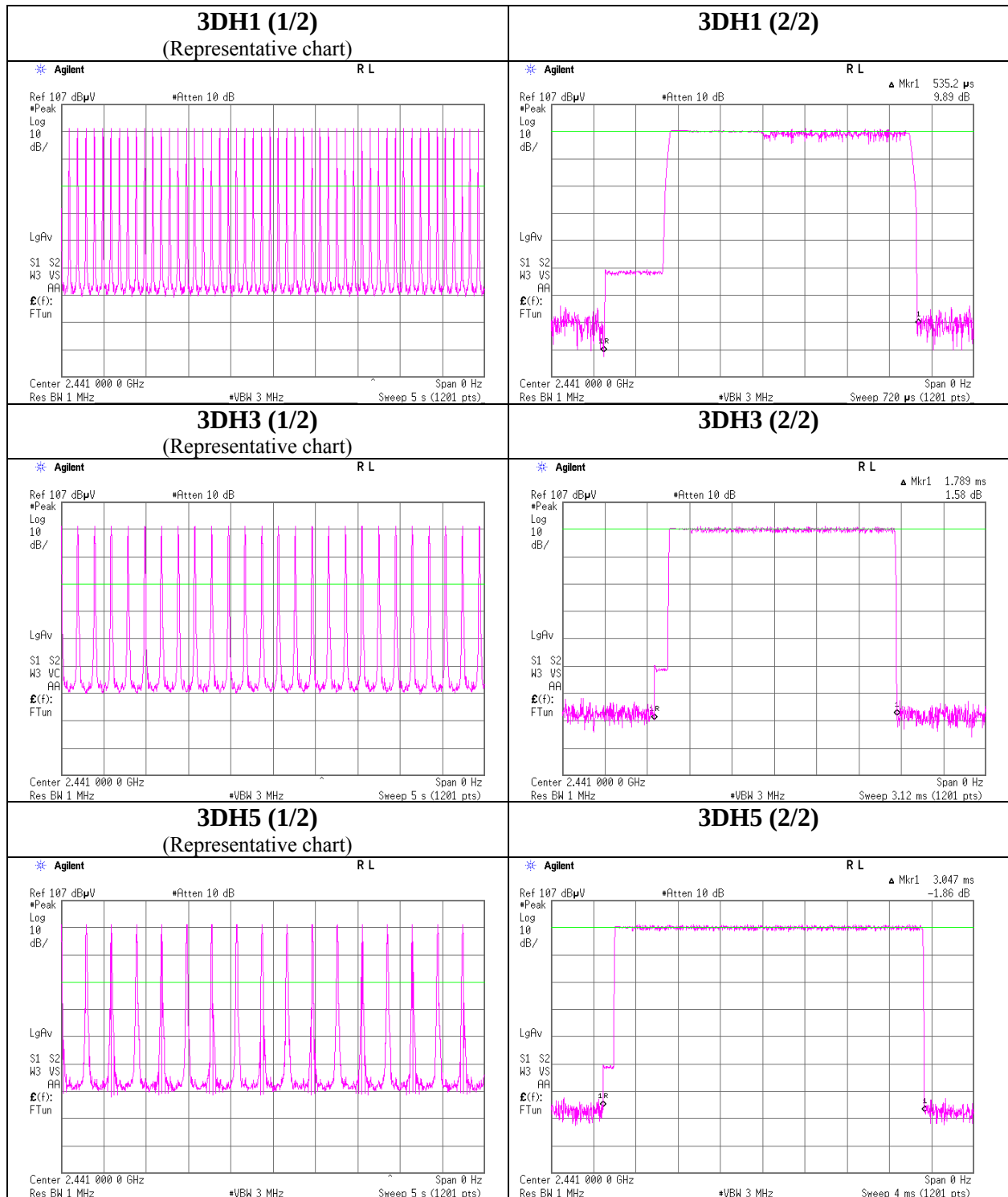
Result = Number of transmission x Length of transmission time

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

Dwell time



Dwell time



Maximum Peak Output Power

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 33CE0031-HO-02-A
Date 12/11/2012
Temperature/ Humidity 22 deg. C / 23% RH
Engineer Tomohisa Nakagawa
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	-8.64	0.13	10.08	1.57	1.44	20.96	125	19.39
DH5	2441.0	-8.57	0.13	10.08	1.64	1.46	20.96	125	19.32
DH5	2480.0	-9.03	0.13	10.09	1.19	1.32	20.96	125	19.77
3DH5	2402.0	-8.59	0.13	10.08	1.62	1.45	20.96	125	19.34
3DH5	2441.0	-8.52	0.13	10.08	1.69	1.48	20.96	125	19.27
3DH5	2480.0	-9.01	0.13	10.09	1.21	1.32	20.96	125	19.75

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.

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	45.461	QP	31.4	12.2	6.9	28.6	21.9	40.0	18.1	
Hori	166.612	QP	32.1	15.6	8.0	28.0	27.7	43.5	15.8	
Hori	192.002	QP	37.5	16.4	8.1	27.9	34.1	43.5	9.4	
Hori	240.001	QP	38.1	17.1	8.5	27.6	36.1	46.0	9.9	
Hori	456.004	QP	35.2	17.7	9.6	28.6	33.9	46.0	12.1	
Hori	468.001	QP	37.6	17.8	9.6	28.7	36.3	46.0	9.7	
Hori	1601.933	PK	58.4	26.5	1.9	35.3	51.5	73.9	22.4	
Hori	2350.000	PK	47.4	27.4	2.3	34.9	42.2	73.9	31.7	
Hori	2390.000	PK	47.6	27.4	2.4	34.8	42.6	73.9	31.3	
Hori	3203.000	PK	45.6	28.8	2.8	34.4	42.8	73.9	31.1	NS
Hori	4804.000	PK	57.7	31.2	4.2	34.0	59.1	73.9	14.8	
Hori	7206.000	PK	45.4	35.9	4.9	34.2	52.0	73.9	21.9	NS
Hori	9608.000	PK	45.8	38.8	5.7	34.7	55.6	73.9	18.4	NS
Hori	1601.933	AV	56.2	26.5	1.9	35.3	49.3	53.9	4.6	
Hori	2350.000	AV	34.7	27.4	2.3	34.9	29.5	53.9	24.4	
Hori	2390.000	AV	34.5	27.4	2.4	34.8	29.5	53.9	24.4	
Hori	3203.000	AV	33.1	28.8	2.8	34.4	30.3	53.9	23.6	NS
Hori	7206.000	AV	32.4	35.9	4.9	34.2	39.0	53.9	14.9	NS
Hori	9608.000	AV	32.8	38.8	5.7	34.7	42.6	53.9	11.3	NS
Vert	45.520	QP	42.5	12.2	6.9	28.6	33.0	40.0	7.0	
Vert	166.550	QP	38.8	15.6	8.0	28.0	34.4	43.5	9.1	
Vert	192.008	QP	29.8	16.4	8.1	27.9	26.4	43.5	17.1	
Vert	240.002	QP	30.8	17.1	8.5	27.6	28.8	46.0	17.2	
Vert	456.004	QP	28.9	17.7	9.6	28.6	27.6	46.0	18.4	
Vert	468.003	QP	32.5	17.8	9.6	28.7	31.2	46.0	14.8	
Vert	1601.933	PK	59.4	26.5	1.9	35.3	52.5	73.9	21.4	
Vert	2350.000	PK	46.8	27.4	2.3	34.9	41.6	73.9	32.3	
Vert	2390.000	PK	48.5	27.4	2.4	34.8	43.5	73.9	30.4	
Vert	3203.000	PK	45.0	28.8	2.8	34.4	42.2	73.9	31.7	NS
Vert	4804.000	PK	53.3	31.2	4.2	34.0	54.7	73.9	19.2	
Vert	7206.000	PK	46.4	35.9	4.9	34.2	53.0	73.9	20.9	NS
Vert	9608.000	PK	45.4	38.8	5.7	34.7	55.2	73.9	18.7	NS
Vert	1601.933	AV	57.3	26.5	1.9	35.3	50.4	53.9	3.5	
Vert	2350.000	AV	34.0	27.4	2.3	34.9	28.8	53.9	25.1	
Vert	2390.000	AV	34.1	27.4	2.4	34.8	29.1	53.9	24.8	
Vert	3203.000	AV	33.1	28.8	2.8	34.4	30.3	53.9	23.6	NS
Vert	7206.000	AV	32.5	35.9	4.9	34.2	39.1	53.9	14.8	NS
Vert	9608.000	AV	32.8	38.8	5.7	34.7	42.6	53.9	11.3	NS

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).

NS:No signal detect

*Harmonics above the 5th were base noise level.

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012
Temperature/ Humidity 20 deg. C / 24% RH
Engineer Yutaka Yoshida
(1-10GHz)
Mode Tx, DH5 2402MHz

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	2402.000	PK	102.7	27.5	2.4	34.8	97.8	-	-	Carrier
Hori	2400.000	PK	62.0	27.5	2.4	34.8	57.1	77.8	20.7	
Vert	2402.000	PK	97.1	27.5	2.4	34.8	92.2	-	-	Carrier
Vert	2400.000	PK	55.0	27.5	2.4	34.8	50.1	72.2	22.1	

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

Dwell time factor relaxation

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Dwell Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	4804.000	AV	51.4	31.2	4.2	34.0	-24.2	28.6	53.9	25.3	
Vert	4804.000	AV	47.3	31.2	4.2	34.0	-24.2	24.5	53.9	29.4	

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	45.520	QP	31.8	12.2	6.9	28.6	22.3	40.0	17.7	
Hori	166.940	QP	38.7	15.6	8.0	28.0	34.3	43.5	9.2	
Hori	192.004	QP	37.6	16.4	8.1	27.9	34.2	43.5	9.3	
Hori	240.003	QP	38.3	17.1	8.5	27.6	36.3	46.0	9.7	
Hori	456.004	QP	33.8	17.7	9.6	28.6	32.5	46.0	13.5	
Hori	468.001	QP	35.6	17.8	9.6	28.7	34.3	46.0	11.7	
Hori	1626.720	PK	58.6	26.6	2.0	35.3	51.9	73.9	22.0	
Hori	4882.000	PK	57.6	31.4	4.2	34.0	59.2	73.9	14.7	
Hori	5000.000	PK	47.1	31.7	4.2	34.0	49.0	73.9	24.9	
Hori	7323.000	PK	44.7	36.0	4.9	34.2	51.4	73.9	22.5	NS
Hori	9764.000	PK	44.8	39.0	5.7	34.7	54.8	73.9	19.1	NS
Hori	1626.720	AV	56.3	26.6	2.0	35.3	49.6	53.9	4.3	
Hori	5000.000	AV	33.0	31.7	4.2	34.0	34.9	73.9	39.0	
Hori	7323.000	AV	33.2	36.0	4.9	34.2	39.9	53.9	14.0	NS
Hori	9764.000	AV	33.1	39.0	5.7	34.7	43.1	53.9	10.8	NS
Vert	44.884	QP	43.6	12.4	6.9	28.6	34.3	40.0	5.7	
Vert	166.799	QP	35.7	15.6	8.0	28.0	31.3	43.5	12.2	
Vert	192.001	QP	35.0	16.4	8.1	27.9	31.6	43.5	11.9	
Vert	240.001	QP	33.6	17.1	8.5	27.6	31.6	46.0	14.4	
Vert	456.001	QP	28.9	17.7	9.6	28.6	27.6	46.0	18.4	
Vert	468.002	QP	31.8	17.8	9.6	28.7	30.5	46.0	15.5	
Vert	1626.720	PK	59.0	26.6	2.0	35.3	52.3	73.9	21.6	
Vert	4882.000	PK	53.6	31.4	4.2	34.0	55.2	73.9	18.7	
Vert	5000.000	PK	56.4	31.7	4.2	34.0	58.3	73.9	15.6	
Vert	7323.000	PK	44.3	36.0	4.9	34.2	51.0	73.9	22.9	NS
Vert	9764.000	PK	44.3	39.0	5.7	34.7	54.3	73.9	19.6	NS
Vert	1626.720	AV	56.9	26.6	2.0	35.3	50.2	53.9	3.7	
Vert	5000.000	AV	38.1	31.7	4.2	34.0	40.0	53.9	13.9	
Vert	7323.000	AV	33.1	36.0	4.9	34.2	39.8	73.9	34.1	NS
Vert	9764.000	AV	33.4	39.0	5.7	34.7	43.4	73.9	30.5	NS

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).

NS:No signal detect

*Harmonics above the 5th were base noise level.

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012
Temperature/ Humidity 20 deg. C / 24% RH
Engineer Yutaka Yoshida
(1-10GHz)
Mode Tx, DH5 2441MHz

Dwell time factor relaxation

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Dwell Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	4882.000	AV	53.0	31.4	4.2	34.0	-24.2	30.4	53.9	23.5	
Vert	4882.000	AV	48.0	31.4	4.2	34.0	-24.2	25.4	53.9	28.5	

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	44.825	QP	31.7	12.5	6.9	28.6	22.5	40.0	17.5	
Hori	166.396	QP	38.0	15.6	8.0	28.0	33.6	43.5	9.9	
Hori	192.018	QP	37.7	16.4	8.1	27.9	34.3	43.5	9.2	
Hori	240.001	QP	38.1	17.1	8.5	27.6	36.1	46.0	9.9	
Hori	455.983	QP	33.1	17.7	9.6	28.6	31.8	46.0	14.2	
Hori	500.770	QP	37.6	18.0	9.9	28.8	36.7	46.0	9.3	
Hori	1652.685	PK	58.1	26.6	2.0	35.3	51.4	73.9	22.5	
Hori	2483.500	PK	52.5	27.5	2.4	34.8	47.6	73.9	26.3	
Hori	4960.000	PK	58.2	31.6	4.2	34.0	60.0	73.9	13.9	
Hori	5002.675	PK	46.8	31.7	4.2	34.0	48.7	73.9	25.2	
Hori	7440.000	PK	43.9	36.2	5.0	34.3	50.8	73.9	23.1	NS
Hori	9920.000	PK	45.3	39.1	5.8	34.7	55.5	73.9	18.4	NS
Hori	1652.685	AV	55.5	26.6	2.0	35.3	48.8	53.9	5.1	
Hori	2483.500	AV	39.4	27.5	2.4	34.8	34.5	53.9	19.4	
Hori	5002.675	AV	33.6	31.7	4.2	34.0	35.5	53.9	18.4	
Hori	7440.000	AV	33.0	36.2	5.0	34.3	39.9	53.9	14.0	NS
Hori	9920.000	AV	33.8	39.1	5.8	34.7	44.0	53.9	9.9	NS
Vert	45.436	QP	44.0	12.2	6.9	28.6	34.5	40.0	5.5	
Vert	166.808	QP	36.0	15.6	8.0	28.0	31.6	43.5	11.9	
Vert	192.006	QP	35.6	16.4	8.1	27.9	32.2	43.5	11.3	
Vert	240.001	QP	34.1	17.1	8.5	27.6	32.1	46.0	13.9	
Vert	456.010	QP	29.2	17.7	9.6	28.6	27.9	46.0	18.1	
Vert	500.720	QP	32.1	18.0	9.9	28.8	31.2	46.0	14.8	
Vert	1652.685	PK	58.9	26.6	2.0	35.3	52.2	73.9	21.7	
Vert	2483.500	PK	51.4	27.5	2.4	34.8	46.5	73.9	27.4	
Vert	4960.000	PK	56.0	31.6	4.2	34.0	57.8	73.9	16.1	
Vert	5002.675	PK	53.7	31.7	4.2	34.0	55.6	73.9	18.3	
Vert	7440.000	PK	43.9	36.2	5.0	34.3	50.8	73.9	23.1	NS
Vert	9920.000	PK	44.1	39.1	5.8	34.7	54.3	73.9	19.6	NS
Vert	1652.685	AV	56.5	26.6	2.0	35.3	49.8	53.9	4.1	
Vert	2483.500	AV	37.4	27.5	2.4	34.8	32.5	53.9	21.4	
Vert	5002.675	AV	36.6	31.7	4.2	34.0	38.5	53.9	15.4	
Vert	7440.000	AV	33.3	36.2	5.0	34.3	40.2	53.9	13.7	NS
Vert	9920.000	AV	33.9	39.1	5.8	34.7	44.1	53.9	9.8	NS

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).

NS:No signal detect

*Harmonics above the 5th were base noise level.

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012
Temperature/ Humidity 20 deg. C / 24% RH
Engineer Yutaka Yoshida
(1-10GHz)
Mode Tx, DH5 2480MHz

Dwell time factor relaxation

Polarity	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Dwell Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori	4960.000	AV	53.7	31.6	4.2	34.0	-24.2	31.3	53.9	22.6	
Vert	4960.000	AV	51.1	31.6	4.2	34.0	-24.2	28.7	53.9	25.2	

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

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	44.849	QP	32.0	12.5	6.9	28.6	22.8	40.0	17.2	
Hori	166.404	QP	37.6	15.6	8.0	28.0	33.2	43.5	10.3	
Hori	192.000	QP	39.1	16.4	8.1	27.9	35.7	43.5	7.8	
Hori	240.006	QP	38.2	17.1	8.5	27.6	36.2	46.0	9.8	
Hori	456.001	QP	33.9	17.7	9.6	28.6	32.6	46.0	13.4	
Hori	499.296	QP	37.9	18.0	9.8	28.8	36.9	46.0	9.1	
Hori	1601.972	PK	58.2	26.5	1.9	35.3	51.3	73.9	22.6	
Hori	2390.000	PK	48.1	27.4	2.4	34.8	43.1	73.9	30.8	
Hori	4804.000	PK	53.4	31.2	4.2	34.0	54.8	73.9	19.1	
Hori	5009.250	PK	47.7	31.7	4.2	34.0	49.6	73.9	24.3	
Hori	7206.000	PK	44.0	35.9	4.9	34.2	50.6	73.9	23.3	NS
Hori	9608.000	PK	44.3	38.8	5.7	34.7	54.1	73.9	19.8	NS
Hori	1601.972	AV	56.4	26.5	1.9	35.3	49.5	53.9	4.4	
Hori	2390.000	AV	35.2	27.4	2.4	34.8	30.2	53.9	23.7	
Hori	4804.000	AV	40.2	31.2	4.2	34.0	41.6	53.9	12.3	
Hori	5009.250	AV	33.7	31.7	4.2	34.0	35.6	53.9	18.3	
Hori	7206.000	AV	32.9	35.9	4.9	34.2	39.5	53.9	14.4	NS
Hori	9608.000	AV	33.0	38.8	5.7	34.7	42.8	53.9	11.1	NS
Vert	45.404	QP	44.0	12.3	6.9	28.6	34.6	40.0	5.4	
Vert	166.542	QP	36.2	15.6	8.0	28.0	31.8	43.5	11.7	
Vert	191.999	QP	35.8	16.4	8.1	27.9	32.4	43.5	11.1	
Vert	240.001	QP	34.3	17.1	8.5	27.6	32.3	46.0	13.7	
Vert	455.990	QP	28.9	17.7	9.6	28.6	27.6	46.0	18.4	
Vert	499.048	QP	32.8	18.0	9.8	28.8	31.8	46.0	14.2	
Vert	1601.987	PK	59.2	26.5	1.9	35.3	52.3	73.9	21.6	
Vert	2390.000	PK	47.0	27.4	2.4	34.8	42.0	73.9	31.9	
Vert	4804.000	PK	49.2	31.2	4.2	34.0	50.6	73.9	23.3	
Vert	5009.250	PK	56.7	31.7	4.2	34.0	58.6	73.9	15.3	
Vert	5009.250	PK	38.9	31.7	4.2	34.0	40.8	73.9	33.1	
Vert	7206.000	PK	43.7	35.9	4.9	34.2	50.3	73.9	23.6	NS
Vert	9608.000	PK	43.8	38.8	5.7	34.7	53.6	73.9	20.3	NS
Vert	1601.987	AV	57.4	26.5	1.9	35.3	50.5	53.9	3.4	
Vert	2390.000	AV	34.6	27.4	2.4	34.8	29.6	53.9	24.3	
Vert	4804.000	AV	36.8	31.2	4.2	34.0	38.2	53.9	15.7	
Vert	7206.000	AV	32.9	35.9	4.9	34.2	39.5	53.9	14.4	NS
Vert	9608.000	AV	32.9	38.8	5.7	34.7	42.7	53.9	11.2	NS

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).

NS:No signal detect

*Harmonics above the 5th were base noise level.

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012
Temperature/ Humidity 20 deg. C / 24% RH
Engineer Yutaka Yoshida
(1-10GHz)
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	99.7	27.5	2.4	34.8	94.8	-	-	Carrier
Hori	2400.000	PK	53.1	27.5	2.4	34.8	48.2	74.8	26.6	
Vert	2402.000	PK	94.9	27.5	2.4	34.8	90.0	-	-	Carrier
Vert	2400.000	PK	49.3	27.5	2.4	34.8	44.4	70.0	25.6	

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	44.806	QP	31.3	12.5	6.9	28.6	22.1	40.0	17.9	
Hori	166.392	QP	37.8	15.6	8.0	28.0	33.4	43.5	10.1	
Hori	191.998	QP	38.9	16.4	8.1	27.9	35.5	43.5	8.0	
Hori	240.001	QP	38.2	17.1	8.5	27.6	36.2	46.0	9.8	
Hori	468.008	QP	35.5	17.8	9.6	28.7	34.2	46.0	11.8	
Hori	500.770	QP	37.8	18.0	9.9	28.8	36.9	46.0	9.1	
Hori	1626.663	PK	58.6	26.6	2.0	35.3	51.9	73.9	22.0	
Hori	4882.000	PK	52.8	31.4	4.2	34.0	54.4	73.9	19.5	
Hori	5000.170	PK	47.6	31.7	4.2	34.0	49.5	73.9	24.5	
Hori	7323.000	PK	44.1	36.0	4.9	34.2	50.8	73.9	23.1	NS
Hori	9764.000	PK	44.2	39.0	5.7	34.7	54.2	73.9	19.7	NS
Hori	1626.663	AV	56.3	26.6	2.0	35.3	49.6	53.9	4.3	
Hori	4882.000	AV	42.2	31.4	4.2	34.0	43.8	53.9	10.1	
Hori	5000.170	AV	33.6	31.7	4.2	34.0	35.5	53.9	18.4	
Hori	7323.000	AV	33.1	36.0	4.9	34.2	39.8	53.9	14.1	NS
Hori	9764.000	AV	33.0	39.0	5.7	34.7	43.0	53.9	10.9	NS
Vert	45.422	QP	44.2	12.2	6.9	28.6	34.7	40.0	5.3	
Vert	166.548	QP	35.8	15.6	8.0	28.0	31.4	43.5	12.1	
Vert	192.001	QP	35.1	16.4	8.1	27.9	31.7	43.5	11.8	
Vert	240.001	QP	33.6	17.1	8.5	27.6	31.6	46.0	14.4	
Vert	468.044	QP	31.5	17.8	9.6	28.7	30.2	46.0	15.8	
Vert	499.080	QP	33.1	18.0	9.8	28.8	32.1	46.0	13.9	
Vert	1626.660	PK	58.9	26.6	2.0	35.3	52.2	73.9	21.7	
Vert	4882.000	PK	51.7	31.4	4.2	34.0	53.3	73.9	20.6	
Vert	5000.170	PK	56.3	31.7	4.2	34.0	58.2	73.9	15.7	
Vert	7323.000	PK	43.9	36.0	4.9	34.2	50.6	73.9	23.3	NS
Vert	9764.000	PK	44.0	39.0	5.7	34.7	54.0	73.9	19.9	NS
Vert	1626.660	AV	56.9	26.6	2.0	35.3	50.2	53.9	3.7	
Vert	4882.000	AV	41.8	31.4	4.2	34.0	43.4	53.9	10.5	
Vert	5000.170	AV	38.2	31.7	4.2	34.0	40.1	53.9	13.8	
Vert	7323.000	AV	33.1	36.0	4.9	34.2	39.8	53.9	14.1	NS
Vert	9764.000	AV	33.0	39.0	5.7	34.7	43.0	53.9	10.9	NS

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).

NS:No signal detect

*Harmonics above the 5th were base noise level.

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 33CE0031-HO-02-A
Date 12/07/2012 12/08/2012
Temperature/ Humidity 20 deg. C / 24% RH 20 deg. C / 36% RH
Engineer Yutaka Yoshida Kazuya Yoshioka
(1-10GHz) (30-1000MHz/10-26.5GHz)
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	44.820	QP	32.3	12.5	6.9	28.6	23.1	40.0	16.9	
Hori	166.406	QP	37.8	15.6	8.0	28.0	33.4	43.5	10.1	
Hori	192.001	QP	39.3	16.4	8.1	27.9	35.9	43.5	7.6	
Hori	239.996	QP	38.5	17.1	8.5	27.6	36.5	46.0	9.5	
Hori	468.003	QP	35.7	17.8	9.6	28.7	34.4	46.0	11.6	
Hori	500.778	QP	37.8	18.0	9.9	28.8	36.9	46.0	9.1	
Hori	1652.695	PK	58.7	26.6	2.0	35.3	52.0	73.9	21.9	
Hori	2483.500	PK	52.1	27.5	2.4	34.8	47.2	73.9	26.7	
Hori	4960.000	PK	52.2	31.6	4.2	34.0	54.0	73.9	19.9	
Hori	4990.500	PK	47.5	31.7	4.2	34.0	49.4	73.9	24.5	
Hori	7440.000	PK	44.4	36.2	5.0	34.3	51.3	73.9	22.6	NS
Hori	9920.000	PK	44.6	39.1	5.8	34.7	54.8	73.9	19.1	NS
Hori	1652.695	AV	56.7	26.6	2.0	35.3	50.0	53.9	3.9	
Hori	2483.500	AV	38.7	27.5	2.4	34.8	33.8	53.9	20.1	
Hori	4960.000	AV	42.7	31.6	4.2	34.0	44.5	53.9	9.4	
Hori	4990.500	AV	33.6	31.7	4.2	34.0	35.5	53.9	18.4	
Hori	7440.000	AV	33.3	36.2	5.0	34.3	40.2	53.9	13.7	NS
Hori	9920.000	AV	33.8	39.1	5.8	34.7	44.0	53.9	9.9	NS
Vert	45.390	QP	44.0	12.3	6.9	28.6	34.6	40.0	5.4	
Vert	166.394	QP	37.6	15.6	8.0	28.0	33.2	43.5	10.3	
Vert	192.001	QP	35.7	16.4	8.1	27.9	32.3	43.5	11.2	
Vert	239.999	QP	33.7	17.1	8.5	27.6	31.7	46.0	14.3	
Vert	468.001	QP	32.2	17.8	9.6	28.7	30.9	46.0	15.1	
Vert	499.282	QP	32.3	18.0	9.8	28.8	31.3	46.0	14.7	
Vert	1652.656	PK	59.8	26.6	2.0	35.3	53.1	73.9	20.8	
Vert	2483.500	PK	52.5	27.5	2.4	34.8	47.6	73.9	26.3	
Vert	4960.000	PK	50.9	31.6	4.2	34.0	52.7	73.9	21.2	
Vert	5004.830	PK	56.7	31.7	4.2	34.0	58.6	73.9	15.3	
Vert	7440.000	PK	44.4	36.2	5.0	34.3	51.3	73.9	22.6	NS
Vert	9920.000	PK	45.6	39.1	5.8	34.7	55.8	73.9	18.1	NS
Vert	1652.656	AV	57.4	26.6	2.0	35.3	50.7	53.9	3.2	
Vert	2483.500	AV	37.2	27.5	2.4	34.8	32.3	53.9	21.6	
Vert	4960.000	AV	40.4	31.6	4.2	34.0	42.2	53.9	11.7	
Vert	5004.830	AV	38.1	31.7	4.2	34.0	40.0	53.9	13.9	
Vert	7440.000	AV	33.3	36.2	5.0	34.3	40.2	53.9	13.7	NS
Vert	9920.000	AV	33.8	39.1	5.8	34.7	44.0	53.9	9.9	NS

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

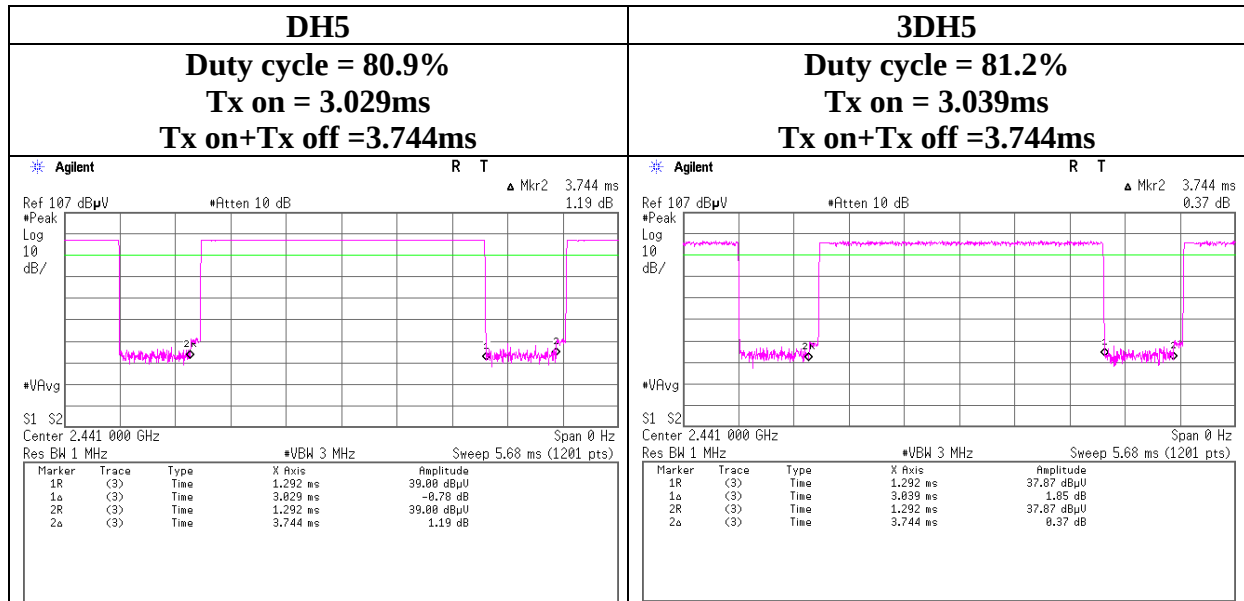
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS:No signal detect

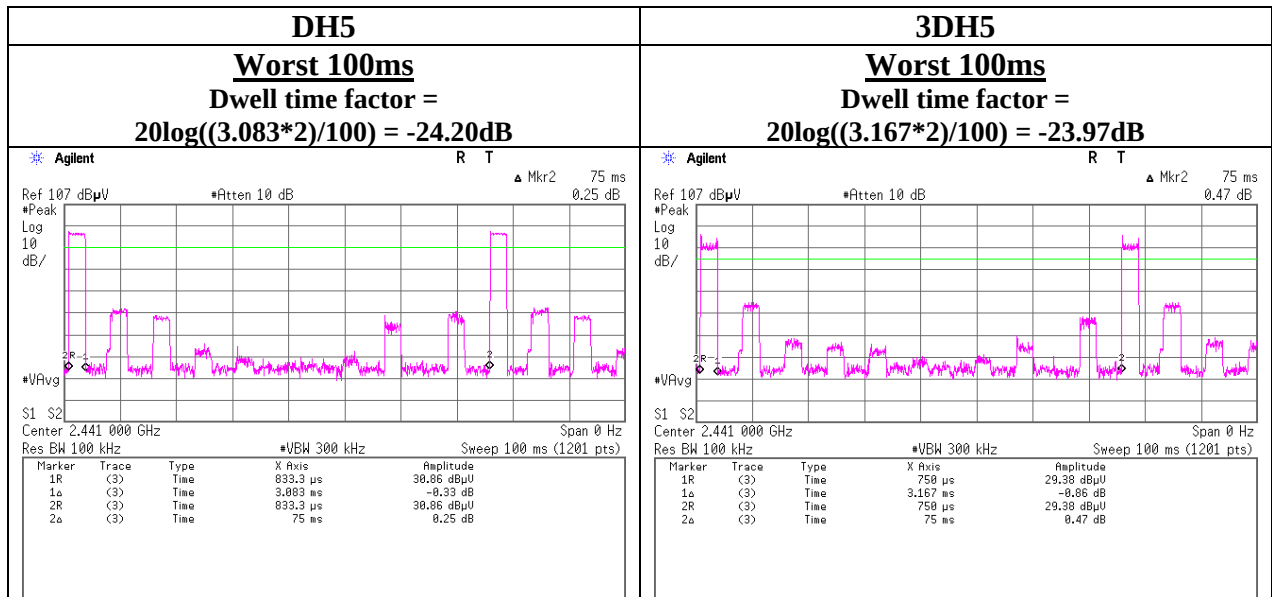
*Harmonics above the 5th were base noise level.

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

Duty Cycle Confirmation

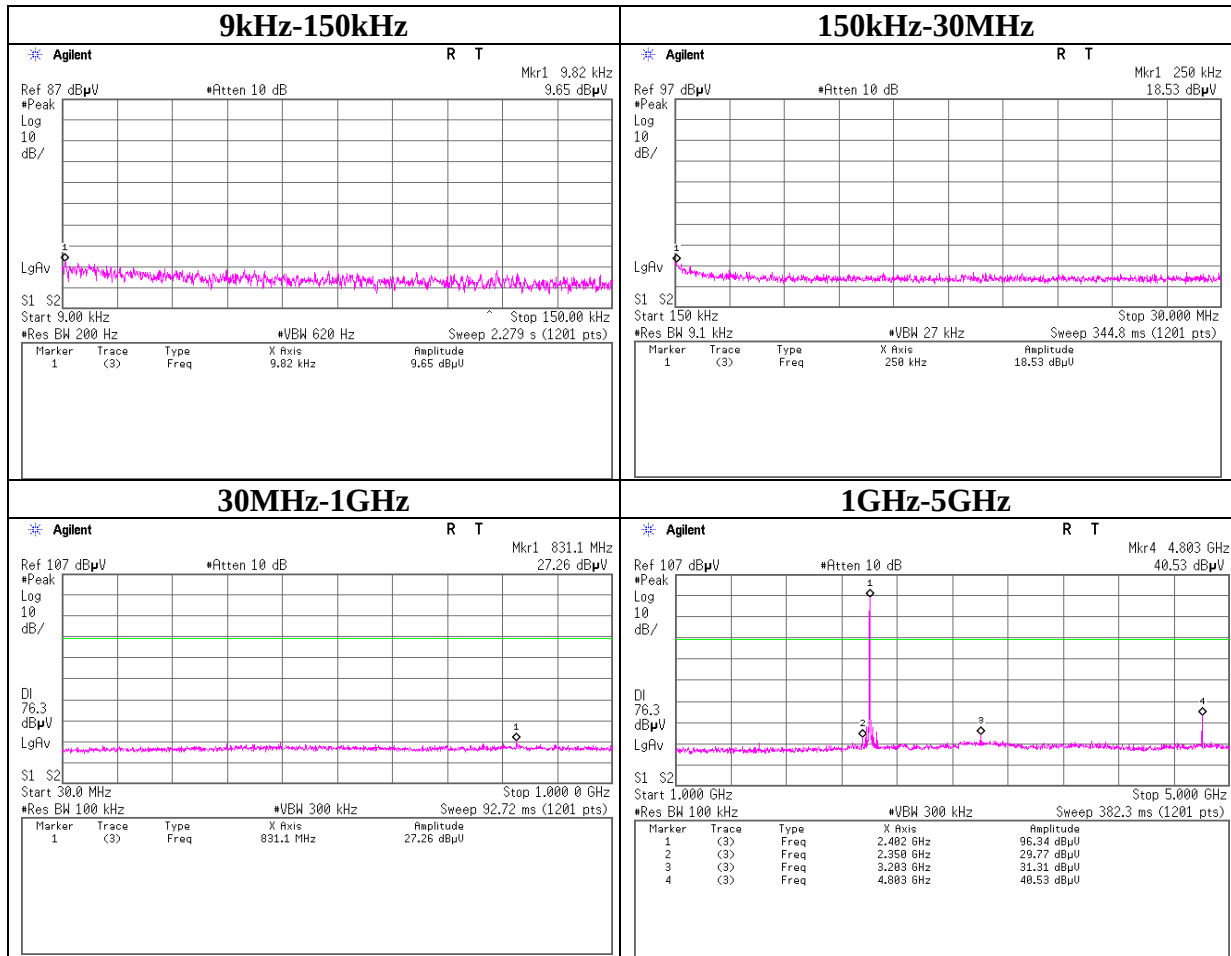


Dwell time factor



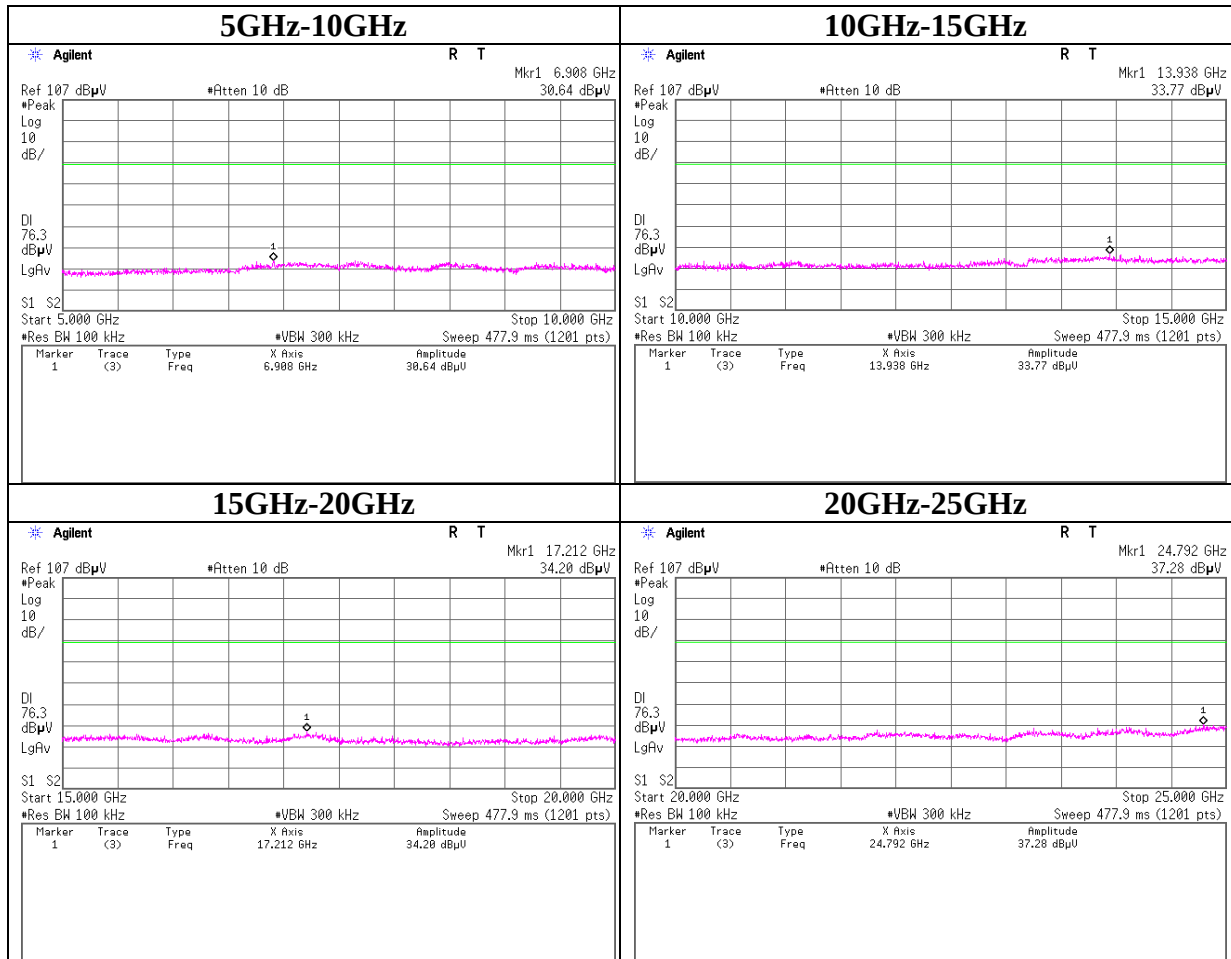
Conducted Spurious Emission

Tx DH5 2402MHz



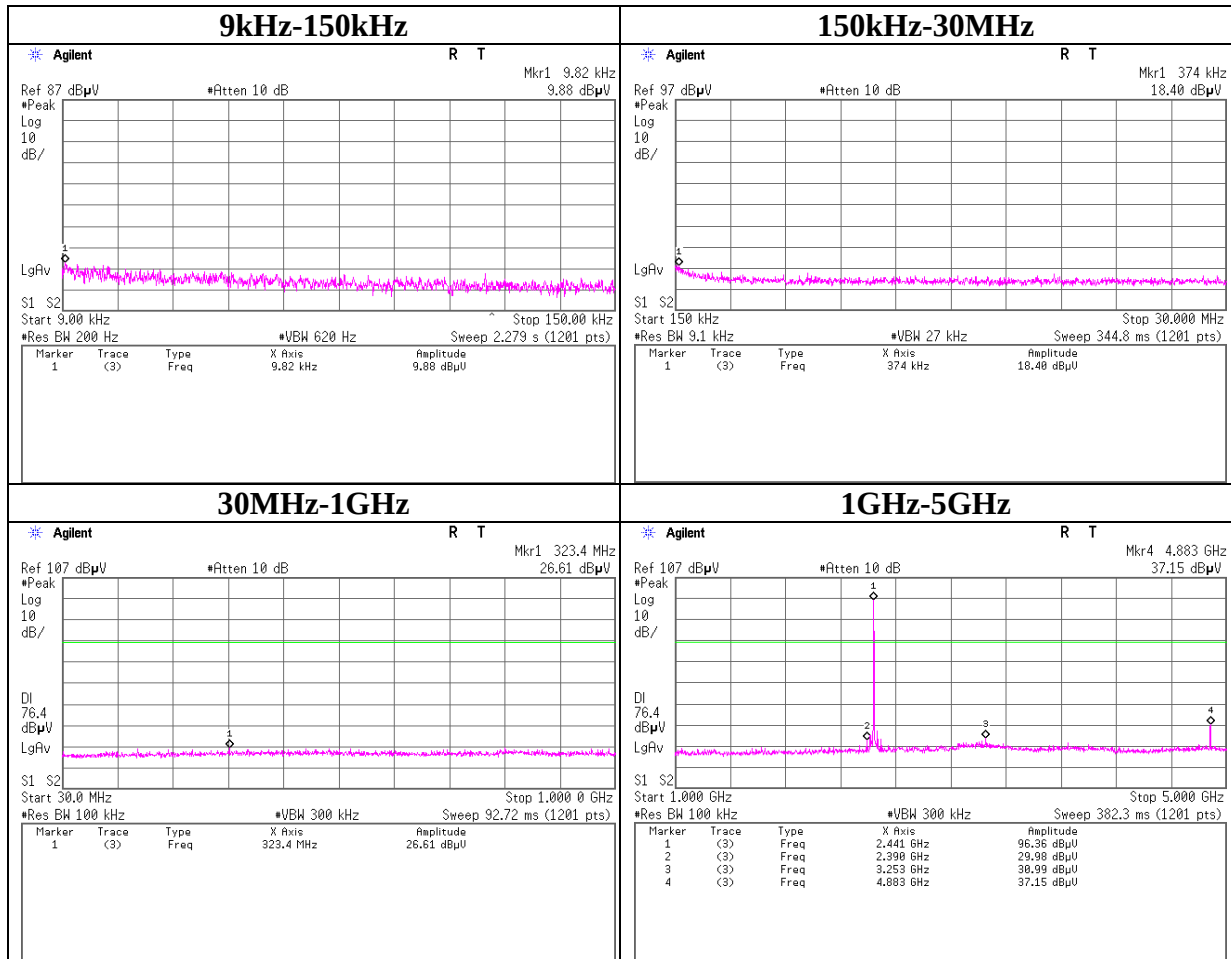
Conducted Spurious Emission

Tx DH5 2402MHz



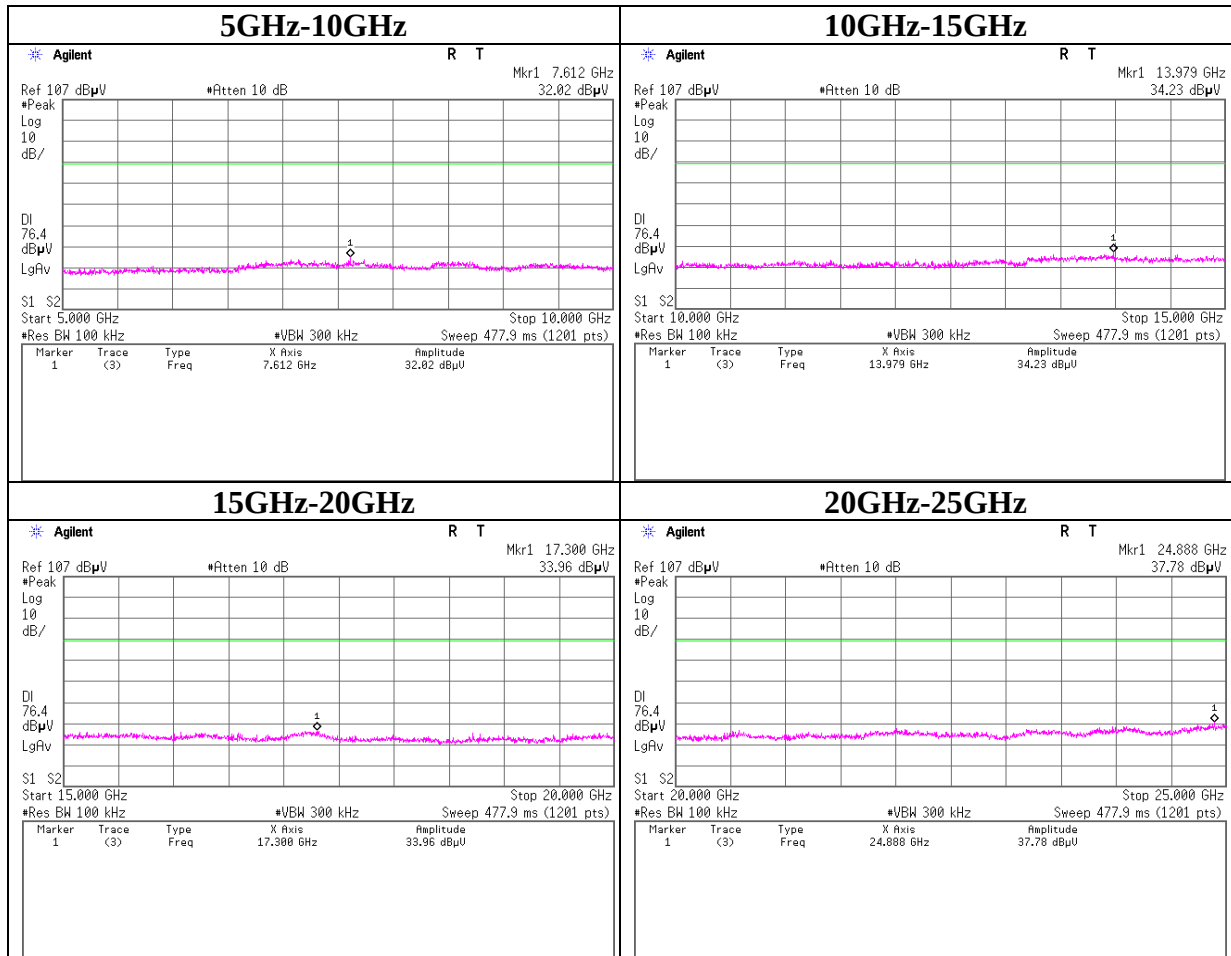
Conducted Spurious Emission

Tx DH5 2441MHz



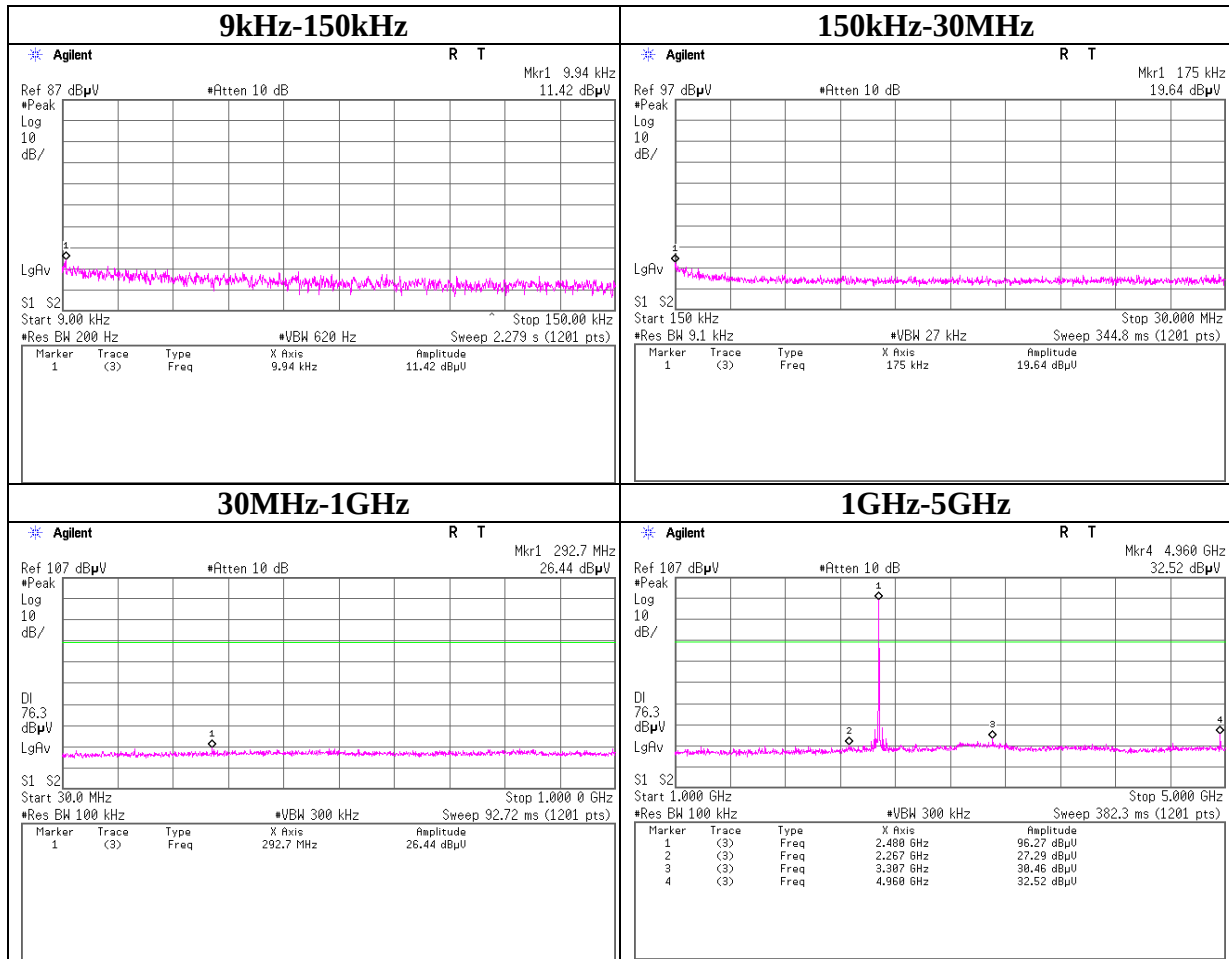
Conducted Spurious Emission

Tx DH5 2441MHz



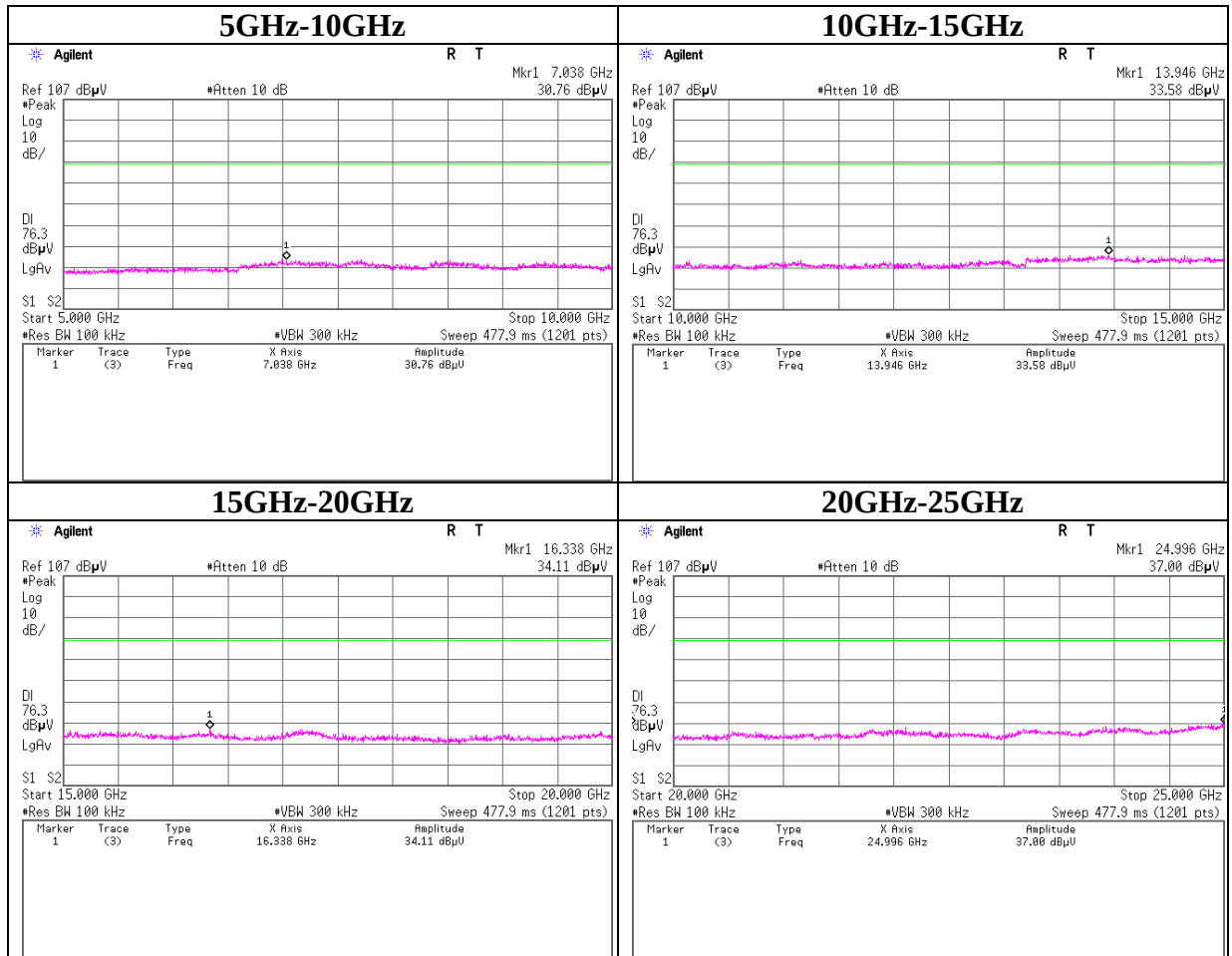
Conducted Spurious Emission

Tx DH5 2480MHz



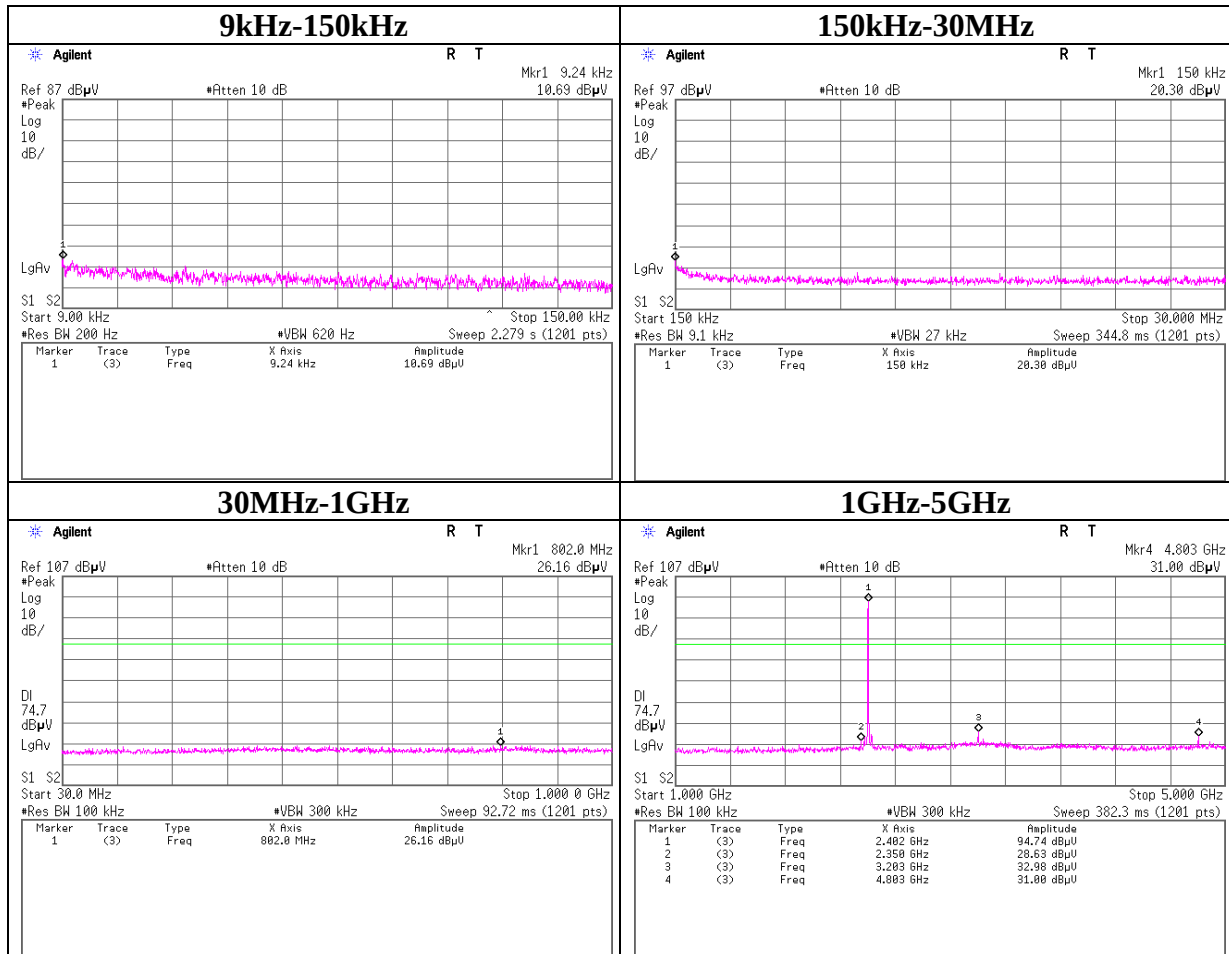
Conducted Spurious Emission

Tx DH5 2480MHz



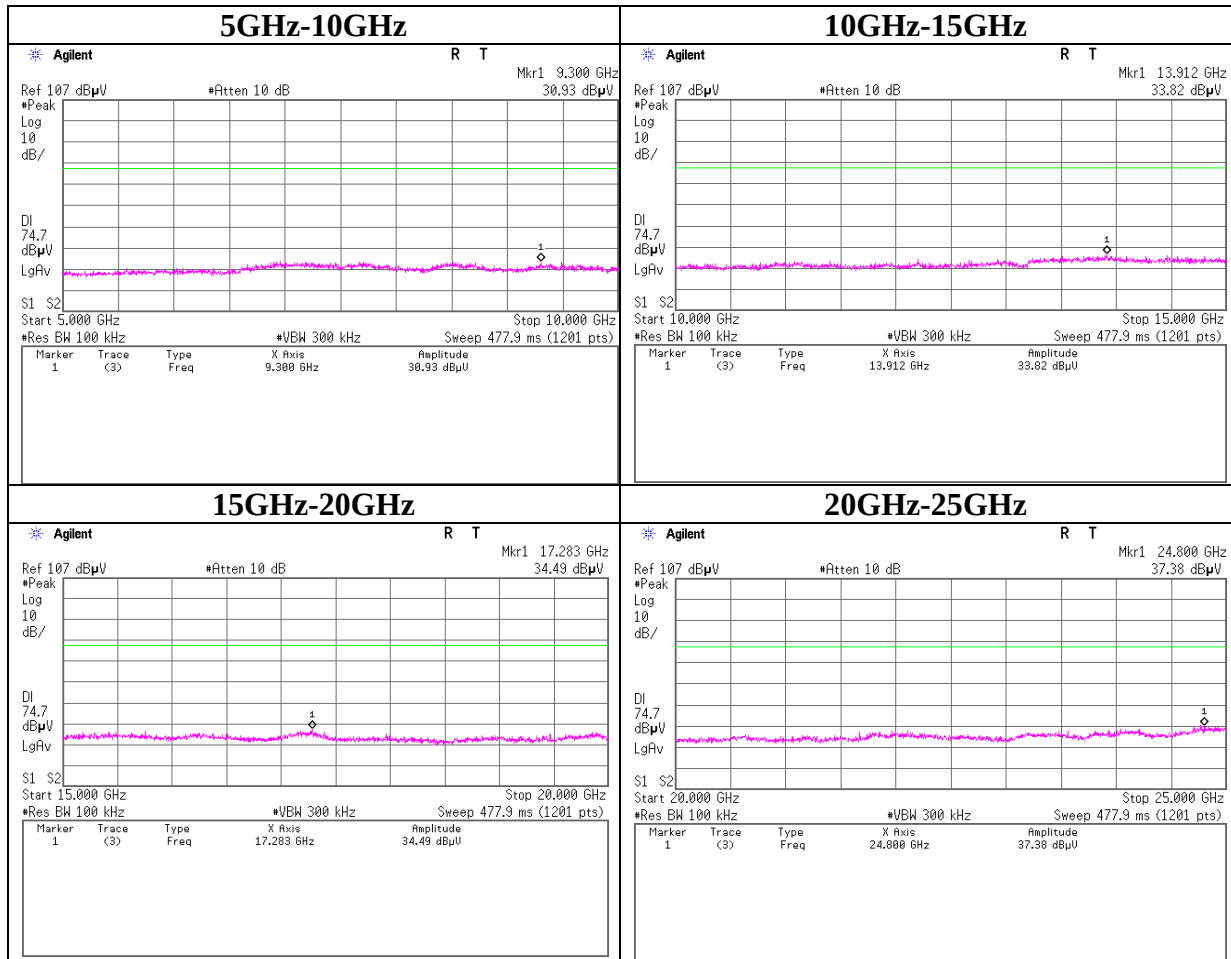
Conducted Spurious Emission

Tx 3DH5 2402MHz



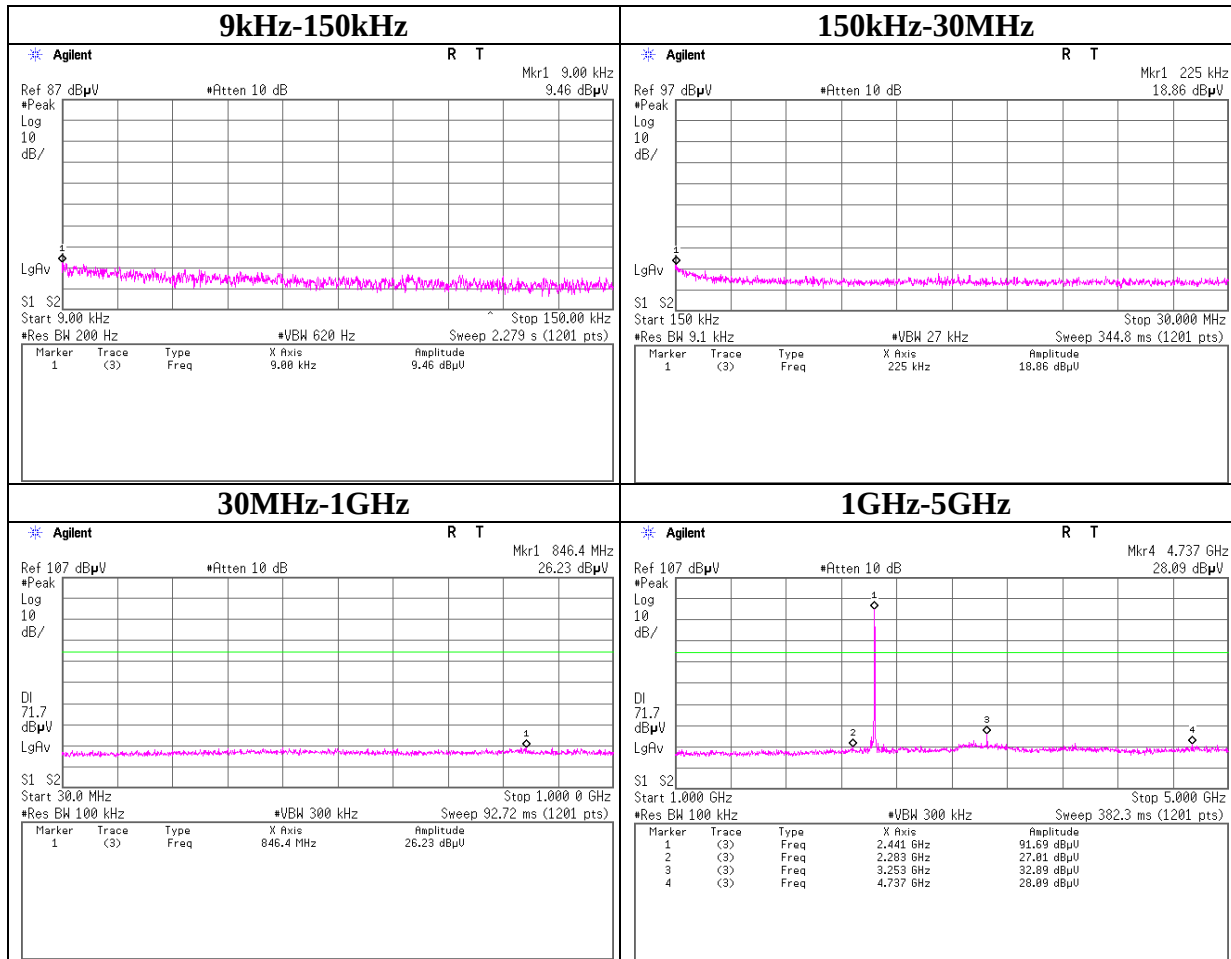
Conducted Spurious Emission

Tx 3DH5 2402MHz



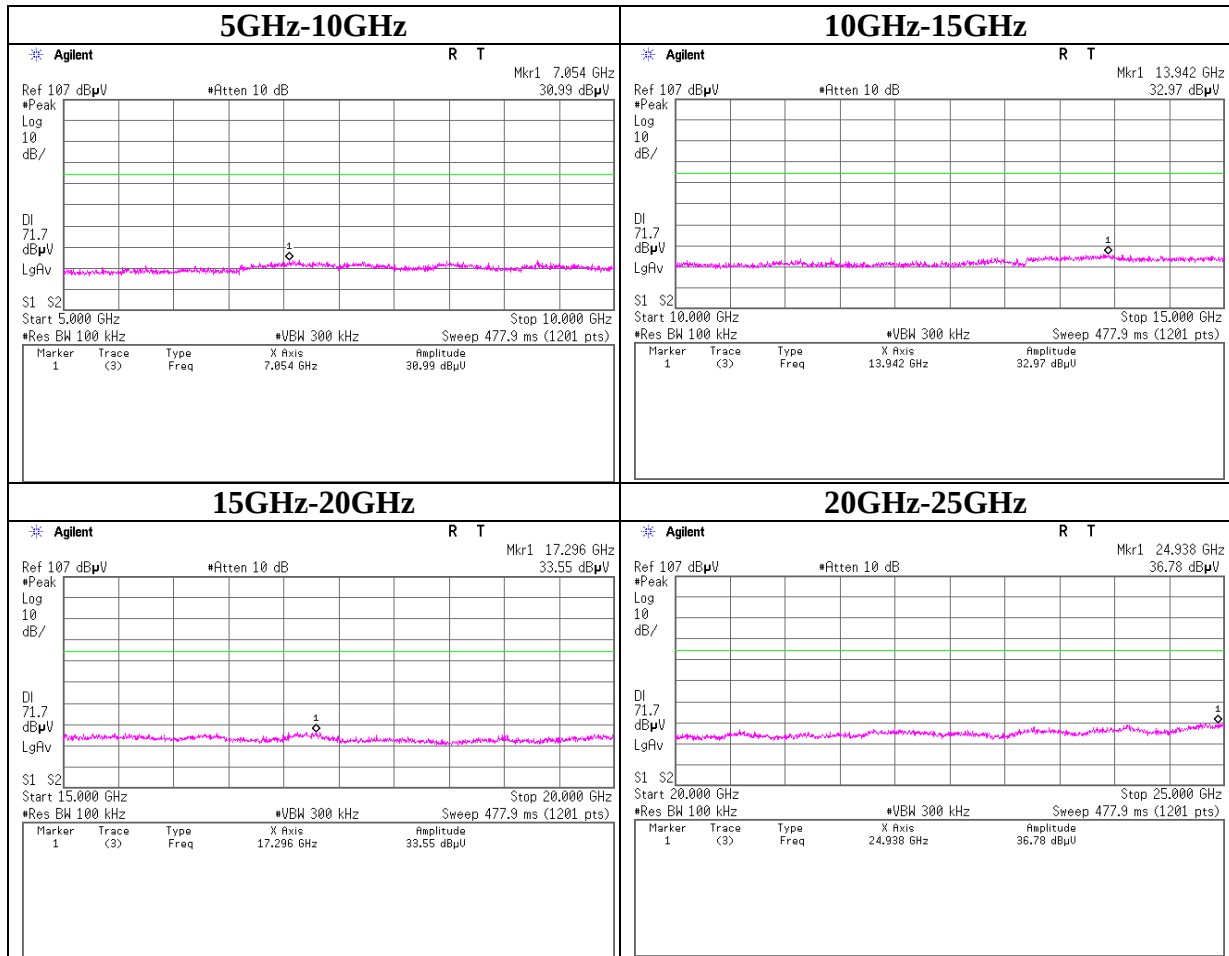
Conducted Spurious Emission

Tx 3DH5 2441MHz



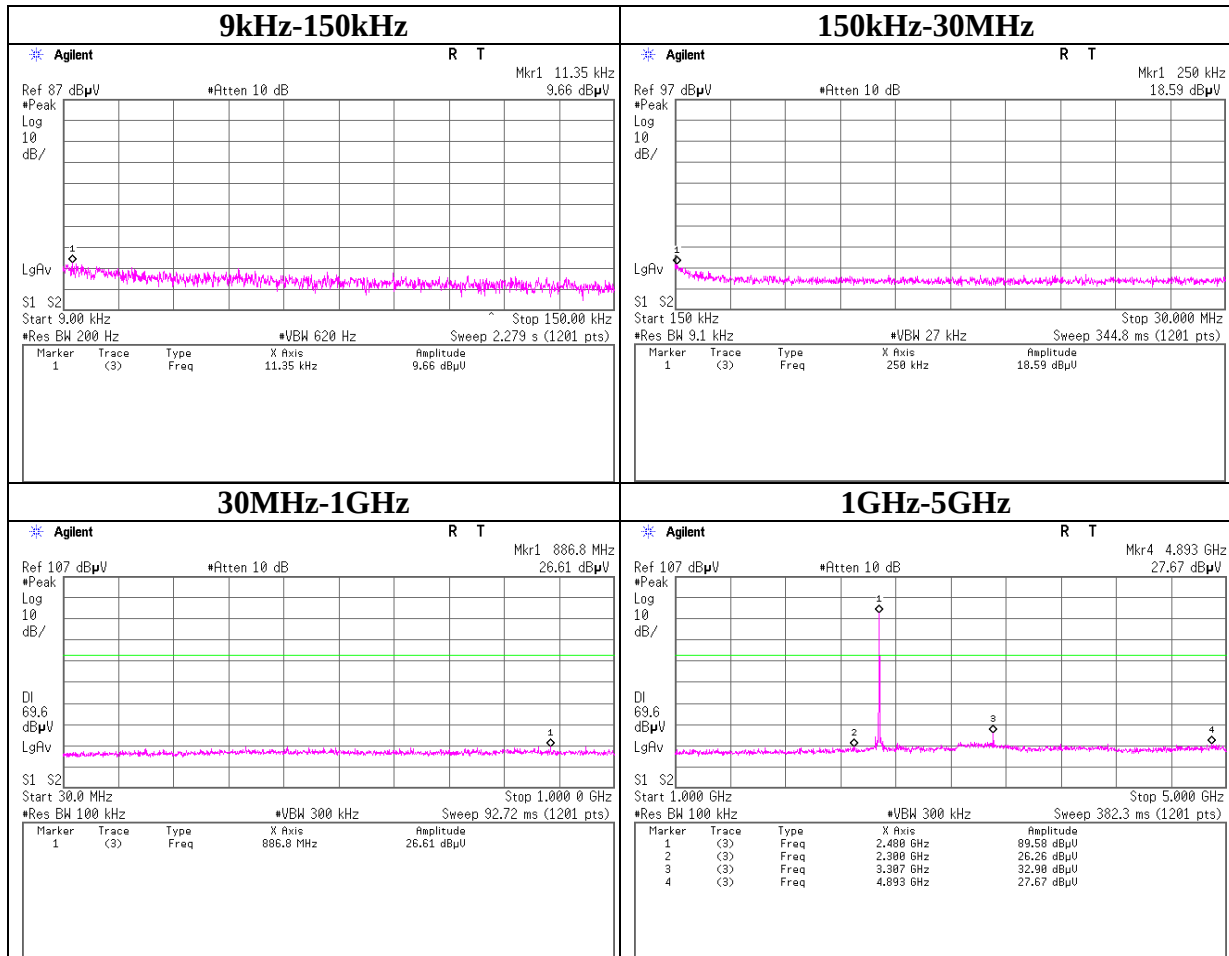
Conducted Spurious Emission

Tx 3DH5 2441MHz



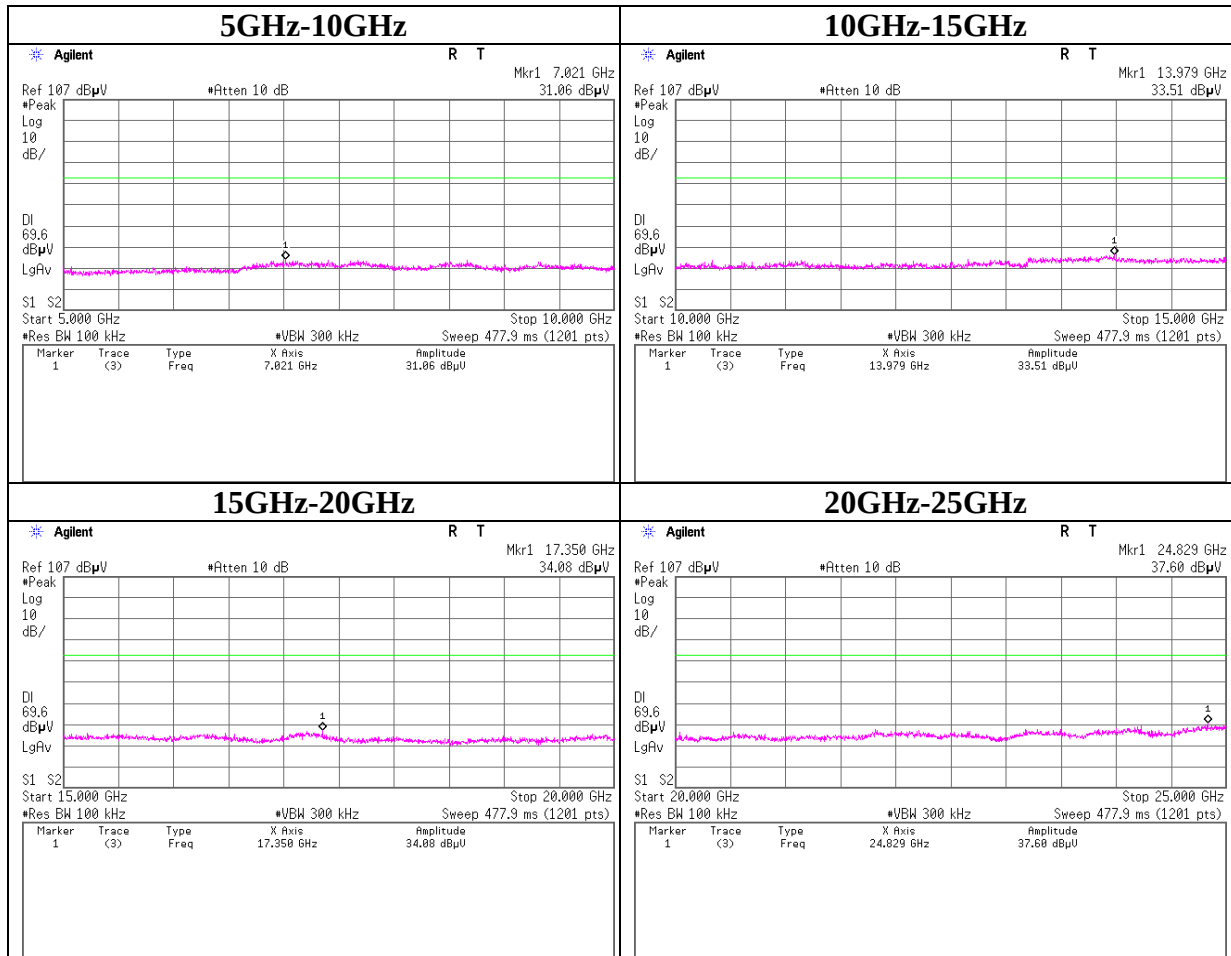
Conducted Spurious Emission

Tx 3DH5 2480MHz



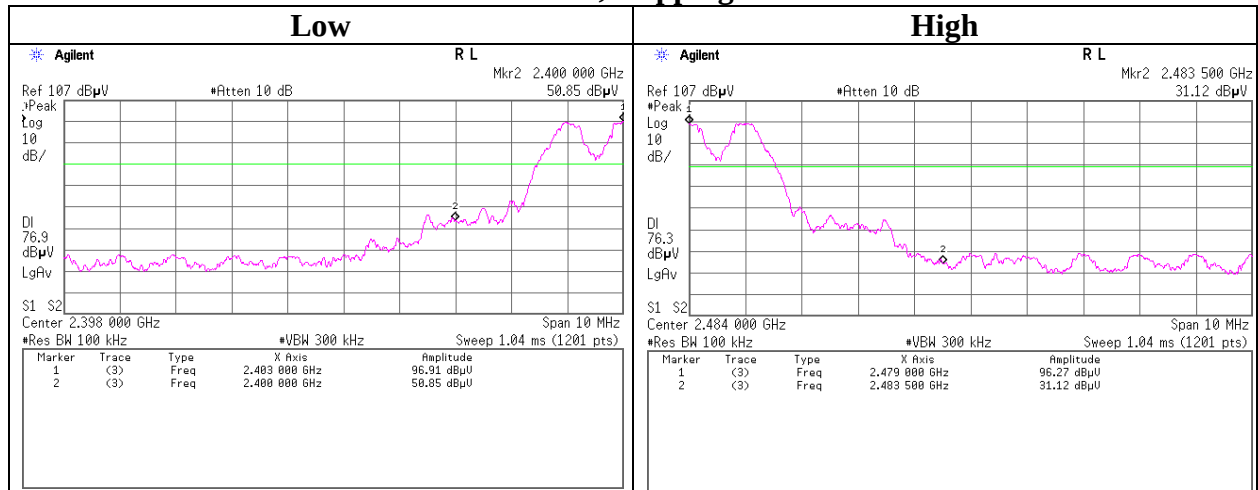
Conducted Spurious Emission

Tx 3DH5 2480MHz

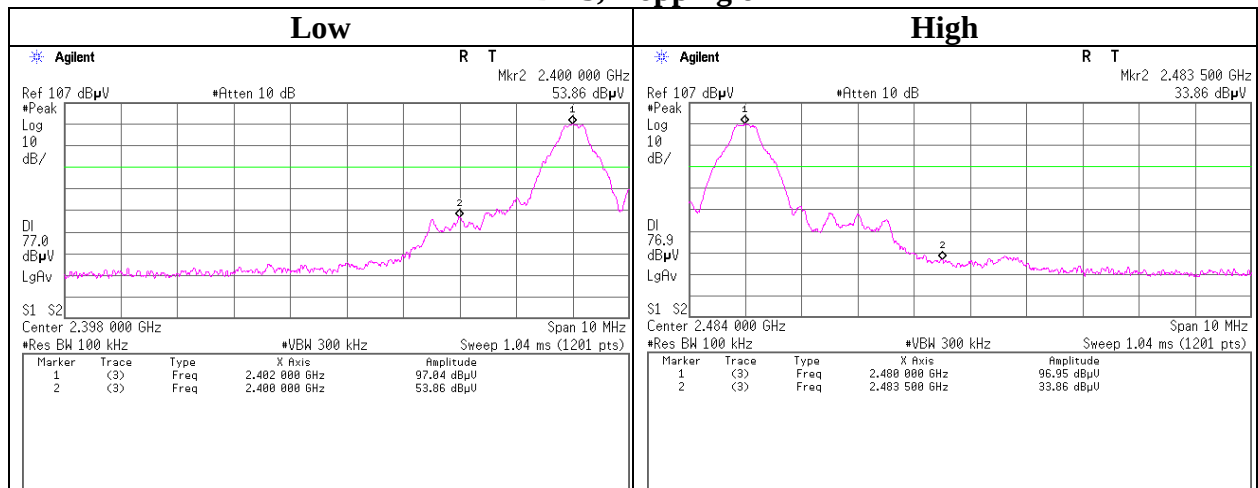


Conducted Emission Band Edge compliance

Tx DH5, Hopping on

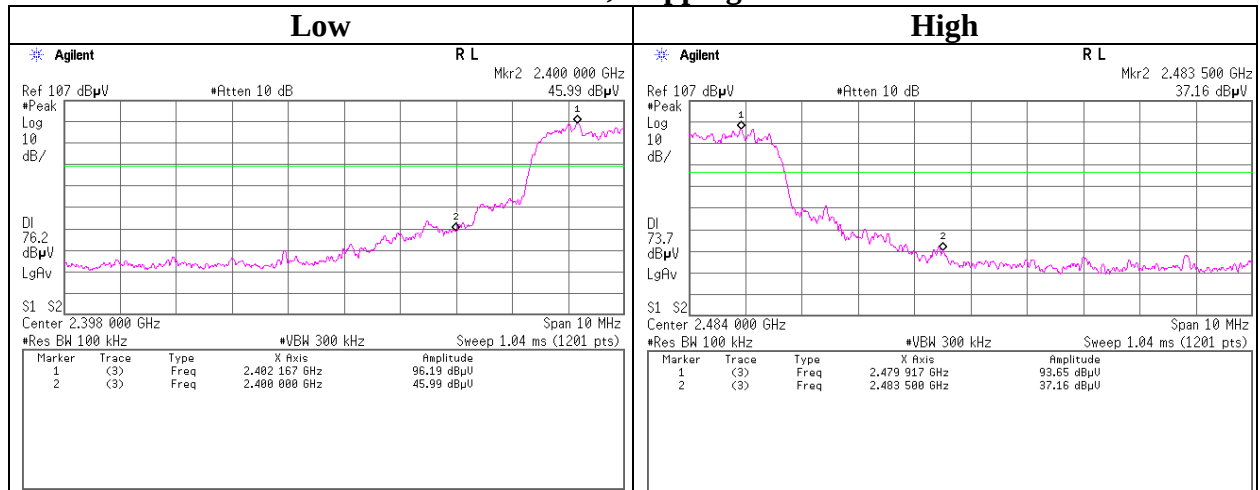


Tx DH5, Hopping off

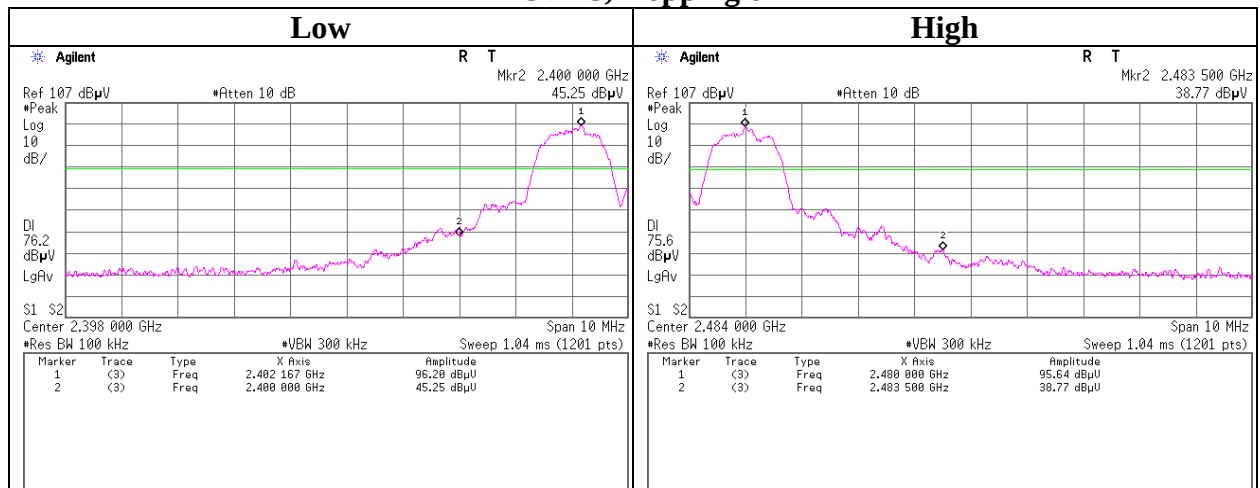


Conducted Emission Band Edge compliance

Tx 3DH5, Hopping on



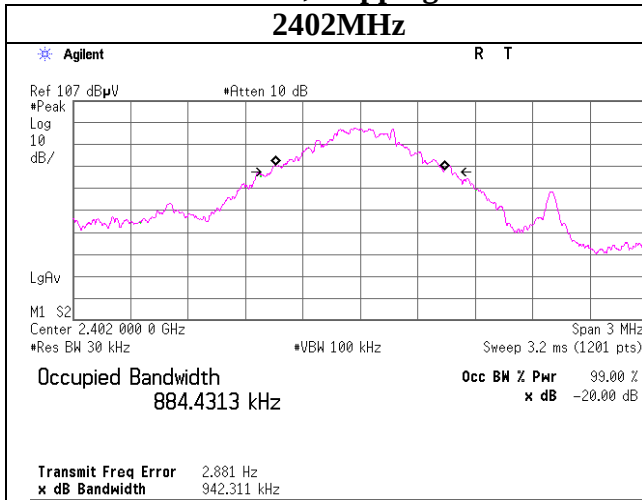
Tx 3DH5, Hopping off



99%Occupied Bandwidth

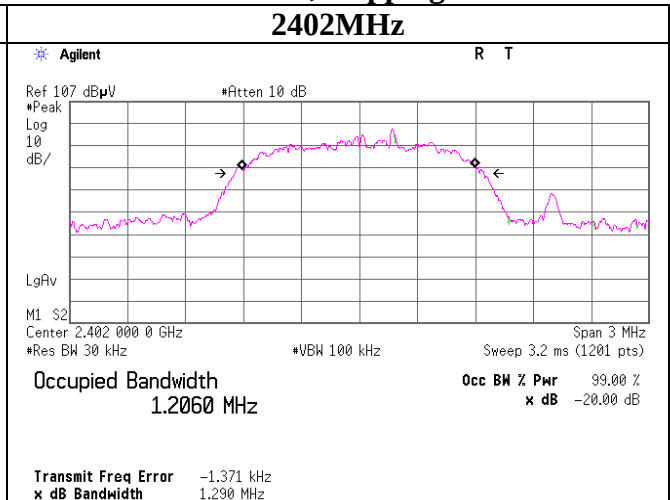
Tx DH5, Hopping off

2402MHz

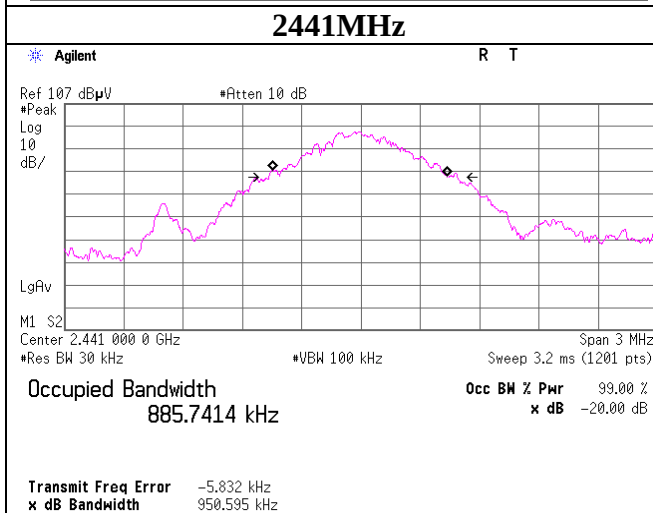


Tx 3DH5, Hopping off

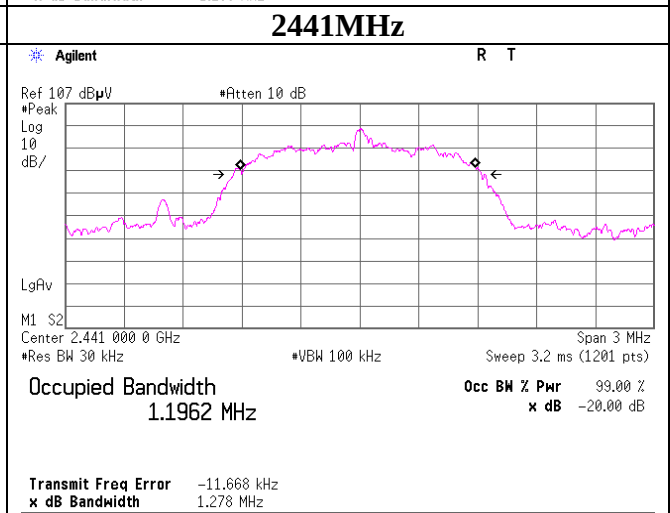
2402MHz



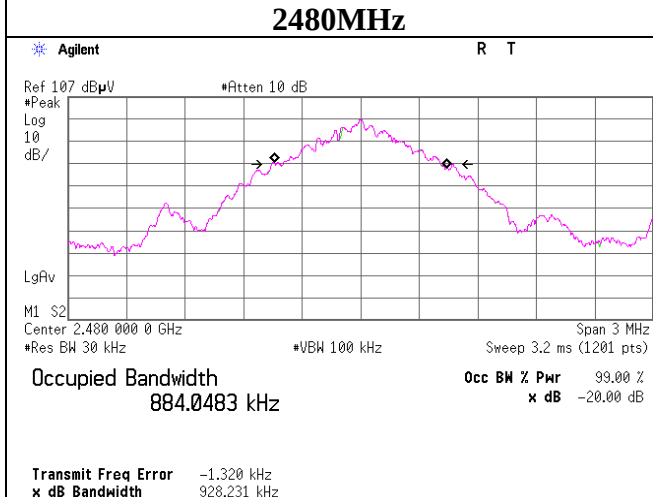
2441MHz



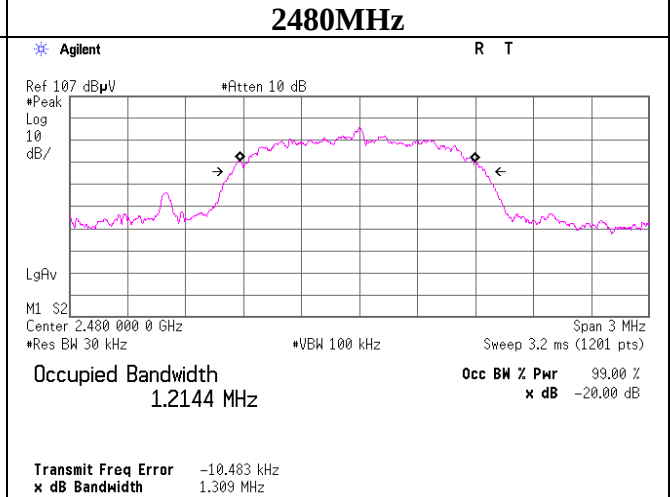
2441MHz



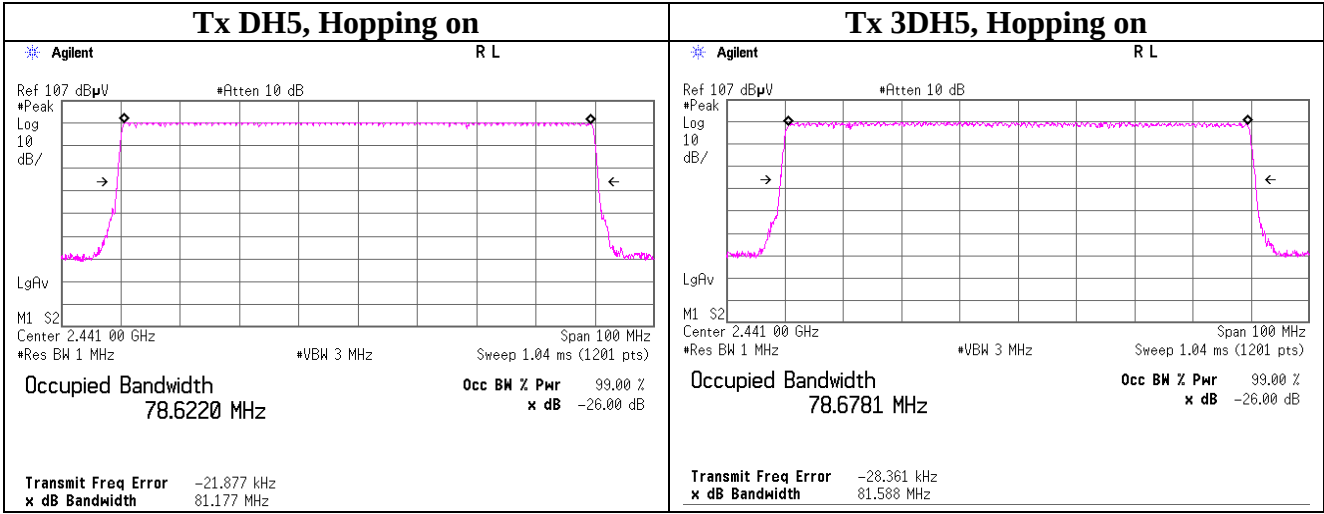
2480MHz



2480MHz



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-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT/RE	2012/11/20 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2012/01/12 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2012/10/19 * 12
MOTS-MATM	Antenna Terminal Measurement Software	UL Japan	-	-	AT	-
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2012/02/06 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2012/10/08 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2012/10/08 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2012/01/12 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2012/02/03 * 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**