

**APPENDIX 2: Data of EMI test**

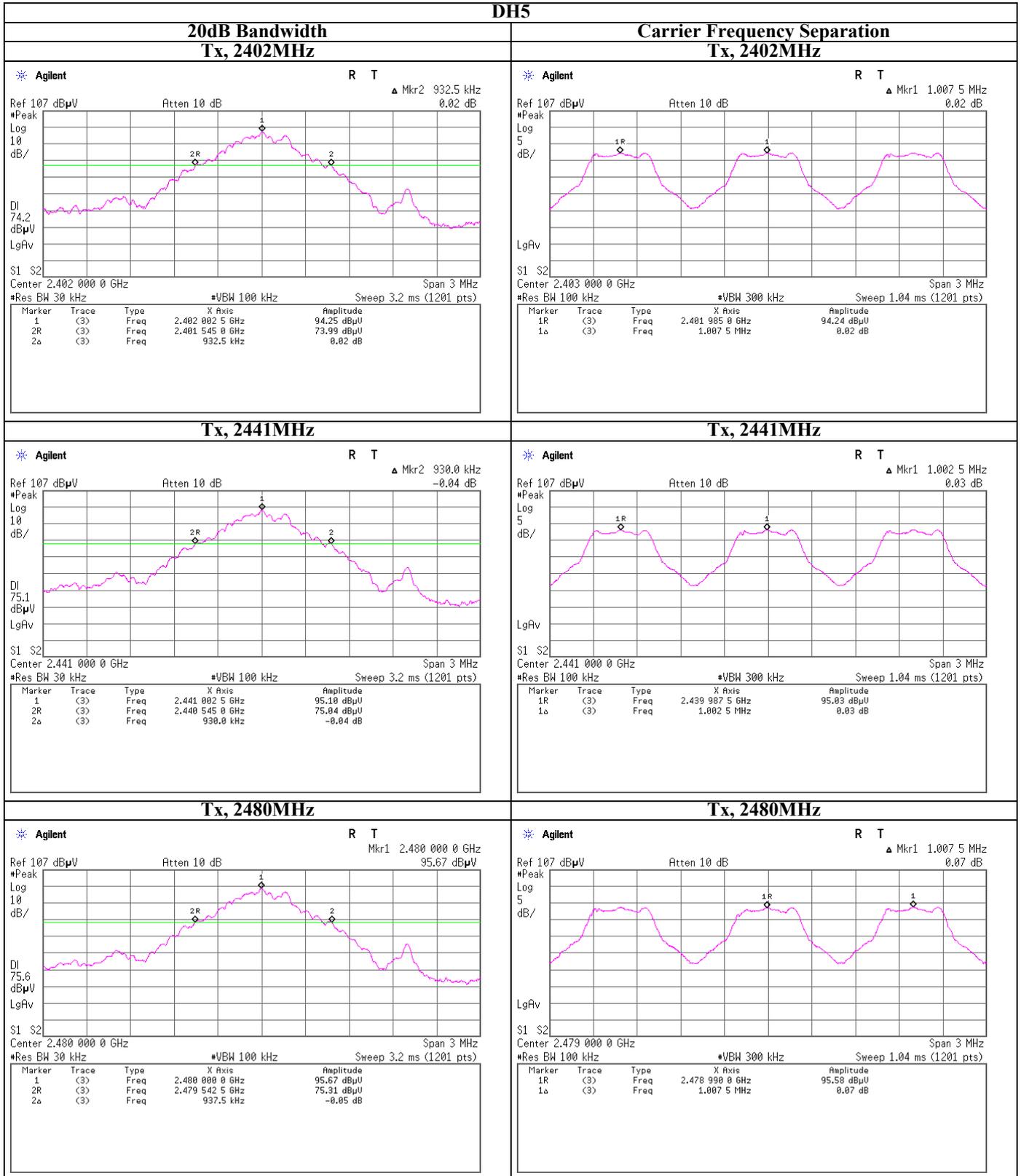
**20dB Bandwidth and Carrier Frequency Separation**

Test place                   UL Japan, Inc. Shonan EMC Lab.           No.5 Shielded Room  
Date                           August 30,2010  
Temperature / Humidity    25deg.C.           , 53%  
Engineer                    Shinichi Takano  
Mode                         Tx,

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.933	1.008	>= 0.622
DH5	2441.0	0.930	1.003	>= 0.620
DH5	2480.0	0.938	1.008	>= 0.625
3DH5	2402.0	1.290	1.008	>= 0.860
3DH5	2441.0	1.298	1.005	>= 0.865
3DH5	2480.0	1.293	1.005	>= 0.862
Inquiry	2441.0	0.820	2.004	>= 0.547

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

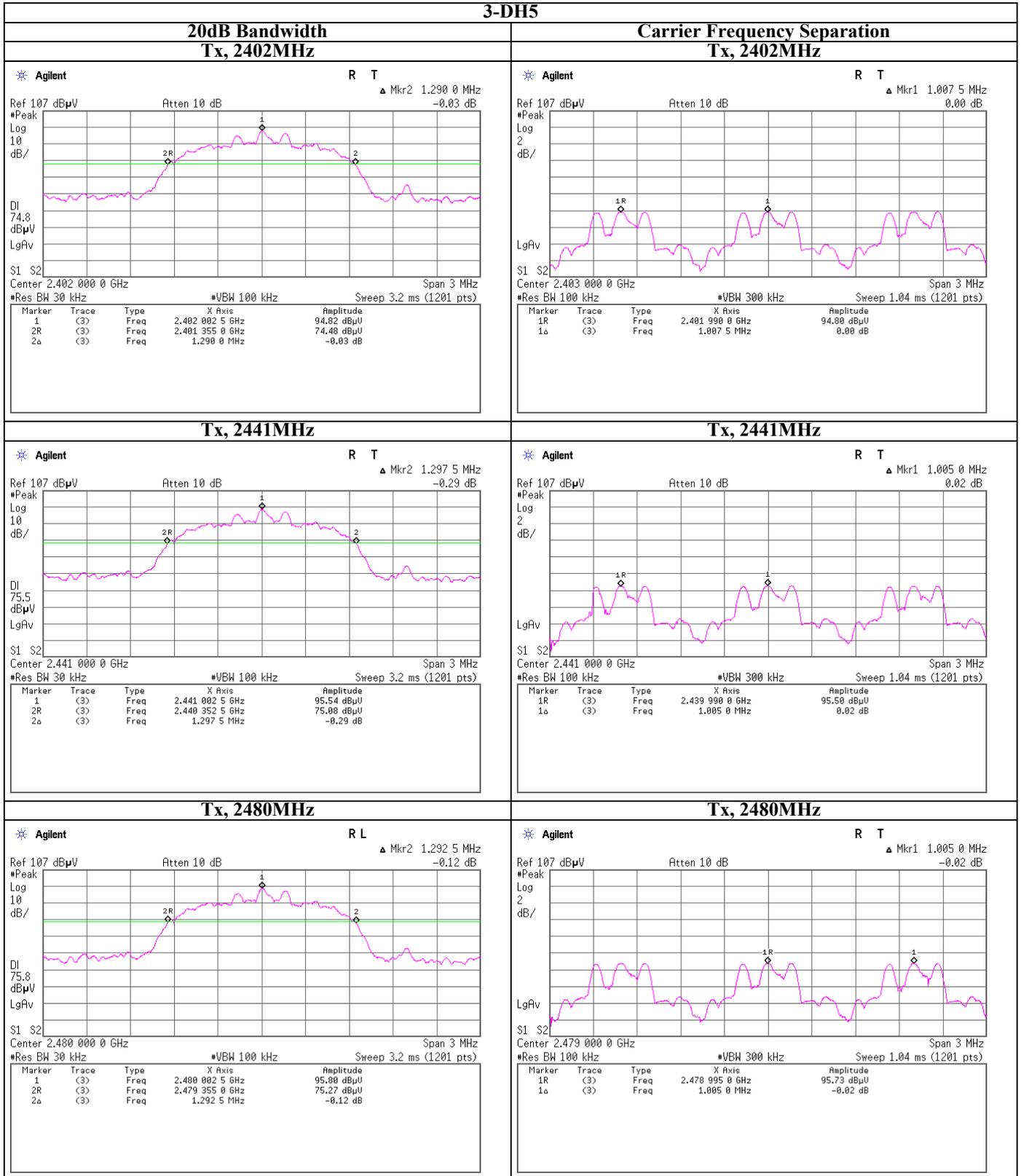
## 20dB Bandwidth and Carrier Frequency Separation



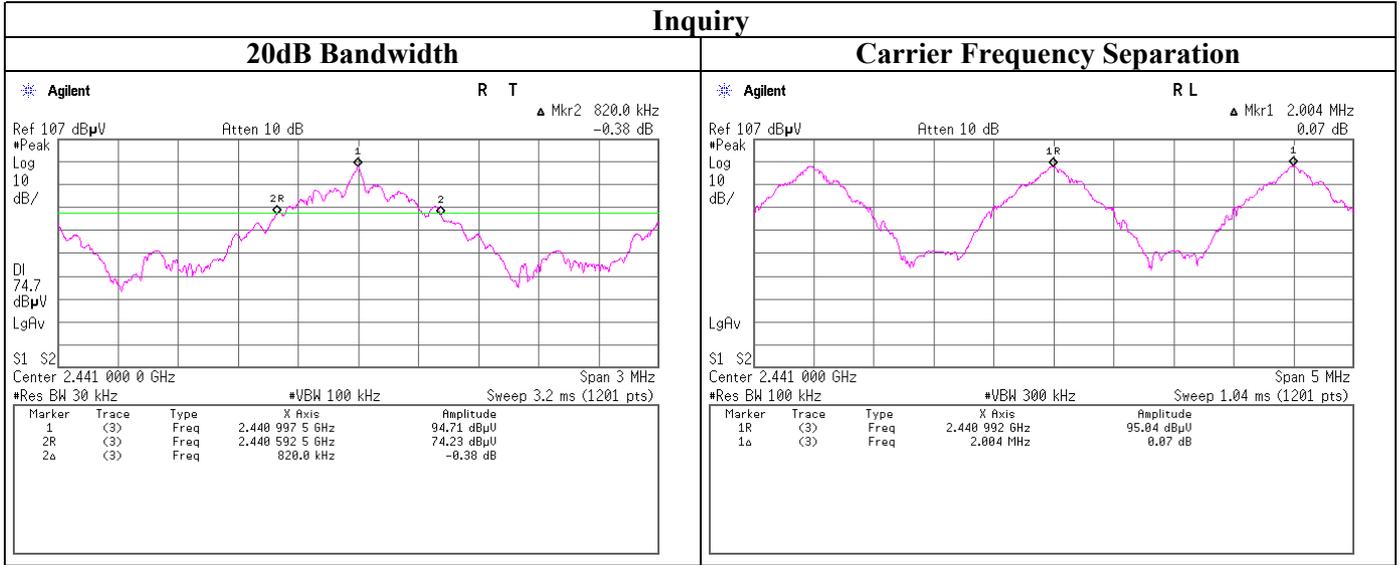
**UL Japan, Inc.**  
**Shonan EMC Lab.**

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## 20dB Bandwidth and Carrier Frequency Separation



## 20dB Bandwidth and Carrier Frequency Separation



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## Number of Hopping Frequency (Conducted)

Test place UL Japan, Inc. Shonan EMC La No.5 Shielded Room  
Date August 31,2010  
Temperature / Humidity 25deg.C , 50%  
Engineer Shinichi Takano  
Mode Tx,

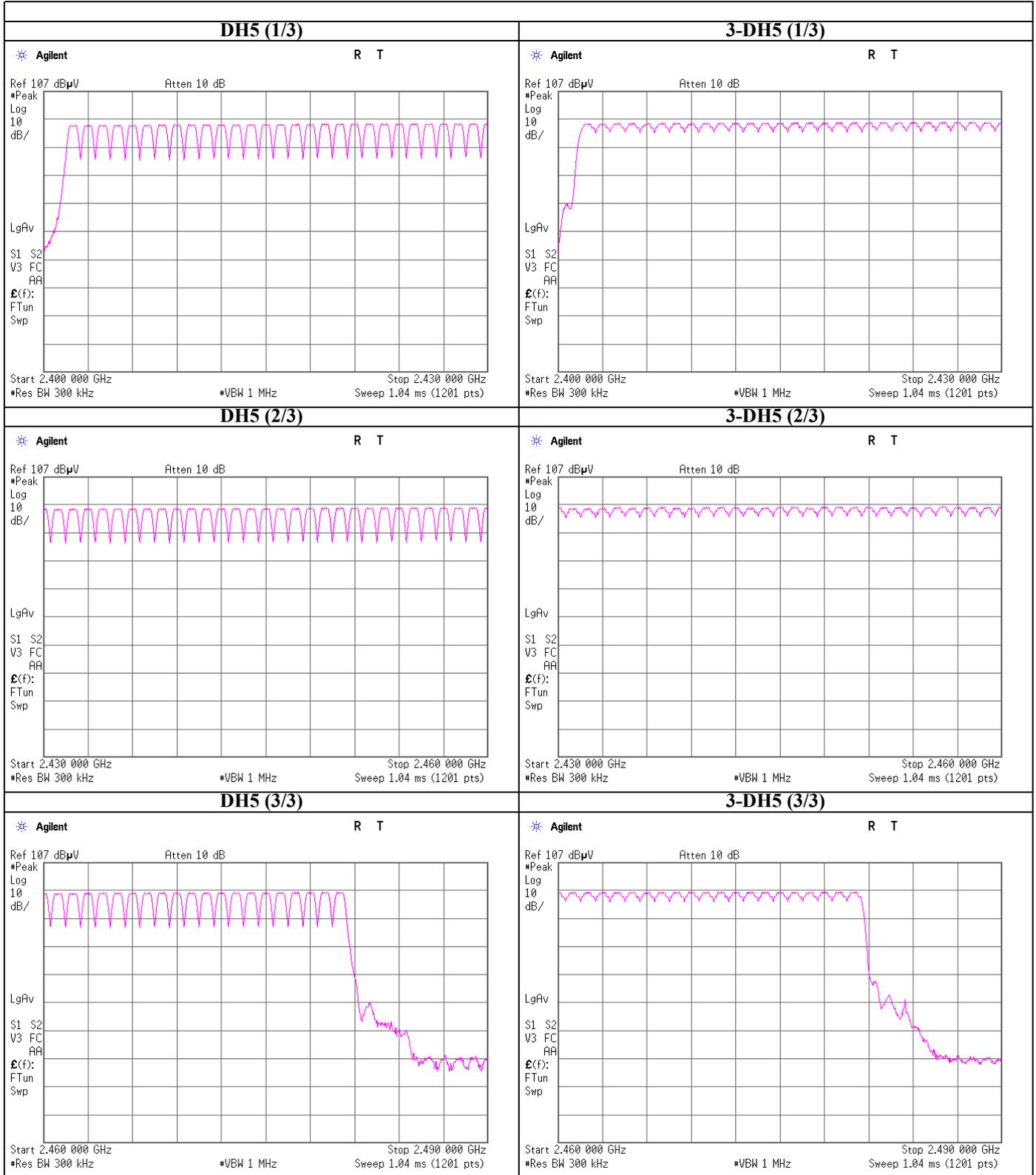
Mode	Number of Channel [times]	Limit [times]
DH5	79	>=15
3-DH5	79	>=15
Inquiry	32	>=15

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## Number of Hopping Frequency



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## Number of Hopping Frequency

<b>Inquiry (1/3)</b>	
<p style="text-align: center;">* Agilent <span style="float: right;">R T</span></p> <p>Ref 107 dBμV <span style="float: right;">Atten 10 dB</span></p> <p>#Peak Log 10 dB/ LgAv</p> <p>S1 S2 V3 FC AA E(f): FTun Swp</p> <p>Start 2.400 000 GHz <span style="float: right;">Stop 2.430 000 GHz</span>          #Res BW 300 kHz <span style="float: right;">#VBW 1 MHz</span> <span style="float: right;">Sweep 1.04 ms (1201 pts)</span></p>	
<b>Inquiry (2/3)</b>	
<p style="text-align: center;">* Agilent <span style="float: right;">R T</span></p> <p>Ref 107 dBμV <span style="float: right;">Atten 10 dB</span></p> <p>#Peak Log 10 dB/ LgAv</p> <p>S1 S2 V3 FC AA E(f): FTun Swp</p> <p>Start 2.430 000 GHz <span style="float: right;">Stop 2.460 000 GHz</span>          #Res BW 300 kHz <span style="float: right;">#VBW 1 MHz</span> <span style="float: right;">Sweep 1.04 ms (1201 pts)</span></p>	
<b>Inquiry (3/3)</b>	
<p style="text-align: center;">* Agilent <span style="float: right;">R T</span></p> <p>Ref 107 dBμV <span style="float: right;">Atten 10 dB</span></p> <p>#Peak Log 10 dB/ LgAv</p> <p>S1 S2 V3 FC AA E(f): FTun Swp</p> <p>Start 2.460 000 GHz <span style="float: right;">Stop 2.490 000 GHz</span>          #Res BW 300 kHz <span style="float: right;">#VBW 1 MHz</span> <span style="float: right;">Sweep 1.04 ms (1201 pts)</span></p>	

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## Dwell Time (Conducted)

Test place                   UL Japan, Inc. Shonan EMC Lab.       No.5 Shielded Room  
Date                            August 30,2010  
Temperature / Humidity     25deg.C.       , 53%  
Engineer                     Shinichi Takano  
Mode                         Tx,

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	Limit
			[msec]	[msec]
DH1	50.6 times / 5 sec. x 31.6 sec. = 320 times	0.400	128	400
DH3	25.2 times / 5 sec. x 31.6 sec. = 160 times	1.657	265	400
DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.907	314	400
3DH1	50.6 times / 5 sec. x 31.6 sec. = 320 times	0.414	132	400
3DH3	25.4 times / 5 sec. x 31.6 sec. = 161 times	1.667	268	400
3DH5	16.8 times / 5 sec. x 31.6 sec. = 107 times	2.920	312	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.101	129	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	51	51	51	50	50	50.6
DH3	25	25	26	25	25	25.2
DH5	17	17	17	17	17	17
3DH1	51	50	50	51	51	50.6
3DH3	25	26	25	26	25	25.4
3DH5	17	17	16	17	17	16.8

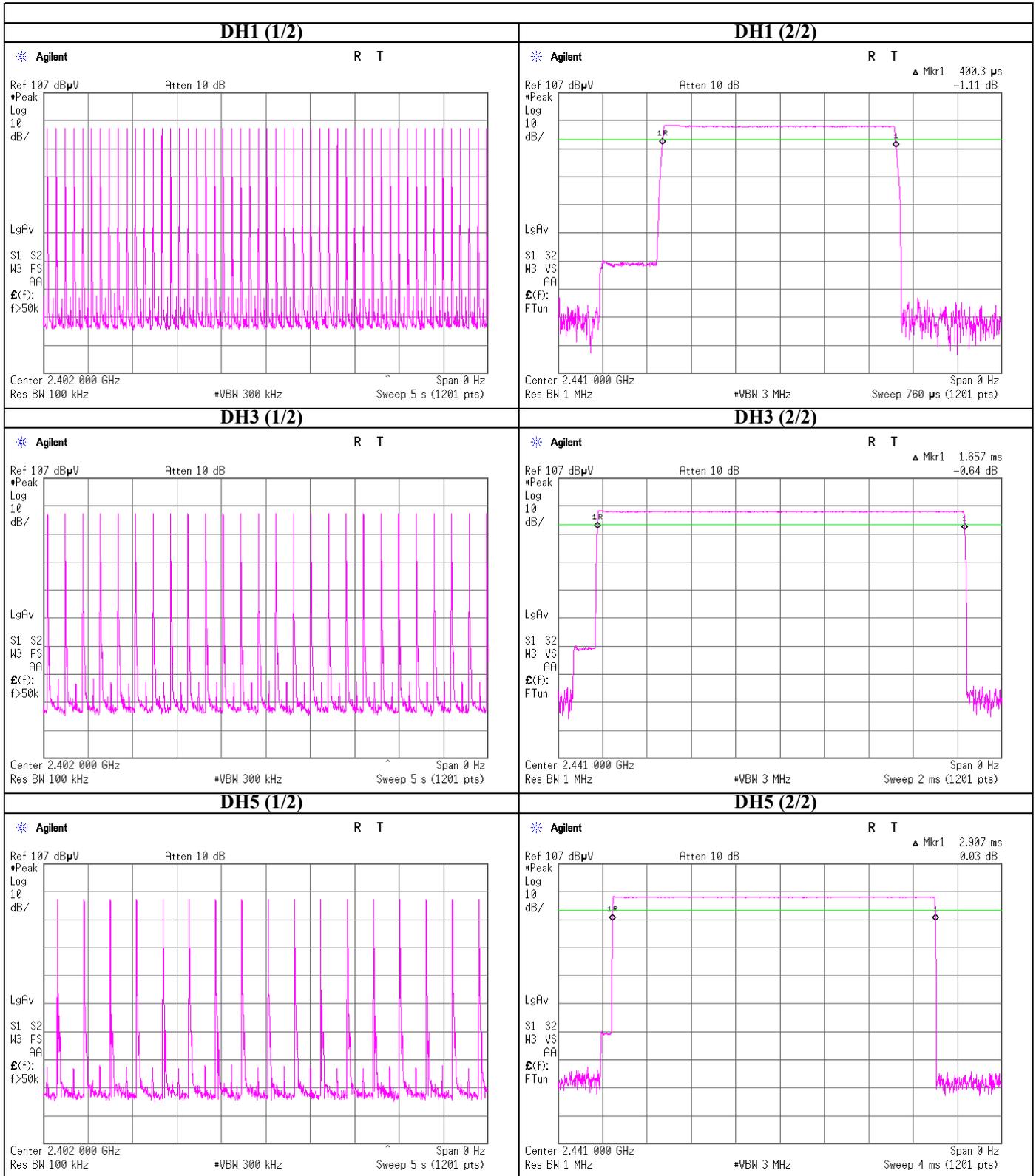
Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

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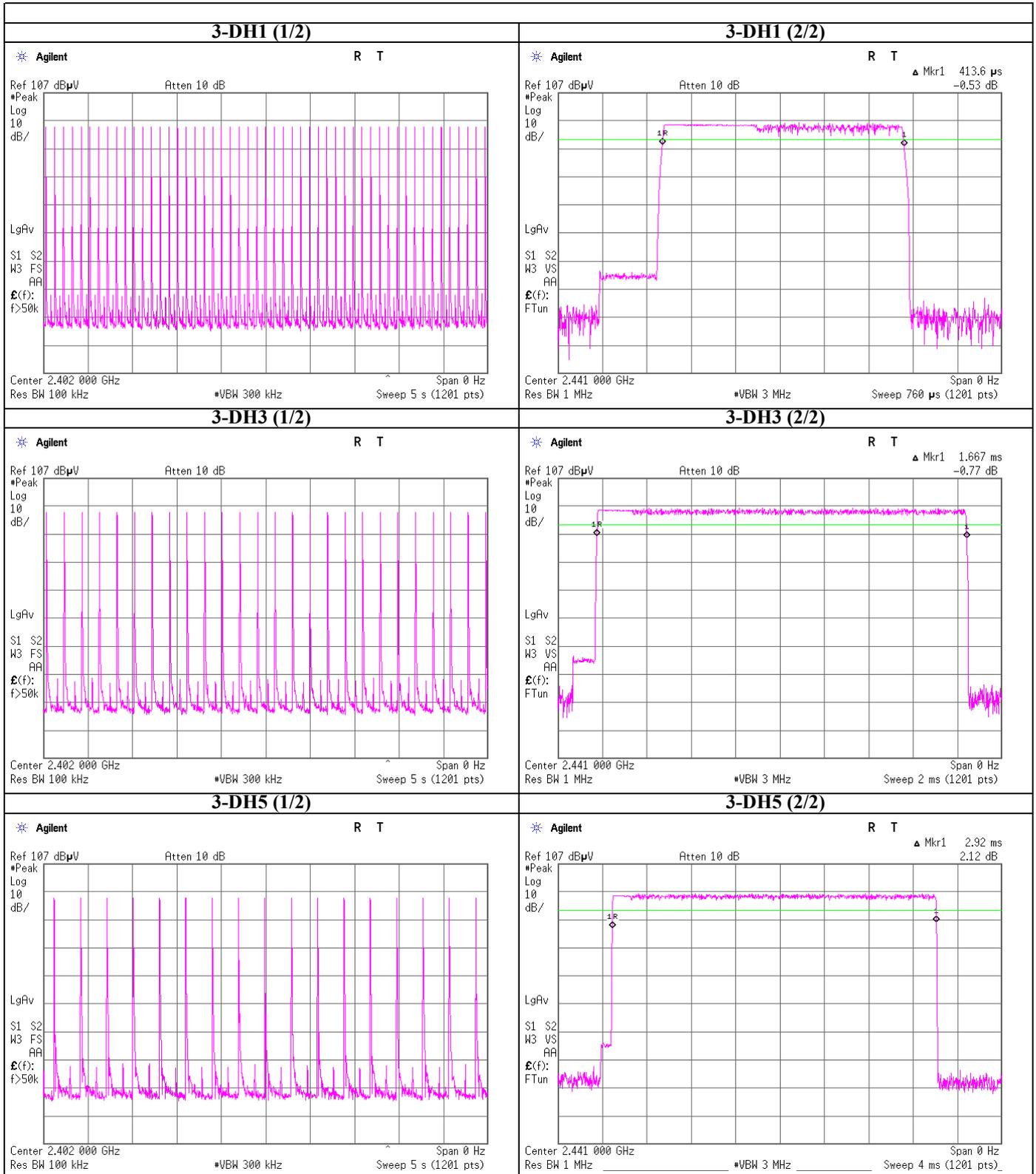
## Dwell time



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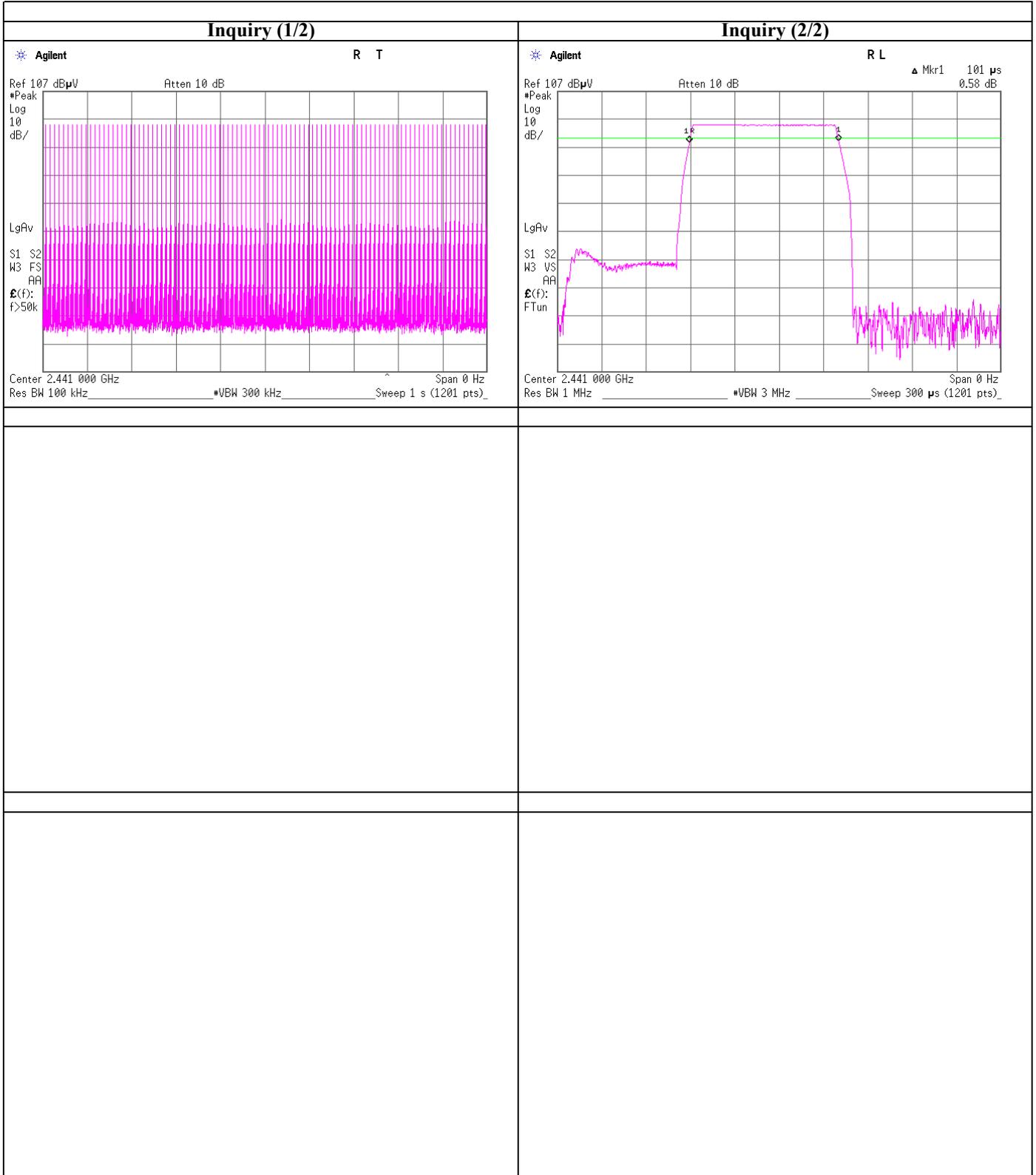
## Dwell time



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## Dwell time



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## Peak Output Power (Conducted)

Test place                   UL Japan, Inc. Shonan EMC Lab.      No.5 Shielded Room  
 Date                         August 31,2010  
 Temperature / Humidity   25deg.C.      , 50%  
 Engineer                  Shinichi Takano  
 Mode                        Tx,

### BDR (DH5)

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	-11.78	1.56	9.98	-0.24	0.95	20.97	125	21.21
Mid	2441.0	-10.99	1.52	9.98	0.51	1.12	20.97	125	20.46
High	2480.0	-10.48	1.53	9.98	1.03	1.27	20.97	125	19.94

### EDR (2-DH5)

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	-10.53	1.56	9.98	1.01	1.26	20.97	125	19.96
Mid	2441.0	-10.05	1.52	9.98	1.45	1.40	20.97	125	19.52
High	2480.0	-9.78	1.53	9.98	1.73	1.49	20.97	125	19.24

### EDR (3-DH5)

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	-10.45	1.56	9.98	1.09	1.29	20.97	125	19.88
Mid	2441.0	-9.93	1.52	9.98	1.57	1.44	20.97	125	19.40
High	2480.0	-9.63	1.53	9.98	1.88	1.54	20.97	125	19.09

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer) + Atten. Loss

\* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

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### Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
 Date                         September 3, 2010                                     September 4, 2010  
 Temperature / Humidity   26deg.C. , 46%                                     25deg.C. , 53%  
 Engineer                   Shinichi Takano                                     Tatsuya Arai  
 Mode                         Tx,                                     2402 MHz  
                                   Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.629	QP	33.9	10.5	7.2	32.1	19.5	43.5	24.0	301	215	
Hori.	118.563	QP	30.5	13.2	7.3	32.1	18.9	43.5	24.6	325	152	
Hori.	1602.005	PK	48.7	25.5	12.7	40.1	46.8	73.9	27.1	114	201	
Hori.	2390.000	PK	47.3	27.5	13.3	40.2	47.9	73.9	26.0	143	188	
Hori.	2400.000	PK	51.3	27.5	13.3	40.2	51.9	73.9	22.0	143	188	
Hori.	3203.000	PK	48.0	29.2	4.9	41.1	41.0	73.9	32.9	100	0	
Hori.	4007.000	PK	47.1	30.1	5.0	40.7	41.5	73.9	32.4	100	0	
Hori.	4804.000	PK	55.3	31.5	5.5	40.1	52.2	73.9	21.7	100	179	
Hori.	7206.000	PK	47.5	36.4	6.7	38.3	52.3	73.9	21.6	100	0	
Hori.	9608.000	PK	45.4	37.9	7.8	37.3	53.8	73.9	20.1	100	0	
Hori.	12010.000	PK	48.3	39.4	9.0	38.4	58.3	73.9	15.6	100	0	
Hori.	1602.005	AV	40.1	25.5	12.7	40.1	38.2	53.9	15.7	114	201	VBW: 10Hz
Hori.	3203.000	AV	36.1	29.2	4.9	41.1	29.1	53.9	24.8	100	0	VBW: 10Hz
Hori.	4007.000	AV	35.9	30.1	5.0	40.7	30.3	53.9	23.6	100	0	VBW: 10Hz
Vert.	101.629	QP	33.1	10.5	7.2	32.1	18.7	43.5	24.8	100	117	
Vert.	118.563	QP	32.9	13.2	7.3	32.1	21.3	43.5	22.2	100	132	
Vert.	1602.005	PK	51.4	25.5	12.7	40.1	49.5	73.9	24.4	100	352	
Vert.	2390.000	PK	47.9	27.5	13.3	40.2	48.5	73.9	25.4	111	338	
Vert.	2400.000	PK	57.0	27.5	13.3	40.2	57.6	73.9	16.3	111	338	
Vert.	3203.000	PK	49.4	29.2	4.9	41.1	42.4	73.9	31.5	100	0	
Vert.	4007.000	PK	48.9	30.1	5.0	40.7	43.3	73.9	30.6	100	0	
Vert.	4804.000	PK	57.3	31.5	5.5	40.1	54.2	73.9	19.7	100	175	
Vert.	7206.000	PK	48.6	36.4	6.7	38.3	53.4	73.9	20.5	100	0	
Vert.	9608.000	PK	47.3	37.9	7.8	37.3	55.7	73.9	18.2	100	0	
Vert.	12010.000	PK	47.3	39.4	9.0	38.4	57.3	73.9	16.6	100	0	
Vert.	1602.005	AV	45.0	25.5	12.7	40.1	43.1	53.9	10.8	100	352	VBW: 10Hz
Vert.	3203.000	AV	37.3	29.2	4.9	41.1	30.3	53.9	23.6	100	0	VBW: 10Hz
Vert.	4007.000	AV	37.1	30.1	5.0	40.7	31.5	53.9	22.4	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

**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.	2390.000	AV	35.5	27.5	13.3	40.2	-30.7	5.4	54.0	48.6	VBW: 300Hz
Hori.	2400.000	AV	40.7	27.5	13.3	40.2	-30.7	10.6	54.0	43.4	VBW: 300Hz
Hori.	4804.000	AV	50.9	31.5	5.5	40.1	-30.7	17.1	54.0	36.9	VBW: 300Hz
Hori.	7206.000	AV	36.2	36.4	6.7	38.3	-30.7	10.3	54.0	43.7	VBW: 300Hz
Hori.	9608.000	AV	34.3	37.9	7.8	37.3	-30.7	12.0	54.0	42.0	VBW: 300Hz
Hori.	12010.000	AV	34.9	39.4	9.0	38.4	-30.7	14.2	54.0	39.8	VBW: 300Hz
Vert.	2390.000	AV	34.9	27.5	13.3	40.2	-30.7	4.8	54.0	49.2	VBW: 300Hz
Vert.	2400.000	AV	47.1	27.5	13.3	40.2	-30.7	17.0	54.0	37.0	VBW: 300Hz
Vert.	4804.000	AV	53.6	31.5	5.5	40.1	-30.7	19.8	54.0	34.2	VBW: 300Hz
Vert.	7206.000	AV	37.4	36.4	6.7	38.3	-30.7	11.5	54.0	42.5	VBW: 300Hz
Vert.	9608.000	AV	35.4	37.9	7.8	37.3	-30.7	13.1	54.0	40.9	VBW: 300Hz
Vert.	12010.000	AV	36.0	39.4	9.0	38.4	-30.7	15.3	54.0	38.7	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 33)

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

\*No noise was detected above the 5th order harmonics.

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## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
Date                           September 3, 2010                                   September 4, 2010  
Temperature / Humidity    26deg.C. , 46%                                 25deg.C. , 53%  
Engineer                    Shinichi Takano                                 Tatsuya Arai  
Mode                         Tx,   2441 MHz  
                                  Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.627	QP	33.8	10.5	7.2	32.1	19.4	43.5	24.1	306	217	
Hori.	118.563	QP	30.5	13.2	7.3	32.1	18.9	43.5	24.6	301	149	
Hori.	1628.007	PK	51.3	25.6	12.7	40.1	49.5	73.9	24.4	112	222	
Hori.	3257.000	PK	48.1	29.3	4.8	41.1	41.1	73.9	32.8	100	0	
Hori.	4070.000	PK	47.7	30.1	5.0	40.7	42.1	73.9	31.8	100	0	
Hori.	4882.000	PK	55.3	31.7	5.6	40.0	52.6	73.9	21.3	114	174	
Hori.	7323.000	PK	47.3	36.7	6.9	38.5	52.4	73.9	21.5	100	0	
Hori.	9764.000	PK	45.0	38.2	7.8	37.4	53.6	73.9	20.3	100	0	
Hori.	12205.000	PK	46.1	39.2	9.1	38.1	56.3	73.9	17.6	100	0	
Hori.	1628.007	AV	44.8	25.6	12.7	40.1	43.0	53.9	10.9	112	222	VBW: 10Hz
Hori.	3257.000	AV	36.1	29.3	4.8	41.1	29.1	53.9	24.8	100	0	VBW: 10Hz
Hori.	4070.000	AV	36.1	30.1	5.0	40.7	30.5	53.9	23.4	100	0	VBW: 10Hz
Vert.	101.627	QP	32.9	10.5	7.2	32.1	18.5	43.5	25.0	100	107	
Vert.	118.563	QP	32.8	13.2	7.3	32.1	21.2	43.5	22.3	100	118	
Vert.	1628.007	PK	50.8	25.6	12.7	40.1	49.0	73.9	24.9	100	351	
Vert.	3257.000	PK	46.5	29.3	4.8	41.1	39.5	73.9	34.4	100	0	
Vert.	4070.000	PK	47.9	30.1	5.0	40.7	42.3	73.9	31.6	100	0	
Vert.	4882.000	PK	57.6	31.7	5.6	40.0	54.9	73.9	19.0	102	8	
Vert.	7323.000	PK	47.3	36.7	6.9	38.5	52.4	73.9	21.5	100	0	
Vert.	9764.000	PK	46.8	38.2	7.8	37.4	55.4	73.9	18.5	100	0	
Vert.	12205.000	PK	46.4	39.2	9.1	38.1	56.6	73.9	17.3	100	0	
Vert.	1628.007	AV	44.5	25.6	12.7	40.1	42.7	53.9	11.2	100	351	VBW: 10Hz
Vert.	3257.000	AV	34.5	29.3	4.8	41.1	27.5	53.9	26.4	100	0	VBW: 10Hz
Vert.	4070.000	AV	36.1	30.1	5.0	40.7	30.5	53.9	23.4	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

### 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	50.9	31.7	5.6	40.0	-30.7	17.5	54.0	36.5	VBW: 300Hz
Hori.	7323.000	AV	35.6	36.7	6.9	38.5	-30.7	10.0	54.0	44.0	VBW: 300Hz
Hori.	9764.000	AV	34.2	38.2	7.8	37.4	-30.7	12.1	54.0	41.9	VBW: 300Hz
Hori.	12205.000	AV	34.8	39.2	9.1	38.1	-30.7	14.3	54.0	39.7	VBW: 300Hz
Vert.	4882.000	AV	53.8	31.7	5.6	40.0	-30.7	20.4	54.0	33.6	VBW: 300Hz
Vert.	7323.000	AV	35.7	36.7	6.9	38.5	-30.7	10.1	54.0	43.9	VBW: 300Hz
Vert.	9764.000	AV	34.2	38.2	7.8	37.4	-30.7	12.1	54.0	41.9	VBW: 300Hz
Vert.	12205.000	AV	34.7	39.2	9.1	38.1	-30.7	14.2	54.0	39.8	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)  
- Gain(Amplifier) + Dwell time factor (Refer to page 33)

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

\*No noise was detected above the 5th order harmonics.

**UL Japan, Inc.**

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### Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
 Date                         September 3, 2010                                     September 4, 2010  
 Temperature / Humidity   26deg.C. , 46%                                     25deg.C. , 53%  
 Engineer                    Shinichi Takano                                     Tatsuya Arai  
 Mode                         Tx,   2480 MHz  
                                   Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.626	QP	33.9	10.5	7.2	32.1	19.5	43.5	24.0	293	218	
Hori.	118.568	QP	30.5	13.2	7.3	32.1	18.9	43.5	24.6	298	141	
Hori.	1654.037	PK	50.7	25.7	12.8	40.2	49.0	73.9	24.9	113	208	
Hori.	2483.500	PK	51.2	27.6	13.4	40.1	52.1	73.9	21.8	136	190	
Hori.	3307.000	PK	47.3	29.3	4.9	41.1	40.4	73.9	33.5	100	0	
Hori.	4137.000	PK	48.1	30.2	5.1	40.6	42.8	73.9	31.1	100	0	
Hori.	4960.000	PK	54.7	31.9	5.6	40.0	52.2	73.9	21.7	100	6	
Hori.	7440.000	PK	47.0	36.9	7.1	38.7	52.3	73.9	21.6	100	0	
Hori.	9920.000	PK	45.5	38.4	8.0	37.5	54.4	73.9	19.5	100	0	
Hori.	12400.000	PK	46.2	39.1	9.4	37.9	56.8	73.9	17.1	100	0	
Hori.	1654.037	AV	44.8	25.7	12.8	40.2	43.1	53.9	10.8	113	208	VBW: 10Hz
Hori.	3307.000	AV	36.1	29.3	4.9	41.1	29.2	53.9	24.7	100	0	VBW: 10Hz
Hori.	4137.000	AV	36.1	30.2	5.1	40.6	30.8	53.9	23.1	100	0	VBW: 10Hz
Vert.	101.626	QP	33.2	10.5	7.2	32.1	18.8	43.5	24.7	100	107	
Vert.	118.568	QP	32.8	13.2	7.3	32.1	21.2	43.5	22.3	100	125	
Vert.	1654.037	PK	49.4	25.7	12.8	40.2	47.7	73.9	26.2	100	28	
Vert.	2483.500	PK	55.9	27.6	13.4	40.1	56.8	73.9	17.1	103	341	
Vert.	3307.000	PK	48.0	29.3	4.9	41.1	41.1	73.9	32.8	100	0	
Vert.	4137.000	PK	47.3	30.2	5.1	40.6	42.0	73.9	31.9	100	0	
Vert.	4960.000	PK	56.9	31.9	5.6	40.0	54.4	73.9	19.5	100	8	
Vert.	7440.000	PK	47.3	36.9	7.1	38.7	52.6	73.9	21.3	100	0	
Vert.	9920.000	PK	44.9	38.4	8.0	37.5	53.8	73.9	20.1	100	0	
Vert.	12400.000	PK	46.1	39.1	9.4	37.9	56.7	73.9	17.2	100	0	
Vert.	1654.037	AV	40.6	25.7	12.8	40.2	38.9	53.9	15.0	100	28	VBW: 10Hz
Vert.	3307.000	AV	36.0	29.3	4.9	41.1	29.1	53.9	24.8	100	0	VBW: 10Hz
Vert.	4137.000	AV	36.1	30.2	5.1	40.6	30.8	53.9	23.1	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

**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.	2483.500	AV	40.5	27.6	13.4	40.1	-30.7	10.7	54.0	43.3	VBW: 300Hz
Hori.	4960.000	AV	50.2	31.9	5.6	40.0	-30.7	17.0	54.0	37.0	VBW: 300Hz
Hori.	7440.000	AV	36.1	36.9	7.1	38.7	-30.7	10.7	54.0	43.3	VBW: 300Hz
Hori.	9920.000	AV	34.4	38.4	8.0	37.5	-30.7	12.6	54.0	41.4	VBW: 300Hz
Hori.	12400.000	AV	35.0	39.1	9.4	37.9	-30.7	14.9	54.0	39.1	VBW: 300Hz
Vert.	2483.500	AV	46.4	27.6	13.4	40.1	-30.7	16.6	54.0	37.4	VBW: 300Hz
Vert.	4960.000	AV	53.7	31.9	5.6	40.0	-30.7	20.5	54.0	33.5	VBW: 300Hz
Vert.	7440.000	AV	36.0	36.9	7.1	38.7	-30.7	10.6	54.0	43.4	VBW: 300Hz
Vert.	9920.000	AV	34.2	38.4	8.0	37.5	-30.7	12.4	54.0	41.6	VBW: 300Hz
Vert.	12400.000	AV	33.9	39.1	9.4	37.9	-30.7	13.8	54.0	40.2	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 33)

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

\*No noise was detected above the 5th order harmonics.

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
Date                           September 3, 2010                                   September 4, 2010  
Temperature / Humidity    26deg.C. , 46%                                 25deg.C. , 53%  
Engineer                    Shinichi Takano                                 Tatsuya Arai  
Mode                         Tx,   2402 MHz  
                                  Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.628	QP	33.8	10.5	7.2	32.1	19.4	43.5	24.1	314	214	
Hori.	118.563	QP	30.4	13.2	7.3	32.1	18.8	43.5	24.7	308	141	
Hori.	1602.045	PK	50.0	25.5	12.7	40.1	48.1	73.9	25.8	116	208	
Hori.	2390.000	PK	47.4	27.5	13.3	40.2	48.0	73.9	25.9	131	65	
Hori.	2400.000	PK	54.7	27.5	13.3	40.2	55.3	73.9	18.6	131	65	
Hori.	3203.000	PK	47.9	29.2	4.9	41.1	40.9	73.9	33.0	100	0	
Hori.	4804.000	PK	50.5	31.5	5.5	40.1	47.4	73.9	26.5	100	178	
Hori.	7206.000	PK	47.3	36.4	6.7	38.3	52.1	73.9	21.8	100	0	
Hori.	9608.000	PK	45.5	37.9	7.8	37.3	53.9	73.9	20.0	100	0	
Hori.	12010.000	PK	46.5	39.4	9.0	38.4	56.5	73.9	17.4	100	0	
Hori.	1602.045	AV	42.8	25.5	12.7	40.1	40.9	53.9	13.0	116	208	VBW: 10Hz
Hori.	3203.000	AV	36.0	29.2	4.9	41.1	29.0	53.9	24.9	100	0	VBW: 10Hz
Vert.	101.628	QP	32.7	10.5	7.2	32.1	18.3	43.5	25.2	100	110	
Vert.	118.563	QP	32.9	13.2	7.3	32.1	21.3	43.5	22.2	100	136	
Vert.	1602.045	PK	51.1	25.5	12.7	40.1	49.2	73.9	24.7	102	350	
Vert.	2390.000	PK	47.3	27.5	13.3	40.2	47.9	73.9	26.0	109	339	
Vert.	2400.000	PK	63.8	27.5	13.3	40.2	64.4	73.9	9.5	109	339	
Vert.	3203.000	PK	47.8	29.2	4.9	41.1	40.8	73.9	33.1	100	0	
Vert.	4804.000	PK	51.7	31.5	5.5	40.1	48.6	73.9	25.3	102	213	
Vert.	7206.000	PK	47.4	36.4	6.7	38.3	52.2	73.9	21.7	100	0	
Vert.	9608.000	PK	45.3	37.9	7.8	37.3	53.7	73.9	20.2	100	0	
Vert.	12010.000	PK	46.0	39.4	9.0	38.4	56.0	73.9	17.9	100	0	
Vert.	1602.045	AV	46.4	25.5	12.7	40.1	44.5	53.9	9.4	102	350	VBW: 10Hz
Vert.	3203.000	AV	36.4	29.2	4.9	41.1	29.4	53.9	24.5	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

### 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.	2390.000	AV	35.5	27.5	13.3	40.2	-30.7	5.4	54.0	48.6	VBW: 300Hz
Hori.	2400.000	AV	41.2	27.5	13.3	40.2	-30.7	11.1	54.0	42.9	VBW: 300Hz
Hori.	4804.000	AV	41.2	31.5	5.5	40.1	-30.7	7.4	54.0	46.6	VBW: 300Hz
Hori.	7206.000	AV	36.1	36.4	6.7	38.3	-30.7	10.2	54.0	43.8	VBW: 300Hz
Hori.	9608.000	AV	34.4	37.9	7.8	37.3	-30.7	12.1	54.0	41.9	VBW: 300Hz
Hori.	12010.000	AV	34.8	39.4	9.0	38.4	-30.7	14.1	54.0	39.9	VBW: 300Hz
Vert.	2390.000	AV	35.7	27.5	13.3	40.2	-30.7	5.6	54.0	48.4	VBW: 300Hz
Vert.	2400.000	AV	50.5	27.5	13.3	40.2	-30.7	20.4	54.0	33.6	VBW: 300Hz
Vert.	4804.000	AV	42.8	31.5	5.5	40.1	-30.7	9.0	54.0	45.0	VBW: 300Hz
Vert.	7206.000	AV	36.2	36.4	6.7	38.3	-30.7	10.3	54.0	43.7	VBW: 300Hz
Vert.	9608.000	AV	34.4	37.9	7.8	37.3	-30.7	12.1	54.0	41.9	VBW: 300Hz
Vert.	12010.000	AV	34.0	39.4	9.0	38.4	-30.7	13.3	54.0	40.7	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)

- Gain(Amplifier) + Dwell time factor (Refer to page 34)

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

\*No noise was detected above the 5th order harmonics.

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
Date                         September 3, 2010                         September 4, 2010  
Temperature / Humidity     26deg.C. , 46%                         25deg.C. , 53%  
Engineer                    Shinichi Takano                         Tatsuya Arai  
Mode                         Tx,                         2441 MHz  
                                  Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.626	QP	33.9	10.5	7.2	32.1	19.5	43.5	24.0	305	222	
Hori.	118.561	QP	30.4	13.2	7.3	32.1	18.8	43.5	24.7	303	138	
Hori.	1627.995	PK	51.1	25.6	12.7	40.1	49.3	73.9	24.6	112	208	
Hori.	3257.000	PK	47.6	29.3	4.8	41.1	40.6	73.9	33.3	100	0	
Hori.	4882.000	PK	50.1	31.7	5.6	40.0	47.4	73.9	26.5	100	92	
Hori.	7323.000	PK	46.5	36.7	6.9	38.5	51.6	73.9	22.3	100	0	
Hori.	9764.000	PK	45.6	38.2	7.8	37.4	54.2	73.9	19.7	100	0	
Hori.	12205.000	PK	46.6	39.2	9.1	38.1	56.8	73.9	17.1	100	0	
Hori.	1627.995	AV	44.6	25.6	12.7	40.1	42.8	53.9	11.1	112	208	VBW: 10Hz
Hori.	3257.000	AV	36.1	29.3	4.8	41.1	29.1	53.9	24.8	100	0	VBW: 10Hz
Vert.	101.626	QP	32.9	10.5	7.2	32.1	18.5	43.5	25.0	100	115	
Vert.	118.561	QP	32.9	13.2	7.3	32.1	21.3	43.5	22.2	100	124	
Vert.	1627.995	PK	50.8	25.6	12.7	40.1	49.0	73.9	24.9	100	352	
Vert.	3257.000	PK	48.1	29.3	4.8	41.1	41.1	73.9	32.8	100	0	
Vert.	4882.000	PK	51.8	31.7	5.6	40.0	49.1	73.9	24.8	102	8	
Vert.	7323.000	PK	47.3	36.7	6.9	38.5	52.4	73.9	21.5	100	0	
Vert.	9764.000	PK	45.6	38.2	7.8	37.4	54.2	73.9	19.7	100	0	
Vert.	12205.000	PK	45.2	39.2	9.1	38.1	55.4	73.9	18.5	100	0	
Vert.	1627.995	AV	44.7	25.6	12.7	40.1	42.9	53.9	11.0	100	352	VBW: 10Hz
Vert.	3257.000	AV	36.1	29.3	4.8	41.1	29.1	53.9	24.8	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

### 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	40.5	31.7	5.6	40.0	-30.7	7.1	54.0	46.9	VBW: 300Hz
Hori.	7323.000	AV	35.5	36.7	6.9	38.5	-30.7	9.9	54.0	44.1	VBW: 300Hz
Hori.	9764.000	AV	34.3	38.2	7.8	37.4	-30.7	12.2	54.0	41.8	VBW: 300Hz
Hori.	12205.000	AV	34.7	39.2	9.1	38.1	-30.7	14.2	54.0	39.8	VBW: 300Hz
Vert.	4882.000	AV	43.5	31.7	5.6	40.0	-30.7	10.1	54.0	43.9	VBW: 300Hz
Vert.	7323.000	AV	35.6	36.7	6.9	38.5	-30.7	10.0	54.0	44.0	VBW: 300Hz
Vert.	9764.000	AV	34.3	38.2	7.8	37.4	-30.7	12.2	54.0	41.8	VBW: 300Hz
Vert.	12205.000	AV	34.9	39.2	9.1	38.1	-30.7	14.4	54.0	39.6	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)  
- Gain(Amprifier) + Dwell time factor (Refer to page 34)

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

\*No noise was detected above the 5th order harmonics.

## Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.3 Semi Anechoic Chamber  
Date                           September 3, 2010   September 4, 2010  
Temperature / Humidity    26deg.C. , 46%   25deg.C. , 53%  
Engineer                    Shinichi Takano   Tatsuya Arai  
Mode                         Tx,   2480 MHz  
                                  Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	101.623	QP	33.9	10.5	7.2	32.1	19.5	43.5	24.0	308	214	
Hori.	118.568	QP	30.3	13.2	7.3	32.1	18.7	43.5	24.8	310	137	
Hori.	1654.005	PK	52.2	25.7	12.8	40.2	50.5	73.9	23.4	110	208	
Hori.	2483.500	PK	54.6	27.6	13.4	40.1	55.5	73.9	18.4	138	174	
Hori.	3307.000	PK	48.3	29.3	4.9	41.1	41.4	73.9	32.5	100	0	
Hori.	4960.000	PK	50.4	31.9	5.6	40.0	47.9	73.9	26.0	100	7	
Hori.	7440.000	PK	47.2	36.9	7.1	38.7	52.5	73.9	21.4	100	0	
Hori.	9920.000	PK	45.9	38.4	8.0	37.5	54.8	73.9	19.1	100	0	
Hori.	12400.000	PK	45.5	39.1	9.4	37.9	56.1	73.9	17.8	100	0	
Hori.	1654.005	AV	46.2	25.7	12.8	40.2	44.5	53.9	9.4	110	208	VBW: 10Hz
Hori.	3307.000	AV	36.4	29.3	4.9	41.1	29.5	53.9	24.4	100	0	VBW: 10Hz
Vert.	101.623	QP	33.1	10.5	7.2	32.1	18.7	43.5	24.8	100	116	
Vert.	118.568	QP	32.7	13.2	7.3	32.1	21.1	43.5	22.4	100	122	
Vert.	1654.005	PK	50.3	25.7	12.8	40.2	48.6	73.9	25.3	105	329	
Vert.	2483.500	PK	59.5	27.6	13.4	40.1	60.4	73.9	13.5	107	343	
Vert.	3307.000	PK	47.7	29.3	4.9	41.1	40.8	73.9	33.1	100	0	
Vert.	4960.000	PK	51.5	31.9	5.6	40.0	49.0	73.9	24.9	100	8	
Vert.	7440.000	PK	47.0	36.9	7.1	38.7	52.3	73.9	21.6	100	0	
Vert.	9920.000	PK	45.5	38.4	8.0	37.5	54.4	73.9	19.5	100	0	
Vert.	12400.000	PK	45.2	39.1	9.4	37.9	55.8	73.9	18.1	100	0	
Vert.	1654.005	AV	42.3	25.7	12.8	40.2	40.6	53.9	13.3	105	329	VBW: 10Hz
Vert.	3307.000	AV	36.2	29.3	4.9	41.1	29.3	53.9	24.6	100	0	VBW: 10Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

### 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.	2483.500	AV	42.8	27.6	13.4	40.1	-30.7	13.0	54.0	41.0	VBW: 300Hz
Hori.	4960.000	AV	40.1	31.9	5.6	40.0	-30.7	6.9	54.0	47.1	VBW: 300Hz
Hori.	7440.000	AV	35.9	36.9	7.1	38.7	-30.7	10.5	54.0	43.5	VBW: 300Hz
Hori.	9920.000	AV	34.7	38.4	8.0	37.5	-30.7	12.9	54.0	41.1	VBW: 300Hz
Hori.	12400.000	AV	34.2	39.1	9.4	37.9	-30.7	14.1	54.0	39.9	VBW: 300Hz
Vert.	2483.500	AV	48.8	27.6	13.4	40.1	-30.7	19.0	54.0	35.0	VBW: 300Hz
Vert.	4960.000	AV	42.6	31.9	5.6	40.0	-30.7	9.4	54.0	44.6	VBW: 300Hz
Vert.	7440.000	AV	36.0	36.9	7.1	38.7	-30.7	10.6	54.0	43.4	VBW: 300Hz
Vert.	9920.000	AV	34.4	38.4	8.0	37.5	-30.7	12.6	54.0	41.4	VBW: 300Hz
Vert.	12400.000	AV	34.3	39.1	9.4	37.9	-30.7	14.2	54.0	39.8	VBW: 300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter)

- Gain(Amplifier) + Dwell time factor (Refer to page 34)

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

\*No noise was detected above the 5th order harmonics.

**UL Japan, Inc.**

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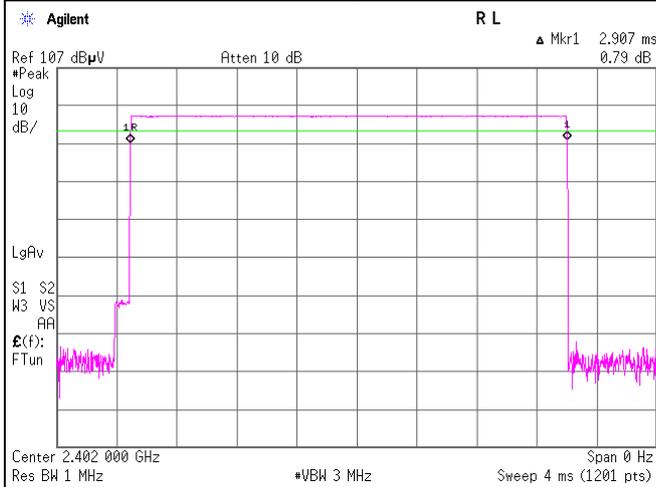
## Spurious emission (Radiated)

DH5,  
 VBW (AV) Calculation

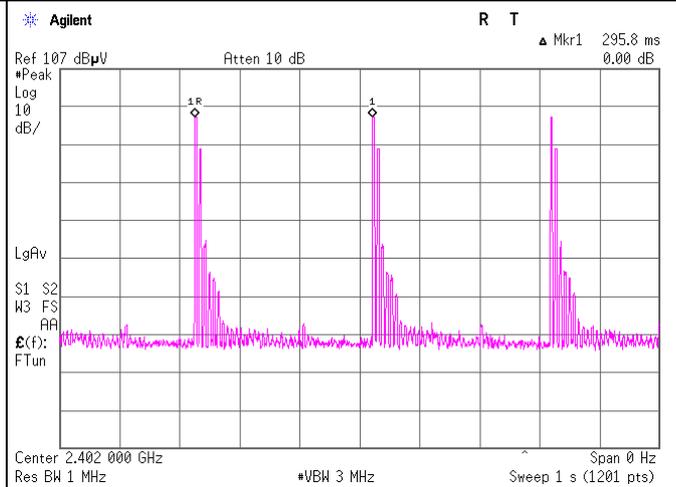
**VBW:  $1/x = 266\text{Hz} < 270\text{Hz}$**   
**x: (Tx on+Tx off) = 3.75ms**



**Worst 100ms,**  
**Dwell time factor =  $20\log(2.907/100) = -30.73\text{dB}$**



**1 cycle time:**  
**295.8ms**



ON time of some channel during 100ms: Once  
 This is the worst case in actual use of EUT.

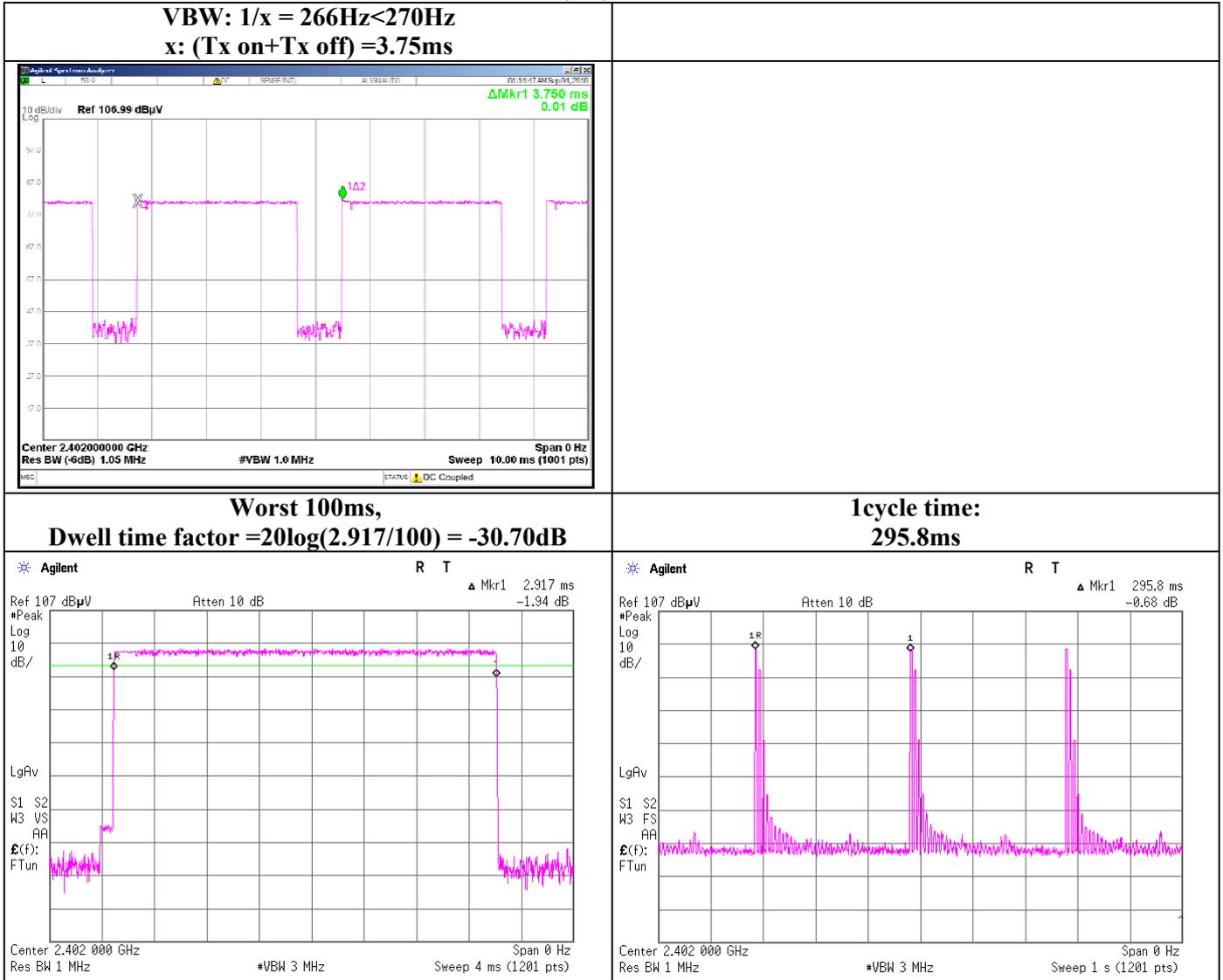
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## Spurious emission (Radiated)

3-DH5,

VBW (AV) Calculation



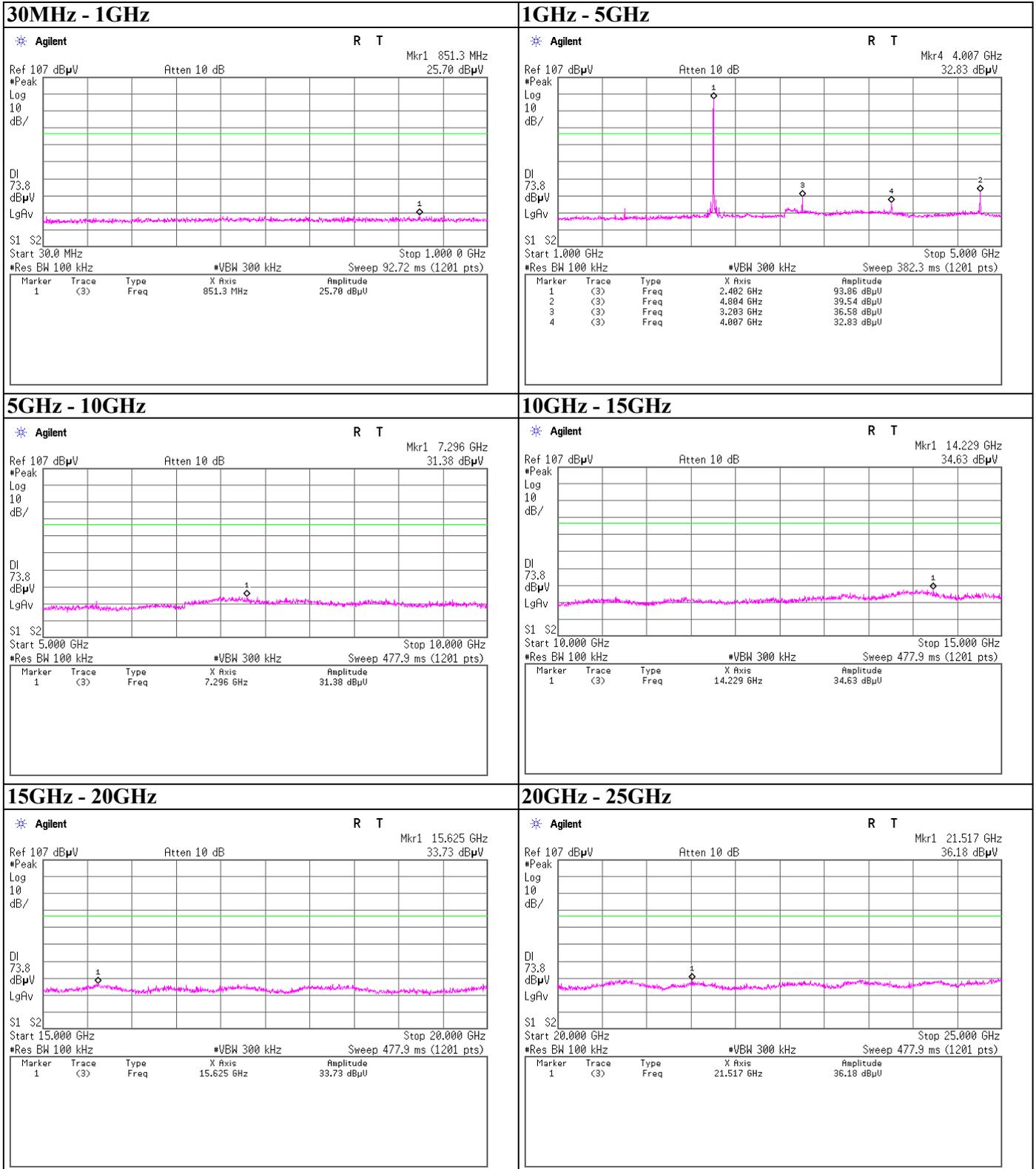
ON time of some channel during 100ms: Once  
 This is the worst case in actual use of EUT.

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## Spurious emission (Conducted)

DH5,  
Tx, 2402MHz

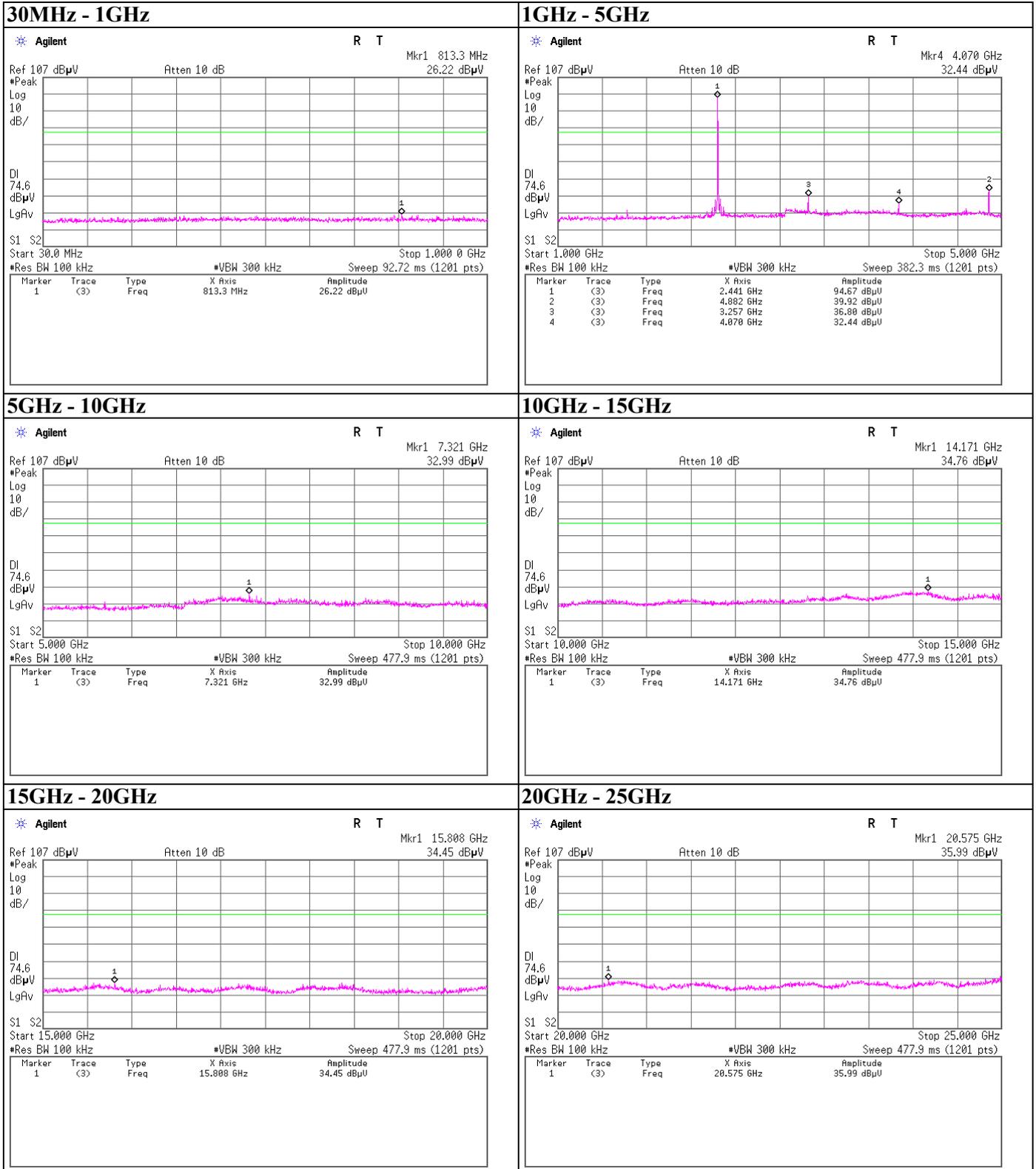


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### Spurious emission (Conducted)

DH5,  
Tx, 2441MHz

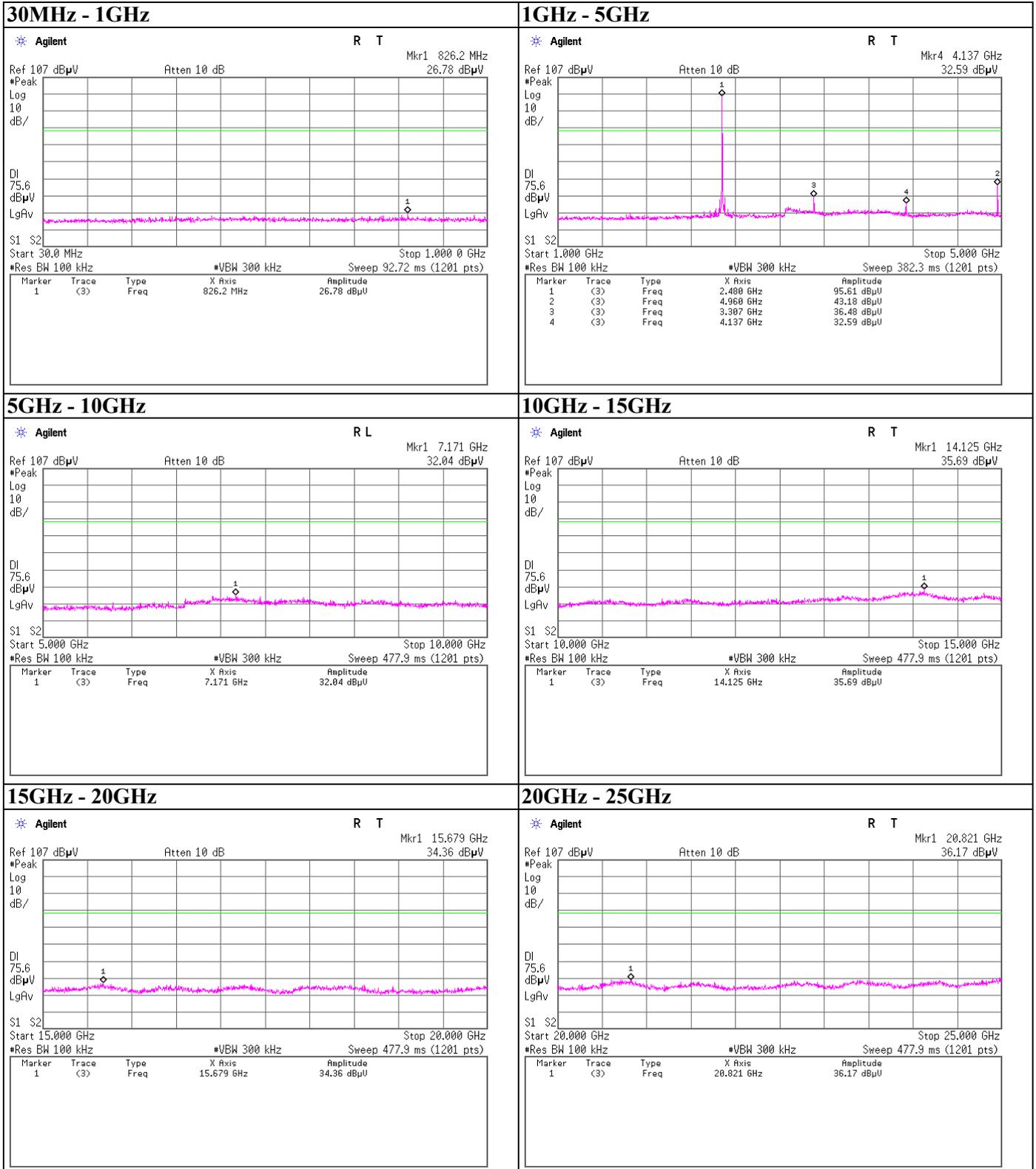


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### Spurious emission (Conducted)

DH5,  
Tx, 2480MHz

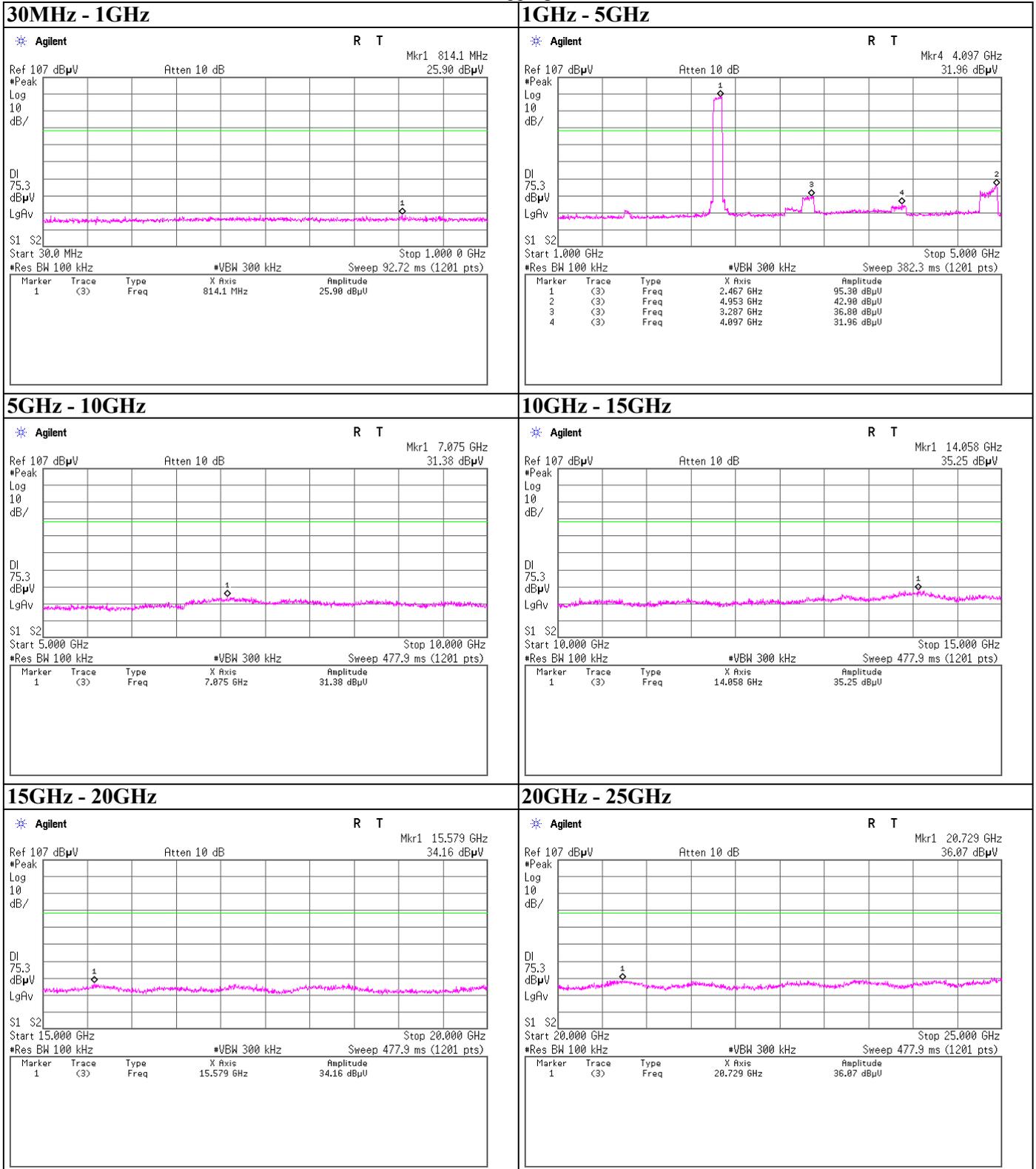


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## Spurious emission (Conducted)

DH5,  
Hopping



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### Spurious emission (Conducted)

3-DH5,

Tx, 2402MHz



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## Spurious emission (Conducted)

3-DH5,  
 Tx, 2441MHz



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## Spurious emission (Conducted)

3-DH5,  
Tx, 2480MHz



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### Spurious emission (Conducted)

3-DH5,  
Hopping



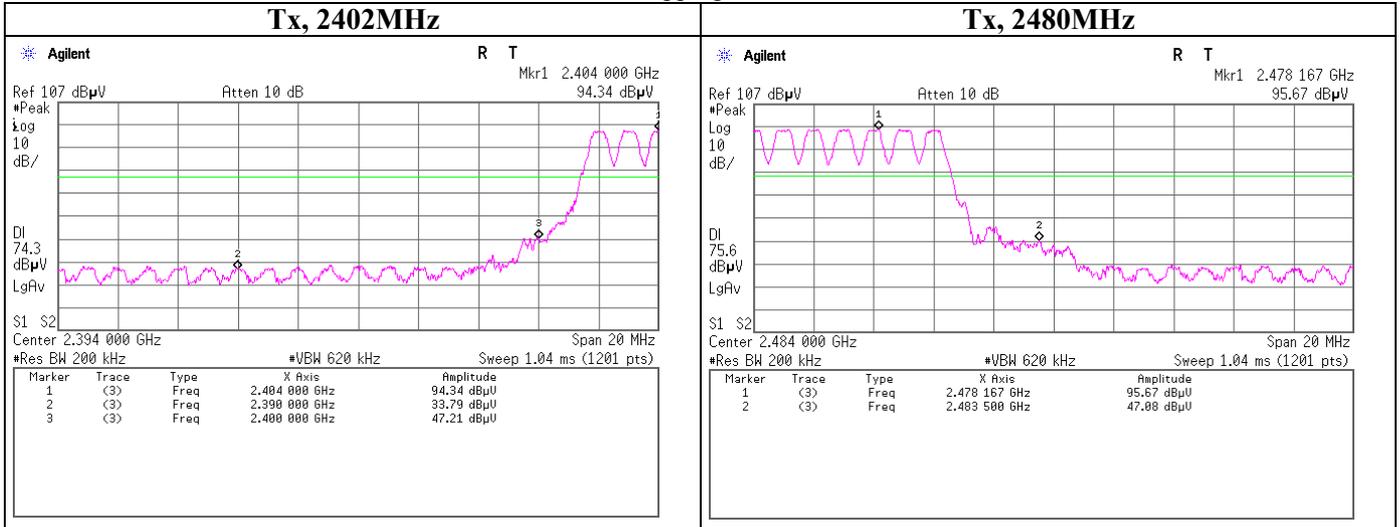
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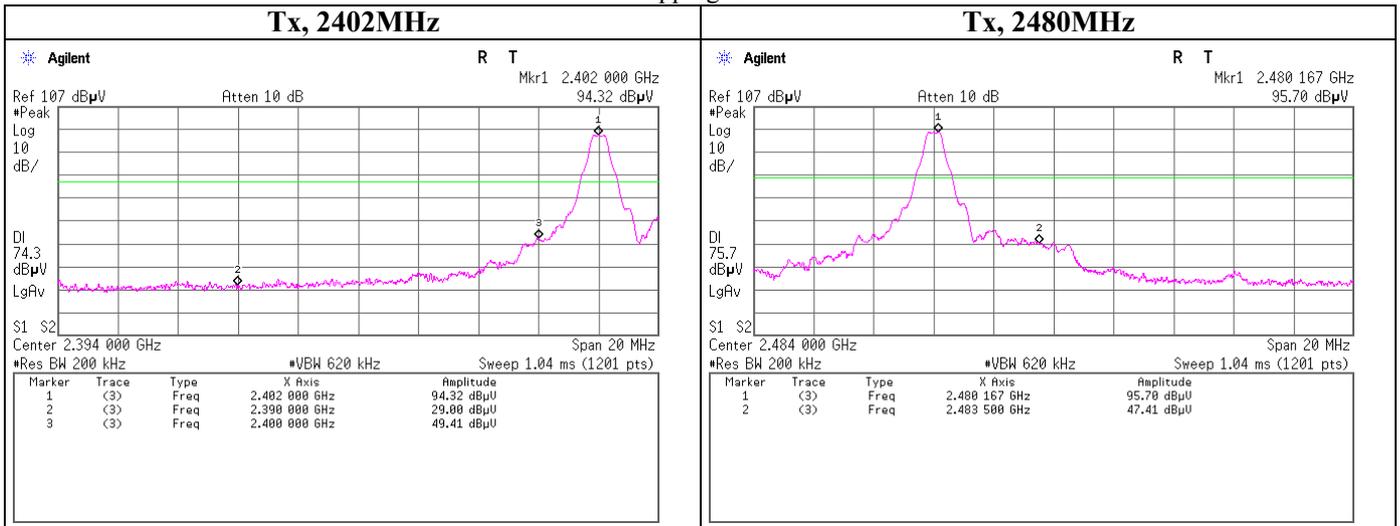
## Spurious emission (Conducted)

Band Edge compliance  
 DH5,

Hopping ON



Hopping OFF



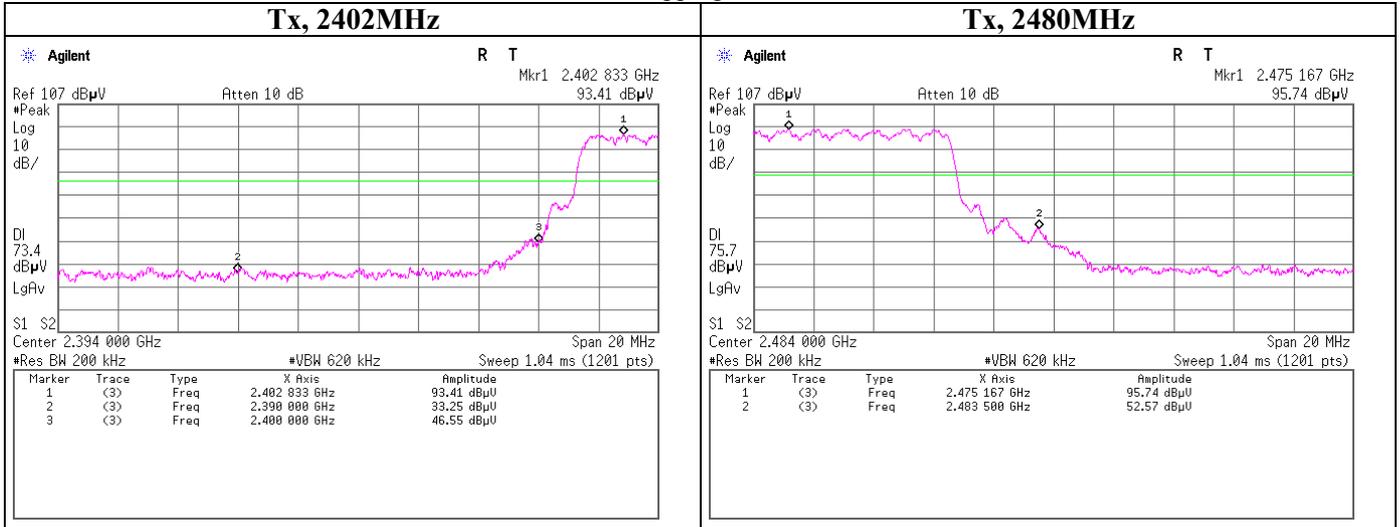
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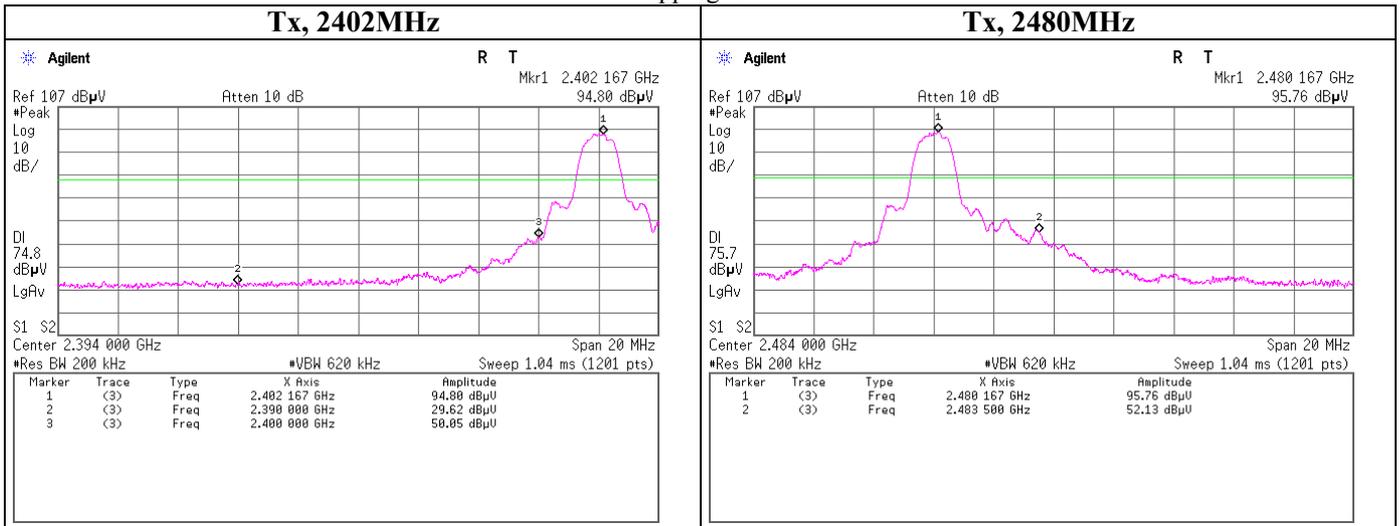
## Spurious emission (Conducted)

Band Edge compliance  
 3-DH5,

Hopping ON



Hopping OFF

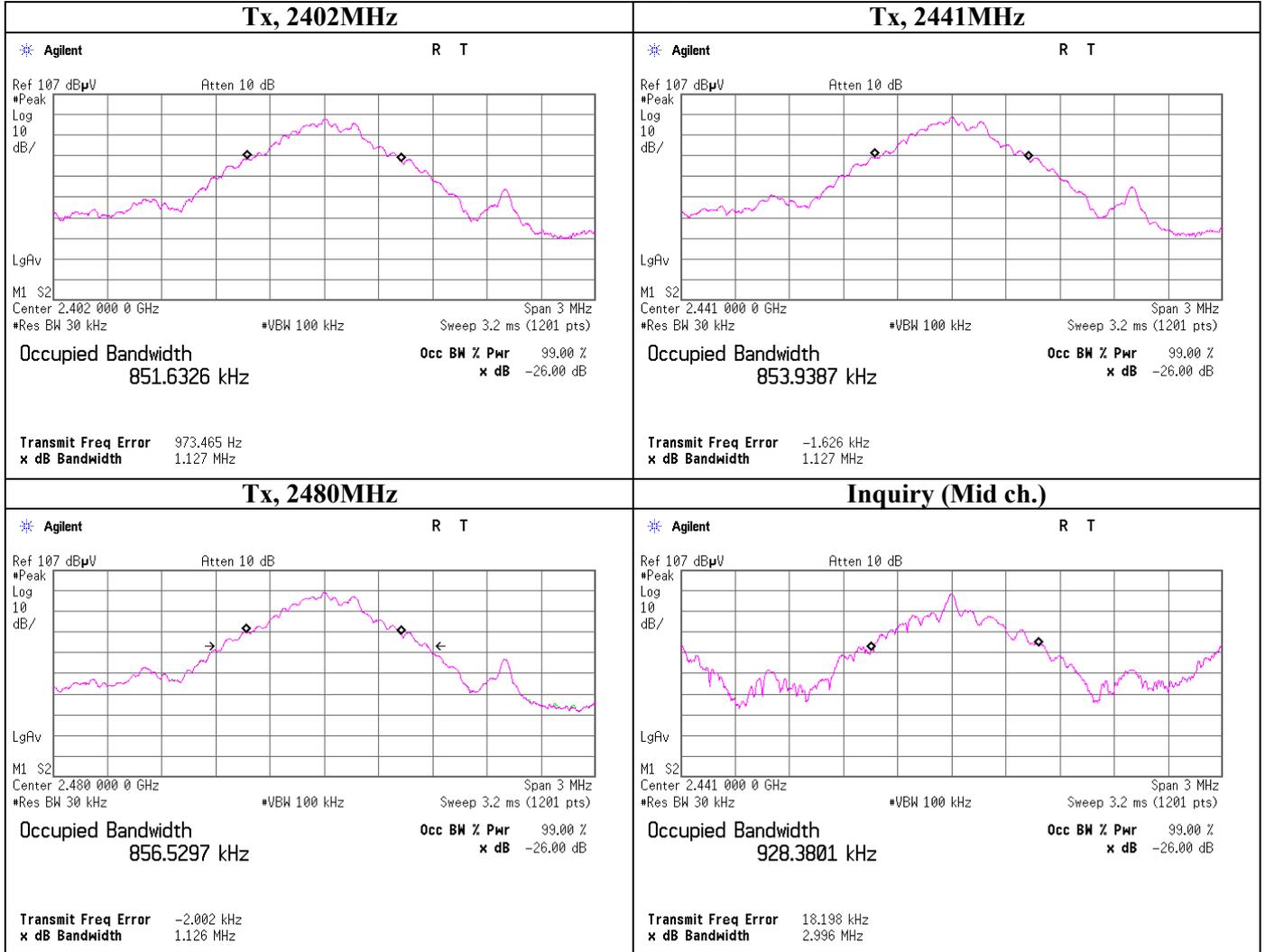


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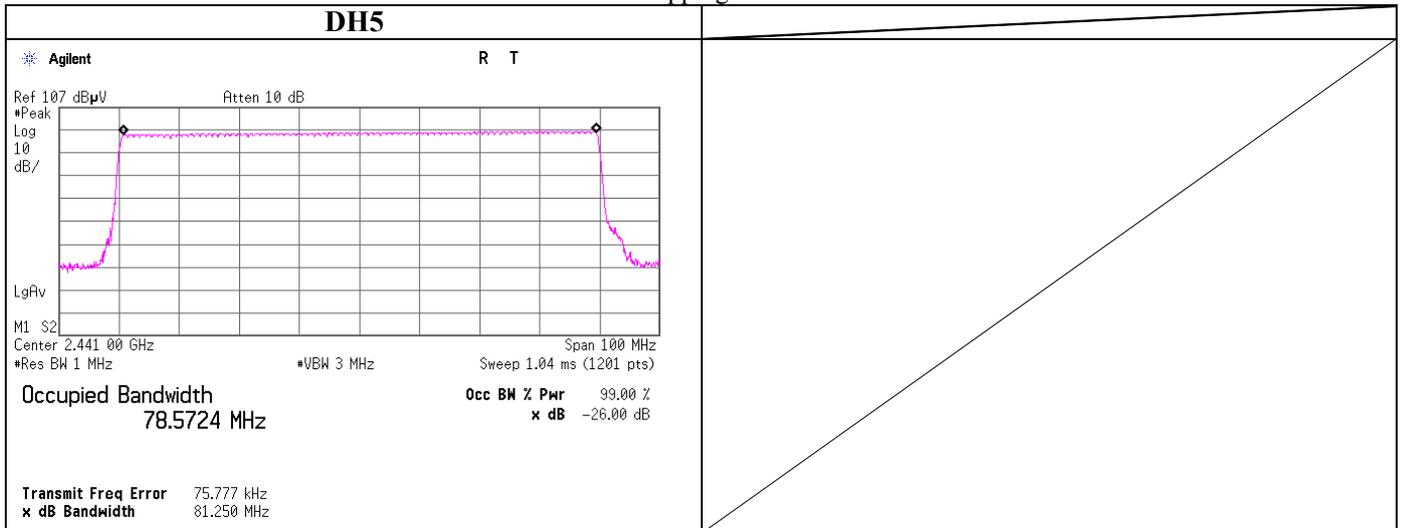
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**99% Occupied Bandwidth**

DH5, Hopping Off

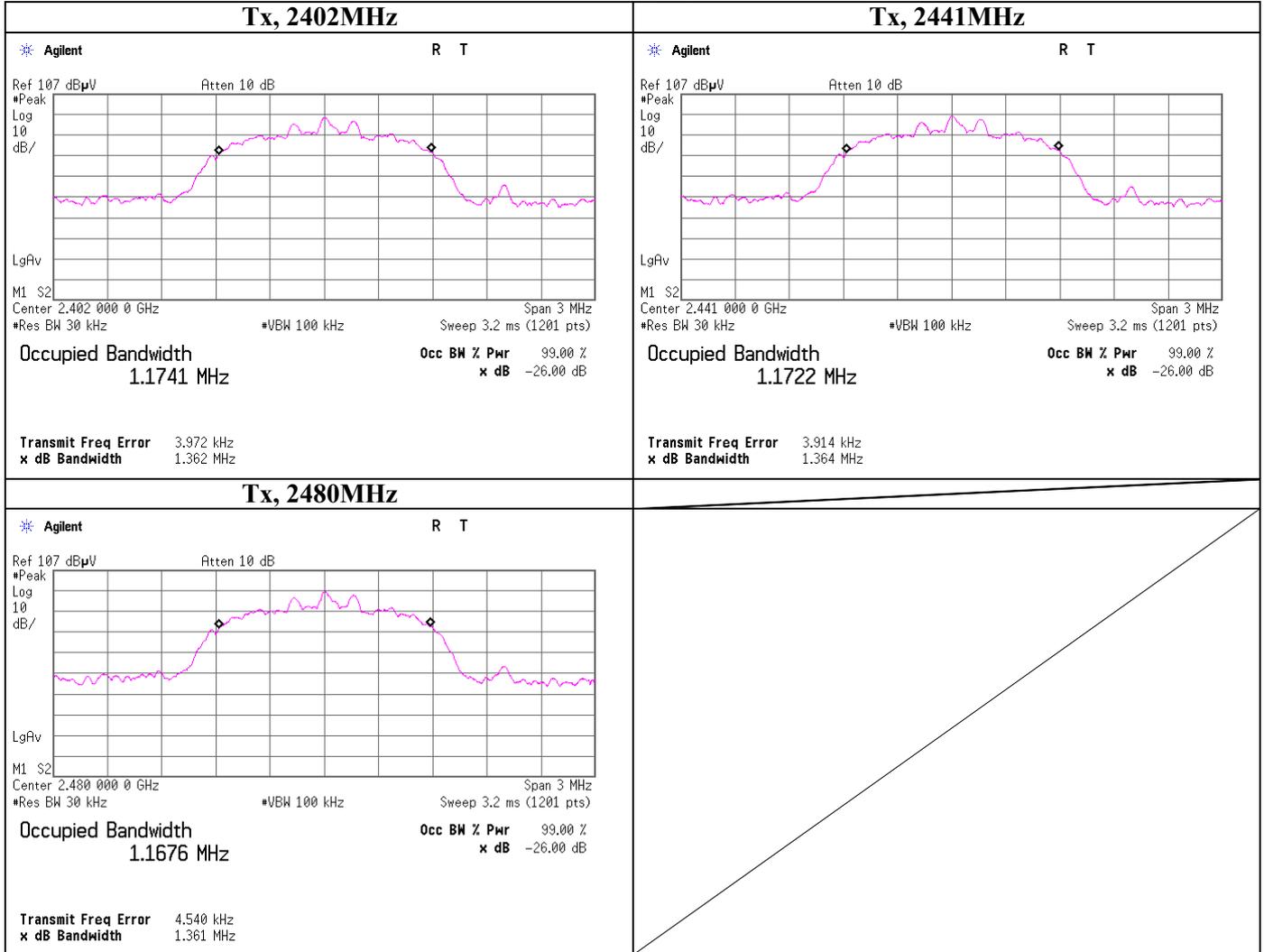


Hopping On



**99% Occupied Bandwidth**

**3-DH5, Hopping Off**



**Hopping On**

