

20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
 Date 2011/5/1
 Temperature / Humidity 24deg.C 41% RH
 Engineer Shinichi Takano
 Mode Tx

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.938	1.003	>= 0.625
DH5	2441.0	0.938	1.005	>= 0.625
DH5	2480.0	0.940	1.003	>= 0.627
3DH5	2402.0	1.303	1.003	>= 0.868
3DH5	2441.0	1.298	1.003	>= 0.865
3DH5	2480.0	1.300	1.003	>= 0.867
Inquiry	2441.0	0.825	2.008	>= 0.550

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

UL Japan, Inc.

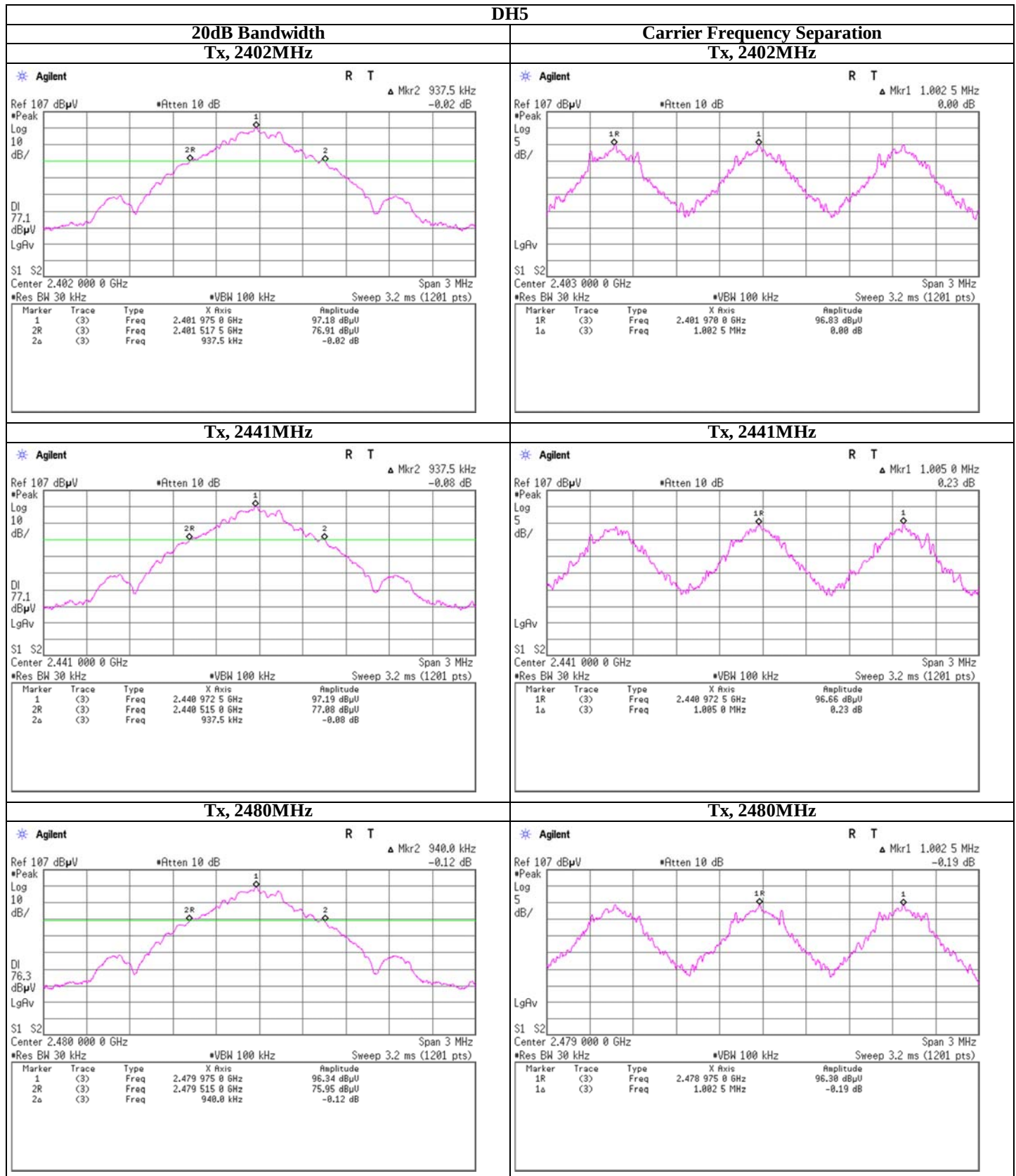
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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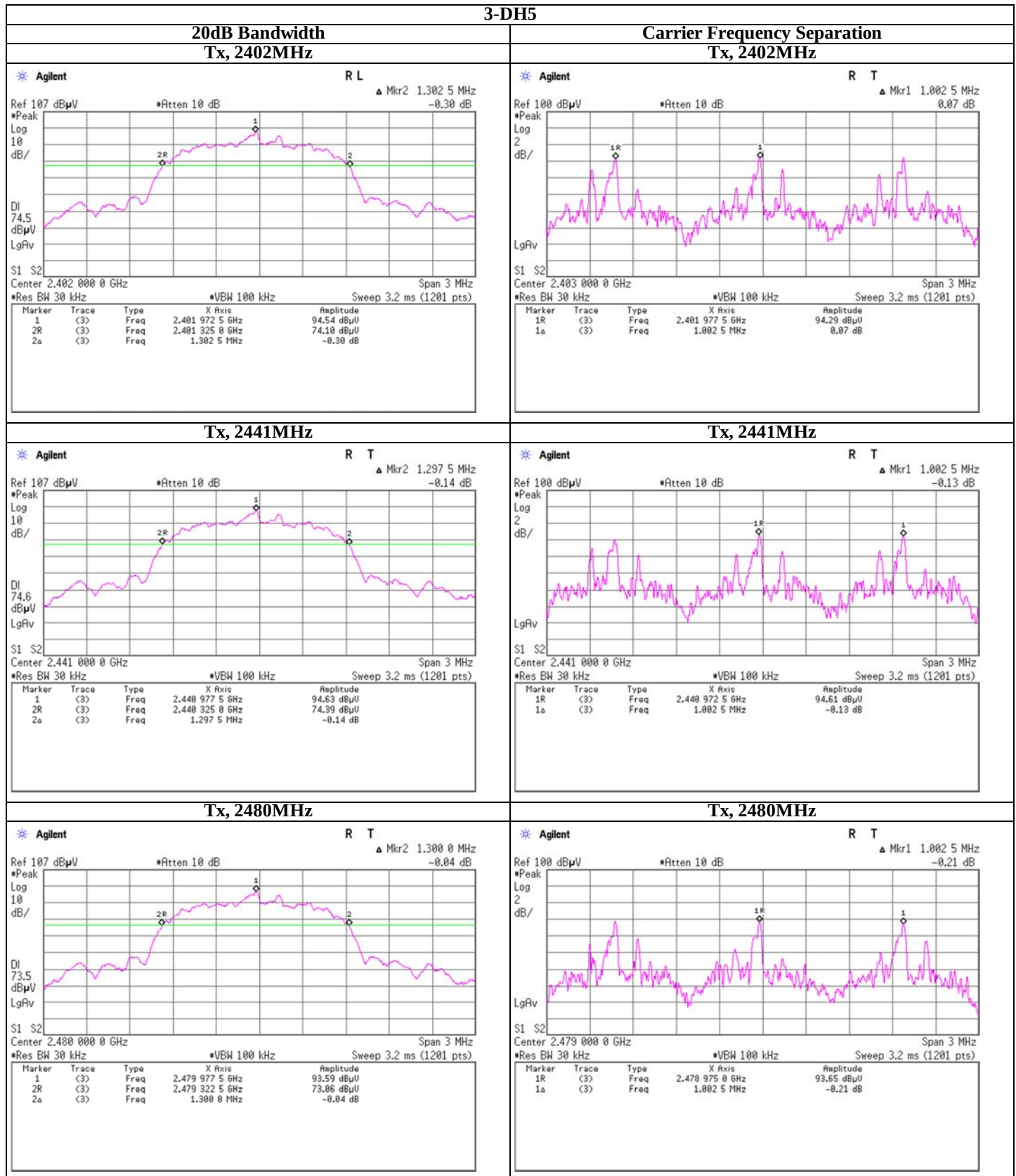
20dB Bandwidth and Carrier Frequency Separation



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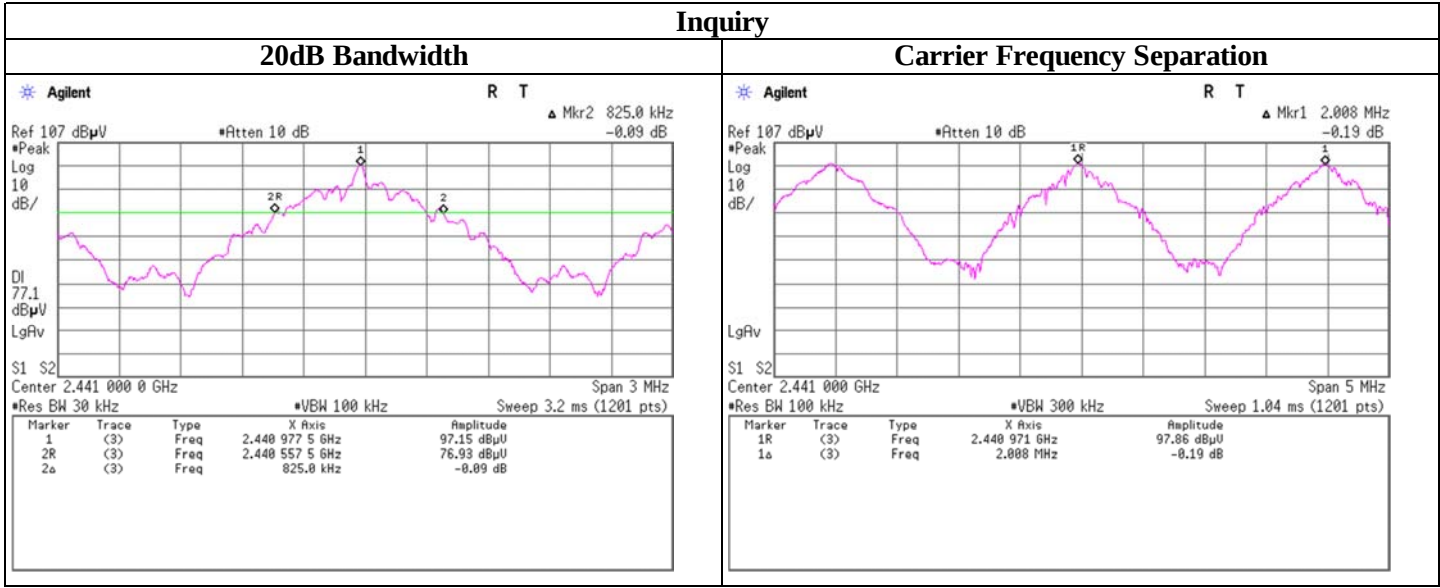
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Number of Hopping Frequency (Conducted)

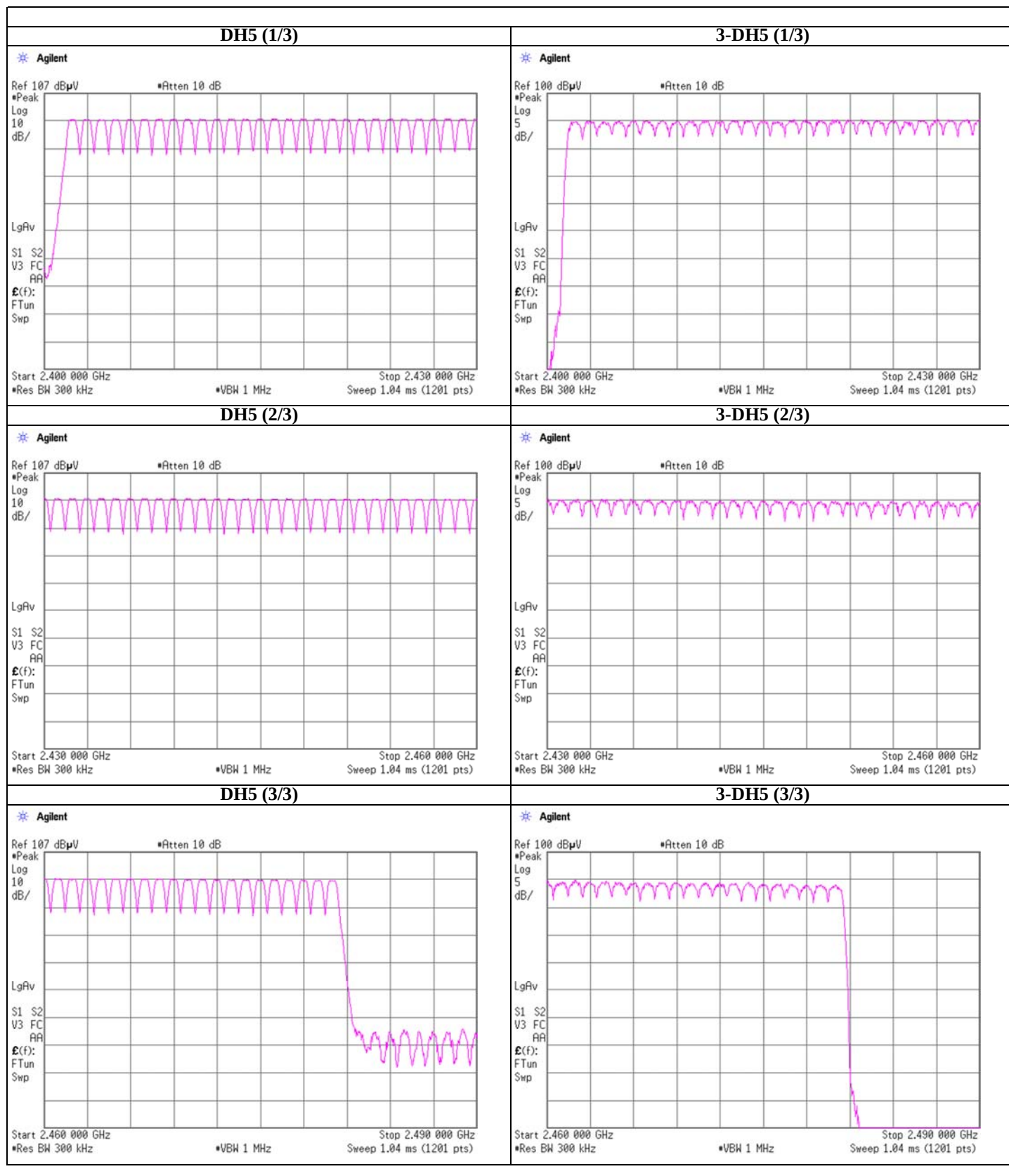
Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date 2011/5/2
Temperature / Humidity 26deg.C 37% RH
Engineer Akira Sato
Mode Tx,

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

Inquiry (1/3)	
Inquiry (2/3)	
Inquiry (3/3)	

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Dwell Time (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date 2011/5/2
 Temperature / Humidity 26deg.C 37% RH
 Engineer Akira Sato
 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 [msec]	Limit [msec]
DH1	19.8 times / 5.0 sec. x 31.6 sec. = 126 times	0.399	50	400
DH3	19.2 times / 5.0 sec. x 31.6 sec. = 122 times	1.655	202	400
DH5	18.2 times / 5.0 sec. x 31.6 sec. = 116 times	2.900	336	400
3DH1	18.4 times / 5.0 sec. x 31.6 sec. = 117 times	0.407	48	400
3DH3	18.2 times / 5.0 sec. x 31.6 sec. = 116 times	1.662	193	400
3DH5	18.2 times / 5.0 sec. x 31.6 sec. = 116 times	2.915	338	400
Inquiry	100.0 times / 1.0 sec. x 12.8 sec. = 1280 times	0.100	128	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	21	19	19	20	20	19.8
DH3	17	19	19	18	23	19.2
DH5	21	19	16	17	18	18.2
3DH1	20	21	17	18	16	18.4
3DH3	16	18	19	20	18	18.2
3DH5	19	17	20	17	18	18.2

Sample Calculation

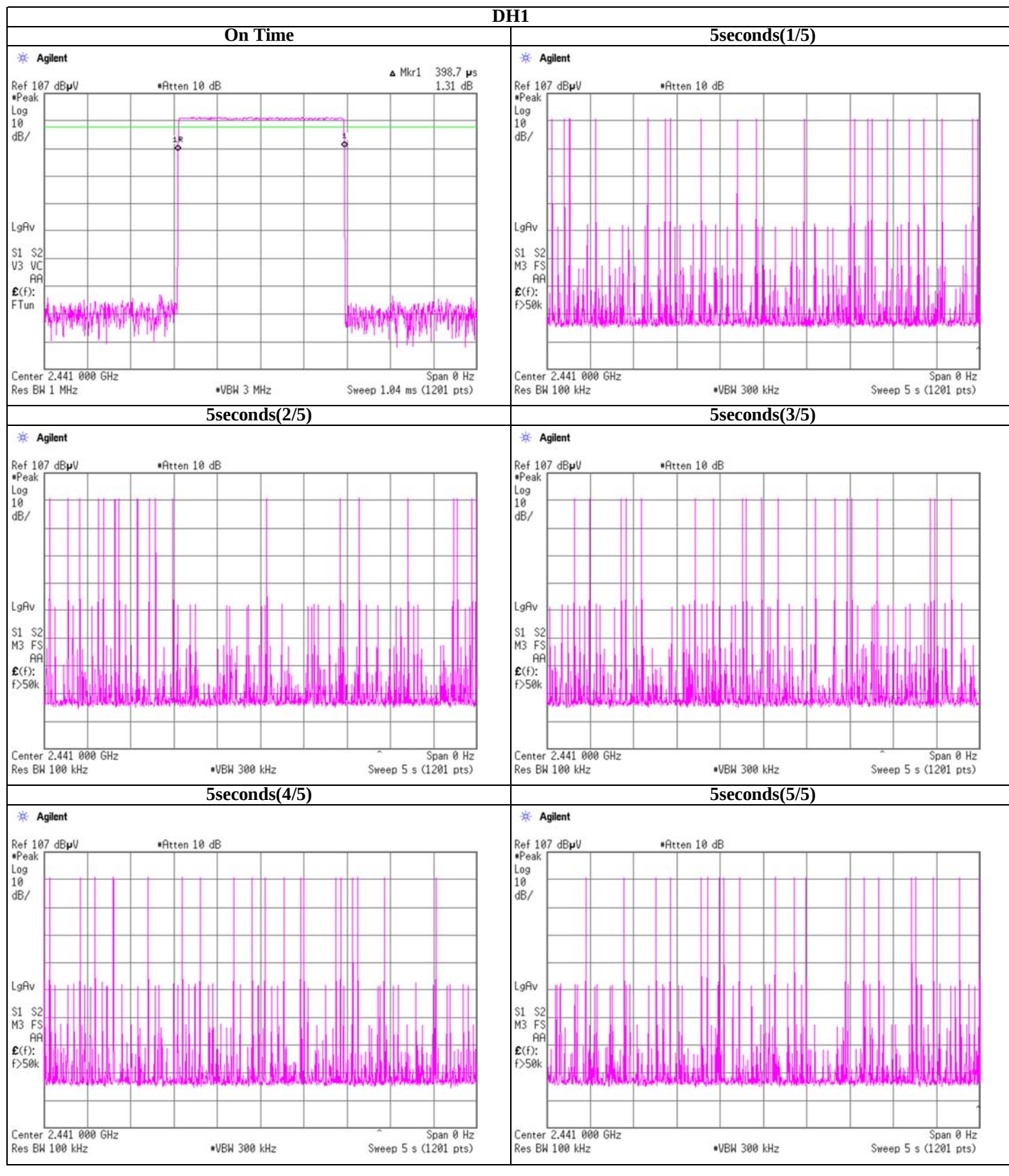
Average= Summation(Sampling 1 to 5) / 5

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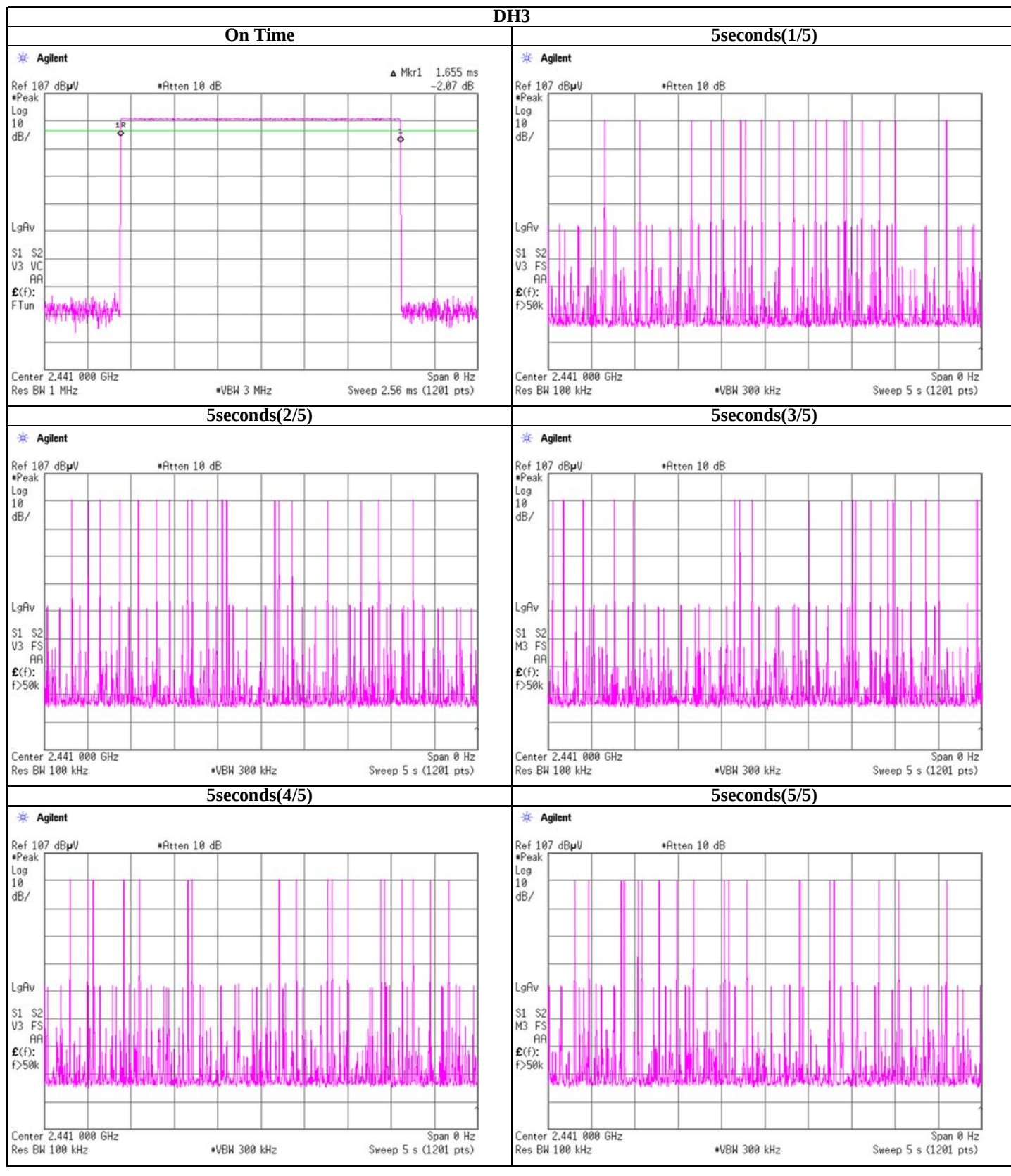
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Dwell time

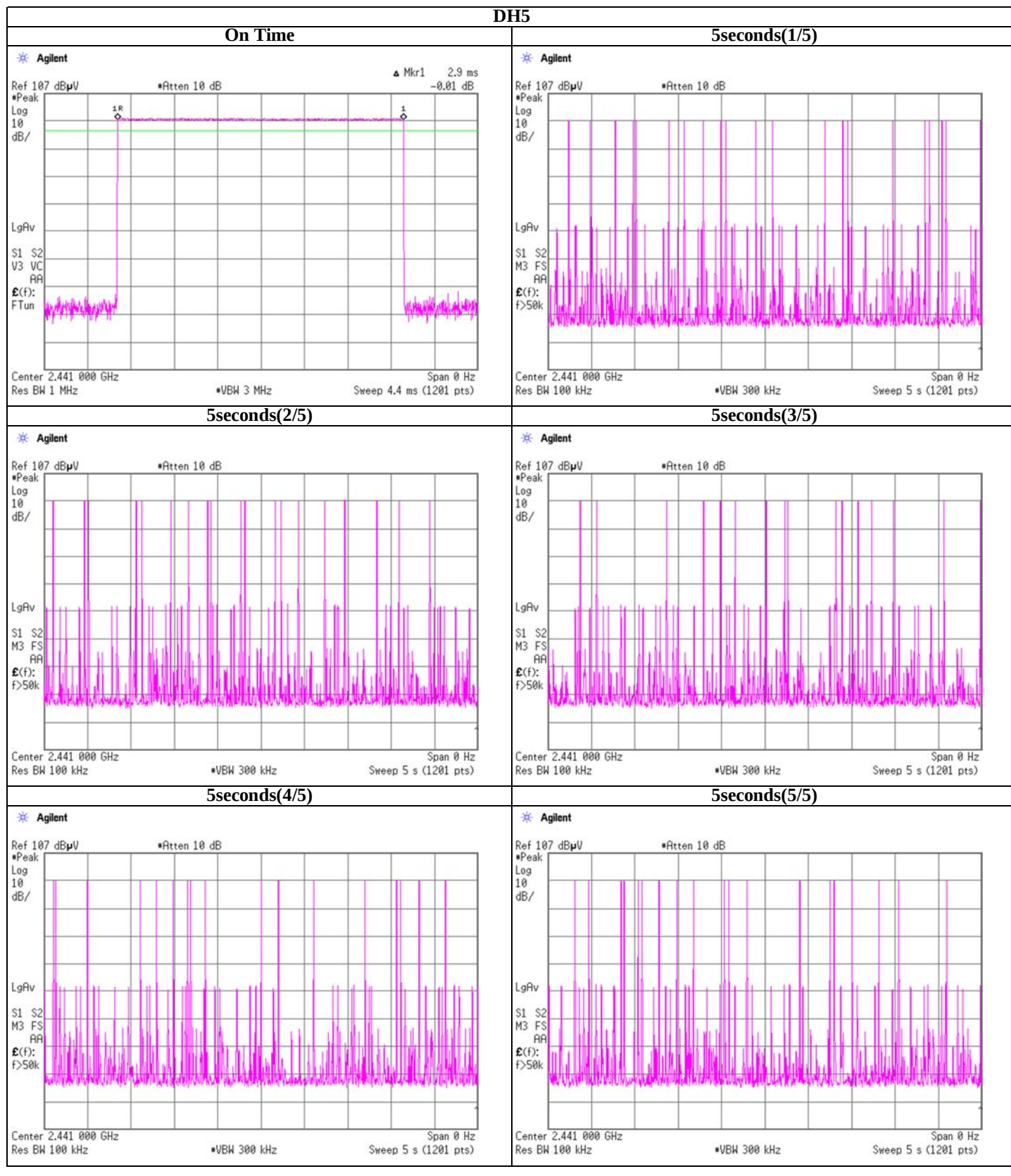
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Dwell time

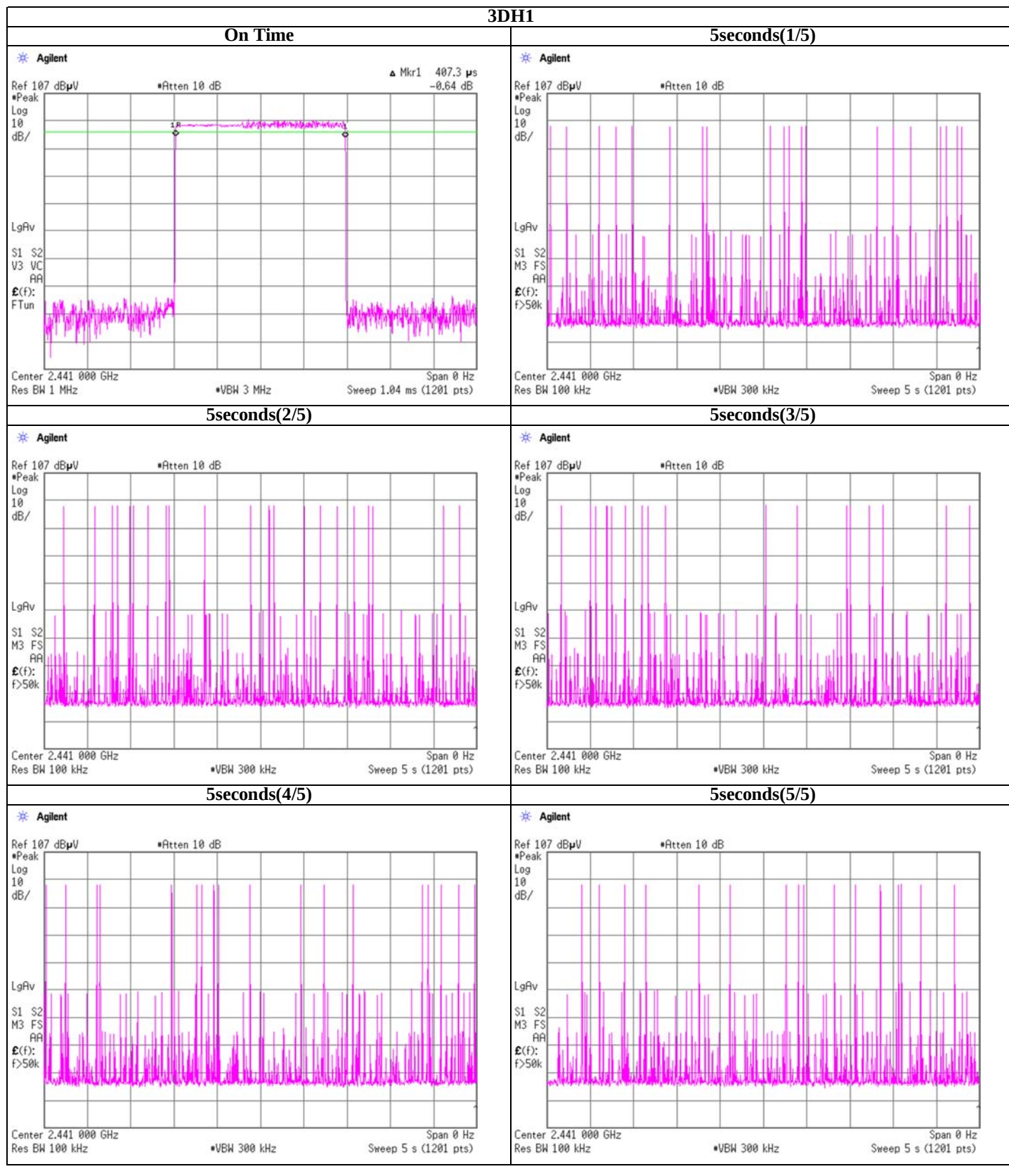
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Dwell time

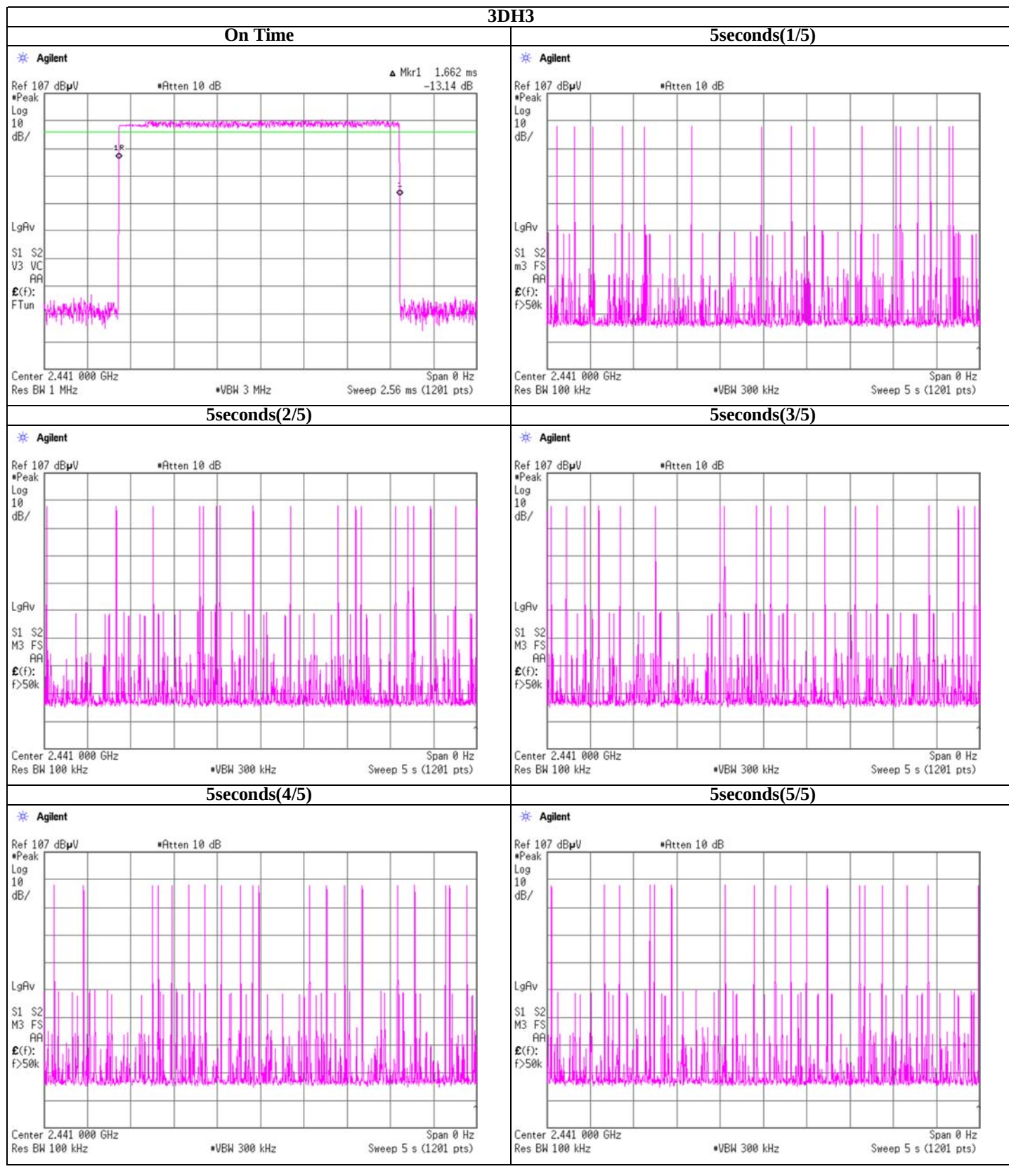
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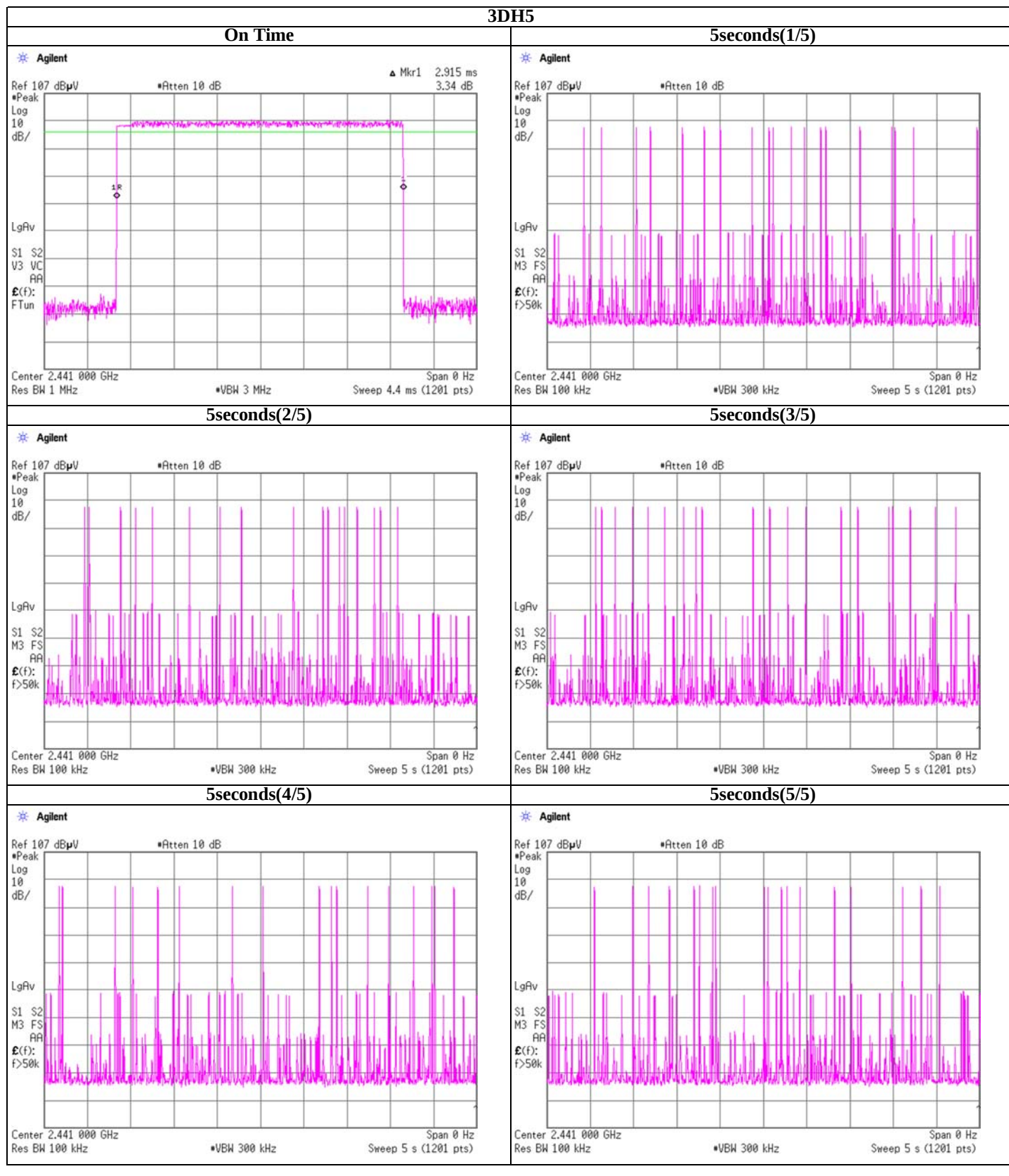
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Dwell time

Inquiry (1/2)		Inquiry (2/2)	
Agilent Ref 107 dBμV #Peak Log 10 dB/ LgRv S1 S2 V3 VC AR E(f): FTun Center 2.441 000 GHz Res BW 1 MHz #VBW 3 MHz Sweep 300 μs (1201 pts) Span 0 Hz Mkr1 99.25 μs 1.06 dB		Agilent Ref 107 dBμV #Peak Log 10 dB/ LgRv S1 S2 M3 FS AR E(f): f>50k Center 2.441 000 GHz Res BW 100 kHz #VBW 300 kHz Sweep 1 s (1201 pts) Span 0 Hz	

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date 2011/5/2
 Temperature / Humidity 26deg.C 37% RH
 Engineer Akira Sato
 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	1.34	0.70	0.00	2.04	1.60	20.97	125	18.93
Mid	2441.0	1.55	0.70	0.00	2.25	1.68	20.97	125	18.72
High	2480.0	0.59	0.70	0.00	1.29	1.35	20.97	125	19.68

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	1.06	0.70	0.00	1.76	1.50	20.97	125	19.21
Mid	2441.0	1.22	0.70	0.00	1.92	1.56	20.97	125	19.05
High	2480.0	0.15	0.70	0.00	0.85	1.22	20.97	125	20.12

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	1.21	0.70	0.00	1.91	1.55	20.97	125	19.06
Mid	2441.0	1.42	0.70	0.00	2.12	1.63	20.97	125	18.85
High	2480.0	0.43	0.70	0.00	1.13	1.30	20.97	125	19.84

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer)

* 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 2011/05/10, 11
Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
Engineer Akira Sato and 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.	215.991	QP	46.2	16.6	8.1	32.0	38.9	43.5	4.6	163	67	
Hori.	287.992	QP	48.6	18.7	8.6	32.0	43.9	46.0	2.1	116	250	
Hori.	415.995	QP	40.1	16.1	9.2	31.9	33.5	46.0	12.5	100	57	
Hori.	479.994	QP	41.5	16.9	9.5	31.9	36.0	46.0	10.0	191	268	
Hori.	959.995	QP	43.0	21.3	10.9	30.5	44.7	46.0	1.3	112	240	
Hori.	1439.909	PK	57.3	24.9	12.9	40.8	54.3	73.9	19.6	100	203	
Hori.	2377.000	PK	50.1	27.5	13.8	40.6	50.8	73.9	23.1	100	271	
Hori.	2390.000	PK	50.3	27.5	13.8	40.6	51.0	73.9	22.9	100	358	
Hori.	2400.000	PK	51.8	27.5	13.8	40.6	52.5	73.9	21.4	100	98	
Hori.	2427.000	PK	50.2	27.6	13.7	40.6	50.9	73.9	23.0	100	70	
Hori.	3357.705	PK	48.2	29.4	5.5	41.4	41.7	73.9	32.2	100	290	
Hori.	4804.000	PK	50.2	31.5	6.1	41.5	46.3	73.9	27.6	100	134	
Hori.	7206.000	PK	48.6	36.4	7.5	40.7	51.8	73.9	22.1	100	98	
Hori.	9608.000	PK	47.5	37.9	8.8	40.5	53.7	73.9	20.2	100	166	
Hori.	12010.000	PK	45.7	39.4	10.3	39.5	55.9	73.9	18.0	100	217	
Hori.	1439.909	AV	50.2	24.9	12.9	40.8	47.2	53.9	6.7	100	203	VBW:10Hz
Hori.	2377.000	AV	37.2	27.5	13.8	40.6	37.9	53.9	16.0	100	271	VBW:300Hz
Hori.	2390.000	AV	37.4	27.5	13.8	40.6	38.1	53.9	15.8	100	358	VBW:300Hz
Hori.	2400.000	AV	43.6	27.5	13.8	40.6	44.3	53.9	9.6	100	98	VBW:300Hz
Hori.	2427.000	AV	37.3	27.6	13.7	40.6	38.0	53.9	15.9	100	70	VBW:300Hz
Hori.	3357.705	AV	38.4	29.4	5.5	41.4	31.9	53.9	22.0	100	290	VBW:10Hz
Hori.	4804.000	AV	38.2	31.5	6.1	41.5	34.3	53.9	19.6	100	134	VBW:300Hz
Hori.	7206.000	AV	37.6	36.4	7.5	40.7	40.8	53.9	13.1	100	98	VBW:300Hz
Hori.	9608.000	AV	36.7	37.9	8.8	40.5	42.9	53.9	11.0	100	166	VBW:300Hz
Hori.	12010.000	AV	35.7	39.4	10.3	39.5	45.9	53.9	8.0	100	217	VBW:300Hz
Ver.	35.948	QP	39.0	16.2	6.6	32.1	29.7	40.0	10.3	99	2	
Ver.	287.992	QP	46.2	18.7	8.6	32.0	41.5	46.0	4.5	100	346	
Ver.	959.994	QP	39.8	21.3	10.9	30.5	41.5	46.0	4.5	172	80	
Vert.	1440.029	PK	53.9	24.9	12.9	40.8	50.9	73.9	23.0	116	283	
Vert.	2377.000	PK	51.5	27.5	13.8	40.6	52.2	73.9	21.7	100	239	
Vert.	2390.000	PK	52.2	27.5	13.8	40.6	52.9	73.9	21.0	100	113	
Vert.	2400.000	PK	54.9	27.5	13.8	40.6	55.6	73.9	18.3	100	332	
Vert.	2427.000	PK	50.0	27.6	13.7	40.6	50.7	73.9	23.2	100	356	
Vert.	3357.705	PK	47.8	29.4	5.5	41.4	41.3	73.9	32.6	100	293	
Vert.	4804.000	PK	51.7	31.5	6.1	41.5	47.8	73.9	26.1	100	177	
Vert.	7206.000	PK	47.9	36.4	7.5	40.7	51.1	73.9	22.8	100	48	
Vert.	9608.000	PK	47.8	37.9	8.8	40.5	54.0	73.9	19.9	100	131	
Vert.	12010.000	PK	46.3	39.4	10.3	39.5	56.5	73.9	17.4	100	168	
Vert.	1440.029	AV	49.4	24.9	12.9	40.8	46.4	53.9	7.5	116	283	VBW:10Hz
Vert.	2377.000	AV	37.1	27.5	13.8	40.6	37.8	53.9	16.1	100	239	VBW:300Hz
Vert.	2390.000	AV	37.4	27.5	13.8	40.6	38.1	53.9	15.8	100	113	VBW:300Hz
Vert.	2400.000	AV	45.7	27.5	13.8	40.6	46.4	53.9	7.5	100	332	VBW:300Hz
Vert.	2427.000	AV	36.9	27.6	13.7	40.6	37.6	53.9	16.3	100	356	VBW:300Hz
Vert.	3357.705	AV	37.5	29.4	5.5	41.4	31.0	53.9	22.9	100	293	VBW:10Hz
Vert.	4804.000	AV	41.8	31.5	6.1	41.5	37.9	53.9	16.0	100	177	VBW:300Hz
Vert.	7206.000	AV	39.7	36.4	7.5	40.7	42.9	53.9	11.0	100	48	VBW:300Hz
Vert.	9608.000	AV	37.8	37.9	8.8	40.5	44.0	53.9	9.9	100	131	VBW:300Hz
Vert.	12010.000	AV	36.4	39.4	10.3	39.5	46.6	53.9	7.3	100	168	VBW:300Hz

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).

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date 2011/05/10, 11
 Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
 Engineer Akira Sato and 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.	215.993	QP	47.7	16.6	8.1	32.0	40.4	43.5	3.1	148	311	
Hori.	287.986	QP	50.1	18.7	8.6	32.0	45.4	46.0	0.6	117	318	
Hori.	359.990	QP	40.3	15.1	9.0	31.9	32.5	46.0	13.5	100	242	
Hori.	431.987	QP	42.1	16.3	9.3	31.9	35.8	46.0	10.2	100	121	
Hori.	959.996	QP	43.0	21.3	10.9	30.5	44.7	46.0	1.3	107	206	
Hori.	1440.123	PK	56.2	24.9	12.9	40.8	53.2	73.9	20.7	100	220	
Hori.	2413.000	PK	49.6	27.6	13.8	40.6	50.4	73.9	23.5	100	0	
Hori.	2467.000	PK	50.6	27.6	13.7	40.5	51.4	73.9	22.5	100	0	
Hori.	4882.000	PK	50.3	31.7	6.1	41.5	46.6	73.9	27.3	100	86	
Hori.	7323.000	PK	48.9	36.7	7.5	40.7	52.4	73.9	21.5	100	0	
Hori.	9764.000	PK	47.6	38.2	8.8	40.5	54.1	73.9	19.8	100	0	
Hori.	12205.000	PK	47.3	39.2	10.3	39.5	57.3	73.9	16.6	100	0	
Hori.	1440.123	AV	49.7	24.9	12.9	40.8	46.7	53.9	7.2	100	220	VBW:10Hz
Hori.	2413.000	AV	37.9	27.6	13.8	40.6	38.7	53.9	15.2	100	0	VBW:300Hz
Hori.	2467.000	AV	37.8	27.6	13.7	40.5	38.6	53.9	15.3	100	0	VBW:300Hz
Hori.	4882.000	AV	37.4	31.7	6.1	41.5	33.7	53.9	20.2	100	86	VBW:300Hz
Hori.	7323.000	AV	36.9	36.7	7.5	40.7	40.4	53.9	13.5	100	0	VBW:300Hz
Hori.	9764.000	AV	35.6	38.2	8.8	40.5	42.1	53.9	11.8	100	0	VBW:300Hz
Hori.	12205.000	AV	35.8	39.2	10.3	39.5	45.8	53.9	8.1	100	0	VBW:300Hz
Ver.	35.947	QP	39.2	16.2	6.6	32.1	29.9	40.0	10.1	100	32	
Ver.	287.986	QP	47.2	18.7	8.6	32.0	42.5	46.0	3.5	100	358	
Ver.	959.996	QP	37.7	21.3	10.9	30.5	39.4	46.0	6.6	178	92	
Vert.	1440.012	PK	52.8	24.9	12.9	40.8	49.8	73.9	24.1	100	219	
Vert.	2413.000	PK	50.8	27.6	13.8	40.6	51.6	73.9	22.3	100	0	
Vert.	2467.000	PK	50.9	27.6	13.7	40.5	51.7	73.9	22.2	100	0	
Vert.	4882.000	PK	49.6	31.7	6.1	41.5	45.9	73.9	28.0	100	329	
Vert.	7323.000	PK	48.5	36.7	7.5	40.7	52	73.9	21.9	100	0	
Vert.	9764.000	PK	46.6	38.2	8.8	40.5	53.1	73.9	20.8	100	0	
Vert.	12205.000	PK	46.8	39.2	10.3	39.5	56.8	73.9	17.1	100	0	
Vert.	1440.012	AV	46.7	24.9	12.9	40.8	43.7	53.9	10.2	100	219	VBW:10Hz
Vert.	2413.000	AV	37.7	27.6	13.8	40.6	38.5	53.9	15.4	100	0	VBW:300Hz
Vert.	2467.000	AV	37.8	27.6	13.7	40.5	38.6	53.9	15.3	100	0	VBW:300Hz
Vert.	4882.000	AV	38.6	31.7	6.1	41.5	34.9	53.9	19.0	100	329	VBW:300Hz
Vert.	7323.000	AV	37.9	36.7	7.5	40.7	41.4	53.9	12.5	100	0	VBW:300Hz
Vert.	9764.000	AV	36.8	38.2	8.8	40.5	43.3	53.9	10.6	100	0	VBW:300Hz
Vert.	12205.000	AV	35.7	39.2	10.3	39.5	45.7	53.9	8.2	100	0	VBW:300Hz

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).

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date 2011/05/10, 11
Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
Engineer Akira Sato and 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.	143.993	QP	44.3	13.9	7.6	32.1	33.7	43.5	9.8	219	3	
Hori.	215.986	QP	46.8	16.6	8.1	32.0	39.5	43.5	4.0	145	316	
Hori.	287.990	QP	48.0	18.7	8.6	32.0	43.3	46.0	2.7	118	82	
Hori.	415.997	QP	44.1	16.1	9.2	31.9	37.5	46.0	8.5	100	354	
Hori.	959.999	QP	40.9	21.3	10.9	30.5	42.6	46.0	3.4	100	239	
Hori.	1439.921	PK	57.8	24.9	12.9	40.8	54.8	73.9	19.1	100	223	
Hori.	2453.000	PK	48.9	27.6	13.7	40.5	49.7	73.9	24.2	100	0	
Hori.	2483.500	PK	47.8	27.6	13.7	40.5	48.6	73.9	25.3	100	114	
Hori.	2507.000	PK	50.3	27.7	13.9	40.5	51.4	73.9	22.5	100	0	
Hori.	4960.000	PK	48.9	31.9	6.1	41.5	45.4	73.9	28.5	100	83	
Hori.	7440.000	PK	49.1	36.9	7.4	40.8	52.6	73.9	21.3	100	0	
Hori.	9920.000	PK	46.4	38.4	8.9	40.5	53.2	73.9	20.7	100	0	
Hori.	12400.000	PK	45.8	39.1	10.3	39.4	55.8	73.9	18.1	100	0	
Hori.	1439.921	AV	51.4	24.9	12.9	40.8	48.4	53.9	5.5	100	223	VBW:10Hz
Hori.	2453.000	AV	37.6	27.6	13.7	40.5	38.4	53.9	15.5	100	0	VBW:300Hz
Hori.	2483.500	AV	37.1	27.6	13.7	40.5	37.9	53.9	16.0	100	114	VBW:300Hz
Hori.	2507.000	AV	37.1	27.7	13.9	40.5	38.2	53.9	15.7	100	0	VBW:300Hz
Hori.	4960.000	AV	36.9	31.9	6.1	41.5	33.4	53.9	20.5	100	83	VBW:300Hz
Hori.	7440.000	AV	37.1	36.9	7.4	40.8	40.6	53.9	13.3	100	0	VBW:300Hz
Hori.	9920.000	AV	36.8	38.4	8.9	40.5	43.6	53.9	10.3	100	0	VBW:300Hz
Hori.	12400.000	AV	35.7	39.1	10.3	39.4	45.7	53.9	8.2	100	0	VBW:300Hz
Vert.	30.480	QP	29.8	18.1	6.5	32.1	22.3	40.0	17.7	100	3	
Vert.	287.993	QP	39.8	18.7	8.6	32.0	35.1	46.0	10.9	100	132	
Vert.	959.999	QP	36.8	21.3	10.9	30.5	38.5	46.0	7.5	187	109	
Vert.	1439.999	PK	53.5	24.9	12.9	40.8	50.5	73.9	23.4	100	156	
Vert.	2453.000	PK	49.6	27.6	13.7	40.5	50.4	73.9	23.5	100	0	
Vert.	2483.500	PK	48.2	27.6	13.7	40.5	49	73.9	24.9	100	349	
Vert.	2507.000	PK	49.4	27.7	13.9	40.5	50.5	73.9	23.4	100	0	
Vert.	4960.000	PK	49.3	31.9	6.1	41.5	45.8	73.9	28.1	100	137	
Vert.	7440.000	PK	49.8	36.9	7.4	40.8	53.3	73.9	20.6	100	0	
Vert.	9920.000	PK	47.6	38.4	8.9	40.5	54.4	73.9	19.5	100	0	
Vert.	12400.000	PK	47.2	39.1	10.3	39.4	57.2	73.9	16.7	100	0	
Vert.	1439.999	AV	47.7	24.9	12.9	40.8	44.7	53.9	9.2	100	156	VBW:10Hz
Vert.	2453.000	AV	37.3	27.6	13.7	40.5	38.1	53.9	15.8	100	0	VBW:300Hz
Vert.	2483.500	AV	37.5	27.6	13.7	40.5	38.3	53.9	15.6	100	349	VBW:300Hz
Vert.	2507.000	AV	37.4	27.7	13.9	40.5	38.5	53.9	15.4	100	0	VBW:300Hz
Vert.	4960.000	AV	38.5	31.9	6.1	41.5	35	53.9	18.9	100	137	VBW:300Hz
Vert.	7440.000	AV	37.8	36.9	7.4	40.8	41.3	53.9	12.6	100	0	VBW:300Hz
Vert.	9920.000	AV	36.4	38.4	8.9	40.5	43.2	53.9	10.7	100	0	VBW:300Hz
Vert.	12400.000	AV	35.3	39.1	10.3	39.4	45.3	53.9	8.6	100	0	VBW:300Hz

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).

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date 2011/05/10, 11
 Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
 Engineer Akira Sato and 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.	215.995	QP	45.5	16.6	8.1	32.0	38.2	43.5	5.3	153	122	
Hori.	287.992	QP	48.2	18.7	8.6	32.0	43.5	46.0	2.5	118	76	
Hori.	359.996	QP	43.9	15.1	9.0	31.9	36.1	46.0	9.9	100	221	
Hori.	415.986	QP	43.7	16.1	9.2	31.9	37.1	46.0	8.9	100	353	
Hori.	959.995	QP	41.1	21.3	10.9	30.5	42.8	46.0	3.2	100	242	
Hori.	1440.021	PK	57.8	24.9	12.9	40.8	54.8	73.9	19.1	100	216	
Hori.	2377.000	PK	50.3	27.5	13.8	40.6	51.0	73.9	22.9	100	0	
Hori.	2390.000	PK	48.9	27.5	13.8	40.6	49.6	73.9	24.3	100	0	
Hori.	2400.000	PK	51.7	27.5	13.8	40.6	52.4	73.9	21.5	100	217	
Hori.	2427.000	PK	50.9	27.6	13.7	40.6	51.6	73.9	22.3	100	0	
Hori.	3359.943	PK	49.9	29.4	5.5	41.4	43.4	73.9	30.5	100	272	
Hori.	4804.000	PK	48.3	31.5	6.1	41.5	44.4	73.9	29.5	100	253	
Hori.	7206.000	PK	47.8	36.4	7.5	40.7	51.0	73.9	22.9	100	0	
Hori.	9608.000	PK	47.4	37.9	8.8	40.5	53.6	73.9	20.3	100	0	
Hori.	12010.000	PK	45.5	39.4	10.3	39.5	55.7	73.9	18.2	100	0	
Hori.	1440.021	AV	50.4	24.9	12.9	40.8	47.4	53.9	6.5	100	216	VBW:10Hz
Hori.	2377.000	AV	37.5	27.5	13.8	40.6	38.2	53.9	15.7	100	0	VBW:300Hz
Hori.	2390.000	AV	37.5	27.5	13.8	40.6	38.2	53.9	15.7	100	0	VBW:300Hz
Hori.	2400.000	AV	42.6	27.5	13.8	40.6	43.3	53.9	10.6	100	217	VBW:300Hz
Hori.	2427.000	AV	37.3	27.6	13.7	40.6	38.0	53.9	15.9	100	0	VBW:300Hz
Hori.	3359.943	AV	41.4	29.4	5.5	41.4	34.9	53.9	19.0	100	272	VBW:10Hz
Hori.	4804.000	AV	37.9	31.5	6.1	41.5	34.0	53.9	19.9	100	253	VBW:300Hz
Hori.	7206.000	AV	37.4	36.4	7.5	40.7	40.6	53.9	13.3	100	0	VBW:300Hz
Hori.	9608.000	AV	36.9	37.9	8.8	40.5	43.1	53.9	10.8	100	0	VBW:300Hz
Hori.	12010.000	AV	35.7	39.4	10.3	39.5	45.9	53.9	8.0	100	0	VBW:300Hz
Vert.	30.506	QP	29.6	18.1	6.5	32.1	22.1	40.0	17.9	100	12	
Vert.	647.976	QP	38.9	19.0	9.9	31.8	36.0	46.0	10.0	124	17	
Vert.	959.994	QP	34.9	21.3	10.9	30.5	36.6	46.0	9.4	150	74	
Vert.	1440.044	PK	57.7	24.9	12.9	40.8	54.7	73.9	19.2	100	224	
Vert.	2377.000	PK	49.7	27.5	13.8	40.6	50.4	73.9	23.5	100	0	
Vert.	2390.000	PK	49.6	27.5	13.8	40.6	50.3	73.9	23.6	100	0	
Vert.	2400.000	PK	53.3	27.5	13.8	40.6	54.0	73.9	19.9	100	58	
Vert.	2427.000	PK	50.1	27.6	13.7	40.6	50.8	73.9	23.1	100	0	
Vert.	3358.029	PK	49.6	29.4	5.5	41.4	43.1	73.9	30.8	100	238	
Vert.	4804.000	PK	47.9	31.5	6.1	41.5	44.0	73.9	29.9	100	143	
Vert.	7206.000	PK	47.6	36.4	7.5	40.7	50.8	73.9	23.1	100	0	
Vert.	9608.000	PK	47.7	37.9	8.8	40.5	53.9	73.9	20.0	100	0	
Vert.	12010.000	PK	46.3	39.4	10.3	39.5	56.5	73.9	17.4	100	0	
Vert.	1440.044	AV	50.6	24.9	12.9	40.8	47.6	53.9	6.3	100	224	VBW:10Hz
Vert.	2377.000	AV	37.3	27.5	13.8	40.6	38.0	53.9	15.9	100	0	VBW:300Hz
Vert.	2390.000	AV	37.6	27.5	13.8	40.6	38.3	53.9	15.6	100	0	VBW:300Hz
Vert.	2400.000	AV	41.6	27.5	13.8	40.6	42.3	53.9	11.6	100	58	VBW:300Hz
Vert.	2427.000	AV	37.3	27.6	13.7	40.6	38.0	53.9	15.9	100	0	VBW:300Hz
Vert.	3358.029	AV	40.5	29.4	5.5	41.4	34.0	53.9	19.9	100	238	VBW:10Hz
Vert.	4804.000	AV	38.2	31.5	6.1	41.5	34.3	53.9	19.6	100	143	VBW:300Hz
Vert.	7206.000	AV	38.8	36.4	7.5	40.7	42.0	53.9	11.9	100	0	VBW:300Hz
Vert.	9608.000	AV	37.9	37.9	8.8	40.5	44.1	53.9	9.8	100	0	VBW:300Hz
Vert.	12010.000	AV	36.5	39.4	10.3	39.5	46.7	53.9	7.2	100	0	VBW:300Hz

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).

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 2011/05/10, 11
 Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
 Engineer Akira Sato and 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.	59.978	QP	45.0	8.1	6.9	32.1	27.9	40.0	12.1	374	54	
Hori.	215.996	QP	47.0	16.6	8.1	32.0	39.7	43.5	3.8	147	319	
Hori.	287.990	QP	48.2	18.7	8.6	32.0	43.5	46.0	2.5	115	72	
Hori.	415.997	QP	43.7	16.1	9.2	31.9	37.1	46.0	8.9	100	353	
Hori.	959.995	QP	41.1	21.3	10.9	30.5	42.8	46.0	3.2	100	241	
Hori.	1440.082	PK	57.6	24.9	12.9	40.8	54.6	73.9	19.3	112	225	
Hori.	2413.000	PK	49.6	27.6	13.8	40.6	50.4	73.9	23.5	100	0	
Hori.	2467.000	PK	49.6	27.6	13.7	40.5	50.4	73.9	23.5	100	0	
Hori.	3360.064	PK	50.2	29.4	5.5	41.4	43.7	73.9	30.2	100	302	
Hori.	4882.000	PK	49.6	31.7	6.1	41.5	45.9	73.9	28.0	100	45	
Hori.	7323.000	PK	47.8	36.7	7.5	40.7	51.3	73.9	22.6	100	0	
Hori.	9764.000	PK	47.6	38.2	8.8	40.5	54.1	73.9	19.8	100	0	
Hori.	12205.000	PK	47.7	39.2	10.3	39.5	57.7	73.9	16.2	100	0	
Hori.	1440.082	AV	51.4	24.9	12.9	40.8	48.4	53.9	5.5	112	225	VBW:10Hz
Hori.	2413.000	AV	36.9	27.6	13.8	40.6	37.7	53.9	16.2	100	0	VBW:300Hz
Hori.	2467.000	AV	37.5	27.6	13.7	40.5	38.3	53.9	15.6	100	0	VBW:300Hz
Hori.	3360.064	AV	42.5	29.4	5.5	41.4	36.0	53.9	17.9	100	302	VBW:10Hz
Hori.	4882.000	AV	37.5	31.7	6.1	41.5	33.8	53.9	20.1	100	45	VBW:300Hz
Hori.	7323.000	AV	36.7	36.7	7.5	40.7	40.2	53.9	13.7	100	0	VBW:300Hz
Hori.	9764.000	AV	35.8	38.2	8.8	40.5	42.3	53.9	11.6	100	0	VBW:300Hz
Hori.	12205.000	AV	34.9	39.2	10.3	39.5	44.9	53.9	9.0	100	0	VBW:300Hz
Vert.	719.991	QP	37.9	19.9	10.2	31.7	36.3	46.0	9.7	100	350	
Vert.	959.993	QP	36.6	21.3	10.9	30.5	38.3	46.0	7.7	179	104	
Vert.	1440.082	PK	53.4	24.9	12.9	40.8	50.4	73.9	23.5	100	351	
Vert.	2413.000	PK	49.3	27.6	13.8	40.6	50.1	73.9	23.8	100	0	
Vert.	2467.000	PK	49.5	27.6	13.7	40.5	50.3	73.9	23.6	100	0	
Vert.	3360.144	PK	46.5	29.4	5.5	41.4	40.0	73.9	33.9	100	194	
Vert.	4882.000	PK	48.6	31.7	6.1	41.5	44.9	73.9	29.0	100	81	
Vert.	7323.000	PK	48.6	36.7	7.5	40.7	52.1	73.9	21.8	100	0	
Vert.	9764.000	PK	46.9	38.2	8.8	40.5	53.4	73.9	20.5	100	0	
Vert.	12205.000	PK	46.6	39.2	10.3	39.5	56.6	73.9	17.3	100	0	
Vert.	1440.082	AV	46.8	24.9	12.9	40.8	43.8	53.9	10.1	100	351	VBW:10Hz
Vert.	2413.000	AV	37.5	27.6	13.8	40.6	38.3	53.9	15.6	100	0	VBW:300Hz
Vert.	2467.000	AV	37.1	27.6	13.7	40.5	37.9	53.9	16.0	100	0	VBW:300Hz
Vert.	3360.144	AV	37.4	29.4	5.5	41.4	30.9	53.9	23.0	100	194	VBW:10Hz
Vert.	4882.000	AV	37.9	31.7	6.1	41.5	34.2	53.9	19.7	100	81	VBW:300Hz
Vert.	7323.000	AV	37.1	36.7	7.5	40.7	40.6	53.9	13.3	100	0	VBW:300Hz
Vert.	9764.000	AV	36.8	38.2	8.8	40.5	43.3	53.9	10.6	100	0	VBW:300Hz
Vert.	12205.000	AV	35.8	39.2	10.3	39.5	45.8	53.9	8.1	100	0	VBW:300Hz

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).

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date 2011/05/10, 11
 Temperature / Humidity 26deg.C 52%RH (5/10) 26deg.C 52%RH (5/11)
 Engineer Akira Sato and 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.	215.996	QP	46.7	16.6	8.1	32.0	39.4	43.5	4.1	157	324	
Hori.	287.994	QP	48.3	18.7	8.6	32.0	43.6	46.0	2.4	119	72	
Hori.	415.990	QP	43.4	16.1	9.2	31.9	36.8	46.0	9.2	100	0	
Hori.	959.994	QP	40.9	21.3	10.9	30.5	42.6	46.0	3.4	100	244	
Hori.	1440.059	PK	57.1	24.9	12.9	40.8	54.1	73.9	19.8	100	46	
Hori.	2453.000	PK	50.2	27.6	13.7	40.5	51.0	73.9	22.9	100	0	
Hori.	2483.500	PK	47.5	27.6	13.7	40.5	48.3	73.9	25.6	100	189	
Hori.	2507.000	PK	49.4	27.7	13.9	40.5	50.5	73.9	23.4	100	0	
Hori.	3360.005	PK	50.3	29.4	5.5	41.4	43.8	73.9	30.1	100	300	
Hori.	4960.000	PK	48.8	31.9	6.1	41.5	45.3	73.9	28.6	100	187	
Hori.	7440.000	PK	47.8	36.9	7.4	40.8	51.3	73.9	22.6	100	0	
Hori.	9920.000	PK	46.9	38.4	8.9	40.5	53.7	73.9	20.2	100	0	
Hori.	12400.000	PK	45.8	39.1	10.3	39.4	55.8	73.9	18.1	100	0	
Hori.	1440.059	AV	51.6	24.9	12.9	40.8	48.6	53.9	5.3	100	46	VBW:10Hz
Hori.	2453.000	AV	37.1	27.6	13.7	40.5	37.9	53.9	16.0	100	0	VBW:300Hz
Hori.	2483.500	AV	36.8	27.6	13.7	40.5	37.6	53.9	16.3	100	189	VBW:300Hz
Hori.	2507.000	AV	37.4	27.7	13.9	40.5	38.5	53.9	15.4	100	0	VBW:300Hz
Hori.	3360.005	AV	43.6	29.4	5.5	41.4	37.1	53.9	16.8	100	300	VBW:10Hz
Hori.	4960.000	AV	36.8	31.9	6.1	41.5	33.3	53.9	20.6	100	187	VBW:300Hz
Hori.	7440.000	AV	36.6	36.9	7.4	40.8	40.1	53.9	13.8	100	0	VBW:300Hz
Hori.	9920.000	AV	34.8	38.4	8.9	40.5	41.6	53.9	12.3	100	0	VBW:300Hz
Hori.	12400.000	AV	34.5	39.1	10.3	39.4	44.5	53.9	9.4	100	0	VBW:300Hz
Vert.	647.990	QP	38.3	19.0	9.9	31.8	35.4	46.0	10.6	100	0	
Vert.	719.987	QP	37.9	19.9	10.2	31.7	36.3	46.0	9.7	100	359	
Vert.	959.993	QP	36.5	21.3	10.9	30.5	38.2	46.0	7.8	169	103	
Vert.	1440.120	PK	53.1	24.9	12.9	40.8	50.1	73.9	23.8	100	176	
Vert.	2453.000	PK	48.9	27.6	13.7	40.5	49.7	73.9	24.2	100	0	
Vert.	2483.500	PK	48.9	27.6	13.7	40.5	49.7	73.9	24.2	100	61	
Vert.	2507.000	PK	49.4	27.7	13.9	40.5	50.5	73.9	23.4	100	0	
Vert.	3359.912	PK	45.7	29.4	5.5	41.4	39.2	73.9	34.7	100	247	
Vert.	4960.000	PK	48.2	31.9	6.1	41.5	44.7	73.9	29.2	100	173	
Vert.	7440.000	PK	48.4	36.9	7.4	40.8	51.9	73.9	22.0	100	0	
Vert.	9920.000	PK	46.8	38.4	8.9	40.5	53.6	73.9	20.3	100	0	
Vert.	12400.000	PK	47.1	39.1	10.3	39.4	57.1	73.9	16.8	100	0	
Vert.	1440.120	AV	47.4	24.9	12.9	40.8	44.4	53.9	9.5	100	176	VBW:10Hz
Vert.	2453.000	AV	37.0	27.6	13.7	40.5	37.8	53.9	16.1	100	0	VBW:300Hz
Vert.	2483.500	AV	36.8	27.6	13.7	40.5	37.6	53.9	16.3	100	61	VBW:300Hz
Vert.	2507.000	AV	37.1	27.7	13.9	40.5	38.2	53.9	15.7	100	0	VBW:300Hz
Vert.	3359.912	AV	37.9	29.4	5.5	41.4	31.4	53.9	22.5	100	247	VBW:10Hz
Vert.	4960.000	AV	35.7	31.9	6.1	41.5	32.2	53.9	21.7	100	173	VBW:300Hz
Vert.	7440.000	AV	36.6	36.9	7.4	40.8	40.1	53.9	13.8	100	0	VBW:300Hz
Vert.	9920.000	AV	34.6	38.4	8.9	40.5	41.4	53.9	12.5	100	0	VBW:300Hz
Vert.	12400.000	AV	34.0	39.1	10.3	39.4	44.0	53.9	9.9	100	0	VBW:300Hz

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).

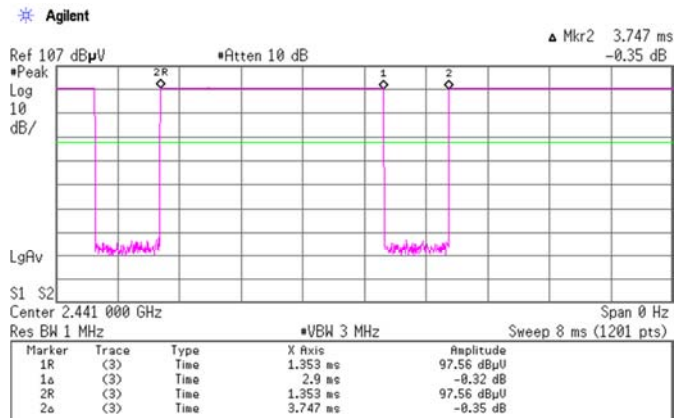
Spurious emission (Radiated)

DH5,

VBW (AV) Calculation

VBW: $1/x = 267\text{Hz} < 300\text{Hz}$

x: (Tx on+Tx off)=3.747ms



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Spurious emission (Radiated)

3-DH5,

VBW (AV) Calculation

VBW: $1/x = 266\text{Hz} < 270\text{Hz}$ **x: (Tx on+Tx off) = 3.754ms**

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