

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2010/09/27

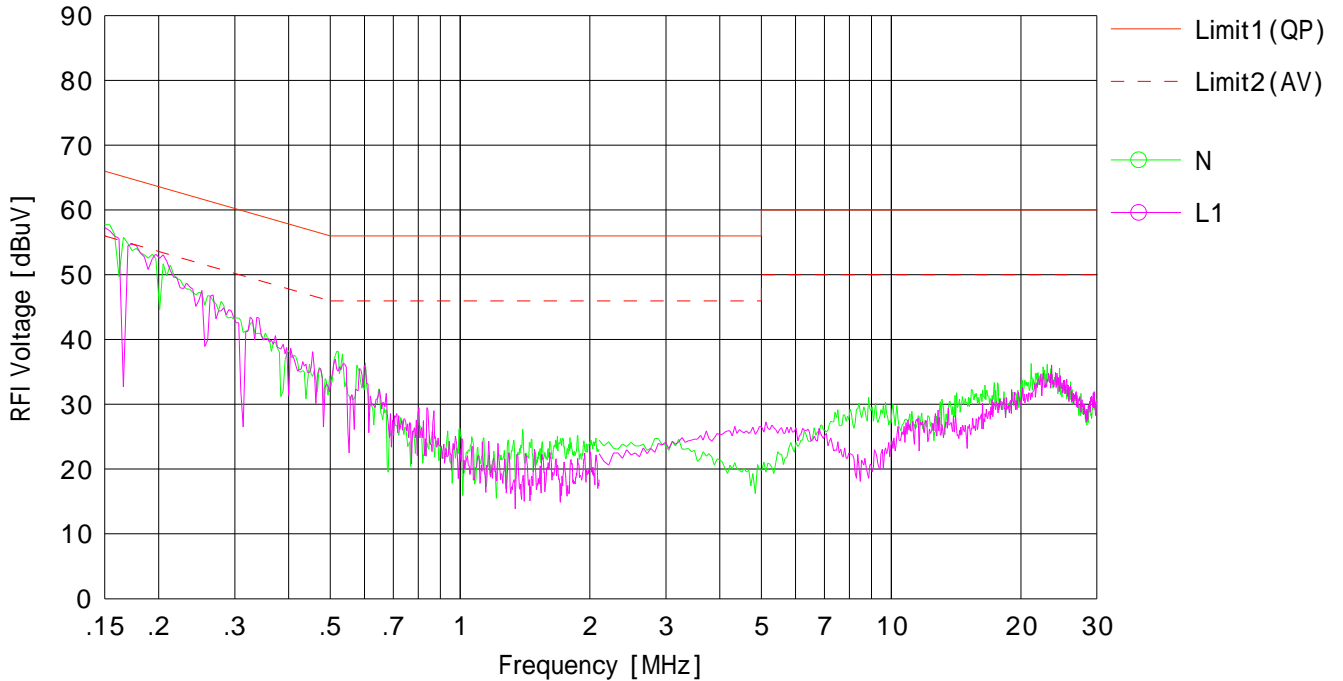
Company : Ricoh Company, Ltd.
Kind of EUT : Option(s) for Radiocommunications
Model No. : R-BT21A
Serial No. : 65

Mode : Tx DH5 2402MHz
Report No. : 31AE0037-HO-09-A
Power : DC5V
Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading [dBuV]	C.Fac [dB]	Results [dBuV]	Limit		Margin		Phase	Comment
					<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

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Date : 2010/09/27

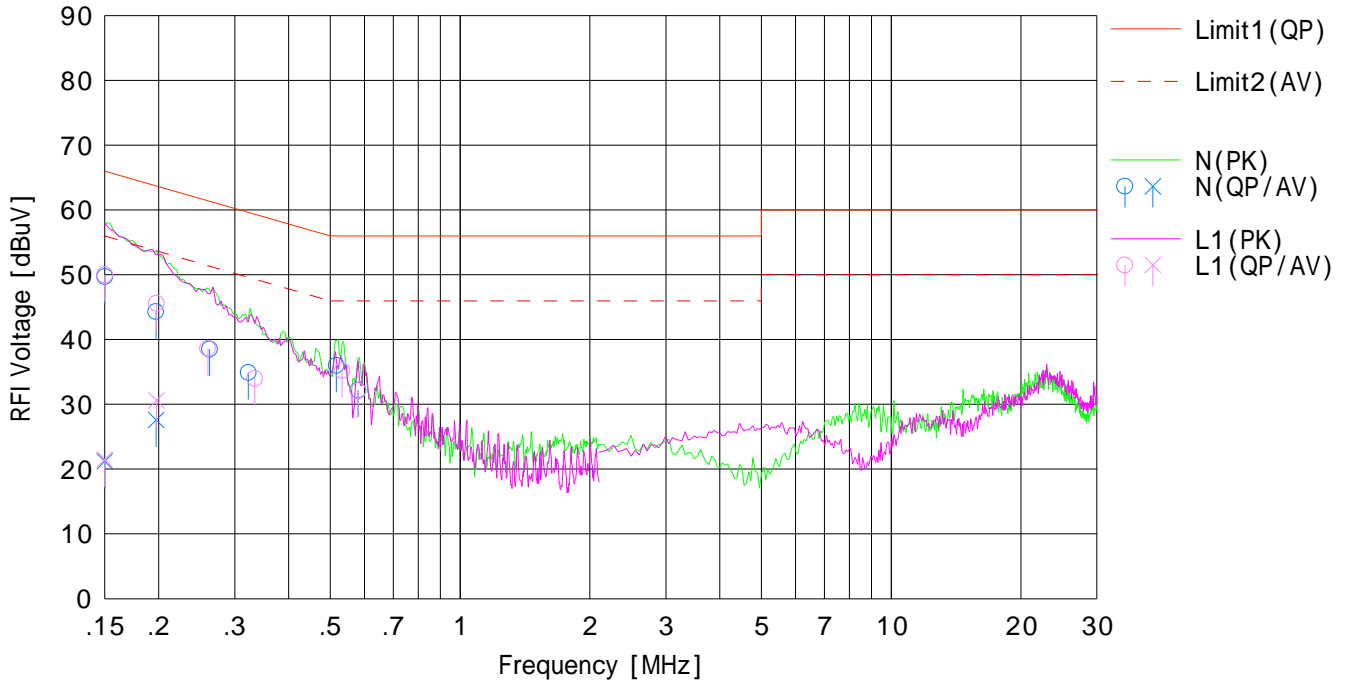
Company : Ricoh Company, Ltd.
Kind of EUT : Option(s) for Radiocommunications
Model No. : R-BT21A
Serial No. : 65

Mode : Tx DH5 2441MHz
Report No. : 31AE0037-HO-09-A
Power : DC5V
Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	37.1	8.6	12.6	49.7	21.2	66.0	56.0	16.3	34.8	N	
2	0.19700	31.7	15.0	12.6	44.3	27.6	63.7	53.7	19.4	26.1	N	
3	0.26232	25.9	---	12.6	38.5	---	61.3	51.3	22.8	---	N	
4	0.32259	22.3	---	12.6	34.9	---	59.6	49.6	24.7	---	N	
5	0.51610	23.4	---	12.6	36.0	---	56.0	46.0	20.0	---	N	
6	0.57984	19.6	---	12.6	32.2	---	56.0	46.0	23.8	---	N	
7	0.15000	37.4	8.9	12.6	50.0	21.5	66.0	56.0	16.0	34.5	L1	
8	0.19755	33.0	18.0	12.6	45.6	30.6	63.7	53.7	18.1	23.1	L1	
9	0.25984	26.0	---	12.6	38.6	---	61.4	51.4	22.8	---	L1	
10	0.33392	21.4	---	12.6	34.0	---	59.3	49.3	25.3	---	L1	
11	0.53233	22.6	---	12.6	35.2	---	56.0	46.0	20.8	---	L1	
12	0.57984	19.5	---	12.6	32.1	---	56.0	46.0	23.9	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

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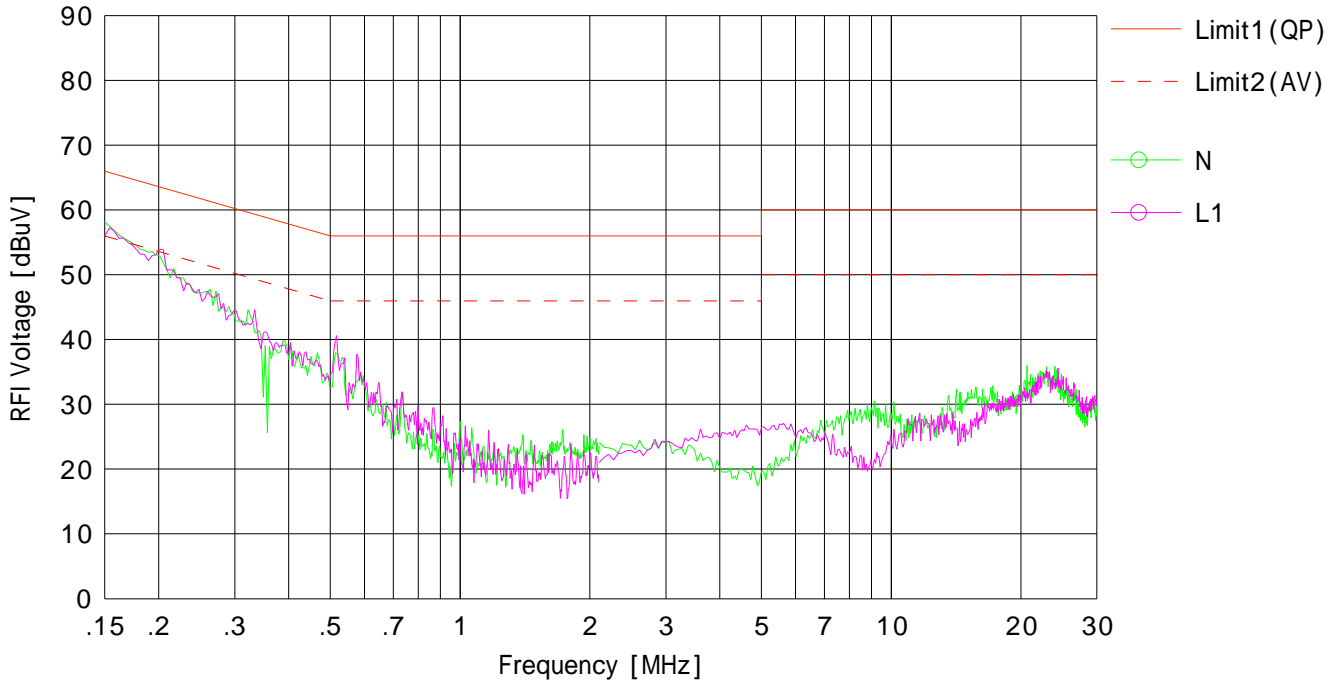
Company : Ricoh Company, Ltd.
Kind of EUT : Option(s) for Radiocommunications
Model No. : R-BT21A
Serial No. : 65

Mode : Tx DH5 2480MHz
Report No. : 31AE0037 -HO -09 -A
Power : DC5V
Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading [dBuV]	C.Fac [dB]	Results [dBuV]	Limit		Margin		Phase	Comment
					<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

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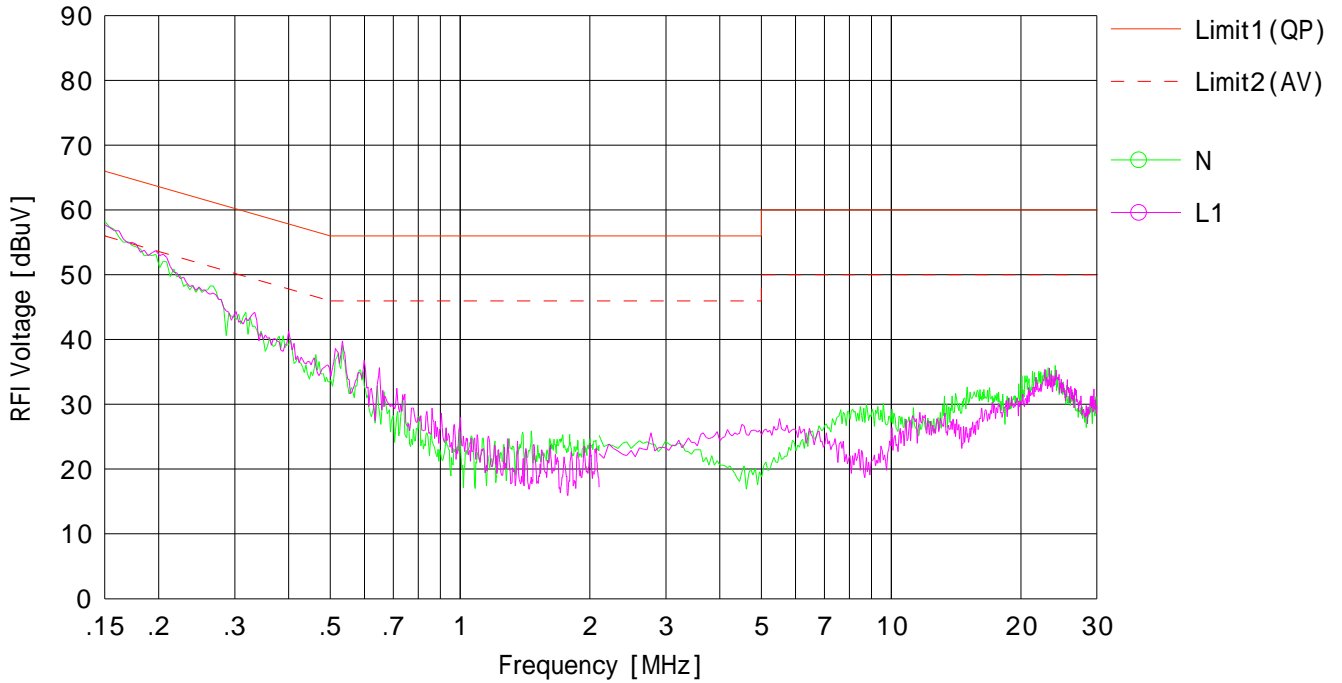
Company : Ricoh Company, Ltd.
Kind of EUT : Option(s) for Radiocommunications
Model No. : R-BT21A
Serial No. : 65

Mode : Tx 3DH5 2402MHz
Report No. : 31AE0037-HO-09-A
Power : DC5V
Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading [dBuV]	C.Fac [dB]	Results [dBuV]	Limit		Margin		Phase	Comment
					<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

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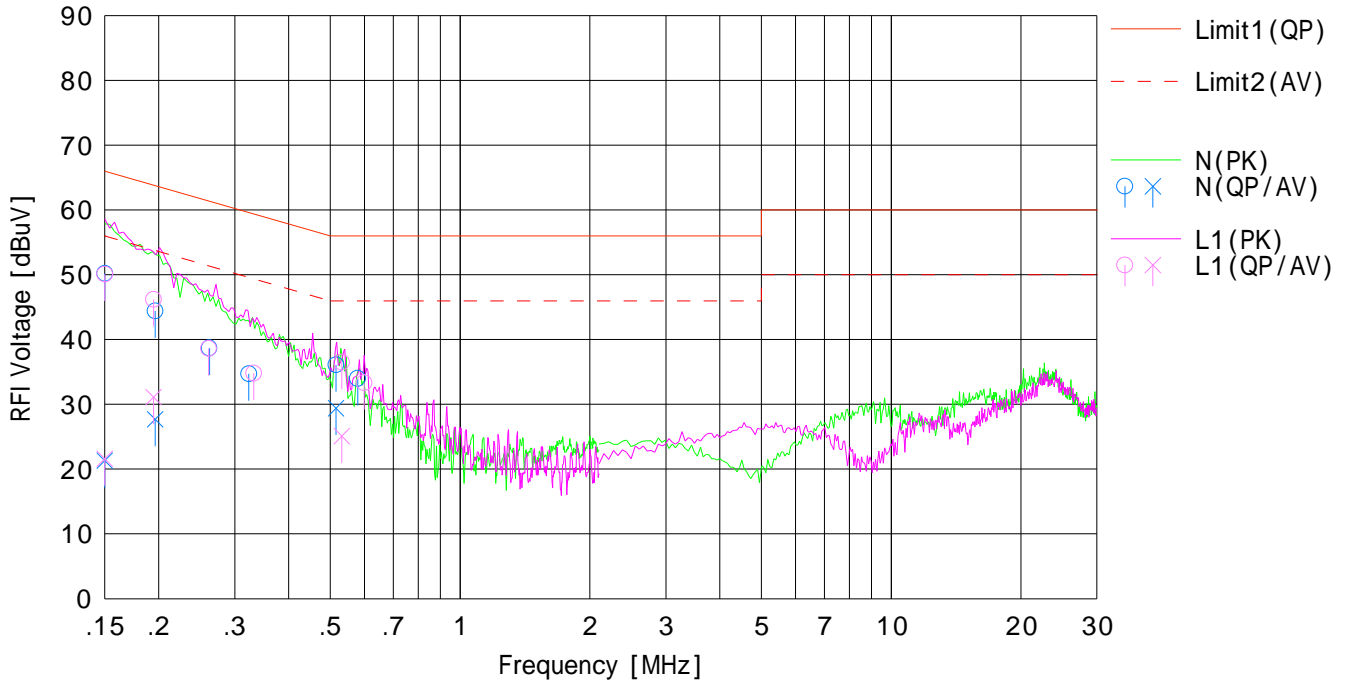
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Model No. : R-BT21A
Serial No. : 65

Mode : Tx 3DH5 2441MHz
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Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	37.6	8.7	12.6	50.2	21.3	66.0	56.0	15.8	34.7	N	
2	0.19625	31.8	15.1	12.6	44.4	27.7	63.7	53.7	19.3	26.0	N	
3	0.26208	26.1	---	12.6	38.7	---	61.3	51.3	22.6	---	N	
4	0.32375	22.1	---	12.6	34.7	---	59.6	49.6	24.9	---	N	
5	0.51550	23.5	16.8	12.6	36.1	29.4	56.0	46.0	19.9	16.6	N	
6	0.57881	21.4	---	12.6	34.0	---	56.0	46.0	22.0	---	N	
7	0.15000	37.5	9.0	12.6	50.1	21.6	66.0	56.0	15.9	34.4	L1	
8	0.19455	33.6	18.5	12.6	46.2	31.1	63.8	53.8	17.6	22.7	L1	
9	0.26105	26.0	---	12.6	38.6	---	61.3	51.3	22.7	---	L1	
10	0.33222	22.2	---	12.6	34.8	---	59.3	49.3	24.5	---	L1	
11	0.53113	23.9	12.5	12.6	36.5	25.1	56.0	46.0	19.5	20.9	L1	
12	0.59893	20.7	---	12.6	33.3	---	56.0	46.0	22.7	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

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Date : 2010/09/27

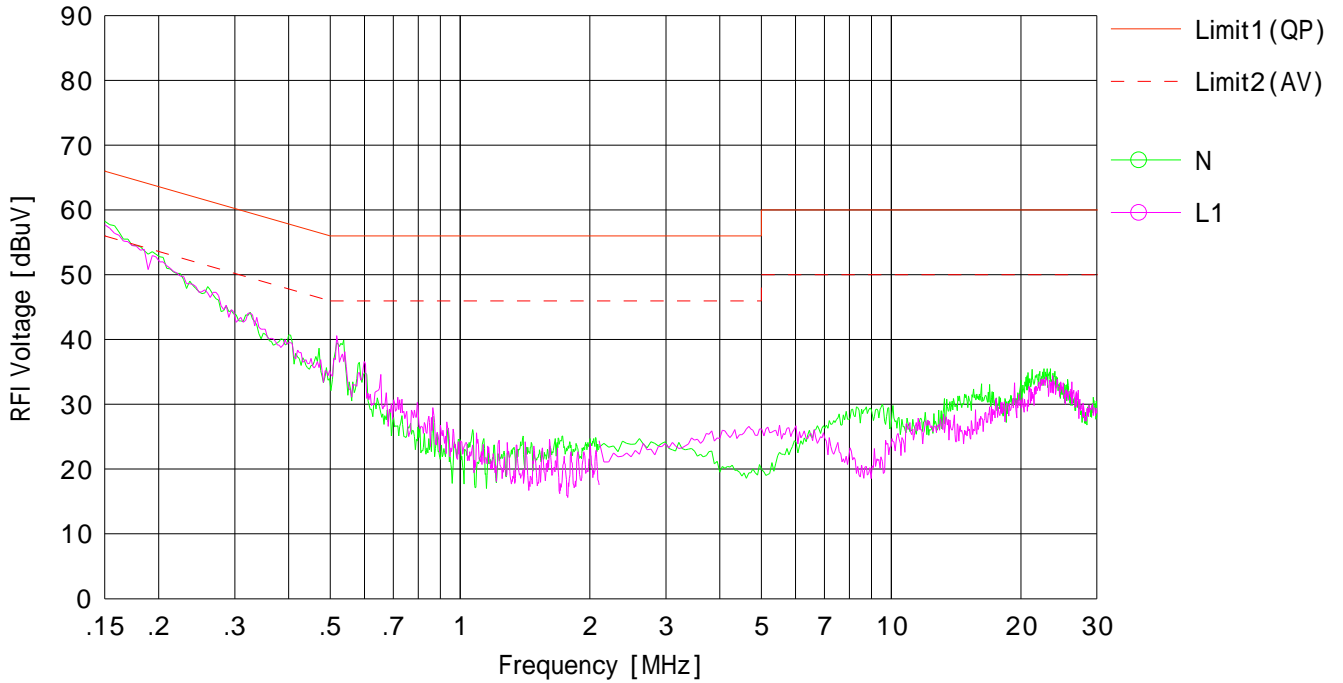
Company : Ricoh Company, Ltd.
Kind of EUT : Option(s) for Radiocommunications
Model No. : R-BT21A
Serial No. : 65

Mode : Tx 3DH5 2480MHz
Report No. : 31AE0037-HO-09-A
Power : DC5V
Temp./Humi. : 25deg.C./47%

Remarks : Host PC (AC120V/60Hz)

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading [dBuV]	C.Fac [dB]	Results [dBuV]	Limit		Margin		Phase	Comment
					<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]

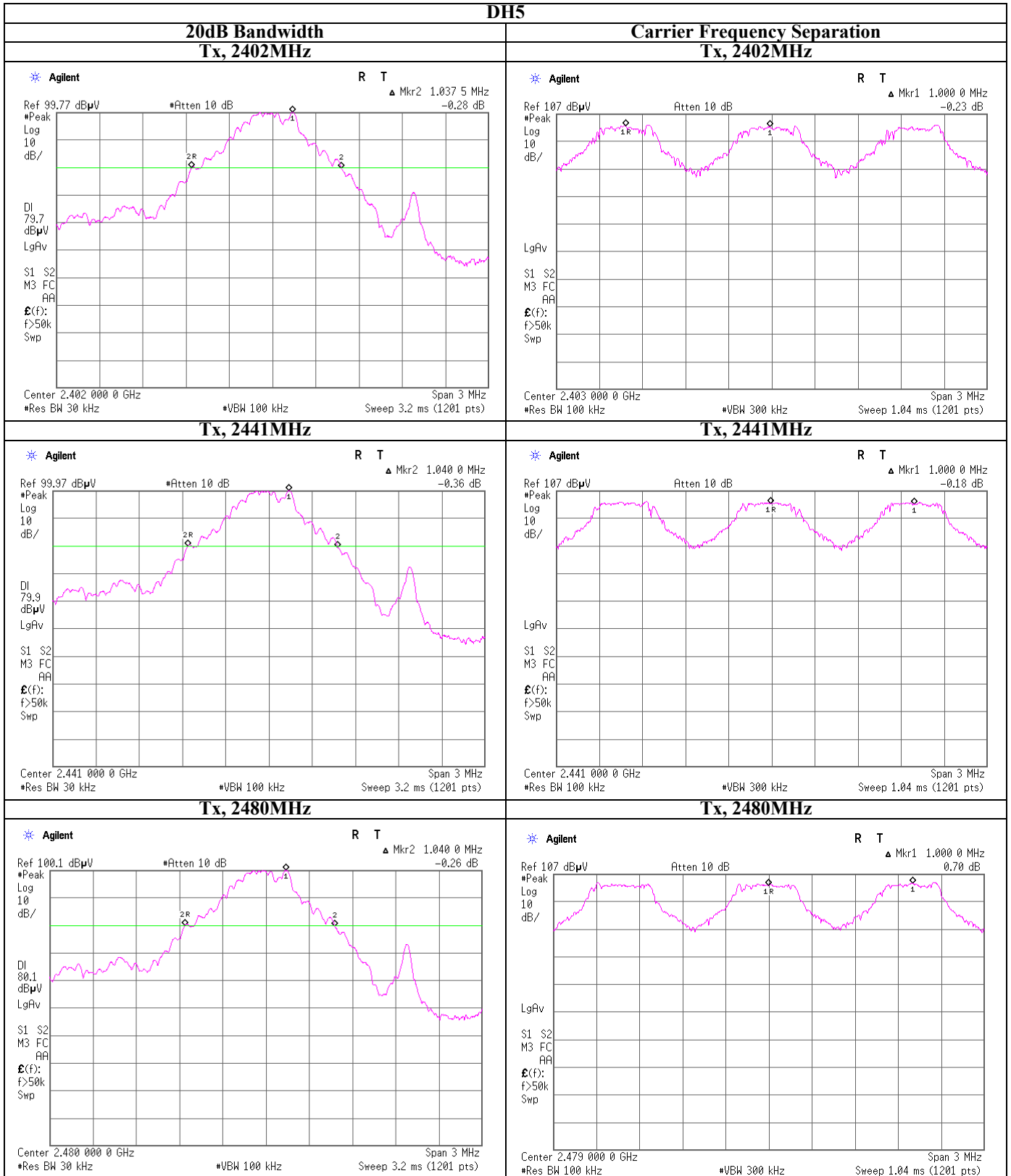
20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2010/10/1
Temperature / Humidity 25deg.C. , 54%
Engineer Akio Hayashi
Mode Tx

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	1.038	1.000	≥ 0.692
DH5	2441.0	1.040	1.000	≥ 0.693
DH5	2480.0	1.040	1.000	≥ 0.693
3DH5	2402.0	1.305	1.000	≥ 0.870
3DH5	2441.0	1.293	1.000	≥ 0.862
3DH5	2480.0	1.305	1.000	≥ 0.870
Inquiry	2441.0	0.830	2.000	≥ 0.553

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

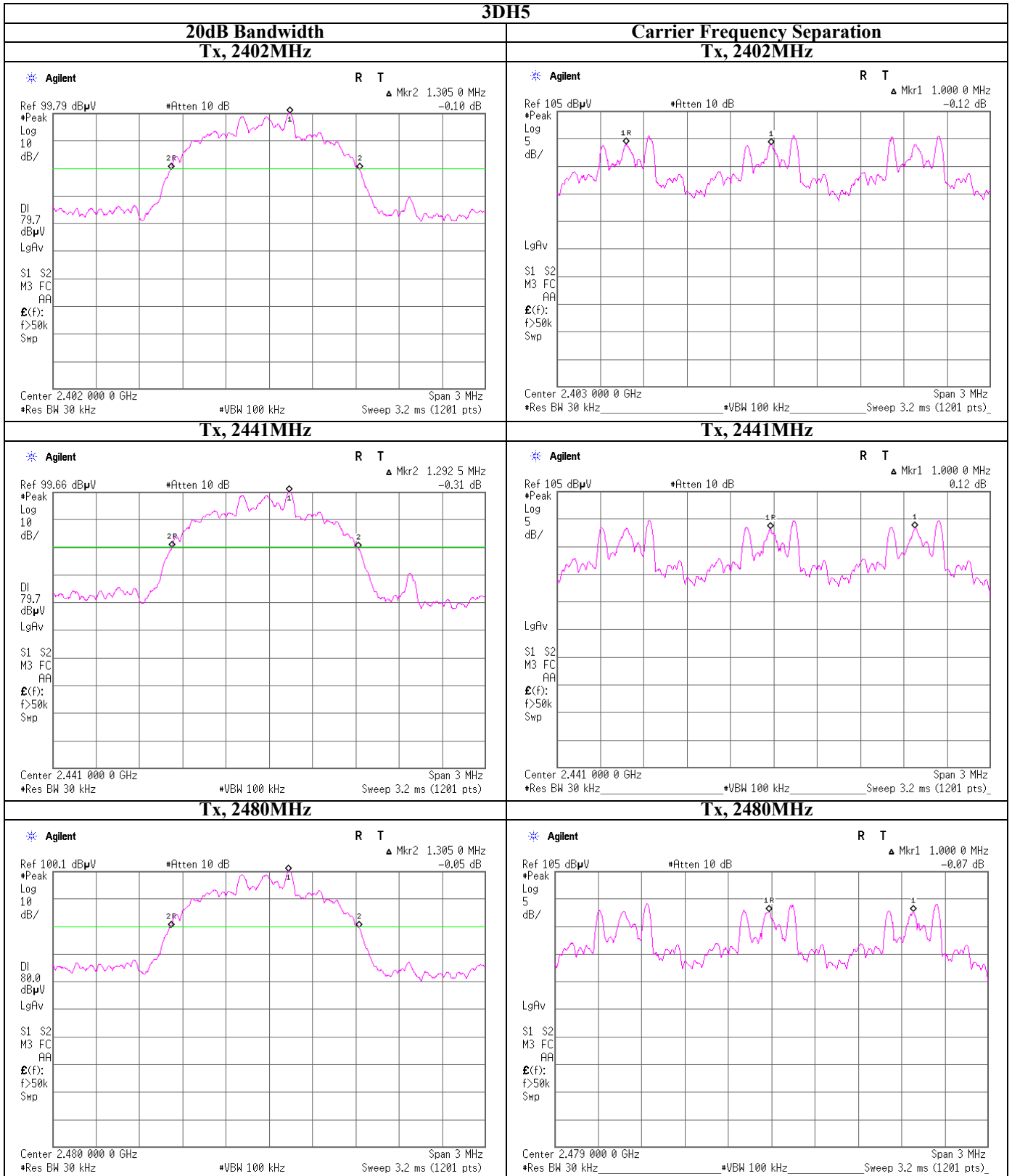
20dB Bandwidth and Carrier Frequency Separation



UL Japan, Inc.
Shonan EMC Lab.

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 Facsimile : +81 463 50 6401

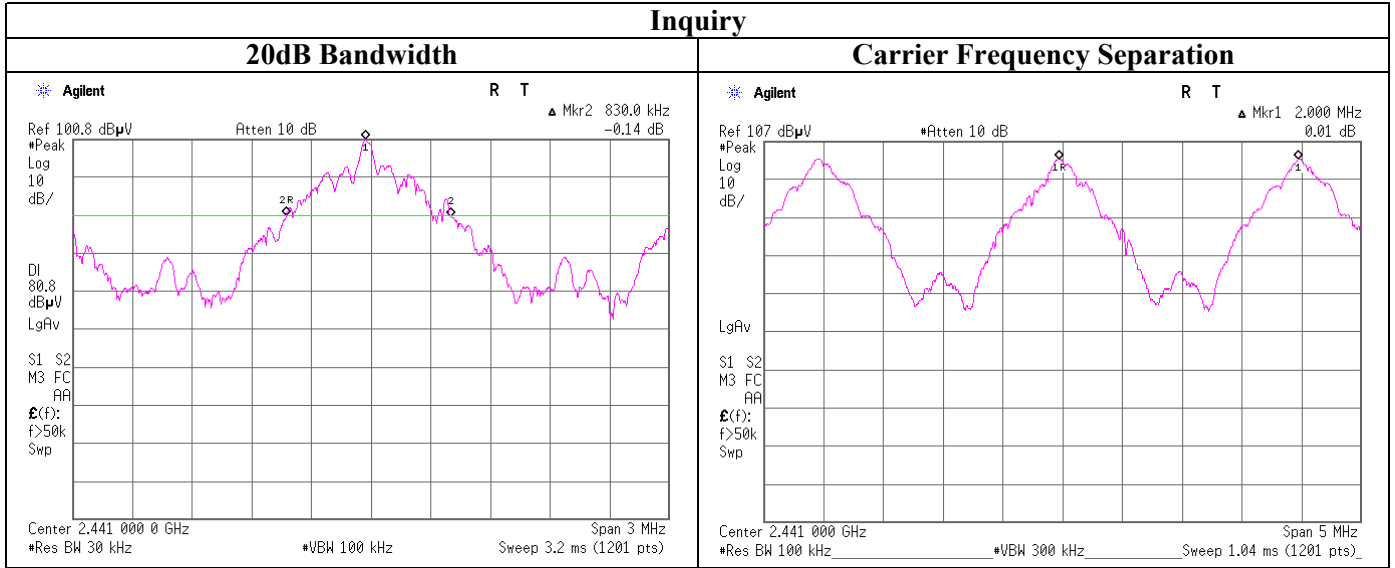
20dB Bandwidth and Carrier Frequency Separation



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20dB Bandwidth and Carrier Frequency Separation



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Number of Hopping Frequency (Conducted)

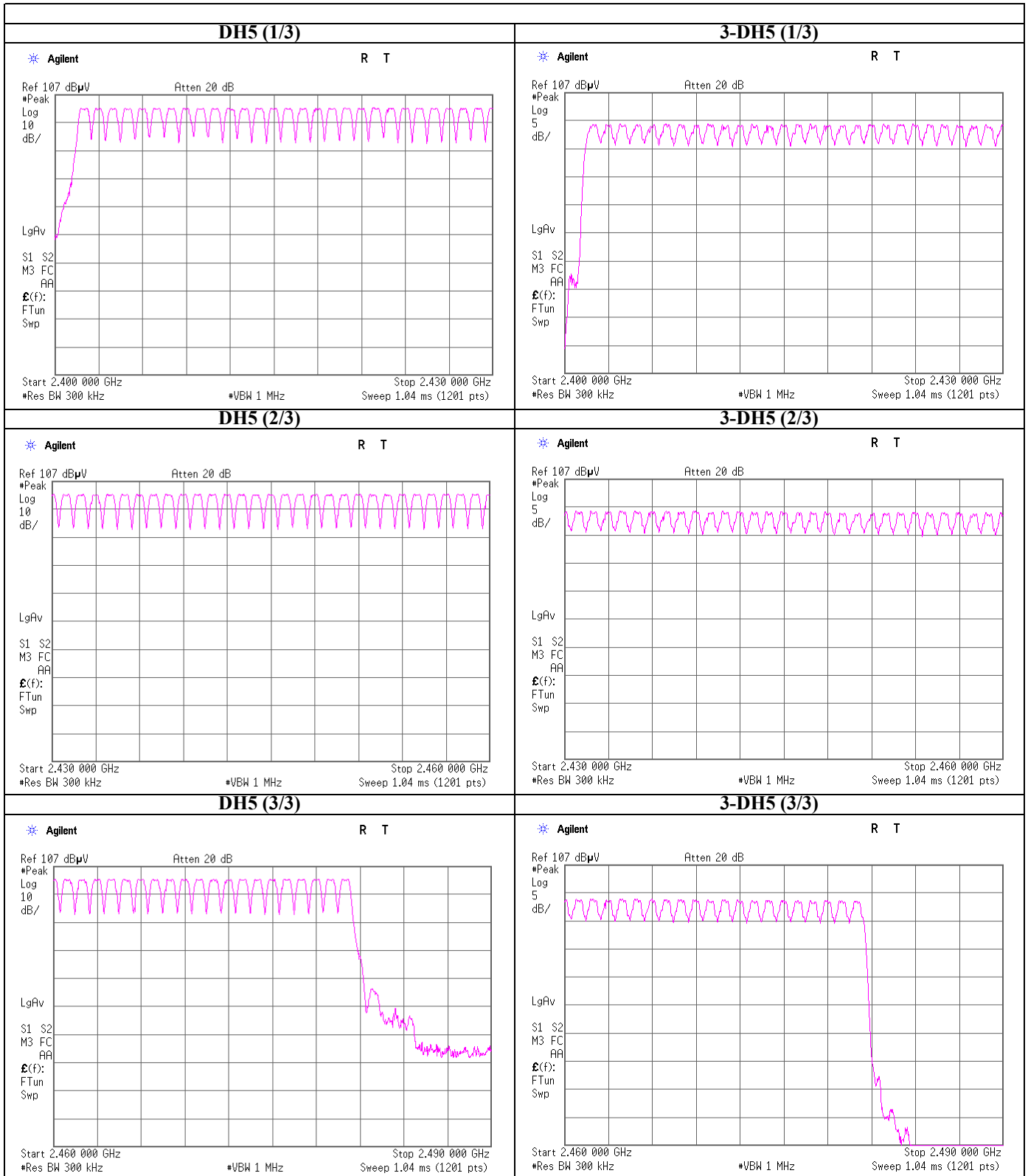
Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2010/9/30
Temperature / Humidity 26deg.C. , 52%
Engineer Akio Hayashi
Mode Tx

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)	
<p>Agilent R T</p> <p>Ref 107 dBμV #Atten 10 dB</p> <p>Start 2.400 000 GHz Stop 2.430 000 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 1.04 ms (1201 pts)</p>	
Inquiry (2/3)	
<p>Agilent R T</p> <p>Ref 107 dBμV #Atten 10 dB</p> <p>Start 2.430 000 GHz Stop 2.460 000 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 1.04 ms (1201 pts)</p>	
Inquiry (3/3)	
<p>Agilent R T</p> <p>Ref 107 dBμV #Atten 10 dB</p> <p>Start 2.460 000 GHz Stop 2.490 000 GHz #Res BW 300 kHz #VBW 1 MHz Sweep 1.04 ms (1201 pts)</p>	

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Dwell Time (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2010/9/30
Temperature / Humidity 26deg.C. , 52%
Engineer Akio Hayashi
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	51.0 times / 5 sec. x 31.6 sec. = 323 times	0.386	125	400
DH3	26.0 times / 5 sec. x 31.6 sec. = 165 times	1.643	271	400
DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.892	312	400
3DH1	51.0 times / 5 sec. x 31.6 sec. = 323 times	0.399	129	400
3DH3	26.0 times / 5 sec. x 31.6 sec. = 165 times	1.650	272	400
3DH5	17.0 times / 5 sec. x 31.6 sec. = 108 times	2.904	314	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.090	116	400

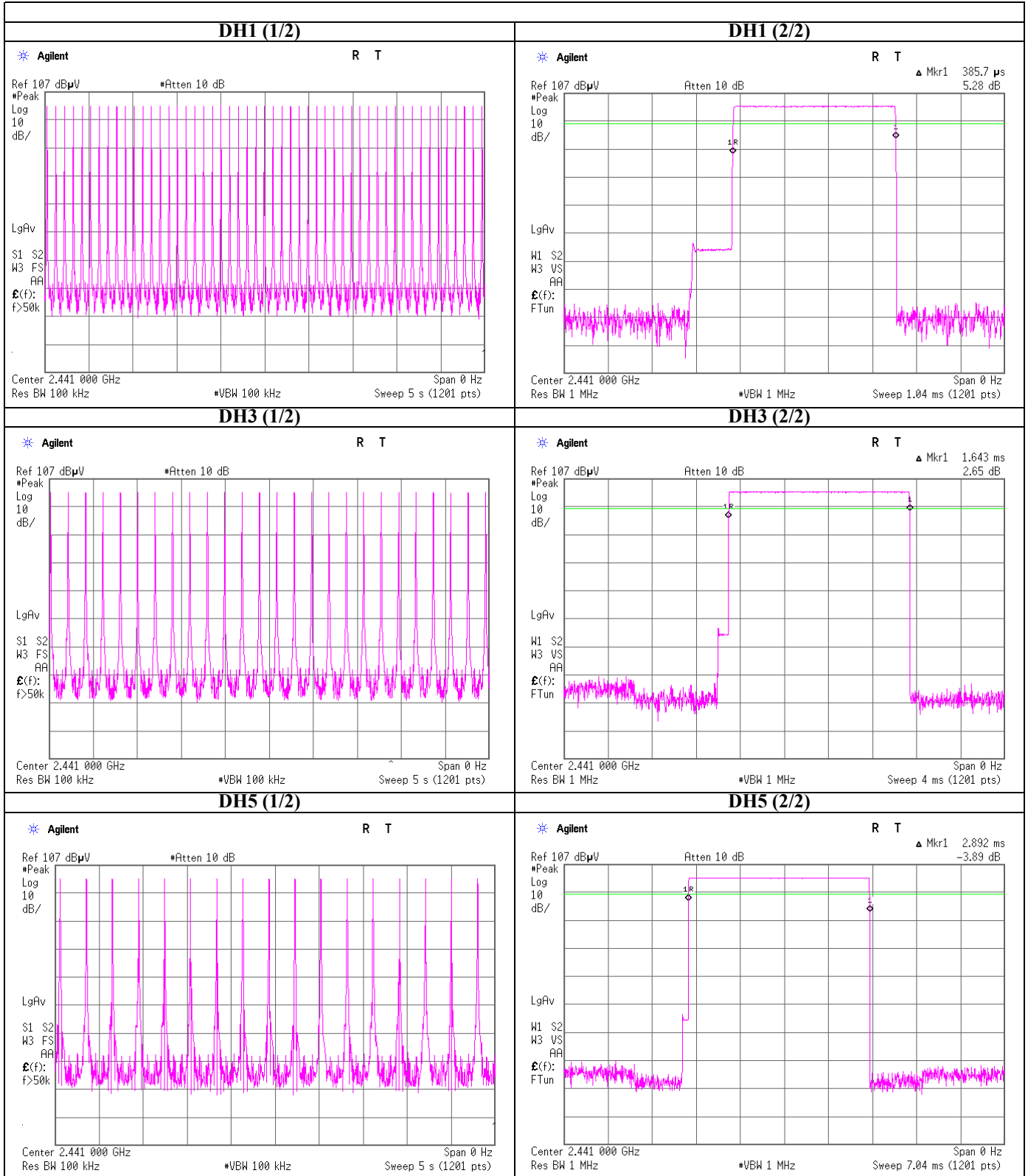
Sample Calculation

Result = Number of transmission x Length of transmission time

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Shonan EMC Lab.

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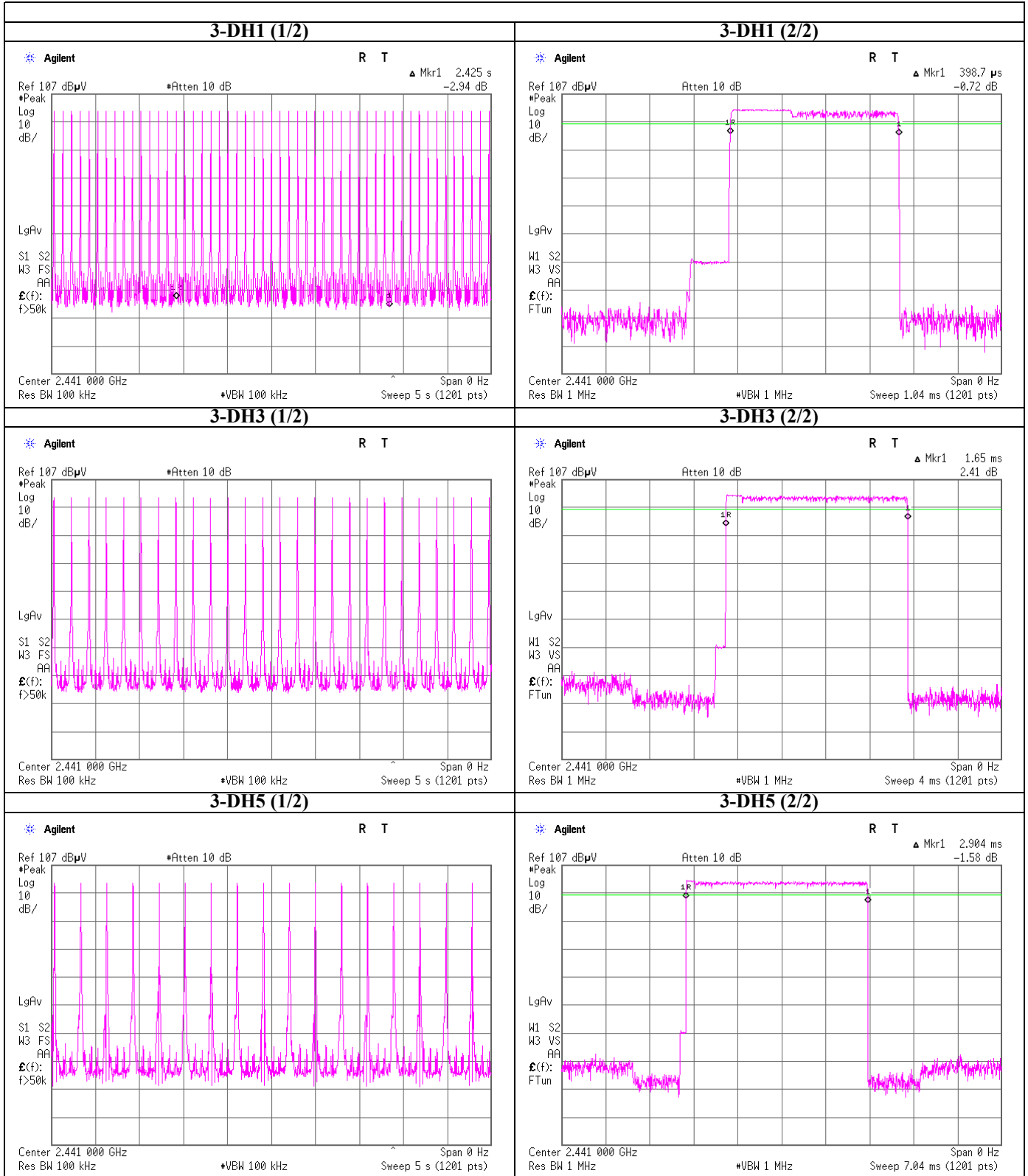
Dwell time



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Shonan EMC Lab.

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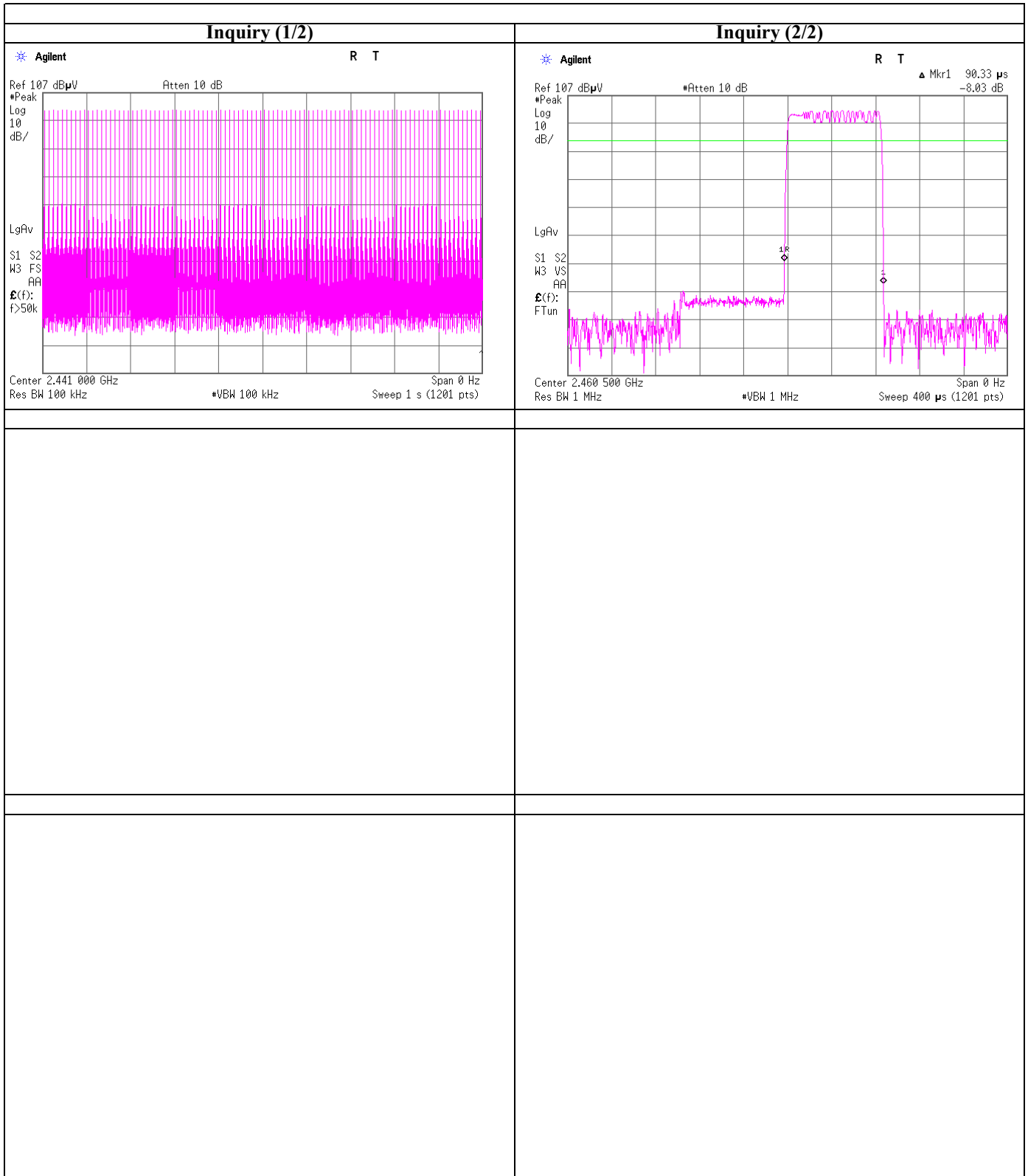
Dwell time



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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 2010/9/30
Temperature / Humidity 26deg.C. , 52%
Engineer Akio Hayashi
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	-4.74	0.30	20.03	15.59	36.22	20.96	125	5.37
Mid	2441.0	-4.66	0.30	20.03	15.67	36.90	20.96	125	5.29
High	2480.0	-4.59	0.30	20.03	15.74	37.50	20.96	125	5.22

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	-5.27	0.30	20.03	15.06	32.06	20.96	125	5.90
Mid	2441.0	-5.31	0.30	20.03	15.02	31.77	20.96	125	5.94
High	2480.0	-5.59	0.30	20.03	14.74	29.79	20.96	125	6.22

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	-5.35	0.30	20.03	14.98	31.48	20.96	125	5.98
Mid	2441.0	-5.48	0.30	20.03	14.85	30.55	20.96	125	6.11
High	2480.0	-5.88	0.30	20.03	14.45	27.86	20.96	125	6.51

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 2010/9/24 2010/9/25 2010/10/6
Temperature / Humidity 23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%
Engineer Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi
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.	565.629	QP	40.1	18.3	9.5	32.0	35.9	46.0	10.1	160	206	Axis:X
Hori.	1602.041	PK	54.6	25.5	12.7	40.1	52.7	73.9	21.2	100	277	Axis:X
Hori.	2390.000	PK	62.3	27.5	13.3	40.2	62.9	73.9	11.0	100	168	Axis:Y
Hori.	3204.010	PK	52.8	29.2	4.9	41.1	45.8	73.9	28.1	109	150	Axis:X
Hori.	4804.000	PK	52.6	31.5	5.5	40.1	49.5	73.9	24.4	100	195	Axis:X
Hori.	7206.000	PK	51.1	36.4	6.7	38.3	55.9	73.9	18.0	100	0	Axis:X , No noise detected
Hori.	9608.000	PK	48.7	37.9	7.8	37.3	57.1	73.9	16.8	100	0	Axis:X , No noise detected
Hori.	12010.000	PK	49.5	39.4	9.0	38.4	59.5	73.9	14.4	100	0	Axis:X , No noise detected
Hori.	1602.041	AV	49.8	25.5	12.7	40.1	47.9	53.9	6.0	100	277	Axis:X , VBW:10Hz
Hori.	3204.010	AV	45.0	29.2	4.9	41.1	38.0	53.9	15.9	109	150	Axis:X , VBW:10Hz
Vert.	75.732	QP	48.1	6.5	7.0	32.1	29.5	40.0	10.5	100	253	Axis:Y
Vert.	110.000	QP	46.6	11.8	7.3	32.1	33.6	43.5	9.9	100	301	Axis:Y
Vert.	130.124	QP	41.0	14.0	7.4	32.1	30.3	43.5	13.2	100	121	Axis:Y
Vert.	196.620	QP	39.4	16.7	7.8	32.0	31.9	43.5	11.6	100	280	Axis:Y
Vert.	212.456	QP	38.8	16.9	7.9	32.0	31.6	43.5	11.9	100	90	Axis:Y
Vert.	1602.405	PK	53.2	25.5	12.7	40.1	51.3	73.9	22.6	100	186	Axis:Y
Vert.	2390.000	PK	61.2	27.5	13.3	40.2	61.8	73.9	12.1	100	269	Axis:Z
Vert.	3204.016	PK	51.3	29.2	4.9	41.1	44.3	73.9	29.6	100	149	Axis:Y
Vert.	4804.000	PK	53.3	31.5	5.5	40.1	50.2	73.9	23.7	105	163	Axis:Y
Vert.	7206.000	PK	51.4	36.4	6.7	38.3	56.2	73.9	17.7	100	0	Axis:Y , No noise detected
Vert.	9608.000	PK	48.9	37.9	7.8	37.3	57.3	73.9	16.6	100	0	Axis:Y , No noise detected
Vert.	12010.000	PK	50.3	39.4	9.0	38.4	60.3	73.9	13.6	100	0	Axis:Y , No noise detected
Vert.	1602.405	AV	47.4	25.5	12.7	40.1	45.5	53.9	8.4	100	186	Axis:Y , VBW:10Hz
Vert.	3204.016	AV	42.9	29.2	4.9	41.1	35.9	53.9	18.0	100	149	Axis:Y , 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).

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

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	113.6	27.5	13.3	40.2	114.2	-	-	Carrier , Axis:Y
Hori.	2399.517	PK	69.6	27.5	13.3	40.2	70.2	94.2	24.0	Axis:Y
Vert.	2402.000	PK	113.9	27.5	13.3	40.2	114.5	-	-	Carrier , Axis:Z
Vert.	2399.517	PK	69.4	27.5	13.3	40.2	70.0	94.5	24.5	Axis:Z

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	46.7	27.5	13.3	40.2	-30.8	16.5	53.9	37.4	Axis:Y , VBW:300Hz
Hori.	4808.000	AV	44.8	31.5	5.5	40.1	-30.8	10.9	53.9	43.0	Axis:X , VBW:300Hz
Hori.	7206.000	AV	39.1	36.4	6.7	38.3	-30.8	13.1	53.9	40.8	Axis:X , VBW:300Hz
Hori.	9608.000	AV	37.7	37.9	7.8	37.3	-30.8	15.3	53.9	38.6	Axis:X , VBW:300Hz
Hori.	12010.000	AV	38.0	39.4	9.0	38.4	-30.8	17.2	53.9	36.7	Axis:X , VBW:300Hz
Vert.	2390.000	AV	46.2	27.5	13.3	40.2	-30.8	16.0	53.9	37.9	Axis:Z , VBW:300Hz
Vert.	4804.000	AV	45.6	31.5	5.5	40.1	-30.8	11.7	53.9	42.2	Axis:Y , VBW:300Hz
Vert.	7206.000	AV	39.2	36.4	6.7	38.3	-30.8	13.2	53.9	40.7	Axis:Y , VBW:300Hz
Vert.	9608.000	AV	37.6	37.9	7.8	37.3	-30.8	15.2	53.9	38.7	Axis:Y , VBW:300Hz
Vert.	12010.000	AV	38.1	39.4	9.0	38.4	-30.8	17.3	53.9	36.6	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 43)

*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 2010/9/24 2010/9/25 2010/9/26 2010/10/6
Temperature / Humidity 23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%
Engineer Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi
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.	565.629	QP	40.3	18.3	9.5	32.0	36.1	46.0	9.9	160	206	Axis:X
Hori.	1628.043	PK	53.0	25.6	12.7	40.1	51.2	73.9	22.7	100	274	Axis:X
Hori.	3256.022	PK	52.8	29.3	4.8	41.1	45.8	73.9	28.1	102	94	Axis:X
Hori.	4882.000	PK	50.8	31.7	5.6	40.0	48.1	73.9	25.8	100	195	Axis:X
Hori.	7323.000	PK	46.4	36.7	6.9	38.5	51.5	73.9	22.4	100	0	Axis:X , No noise detected
Hori.	9764.000	PK	45.8	38.2	7.8	37.4	54.4	73.9	19.5	100	0	Axis:X , No noise detected
Hori.	12205.000	PK	45.6	39.2	9.1	38.1	55.8	73.9	18.1	100	0	Axis:X , No noise detected
Hori.	1628.043	AV	49.2	25.6	12.7	40.1	47.4	53.9	6.5	100	274	Axis:X , VBW:10Hz
Hori.	3256.022	AV	47.0	29.3	4.8	41.1	40.0	53.9	13.9	102	94	Axis:X , VBW:10Hz
Vert.	75.732	QP	47.9	6.5	7.0	32.1	29.3	40.0	10.7	100	253	Axis:Y
Vert.	110.000	QP	46.7	11.8	7.3	32.1	33.7	43.5	9.8	100	301	Axis:Y
Vert.	130.124	QP	40.4	14.0	7.4	32.1	29.7	43.5	13.8	100	121	Axis:Y
Vert.	196.620	QP	42.0	16.7	7.8	32.0	34.5	43.5	9.0	100	280	Axis:Y
Vert.	212.456	QP	39.8	16.9	7.9	32.0	32.6	43.5	10.9	100	90	Axis:Y
Vert.	1628.031	PK	53.5	25.6	12.7	40.1	51.7	73.9	22.2	100	182	Axis:Y
Vert.	3256.007	PK	52.8	29.3	4.8	41.1	45.8	73.9	28.1	100	169	Axis:Y
Vert.	4882.000	PK	51.6	31.7	5.6	40.0	48.9	73.9	25.0	101	176	Axis:Y
Vert.	7323.000	PK	46.6	36.7	6.9	38.5	51.7	73.9	22.2	100	0	Axis:Y , No noise detected
Vert.	9764.000	PK	44.9	38.2	7.8	37.4	53.5	73.9	20.4	100	0	Axis:Y , No noise detected
Vert.	12205.000	PK	45.7	39.2	9.1	38.1	55.9	73.9	18.0	100	0	Axis:Y , No noise detected
Vert.	1628.031	AV	49.3	25.6	12.7	40.1	47.5	53.9	6.4	100	182	Axis:Y , VBW:10Hz
Vert.	3256.007	AV	47.7	29.3	4.8	41.1	40.7	53.9	13.2	100	169	Axis:Y , 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	43.1	31.7	5.6	40.0	-30.8	9.6	53.9	44.3	Axis:X , VBW:300Hz
Hori.	7323.000	AV	35.1	36.7	6.9	38.5	-30.8	9.4	53.9	44.5	Axis:X , VBW:300Hz
Hori.	9764.000	AV	33.5	38.2	7.8	37.4	-30.8	11.3	53.9	42.6	Axis:X , VBW:300Hz
Hori.	12205.000	AV	35.0	39.2	9.1	38.1	-30.8	14.4	53.9	39.5	Axis:X , VBW:300Hz
Vert.	4882.000	AV	44.6	31.7	5.6	40.0	-30.8	11.1	53.9	42.8	Axis:Y , VBW:300Hz
Vert.	7323.000	AV	34.9	36.7	6.9	38.5	-30.8	9.2	53.9	44.7	Axis:Y , VBW:300Hz
Vert.	9764.000	AV	33.4	38.2	7.8	37.4	-30.8	11.2	53.9	42.7	Axis:Y , VBW:300Hz
Vert.	12205.000	AV	33.8	39.2	9.1	38.1	-30.8	13.2	53.9	40.7	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 43)

*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	2010/9/24 2010/9/25 2010/9/26 2010/10/6	
Temperature / Humidity	23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%	
Engineer	Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi	
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.	565.629	QP	40.0	18.3	9.5	32.0	35.8	46.0	10.2	160	206	Axis:X
Hori.	1654.057	PK	53.5	25.7	12.8	40.2	51.8	73.9	22.1	100	270	Axis:X
Hori.	3306.046	PK	52.5	29.3	4.9	41.1	45.6	73.9	28.3	105	96	Axis:X
Hori.	4960.000	PK	49.0	31.9	5.6	40.0	46.5	73.9	27.4	100	322	Axis:X
Hori.	7440.000	PK	48.2	36.9	7.1	38.7	53.5	73.9	20.4	100	0	Axis:X , No noise detected
Hori.	9920.000	PK	45.3	38.4	8.0	37.5	54.2	73.9	19.7	100	0	Axis:X , No noise detected
Hori.	12400.000	PK	44.0	39.1	9.4	37.9	54.6	73.9	19.3	100	0	Axis:X , No noise detected
Hori.	1654.057	AV	49.6	25.7	12.8	40.2	47.9	53.9	6.0	100	270	Axis:X , VBW:10Hz
Hori.	3306.046	AV	45.9	29.3	4.9	41.1	39.0	53.9	14.9	105	96	Axis:X , VBW:10Hz
Vert.	75.732	QP	47.8	6.5	7.0	32.1	29.2	40.0	10.8	100	253	Axis:Y
Vert.	110.000	QP	46.5	11.8	7.3	32.1	33.5	43.5	10.0	100	301	Axis:Y
Vert.	130.124	QP	40.3	14.0	7.4	32.1	29.6	43.5	13.9	100	121	Axis:Y
Vert.	196.620	QP	42.0	16.7	7.8	32.0	34.5	43.5	9.0	100	280	Axis:Y
Vert.	212.456	QP	39.8	16.9	7.9	32.0	32.6	43.5	10.9	100	90	Axis:Y
Vert.	1654.042	PK	53.1	25.7	12.8	40.2	51.4	73.9	22.5	100	184	Axis:Y
Vert.	3306.055	PK	55.0	29.3	4.9	41.1	48.1	73.9	25.8	100	200	Axis:Y
Vert.	4960.000	PK	50.0	31.9	5.6	40.0	47.5	73.9	26.4	100	191	Axis:Y
Vert.	7440.000	PK	47.4	36.9	7.1	38.7	52.7	73.9	21.2	100	0	Axis:Y , No noise detected
Vert.	9920.000	PK	45.2	38.4	8.0	37.5	54.1	73.9	19.8	100	0	Axis:Y , No noise detected
Vert.	12400.000	PK	43.7	39.1	9.4	37.9	54.3	73.9	19.6	100	0	Axis:Y , No noise detected
Vert.	1654.042	AV	48.6	25.7	12.8	40.2	46.9	53.9	7.0	100	184	Axis:Y , VBW:10Hz
Vert.	3306.055	AV	51.8	29.3	4.9	41.1	44.9	53.9	9.0	100	200	Axis:Y , 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.	4960.000	AV	40.0	31.9	5.6	40.0	-30.8	6.7	53.9	47.2	Axis:X , VBW:300Hz
Hori.	7440.000	AV	35.4	36.9	7.1	38.7	-30.8	9.9	53.9	44.0	Axis:X , VBW:300Hz
Hori.	9920.000	AV	33.7	38.4	8.0	37.5	-30.8	11.8	53.9	42.1	Axis:X , VBW:300Hz
Hori.	12400.000	AV	32.6	39.1	9.4	37.9	-30.8	12.4	53.9	41.5	Axis:X , VBW:300Hz
Vert.	4960.000	AV	42.1	31.9	5.6	40.0	-30.8	8.8	53.9	45.1	Axis:Y , VBW:300Hz
Vert.	7440.000	AV	35.3	36.9	7.1	38.7	-30.8	9.8	53.9	44.1	Axis:Y , VBW:300Hz
Vert.	9920.000	AV	33.7	38.4	8.0	37.5	-30.8	11.8	53.9	42.1	Axis:Y , VBW:300Hz
Vert.	12400.000	AV	32.3	39.1	9.4	37.9	-30.8	12.1	53.9	41.8	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 43)

*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(Band Edge Compliance) (for Marker Delta Method)

Bluetooth, DH5, Tx 2480MHz

Marker Delta Method(Test distance 3meters)

Frequency of Band-edge:2483.500MHz

		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]		[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]
Step1	Fundamental(2480.000MHz)	1M / 3MHz	103.6	114.7	104.7	115.8	1M / 300Hz	103.4	114.5	104.2	115.3
Step2	Fundamental(2480.000MHz)	51k / 160kHz	103.3	114.4	104.4	115.5	-	-	-	-	-
	Band-edge	51k / 160kHz	50.2	61.3	51.4	62.5	-	-	-	-	-
	Amplitude delta[dB]	-	53.1		53.0		-	53.1		53.0	
Step3	Field strength of band-edge	-	-	61.6	-	62.8	-	-	61.4	-	62.3
Step4	Dwell time factor (-30.78dB)	-	-	-	-	-	-	-	30.6	-	31.5
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	12.3		11.1		-	23.3		22.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:51kHz,VBW:160kHz) - Band-edge(RBW:51kHz,VBW:160kHz)

*2 Field strength of band-edge = Fundamental(PK or AV) - Amplitude delta - Dwell time factor(AV)

Marker Delta Method(Test distance 3meters)

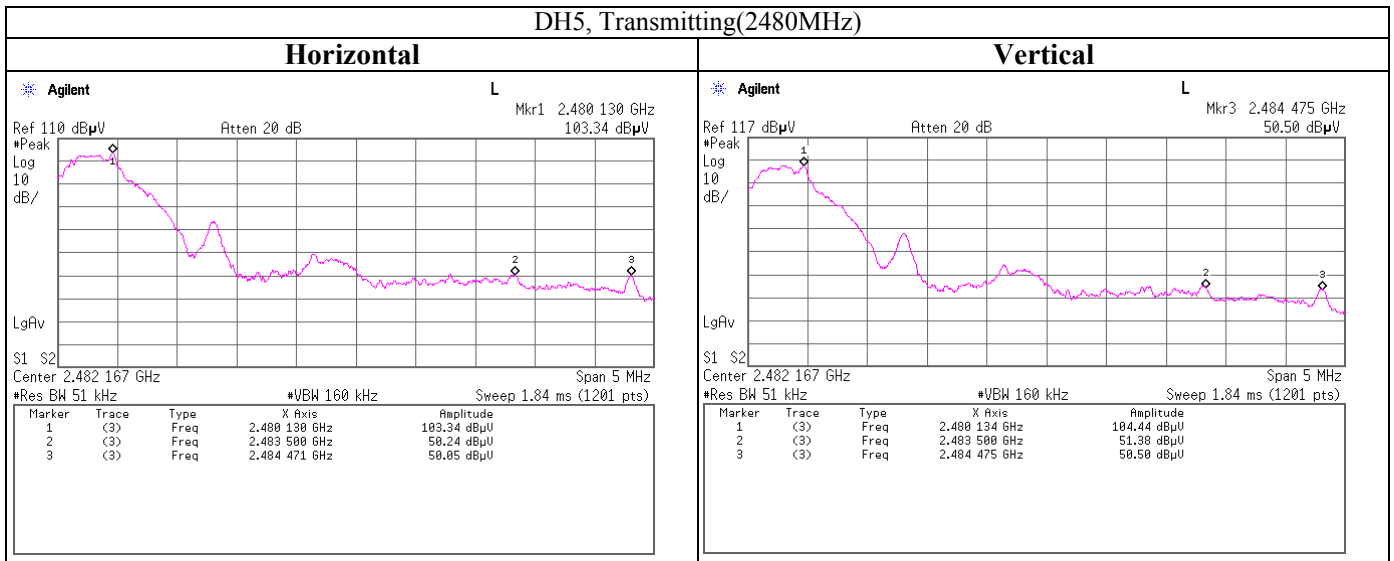
Frequency of Band-edge:2484.471MHz(Hor) , 2484.475MHz(Ver)

		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]		[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]
Step1	Fundamental(2480.000MHz)	1M / 3MHz	103.6	114.7	104.7	115.8	1M / 300Hz	103.4	114.5	104.2	115.3
Step2	Fundamental(2480.000MHz)	51k / 160kHz	103.3	114.4	104.4	115.5	-	-	-	-	-
	Band-edge	51k / 160kHz	50.1	61.2	50.5	61.6	-	-	-	-	-
	Amplitude delta[dB]	-	53.2		53.9		-	53.2		53.9	
Step3	Field strength of band-edge	-	-	61.5	-	61.9	-	-	61.3	-	61.4
Step4	Dwell time factor (-30.78dB)	-	-	-	-	-	-	-	30.5	-	30.6
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	12.4		12.0		-	23.4		23.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:51kHz,VBW:160kHz) - Band-edge(RBW:51kHz,VBW:160kHz)

*2 Field strength of band-edge = Fundamental(PK or AV) - Amplitude delta - Dwell time factor(AV)



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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date 2010/9/24 2010/9/26 2010/10/6
Temperature / Humidity 23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%
Engineer Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi
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.	565.629	QP	39.6	18.3	9.5	32.0	35.4	46.0	10.6	160	200	Axis:X
Hori.	1602.405	PK	54.2	25.5	12.7	40.1	52.3	73.9	21.6	100	278	Axis:X
Hori.	2390.000	PK	60.0	27.5	13.3	40.2	60.6	73.9	13.3	100	168	Axis:Y
Hori.	3204.033	PK	53.8	29.2	4.9	41.1	46.8	73.9	27.1	108	195	Axis:X
Hori.	4804.000	PK	50.6	31.5	5.5	40.1	47.5	73.9	26.4	100	194	Axis:X
Hori.	7206.000	PK	47.4	36.4	6.7	38.3	52.2	73.9	21.7	100	0	Axis:X , No noise detected
Hori.	9608.000	PK	45.9	37.9	7.8	37.3	54.3	73.9	19.6	100	0	Axis:X , No noise detected
Hori.	12010.000	PK	45.6	39.4	9.0	38.4	55.6	73.9	18.3	100	0	Axis:X , No noise detected
Hori.	1602.405	AV	50.8	25.5	12.7	40.1	48.9	53.9	5.0	100	278	Axis:X , VBW:10Hz
Hori.	3204.033	AV	46.1	29.2	4.9	41.1	39.1	53.9	14.8	108	195	Axis:X , VBW:10Hz
Vert.	75.732	QP	48.1	6.5	7.0	32.1	29.5	40.0	10.5	100	253	Axis:Y
Vert.	110.000	QP	45.7	11.8	7.3	32.1	32.7	43.5	10.8	100	301	Axis:Y
Vert.	130.124	QP	41.2	14.0	7.4	32.1	30.5	43.5	13.0	100	121	Axis:Y
Vert.	196.620	QP	40.8	16.7	7.8	32.0	33.3	43.5	10.2	100	280	Axis:Y
Vert.	212.456	QP	39.5	16.9	7.9	32.0	32.3	43.5	11.2	100	90	Axis:Y
Vert.	1602.053	PK	54.1	25.5	12.7	40.1	52.2	73.9	21.7	100	186	Axis:Y
Vert.	2390.000	PK	60.8	27.5	13.3	40.2	61.4	73.9	12.5	100	269	Axis:Z
Vert.	3204.037	PK	54.1	29.2	4.9	41.1	47.1	73.9	26.8	100	160	Axis:Y
Vert.	4804.000	PK	51.5	31.5	5.5	40.1	48.4	73.9	25.5	104	175	Axis:Y
Vert.	7206.000	PK	47.2	36.4	6.7	38.3	52.0	73.9	21.9	100	0	Axis:Y , No noise detected
Vert.	9608.000	PK	45.5	37.9	7.8	37.3	53.9	73.9	20.0	100	0	Axis:Y , No noise detected
Vert.	12010.000	PK	45.3	39.4	9.0	38.4	55.3	73.9	18.6	100	0	Axis:Y , No noise detected
Vert.	1602.053	AV	49.8	25.5	12.7	40.1	47.9	53.9	6.0	100	186	Axis:Y , VBW:10Hz
Vert.	3204.037	AV	49.0	29.2	4.9	41.1	42.0	53.9	11.9	100	160	Axis:Y , 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).

20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

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	110.0	27.5	13.3	40.2	110.6	-	-	Carrier , Axis:Y
Hori.	2400.000	PK	64.5	27.5	13.3	40.2	65.1	90.6	25.5	Axis:Y
Vert.	2402.000	PK	111.7	27.5	13.3	40.2	112.3	-	-	Carrier , Axis:Z
Vert.	2400.000	PK	66.3	27.5	13.3	40.2	66.9	92.3	25.4	Axis:Z

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

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	45.2	27.5	13.3	40.2	-30.7	15.1	53.9	38.8	Axis:Y , VBW:300Hz
Hori.	4808.000	AV	41.6	31.5	5.5	40.1	-30.7	7.8	53.9	46.1	Axis:X , VBW:300Hz
Hori.	7206.000	AV	35.5	36.4	6.7	38.3	-30.7	9.6	53.9	44.3	Axis:X , VBW:300Hz
Hori.	9608.000	AV	33.8	37.9	7.8	37.3	-30.7	11.5	53.9	42.4	Axis:X , VBW:300Hz
Hori.	12010.000	AV	33.7	39.4	9.0	38.4	-30.7	13.0	53.9	40.9	Axis:X , VBW:300Hz
Vert.	2390.000	AV	45.7	27.5	13.3	40.2	-30.7	15.6	53.9	38.3	Axis:Z , VBW:300Hz
Vert.	4804.000	AV	42.2	31.5	5.5	40.1	-30.7	8.4	53.9	45.5	Axis:Y , VBW:300Hz
Vert.	7206.000	AV	35.6	36.4	6.7	38.3	-30.7	9.7	53.9	44.2	Axis:Y , VBW:300Hz
Vert.	9608.000	AV	33.7	37.9	7.8	37.3	-30.7	11.4	53.9	42.5	Axis:Y , VBW:300Hz
Vert.	12010.000	AV	32.9	39.4	9.0	38.4	-30.7	12.2	53.9	41.7	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 44)

*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 2010/9/24 2010/9/25 2010/9/26 2010/10/6
Temperature / Humidity 23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%
Engineer Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi
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.	565.629	QP	40.0	18.3	9.5	32.0	35.8	46.0	10.2	160	200	Axis:X
Hori.	1628.051	PK	53.0	25.6	12.7	40.1	51.2	73.9	22.7	100	204	Axis:X
Hori.	3256.027	PK	54.3	29.3	4.8	41.1	47.3	73.9	26.6	107	139	Axis:X
Hori.	4882.000	PK	49.7	31.7	5.6	40.0	47.0	73.9	26.9	100	195	Axis:X
Hori.	7323.000	PK	47.4	36.7	6.9	38.5	52.5	73.9	21.4	100	0	Axis:X , No noise detected
Hori.	9764.000	PK	46.2	38.2	7.8	37.4	54.8	73.9	19.1	100	0	Axis:X , No noise detected
Hori.	12205.000	PK	46.7	39.2	9.1	38.1	56.9	73.9	17.0	100	0	Axis:X , No noise detected
Hori.	1628.051	AV	48.4	25.6	12.7	40.1	46.6	53.9	7.3	100	204	Axis:X , VBW:10Hz
Hori.	3256.027	AV	47.2	29.3	4.8	41.1	40.2	53.9	13.7	107	139	Axis:X , VBW:10Hz
Vert.	75.732	QP	48.0	6.5	7.0	32.1	29.4	40.0	10.6	100	253	Axis:Y
Vert.	110.000	QP	46.3	11.8	7.3	32.1	33.3	43.5	10.2	100	301	Axis:Y
Vert.	130.124	QP	40.7	14.0	7.4	32.1	30.0	43.5	13.5	100	121	Axis:Y
Vert.	196.620	QP	41.3	16.7	7.8	32.0	33.8	43.5	9.7	100	280	Axis:Y
Vert.	212.456	QP	39.7	16.9	7.9	32.0	32.5	43.5	11.0	100	90	Axis:Y
Vert.	1628.047	PK	53.2	25.6	12.7	40.1	51.4	73.9	22.5	100	180	Axis:Y
Vert.	3256.005	PK	54.0	29.3	4.8	41.1	47.0	73.9	26.9	100	166	Axis:Y
Vert.	4882.000	PK	50.9	31.7	5.6	40.0	48.2	73.9	25.7	104	192	Axis:Y
Vert.	7323.000	PK	47.5	36.7	6.9	38.5	52.6	73.9	21.3	100	0	Axis:Y , No noise detected
Vert.	9764.000	PK	45.0	38.2	7.8	37.4	53.6	73.9	20.3	100	0	Axis:Y , No noise detected
Vert.	12205.000	PK	44.8	39.2	9.1	38.1	55.0	73.9	18.9	100	0	Axis:Y , No noise detected
Vert.	1628.047	AV	48.9	25.6	12.7	40.1	47.1	53.9	6.8	100	180	Axis:Y , VBW:10Hz
Vert.	3256.005	AV	47.0	29.3	4.8	41.1	40.0	53.9	13.9	100	166	Axis:Y , 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	39.8	31.7	5.6	40.0	-30.7	6.4	53.9	47.5	Axis:X , VBW:300Hz
Hori.	7323.000	AV	35.2	36.7	6.9	38.5	-30.7	9.6	53.9	44.3	Axis:X , VBW:300Hz
Hori.	9764.000	AV	33.5	38.2	7.8	37.4	-30.7	11.4	53.9	42.5	Axis:X , VBW:300Hz
Hori.	12205.000	AV	34.2	39.2	9.1	38.1	-30.7	13.7	53.9	40.2	Axis:X , VBW:300Hz
Vert.	4882.000	AV	41.0	31.7	5.6	40.0	-30.7	7.6	53.9	46.3	Axis:Y , VBW:300Hz
Vert.	7323.000	AV	35.0	36.7	6.9	38.5	-30.7	9.4	53.9	44.5	Axis:Y , VBW:300Hz
Vert.	9764.000	AV	33.6	38.2	7.8	37.4	-30.7	11.5	53.9	42.4	Axis:Y , VBW:300Hz
Vert.	12205.000	AV	33.4	39.2	9.1	38.1	-30.7	12.9	53.9	41.0	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 44)

*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 2010/9/24 2010/9/25 2010/9/26 2010/10/6
Temperature / Humidity 23deg.C. , 58% 25deg.C. , 46% 25deg.C. , 55% 22deg.C. , 60%
Engineer Shinichi Takano Shinichi Takano Makoto Hosaka Akio Hayashi
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.	565.629	QP	40.1	18.3	9.5	32.0	35.9	46.0	10.1	160	200	Axis:X
Hori.	1654.041	PK	53.1	25.7	12.8	40.2	51.4	73.9	22.5	100	272	Axis:X
Hori.	3308.021	PK	56.3	29.3	4.9	41.1	49.4	73.9	24.5	102	94	Axis:X
Hori.	4960.000	PK	47.8	31.9	5.6	40.0	45.3	73.9	28.6	100	192	Axis:X
Hori.	7440.000	PK	47.5	36.9	7.1	38.7	52.8	73.9	21.1	100	0	Axis:X , No noise detected
Hori.	9920.000	PK	46.0	38.4	8.0	37.5	54.9	73.9	19.0	100	0	Axis:X , No noise detected
Hori.	12400.000	PK	43.8	39.1	9.4	37.9	54.4	73.9	19.5	100	0	Axis:X , No noise detected
Hori.	1654.041	AV	48.8	25.7	12.8	40.2	47.1	53.9	6.8	100	272	Axis:X , VBW:10Hz
Hori.	3308.021	AV	50.4	29.3	4.9	41.1	43.5	53.9	10.4	102	94	Axis:X , VBW:10Hz
Vert.	75.732	QP	47.9	6.5	7.0	32.1	29.3	40.0	10.7	100	253	Axis:Y
Vert.	110.000	QP	46.5	11.8	7.3	32.1	33.5	43.5	10.0	100	301	Axis:Y
Vert.	130.124	QP	41.1	14.0	7.4	32.1	30.4	43.5	13.1	100	121	Axis:Y
Vert.	196.620	QP	41.7	16.7	7.8	32.0	34.2	43.5	9.3	100	280	Axis:Y
Vert.	212.456	QP	39.1	16.9	7.9	32.0	31.9	43.5	11.6	100	90	Axis:Y
Vert.	1654.037	PK	52.5	25.7	12.8	40.2	50.8	73.9	23.1	100	185	Axis:Y
Vert.	3308.021	PK	55.7	29.3	4.9	41.1	48.8	73.9	25.1	100	200	Axis:Y
Vert.	4960.000	PK	48.8	31.9	5.6	40.0	46.3	73.9	27.6	101	191	Axis:Y
Vert.	7440.000	PK	47.1	36.9	7.1	38.7	52.4	73.9	21.5	100	0	Axis:Y , No noise detected
Vert.	9920.000	PK	45.5	38.4	8.0	37.5	54.4	73.9	19.5	100	0	Axis:Y , No noise detected
Vert.	12400.000	PK	44.6	39.1	9.4	37.9	55.2	73.9	18.7	100	0	Axis:Y , No noise detected
Vert.	1654.037	AV	47.7	25.7	12.8	40.2	46.0	53.9	7.9	100	185	Axis:Y , VBW:10Hz
Vert.	3308.021	AV	49.6	29.3	4.9	41.1	42.7	53.9	11.2	100	200	Axis:Y , 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.	4960.000	AV	36.8	31.9	5.6	40.0	-30.7	3.6	53.9	50.3	Axis:X , VBW:300Hz
Hori.	7440.000	AV	34.9	36.9	7.1	38.7	-30.7	9.5	53.9	44.4	Axis:X , VBW:300Hz
Hori.	9920.000	AV	33.4	38.4	8.0	37.5	-30.7	11.6	53.9	42.3	Axis:X , VBW:300Hz
Hori.	12400.000	AV	32.1	39.1	9.4	37.9	-30.7	12.0	53.9	41.9	Axis:X , VBW:300Hz
Vert.	4960.000	AV	38.9	31.9	5.6	40.0	-30.7	5.7	53.9	48.2	Axis:Y , VBW:300Hz
Vert.	7440.000	AV	35.0	36.9	7.1	38.7	-30.7	9.6	53.9	44.3	Axis:Y , VBW:300Hz
Vert.	9920.000	AV	33.5	38.4	8.0	37.5	-30.7	11.7	53.9	42.2	Axis:Y , VBW:300Hz
Vert.	12400.000	AV	33.3	39.1	9.4	37.9	-30.7	13.2	53.9	40.7	Axis:Y , VBW:300Hz

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Dwell time factor (Refer to page 44)

*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(Band Edge Compliance) (for Marker Delta Method)

Bluetooth, 3-DH5, Tx 2480MHz

Marker Delta Method(Test distance 3meters)
Frequency of Band-edge:2483.500MHz

		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			RBW / VBW	[dBuV] Reading	[dBuV/m] Result	[dBuV] Reading		[dBuV/m] Result	RBW / VBW	[dBuV] Reading	[dBuV/m] Result
Step1	Fundamental(2480.000MHz)	1M / 3MHz	101.8	112.9	102.8	113.9	1M / 300Hz	98.6	109.7	100.1	111.2
Step2	Fundamental(2480.000MHz)	51k / 160kHz	101.6	112.7	102.4	113.5	-	-	-	-	-
	Band-edge	51k / 160kHz	55.0	66.1	54.1	65.2	-	-	-	-	-
	Amplitude delta[dB]	-	-	46.6	-	48.3	-	-	46.6	-	48.3
Step3	Field strength of band-edge	-	-	66.3	-	65.6	-	-	63.1	-	62.9
Step4	Dwell time factor (-30.74dB)	-	-	-	-	-	-	-	32.4	-	32.2
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	7.6	-	8.3	-	-	21.5	-	21.7

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:51kHz,VBW:160kHz) - Band-edge(RBW:51kHz,VBW:160kHz)

*2 Field strength of band-edge = Fundamental(PK or AV) - Amplitude delta - Dwell time factor(AV)

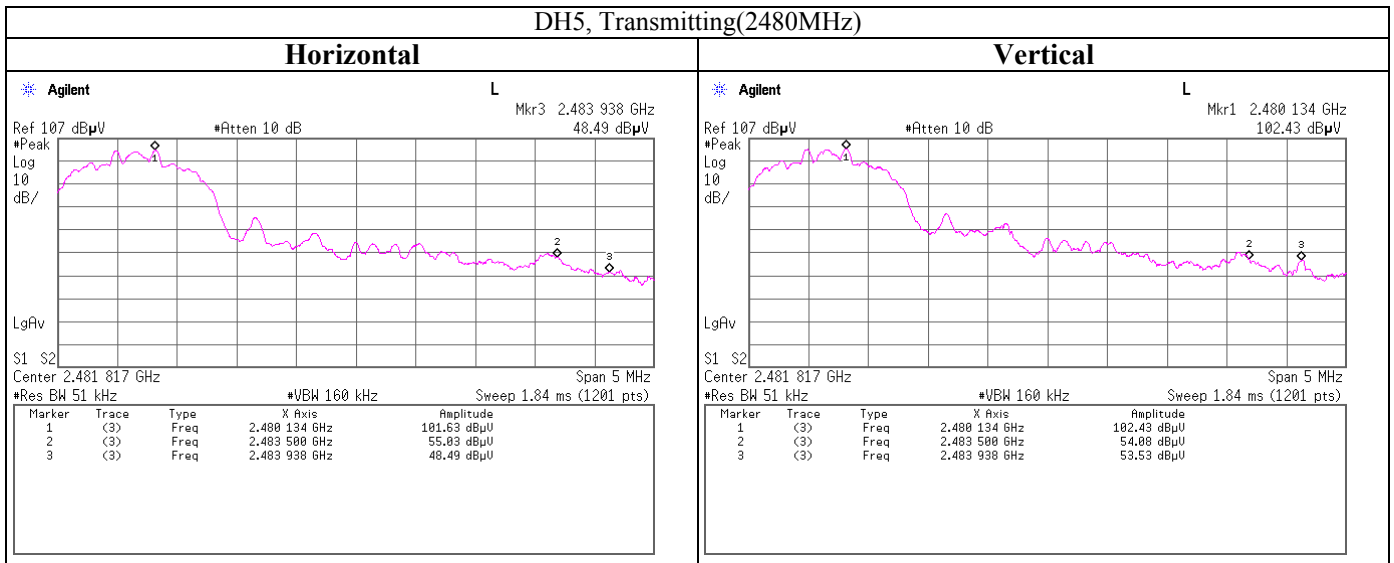
Marker Delta Method(Test distance 3meters)
Frequency of Band-edge:2483.938MHz

		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			RBW / VBW	[dBuV] Reading	[dBuV/m] Result	[dBuV] Reading		[dBuV/m] Result	RBW / VBW	[dBuV] Reading	[dBuV/m] Result
Step1	Fundamental(2480.000MHz)	1M / 3MHz	101.8	112.9	102.8	113.9	1M / 300Hz	97.8	108.9	100.1	111.2
Step2	Fundamental(2480.000MHz)	51k / 160kHz	101.6	112.7	102.4	113.5	-	-	-	-	-
	Band-edge	51k / 160kHz	48.5	59.6	53.5	64.6	-	-	-	-	-
	Amplitude delta[dB]	-	-	53.1	-	48.9	-	-	53.1	-	48.9
Step3	Field strength of band-edge	-	-	59.8	-	65.0	-	-	55.8	-	62.3
Step4	Dwell time factor (-30.74dB)	-	-	-	-	-	-	-	25.1	-	31.6
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	14.1	-	8.9	-	-	28.8	-	22.3

Result = Reading + Ant Factor + Loss (Cable+Attenuator) - Gain(Amplifier)

*1 Amplitude delta = Fundamental(RBW:51kHz,VBW:160kHz) - Band-edge(RBW:51kHz,VBW:160kHz)

*2 Field strength of band-edge = Fundamental(PK or AV) - Amplitude delta - Dwell time factor(AV)

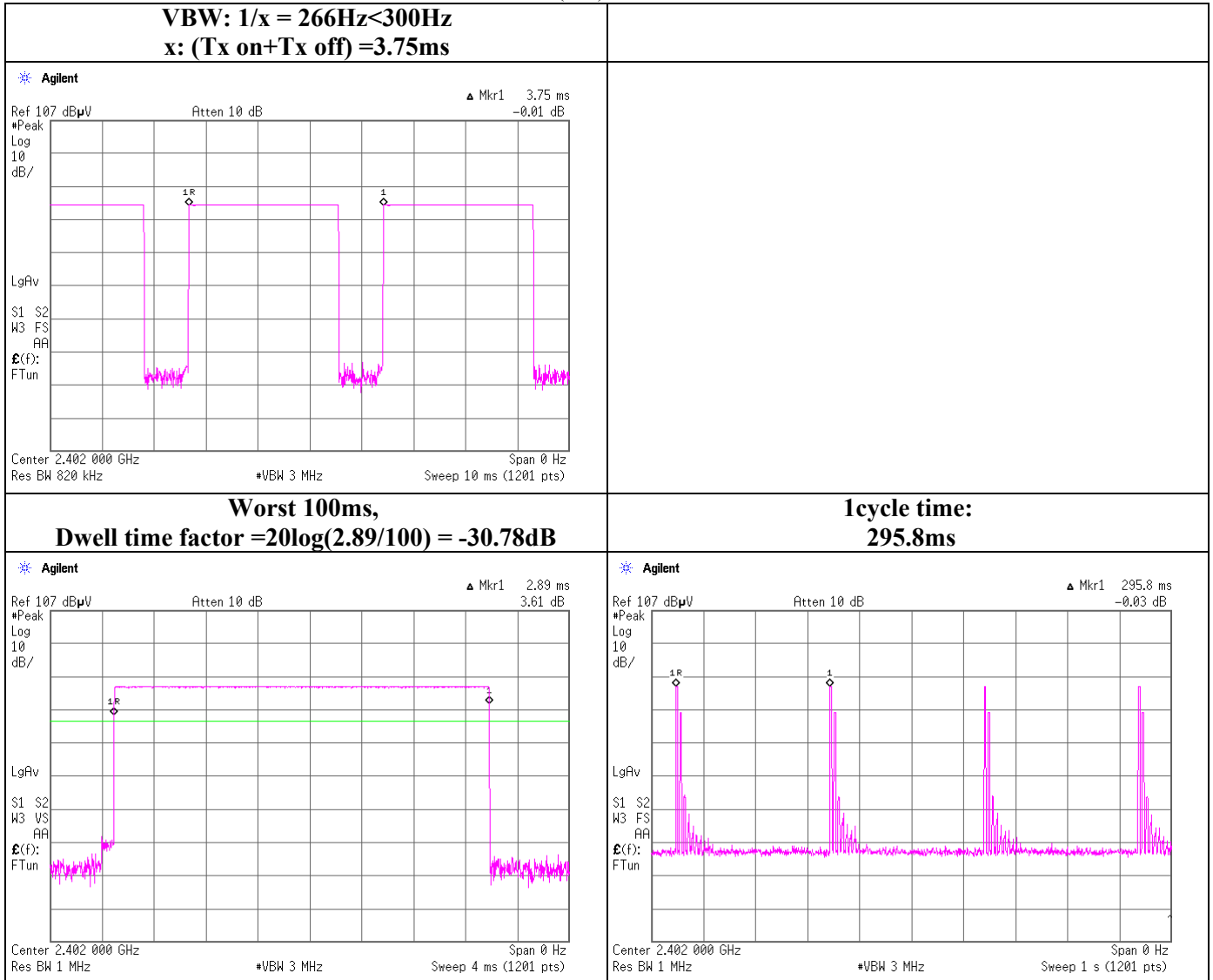


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Spurious emission (Radiated)

DH5,
 VBW (AV) Calculation



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

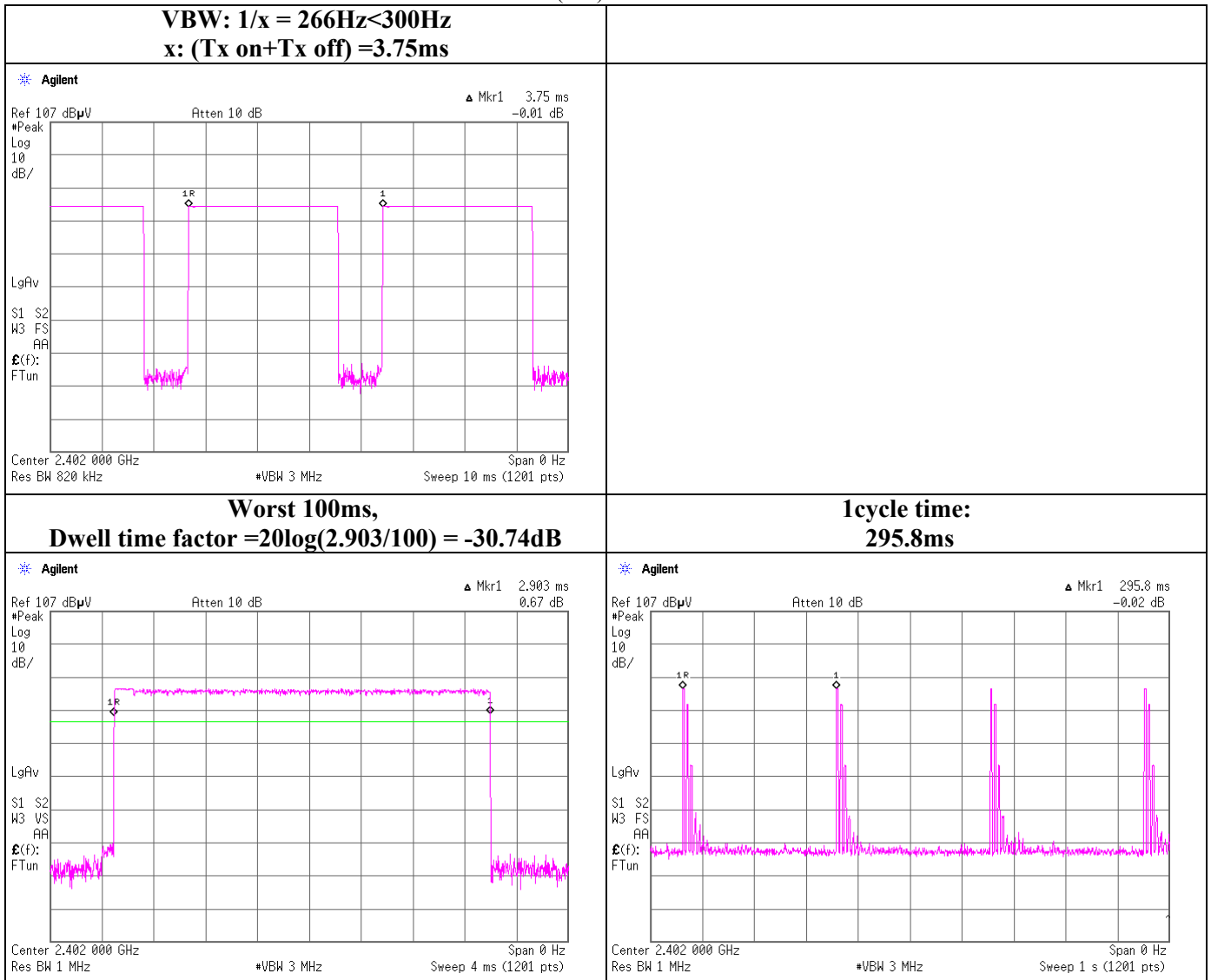
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Spurious emission (Radiated)

3-DH5,

VBW (AV) Calculation



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

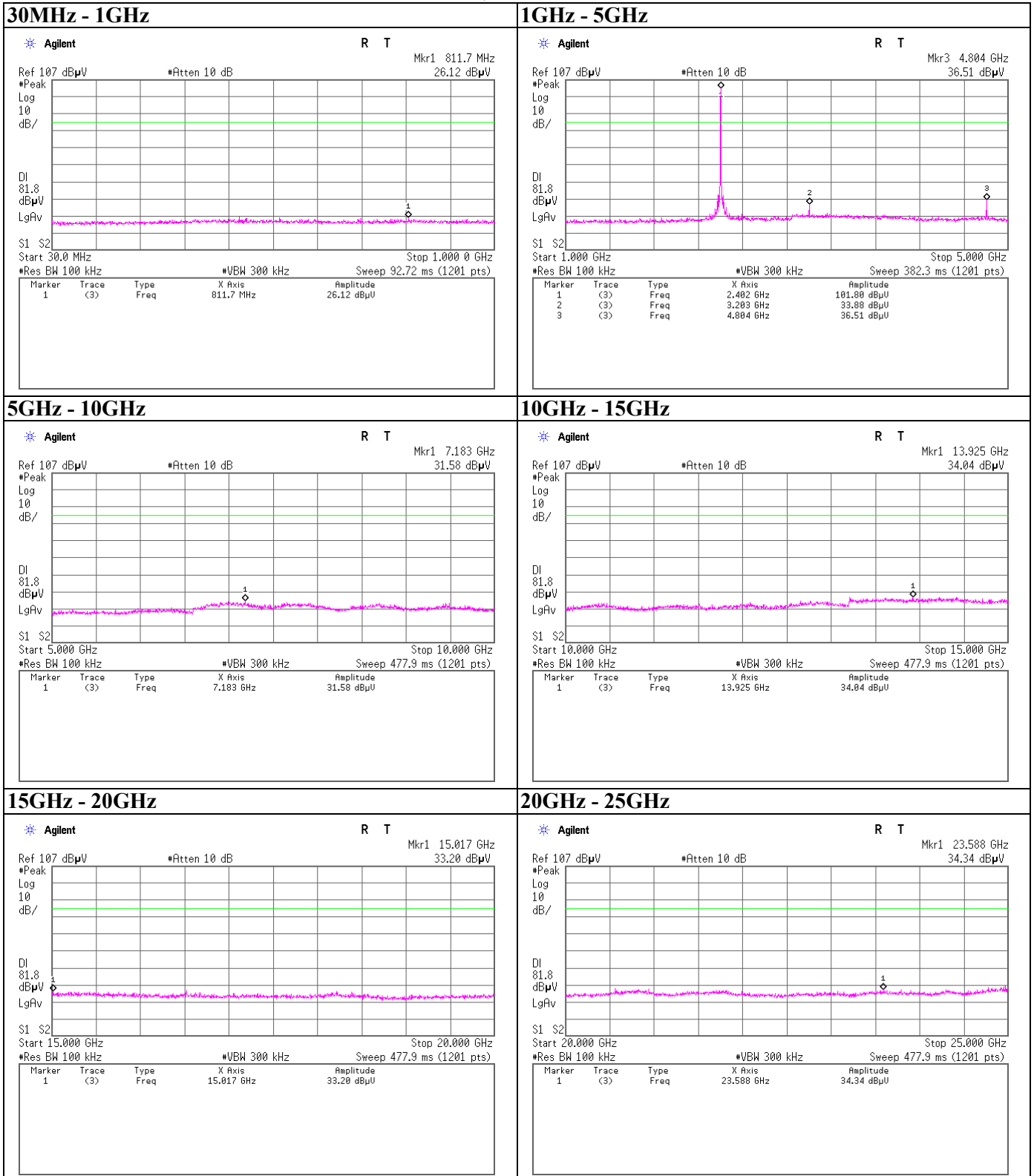
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Spurious emission (Conducted)

DH5

Tx, 2402MHz



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Spurious emission (Conducted)

DH5

Tx, 2441MHz

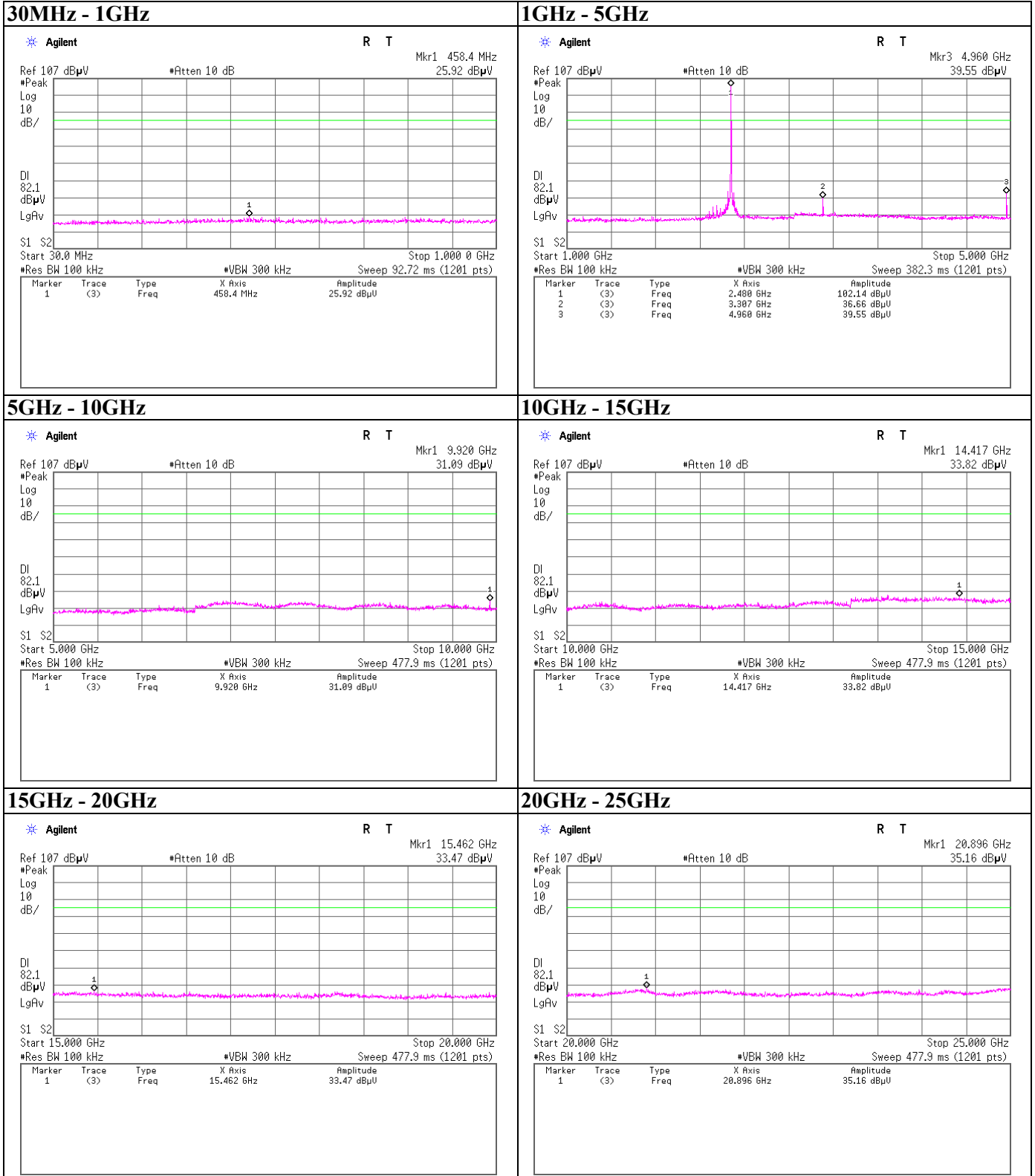


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Spurious emission (Conducted)

DH5
Tx, 2480MHz



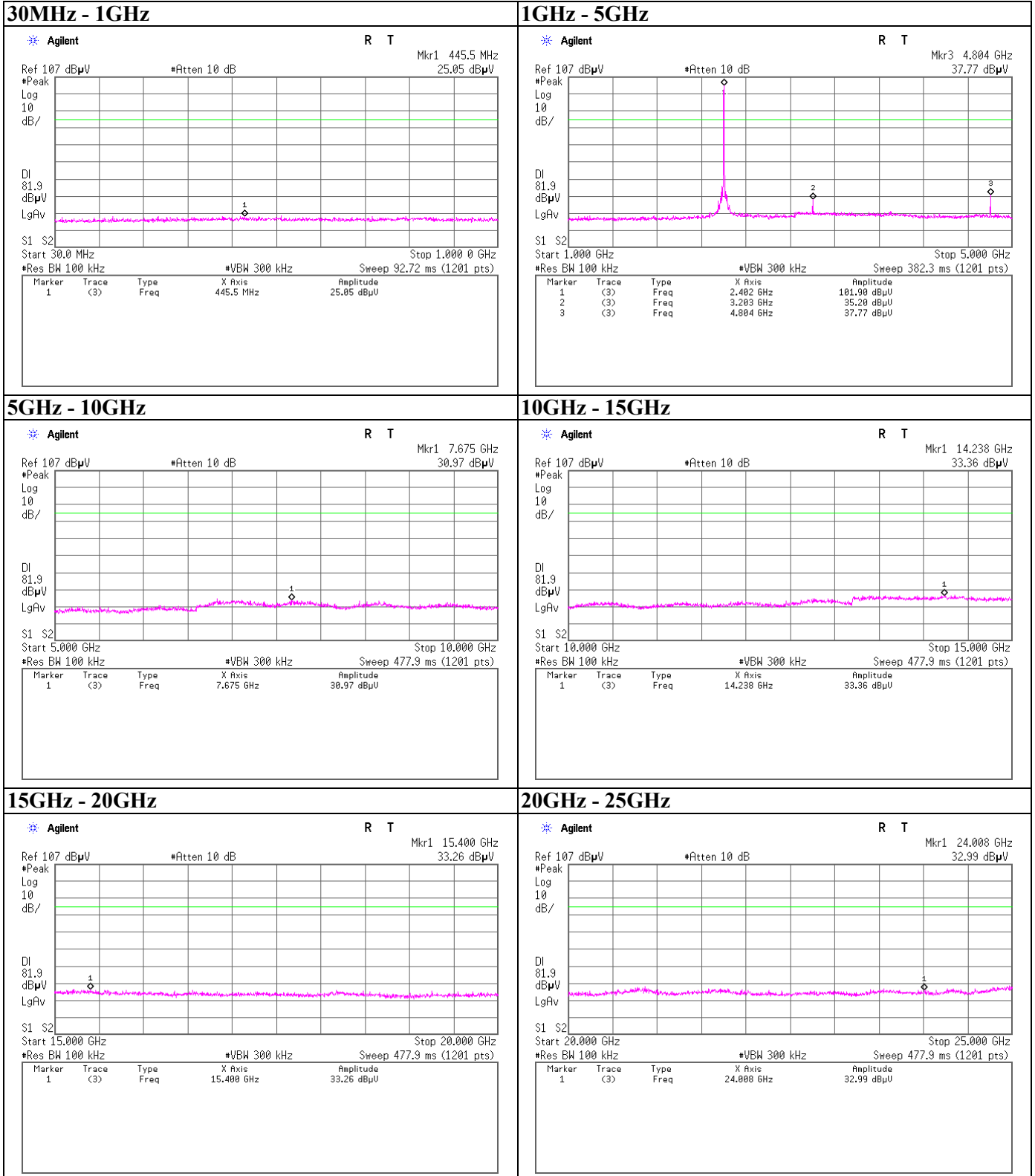
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Spurious emission (Conducted)

3-DH5

Tx, 2402MHz



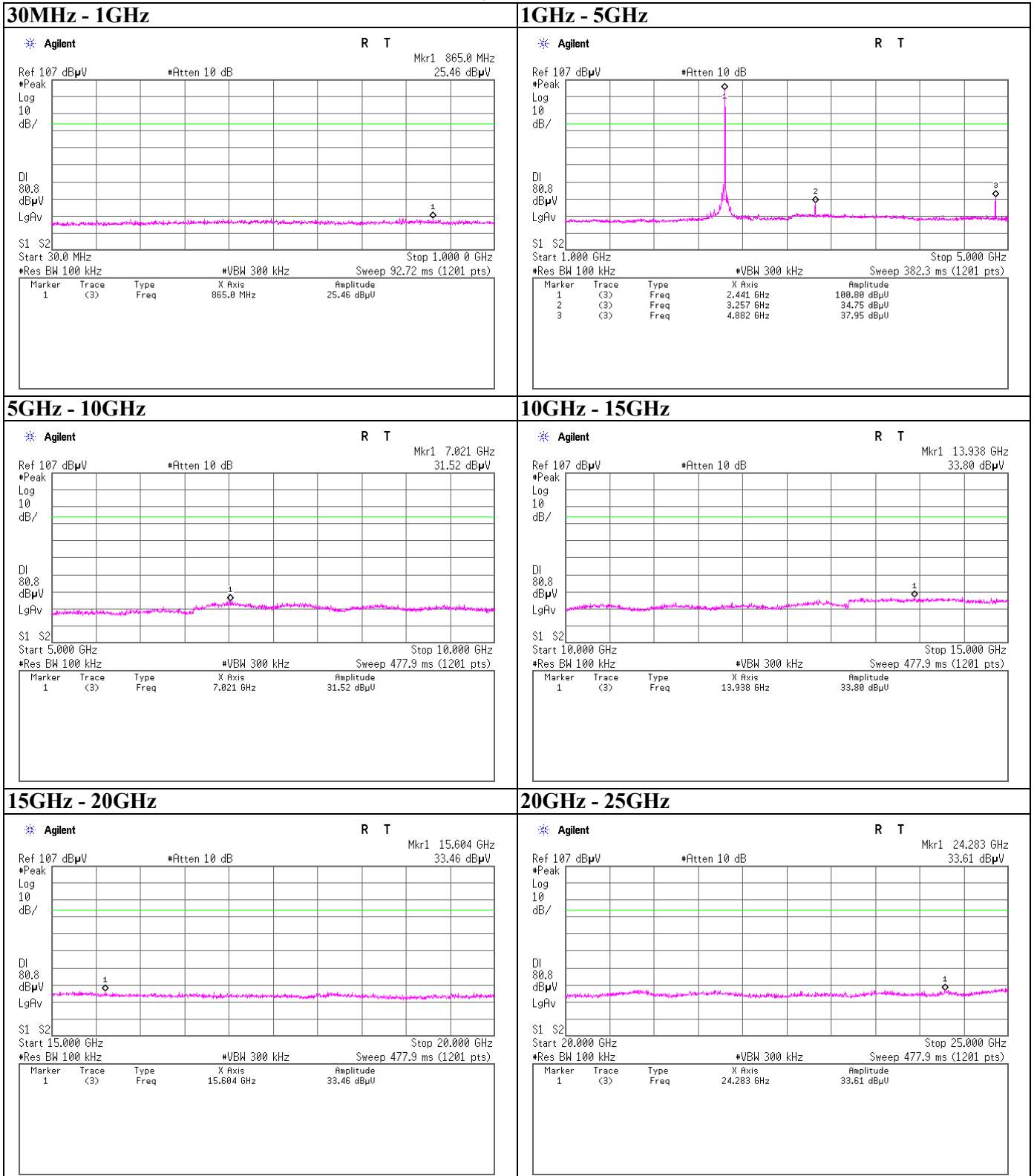
UL Japan, Inc.
Shonan EMC Lab.

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Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

Spurious emission (Conducted)

3-DH5

Tx, 2441MHz



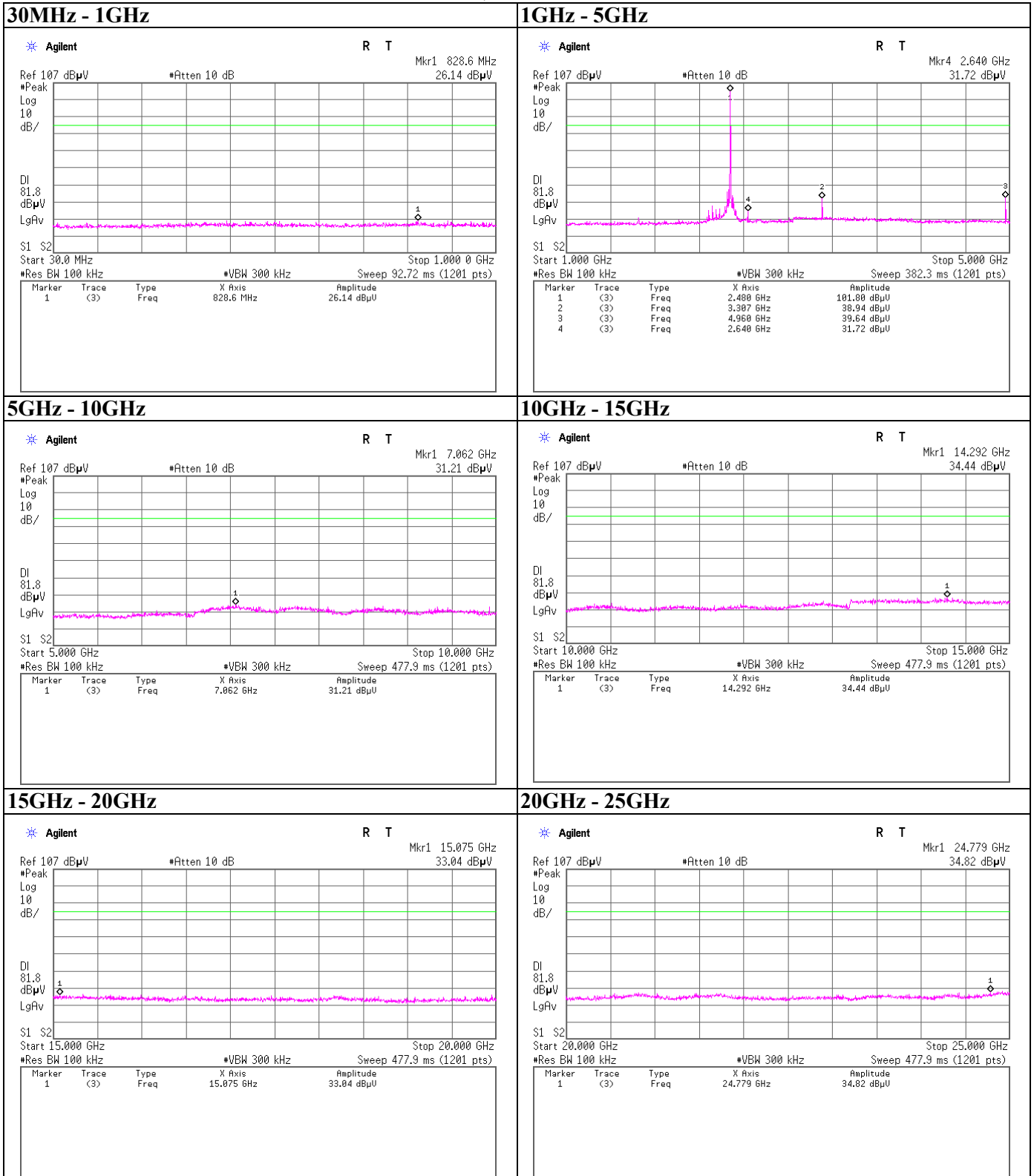
UL Japan, Inc.
Shonan EMC Lab.

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Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

Spurious emission (Conducted)

3-DH5

Tx, 2480MHz



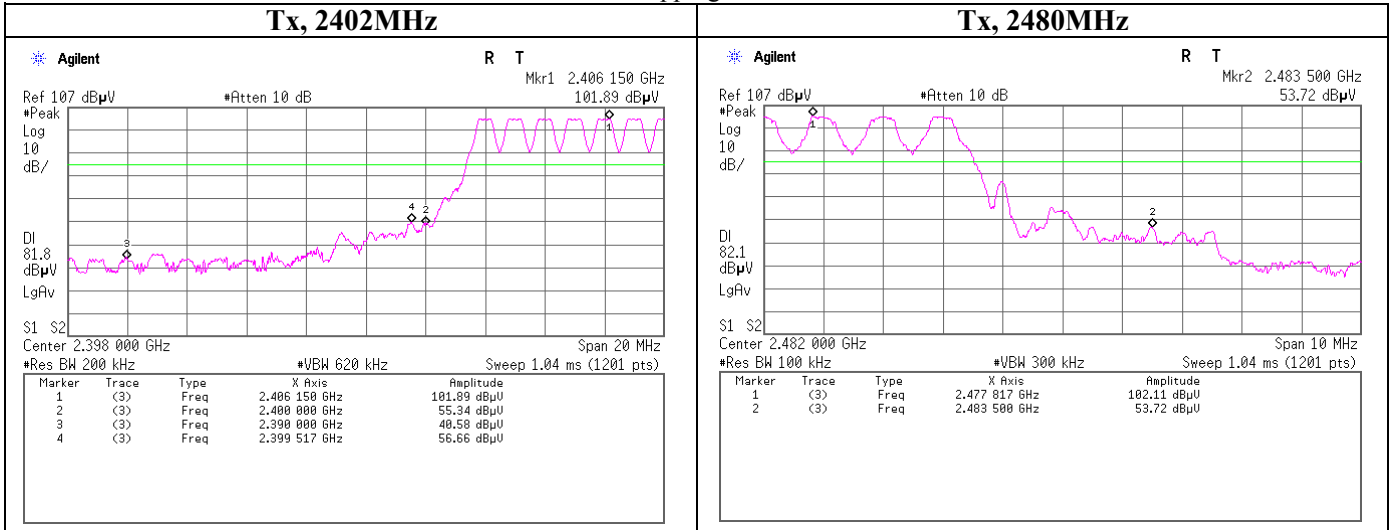
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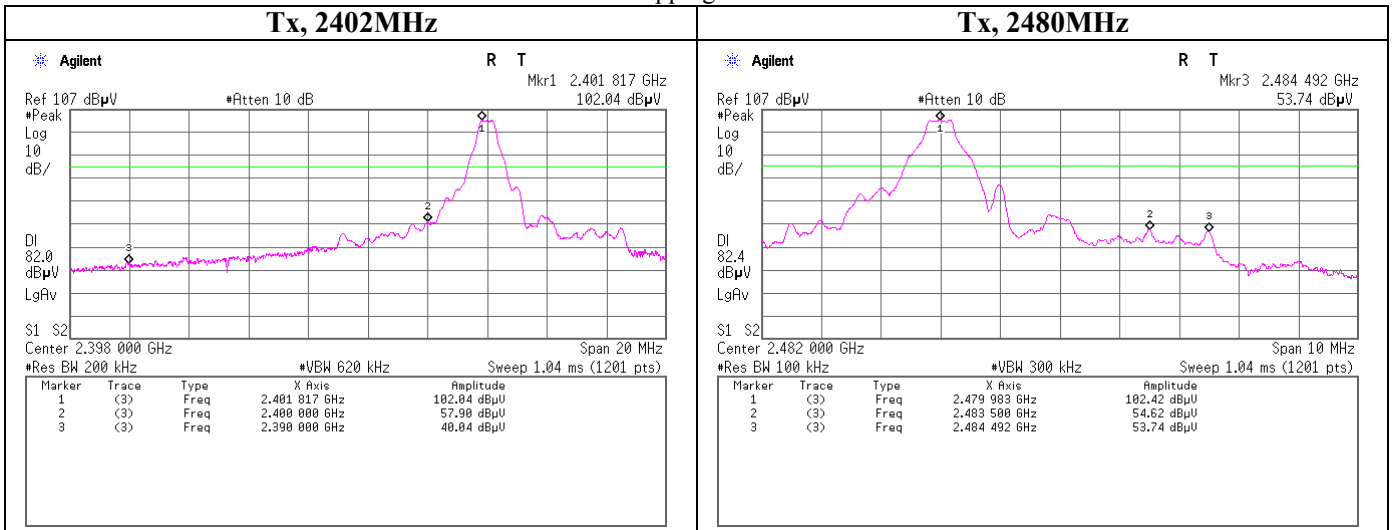
Spurious emission (Conducted)

Band Edge compliance
DH5

Hopping ON



Hopping OFF



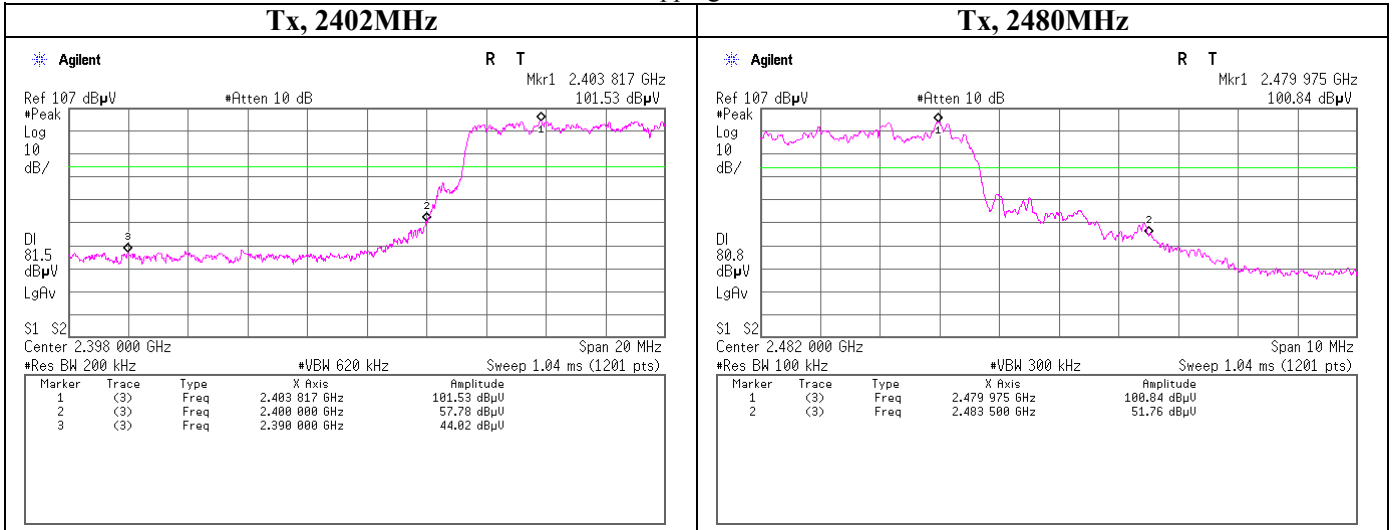
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Facsimile : +81 463 50 6401

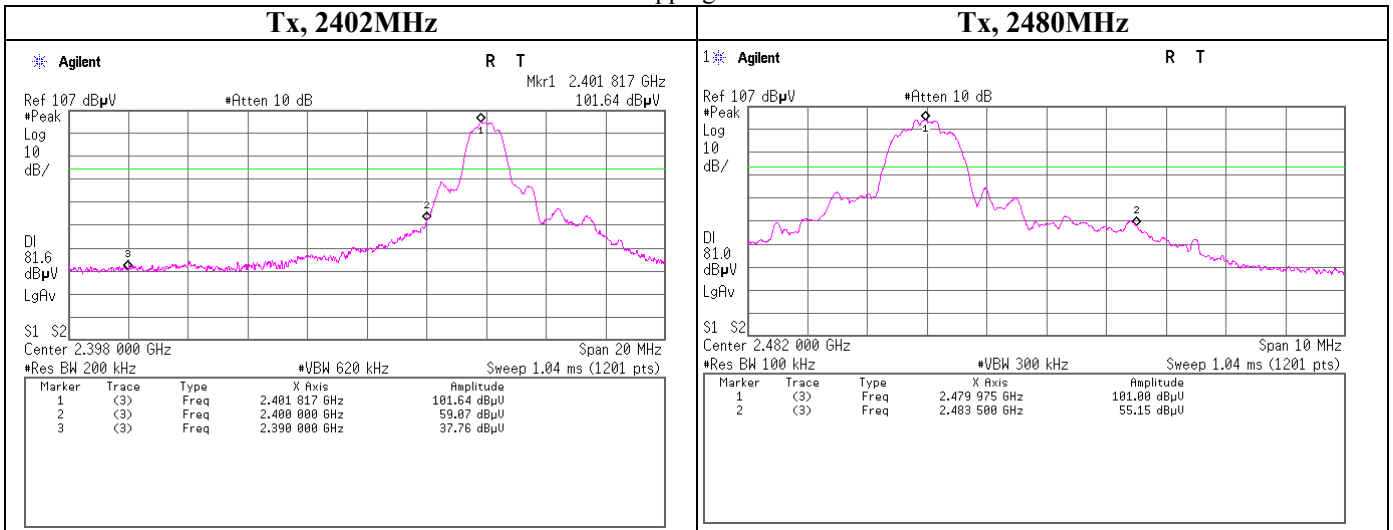
Spurious emission (Conducted)

Band Edge compliance
 3-DH5

Hopping ON

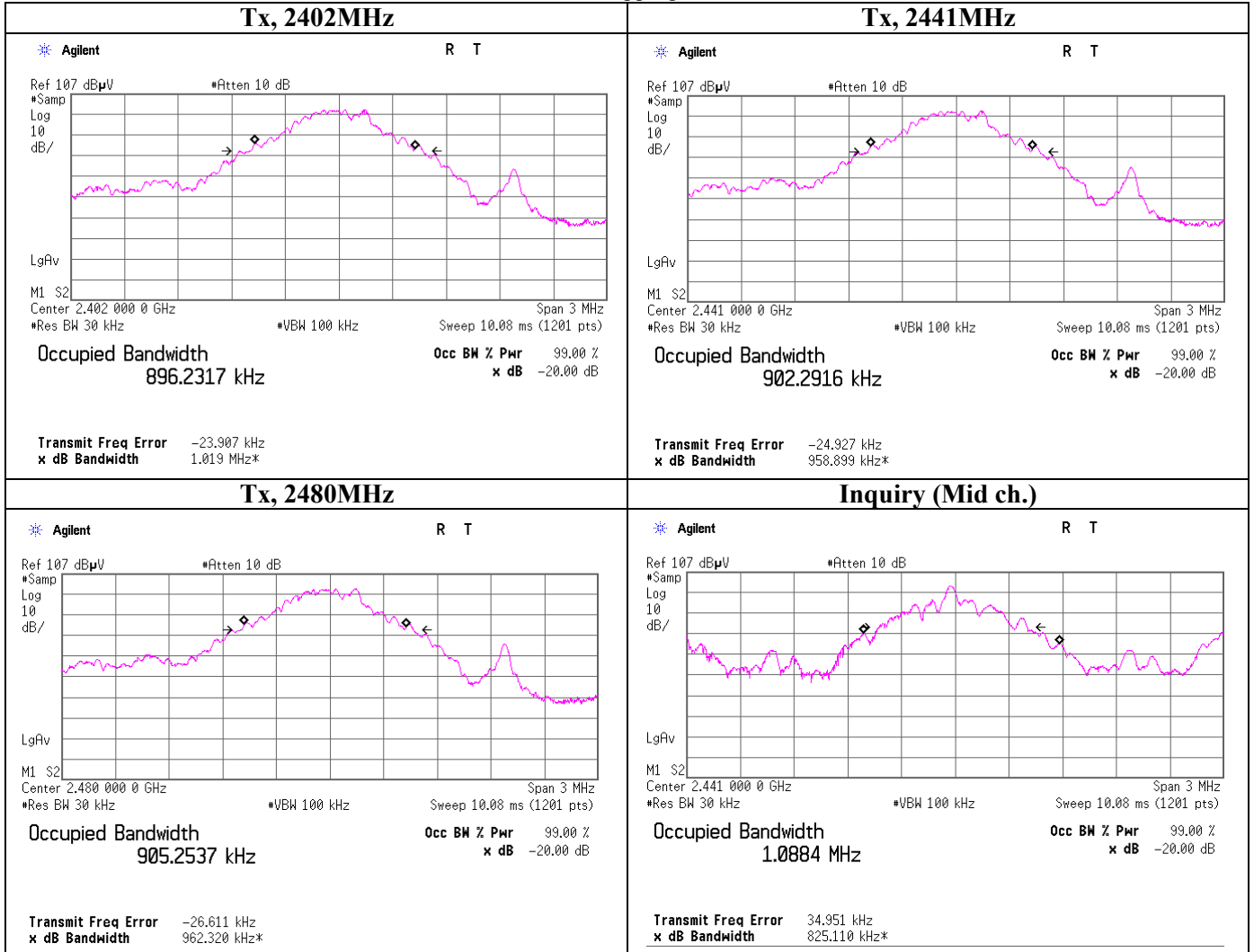


Hopping OFF

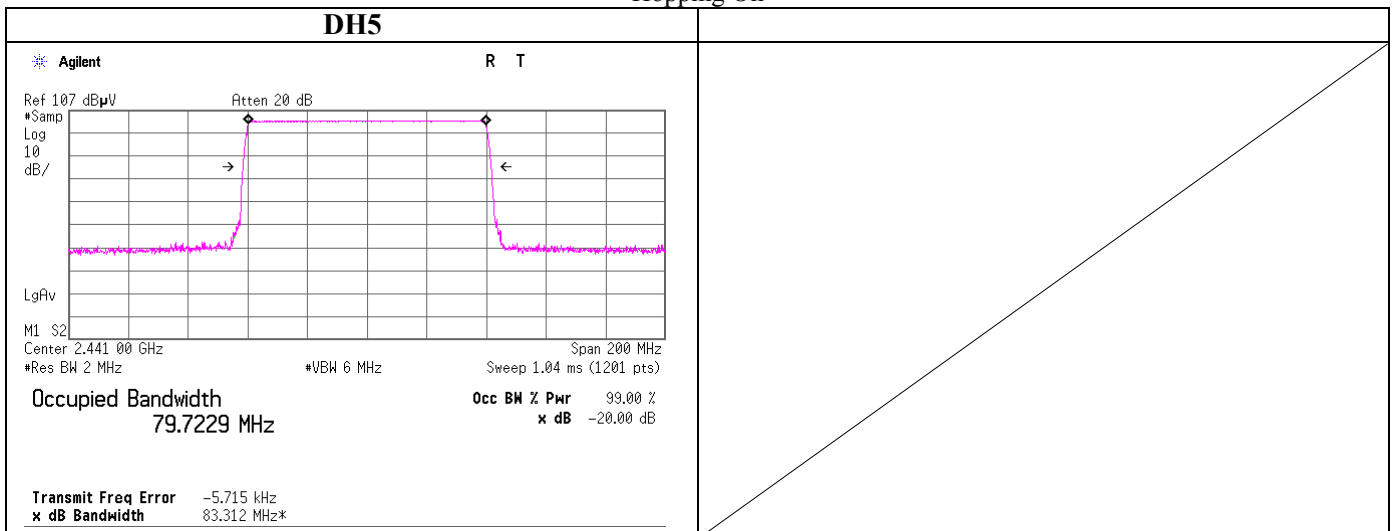


99% Occupied Bandwidth

DH5, Hopping Off

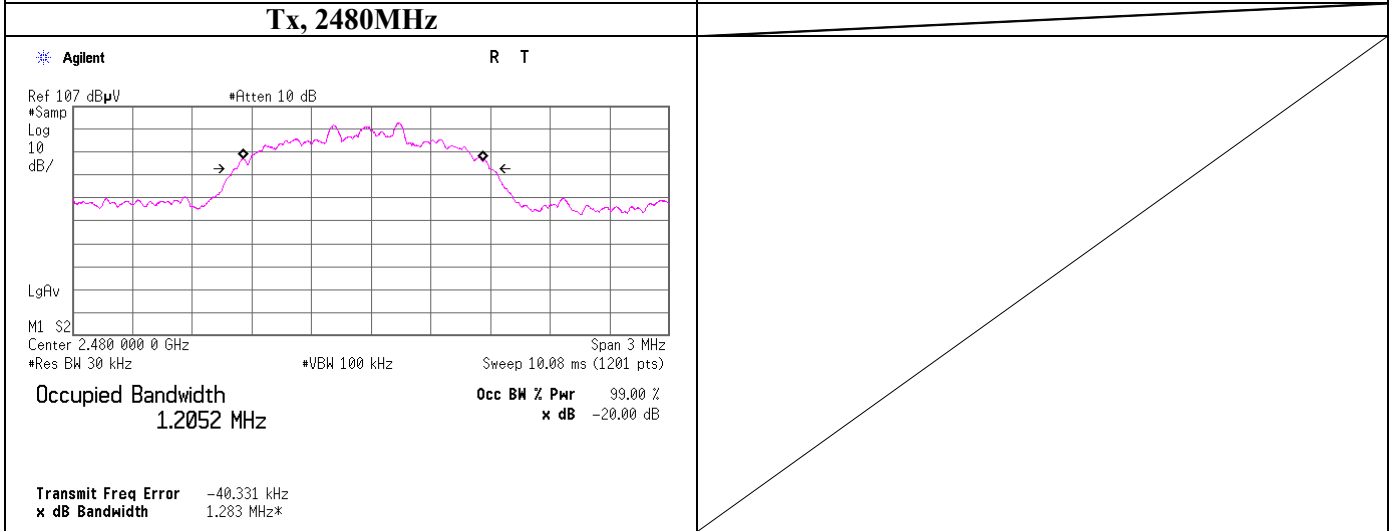
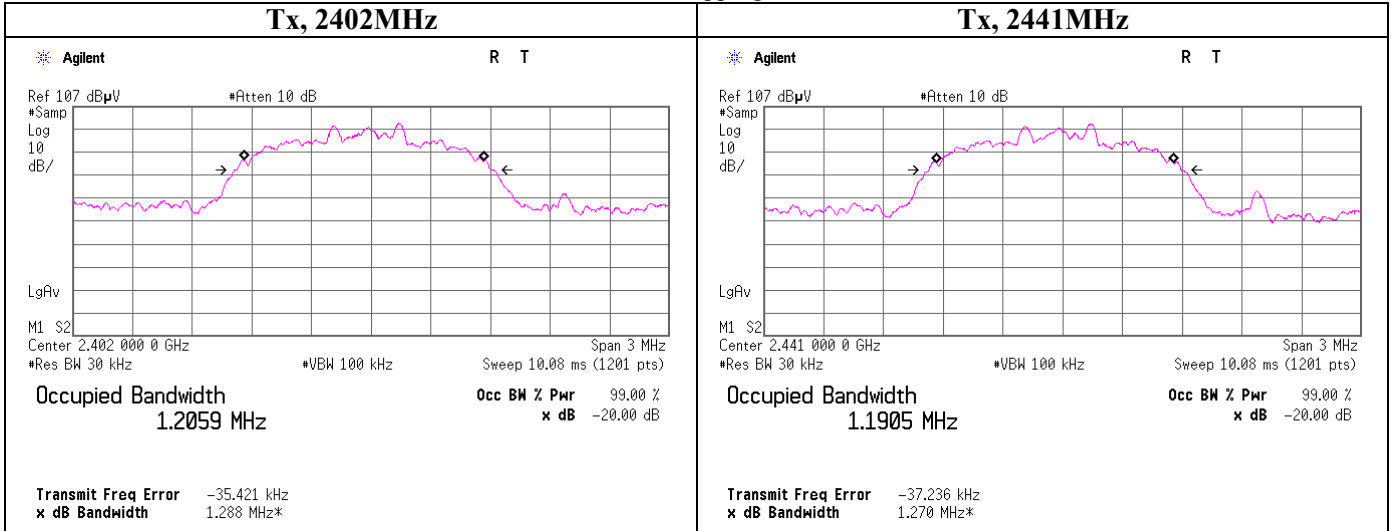


Hopping On



99% Occupied Bandwidth

3-DH5, Hopping Off



Hopping On

