

20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2009/11/6 2010/8/6
Temperature / Humidity 23deg.C , 45% 22deg.C , 60%
Engineer Tatsuya Arai Makoto Hosaka
Mode Tx,

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.958	1.019	>= 0.638
DH5	2441.0	0.938	1.019	>= 0.625
DH5	2480.0	0.938	1.031	>= 0.625
3DH5	2402.0	1.293	1.003	>= 0.862
3DH5	2441.0	1.280	1.003	>= 0.853
3DH5	2480.0	1.275	1.005	>= 0.850
Inquiry	2441.0	0.779	2.004	>= 0.519

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

UL Japan, Inc.

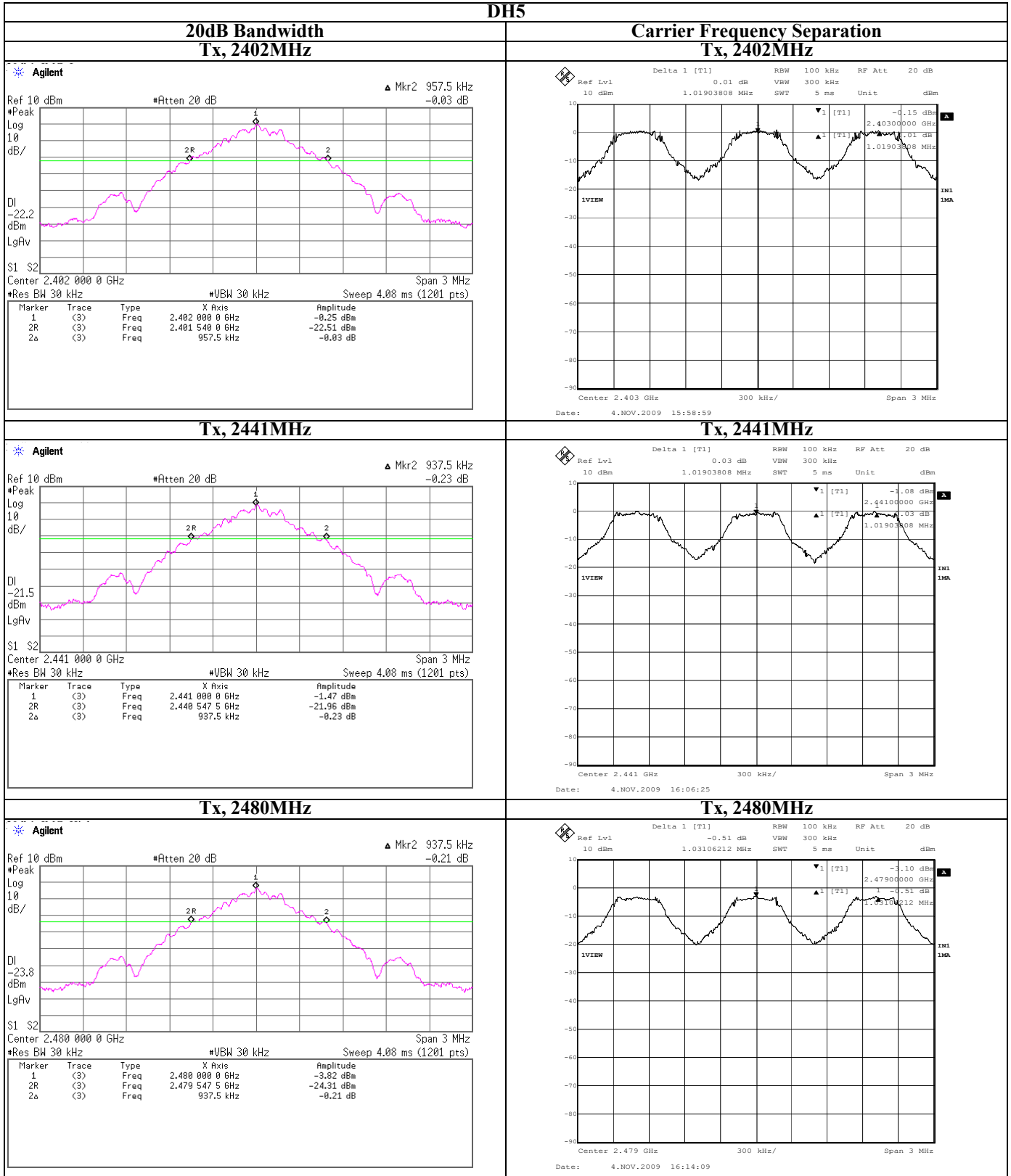
Shonan EMC Lab.

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

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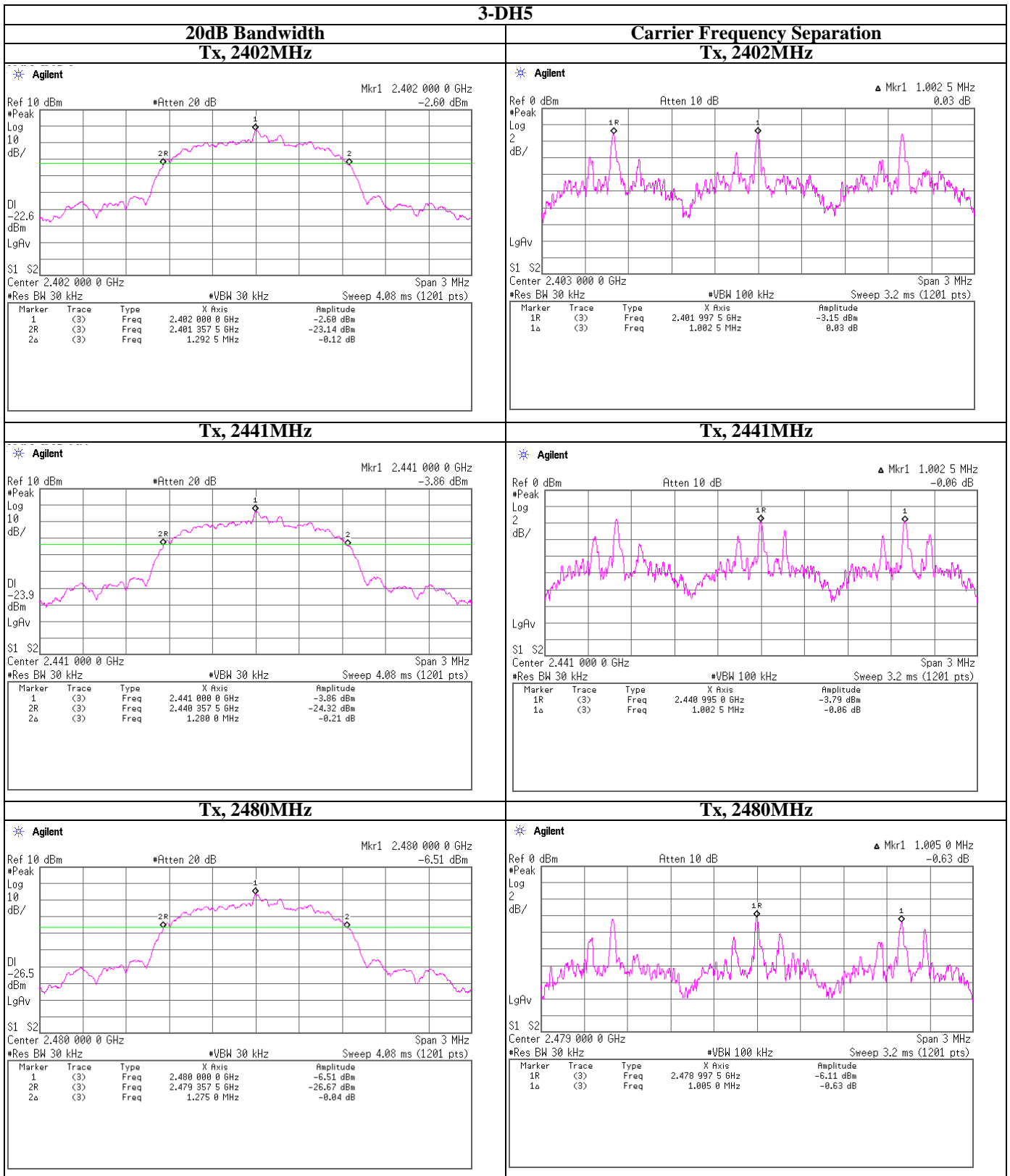
20dB Bandwidth and Carrier Frequency Separation



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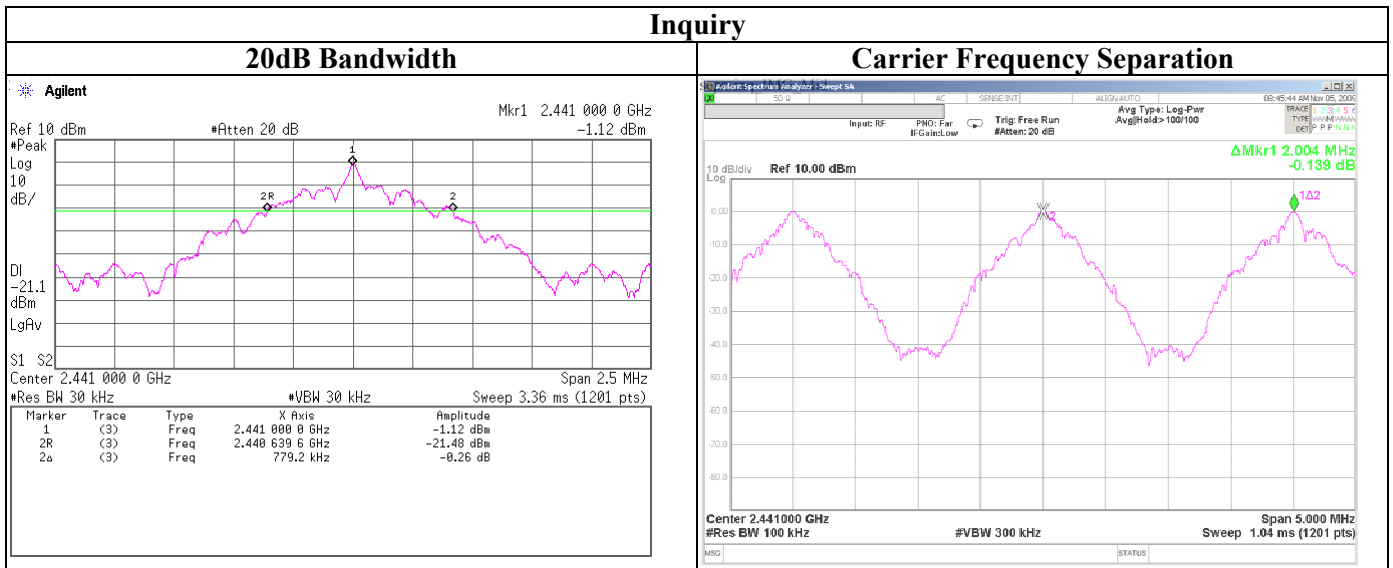
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Number of Hopping Frequency (Conducted)

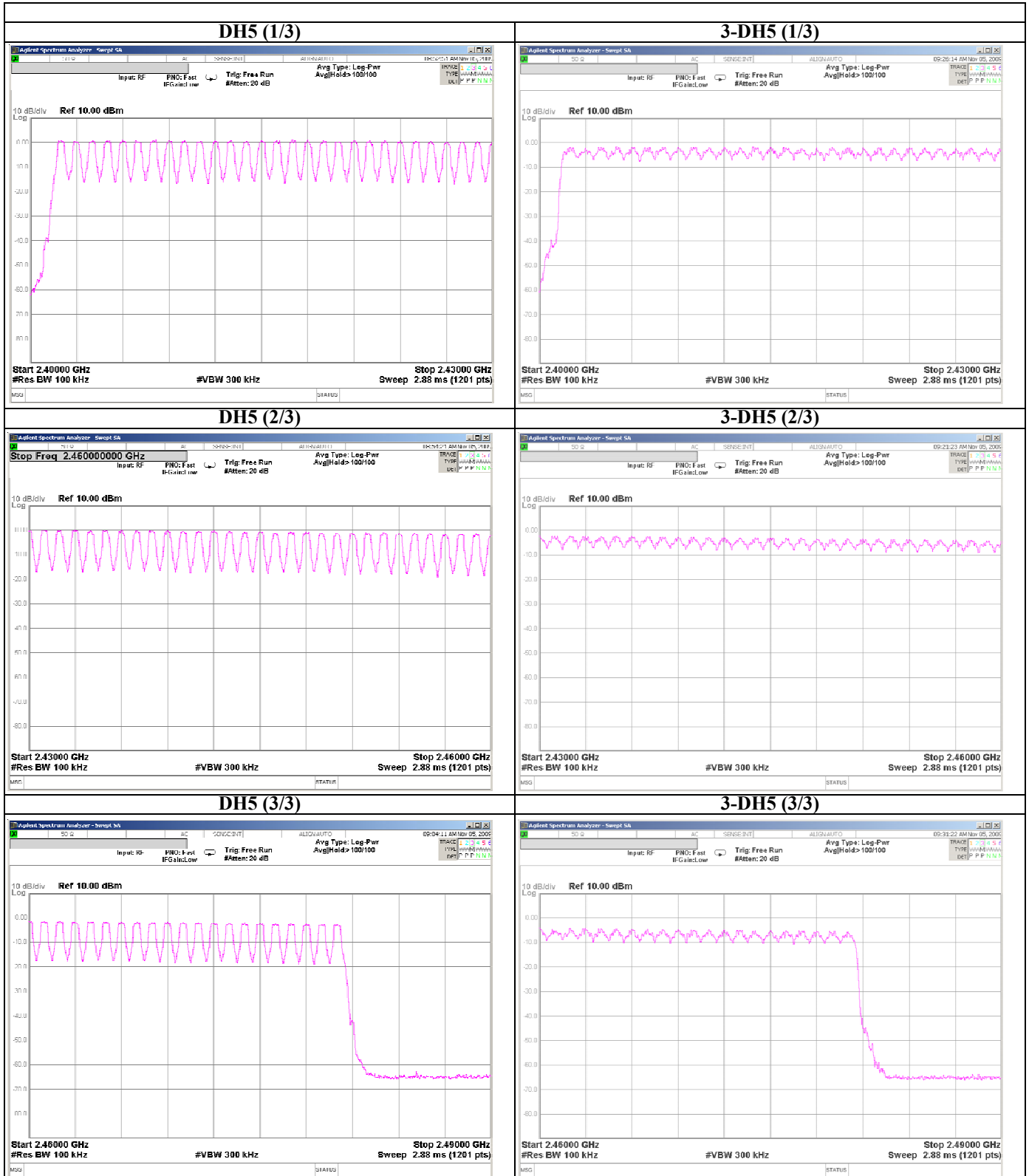
Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2009/11/6
Temperature / Humidity 23deg.C. , 45%
Engineer Tatsuya Arai
Mode Tx,

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

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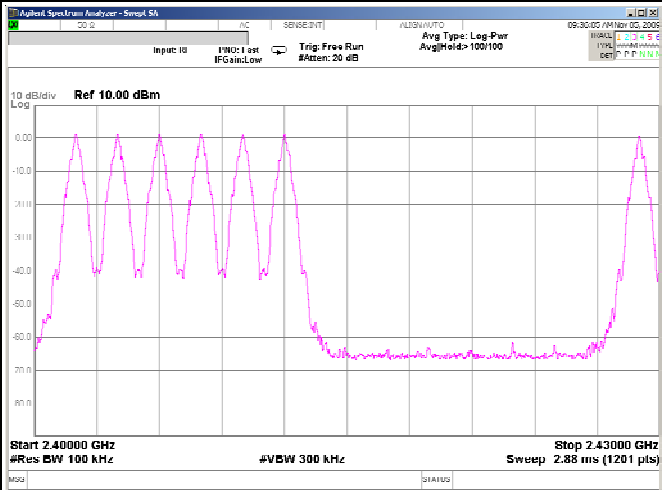

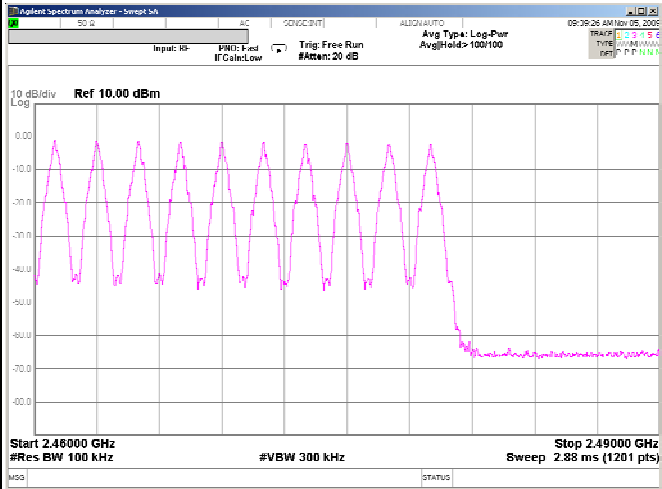
Number of Hopping Frequency



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Number of Hopping Frequency

Inquiry (1/3)	
	
	
	

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Dwell Time (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2009/11/6
Temperature / Humidity 23deg.C. , 45%
Engineer Tatsuya Arai
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	16.8 times / 5 sec. x 31.6 sec. = 107 times	0.400	43	400
DH3	17.4 times / 5 sec. x 31.6 sec. = 110 times	1.660	183	400
DH5	15.8 times / 5 sec. x 31.6 sec. = 100 times	2.909	291	400
3DH1	18.8 times / 5 sec. x 31.6 sec. = 119 times	0.410	49	400
3DH3	18.8 times / 5 sec. x 31.6 sec. = 119 times	1.665	198	400
3DH5	18.6 times / 5 sec. x 31.6 sec. = 118 times	2.918	344	400
Inquiry	100.0 times / 1 sec. x 12.8 sec. = 1280 times	0.102	131	400

Sample Calculation

Result = Number of transmission x Length of transimtion time

*Average data of 5 tests.(except Inquiry)

Mode	Sampling [times]					Average [times]
	1	2	3	4	5	
DH1	14	18	17	17	18	16.8
DH3	16	17	18	18	18	17.4
DH5	16	15	15	14	19	15.8
3DH1	20	18	18	19	19	18.8
3DH3	17	18	19	20	20	18.8
3DH5	19	16	19	20	19	18.6

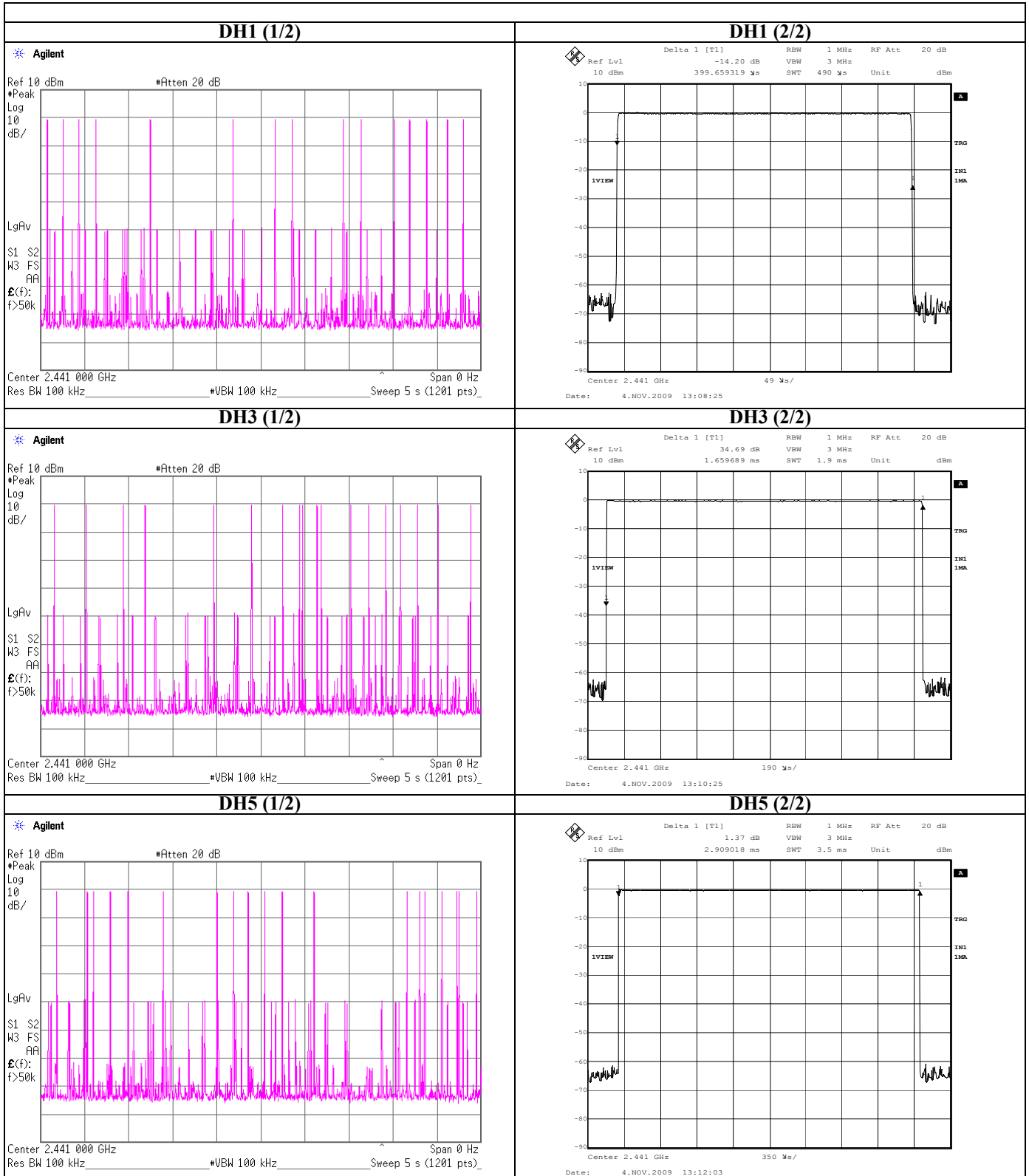
Sample Calculation

Average= Summation(Sampling 1 to 5) / 5

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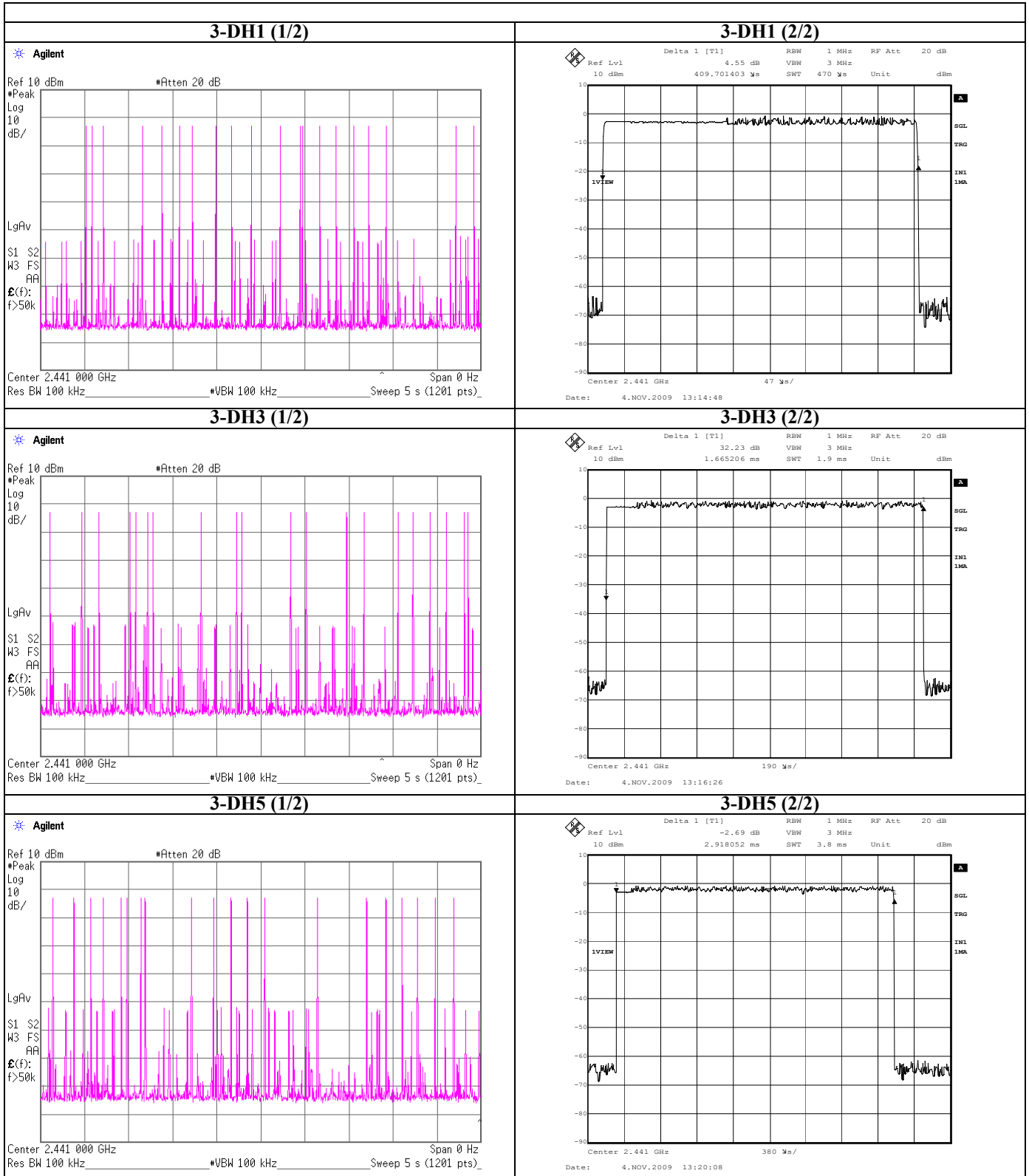
Dwell time



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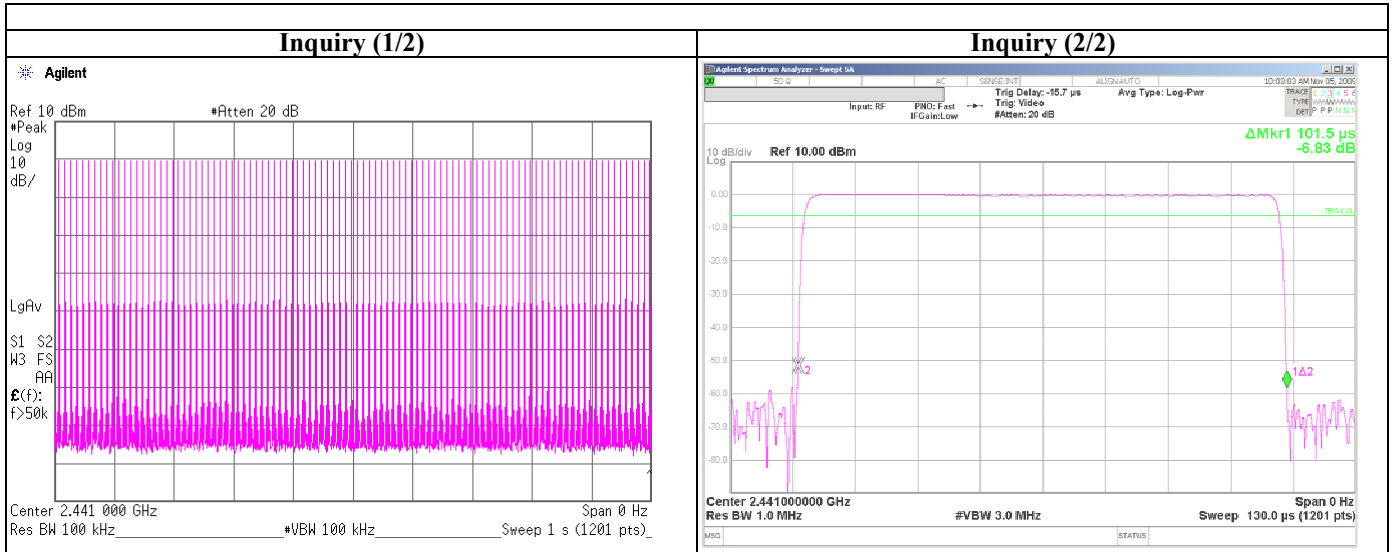
Dwell time



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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 : 2009/11/9
Temperature / Humidity : 22deg.C. , 51%
Engineer : Tatsuya Arai
Mode : Tx,

BDR (DH5)

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	1.34	0.86	0.00	2.20	1.66	20.97	125	18.77
Mid	2441.0	0.27	0.97	0.00	1.24	1.33	20.97	125	19.73
High	2480.0	-2.36	1.14	0.00	-1.22	0.76	20.97	125	22.19

EDR (2-DH5)

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	0.38	0.86	0.00	1.24	1.33	20.97	125	19.73
Mid	2441.0	-0.70	0.97	0.00	0.27	1.06	20.97	125	20.70
High	2480.0	-3.47	1.14	0.00	-2.33	0.58	20.97	125	23.30

EDR (3-DH5)

Ch	Freq. [MHz]	P/M Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	0.72	0.86	0.00	1.58	1.44	20.97	125	19.39
Mid	2441.0	-0.35	0.97	0.00	0.62	1.15	20.97	125	20.35
High	2480.0	-3.11	1.14	0.00	-1.97	0.64	20.97	125	22.94

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.

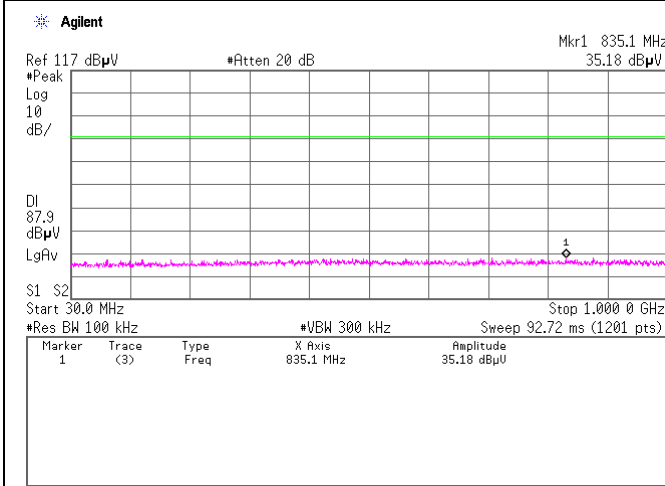
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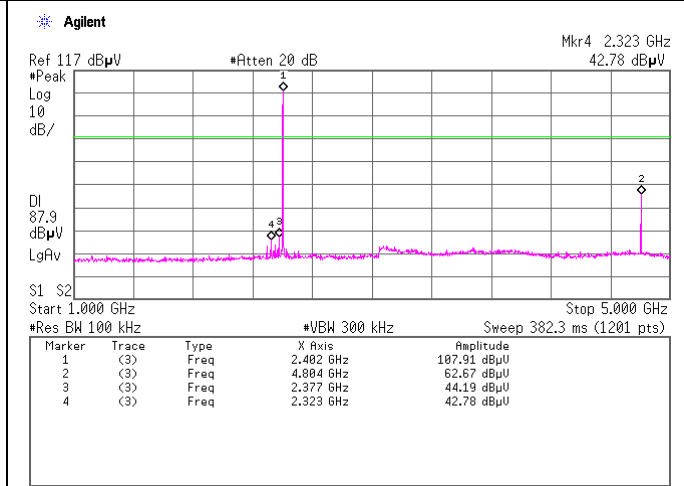
Spurious emission (Conducted)

DH5,
 Tx, 2402MHz

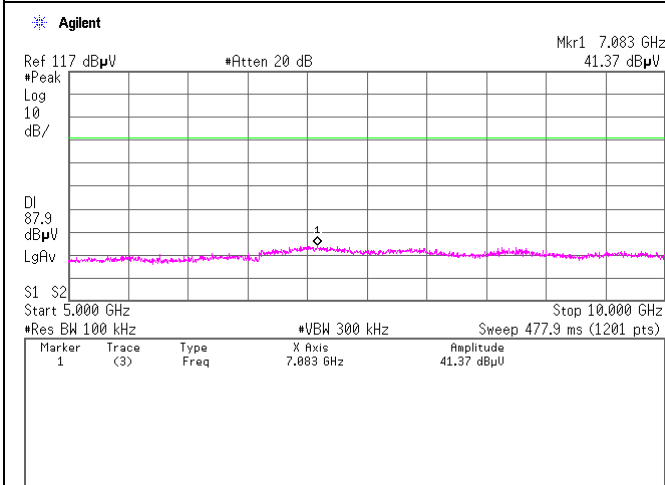
30MHz - 1GHz



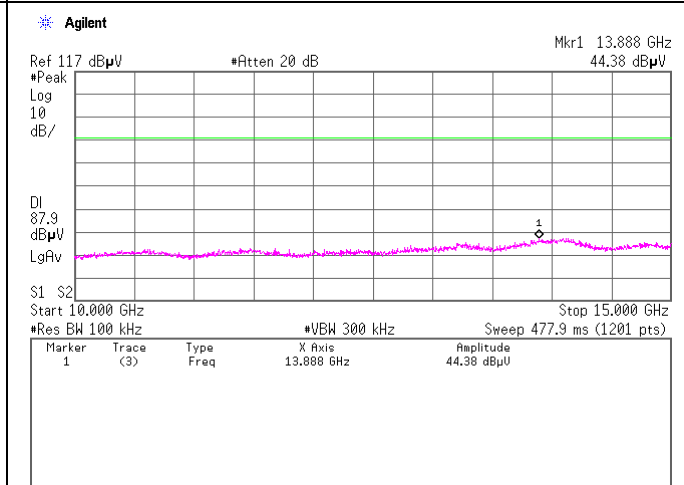
1GHz - 5GHz



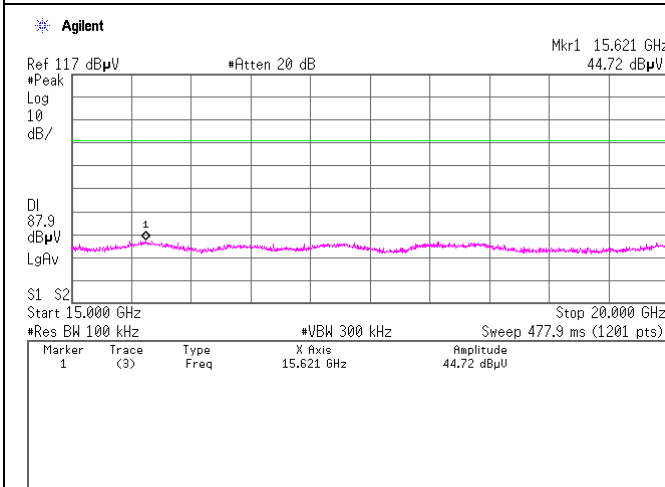
5GHz - 10GHz



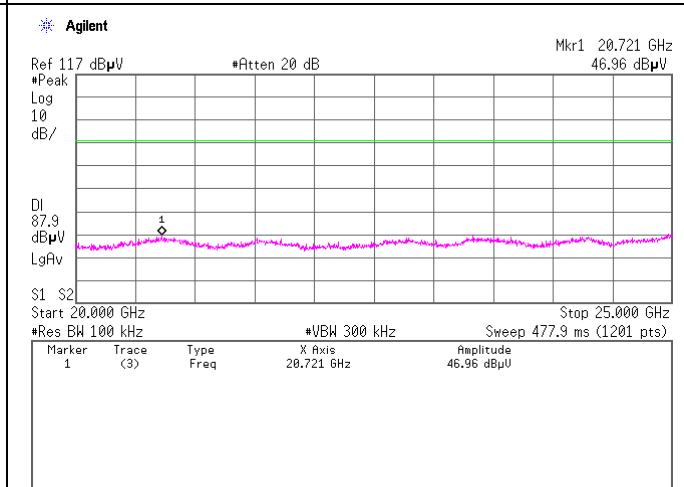
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



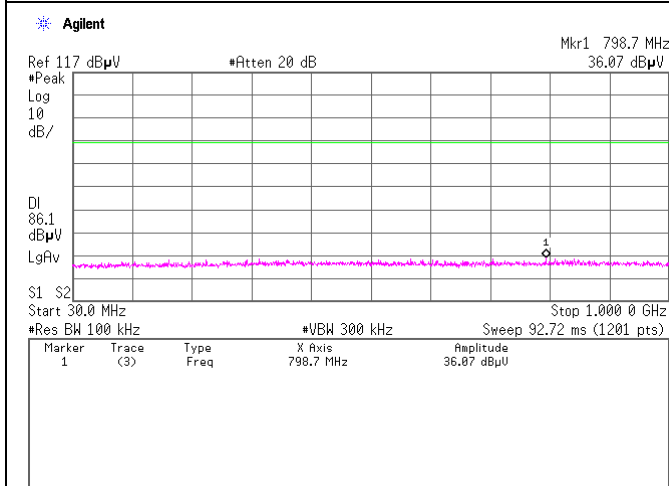
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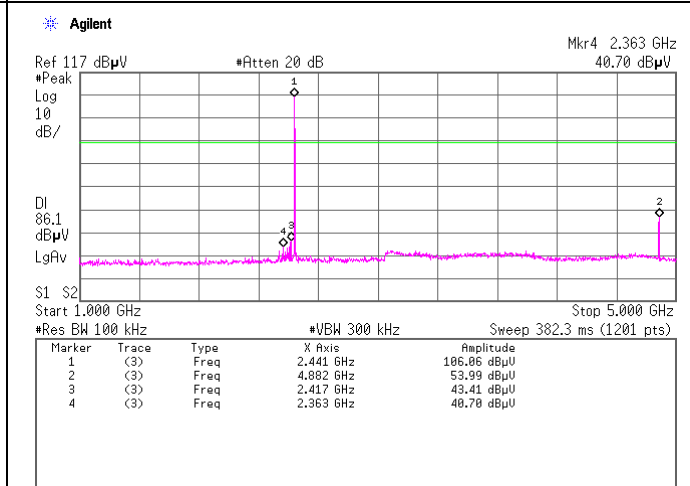
Spurious emission (Conducted)

DH5,
Tx, 2441MHz

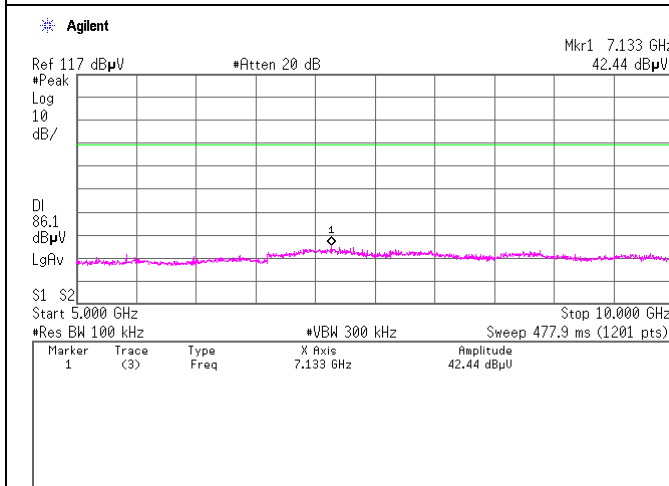
30MHz - 1GHz



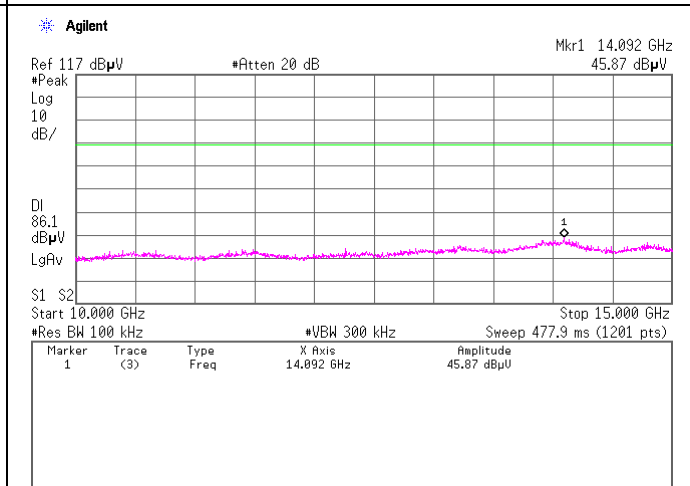
1GHz - 5GHz



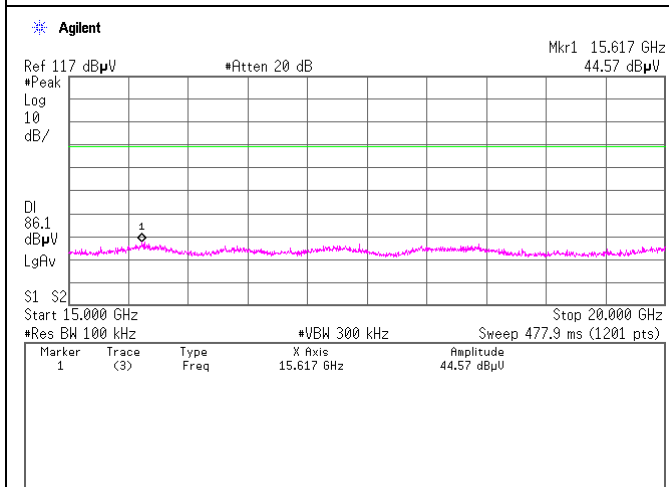
5GHz - 10GHz



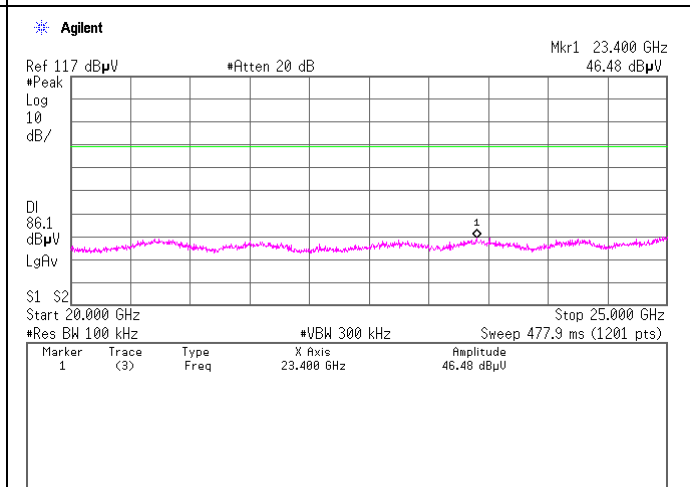
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



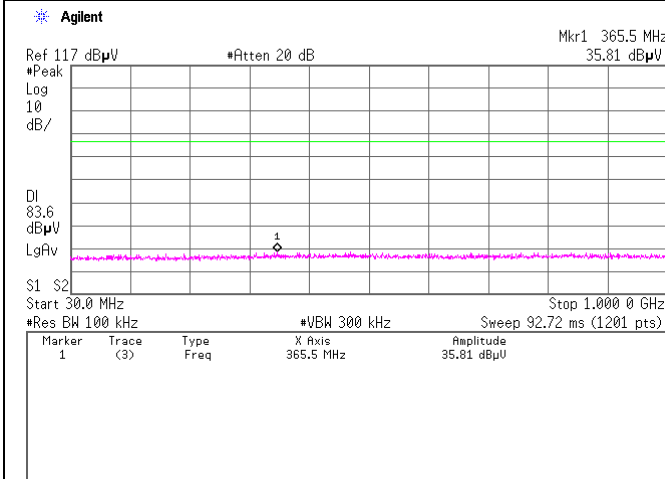
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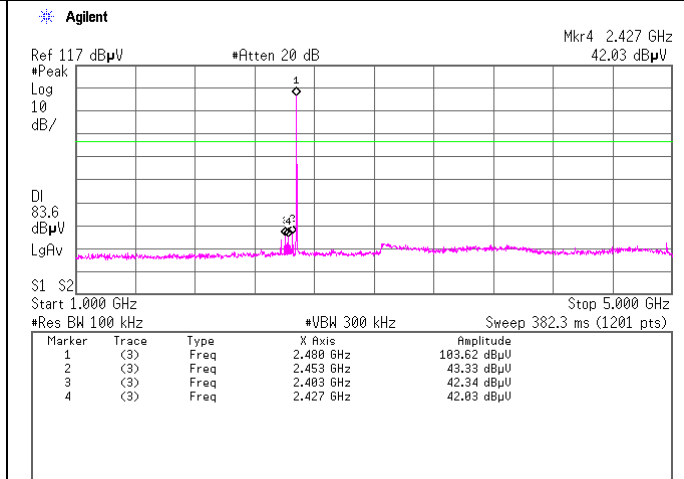
Spurious emission (Conducted)

DH5,
Tx, 2480MHz

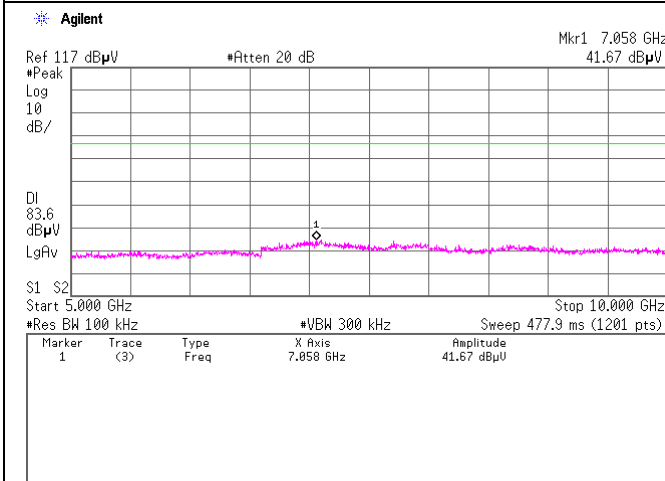
30MHz - 1GHz



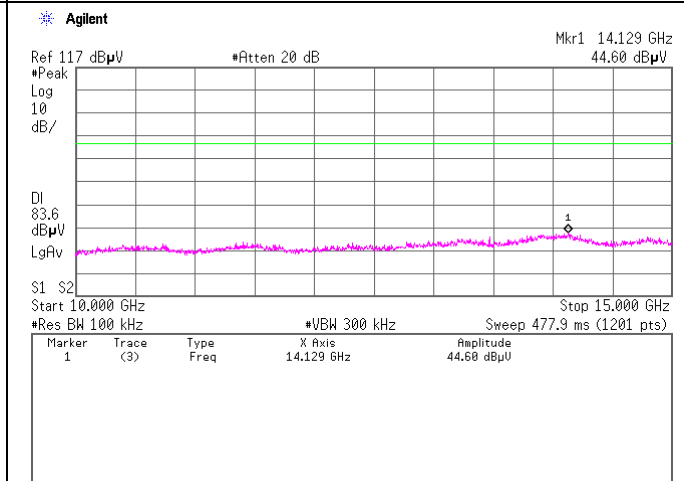
1GHz - 5GHz



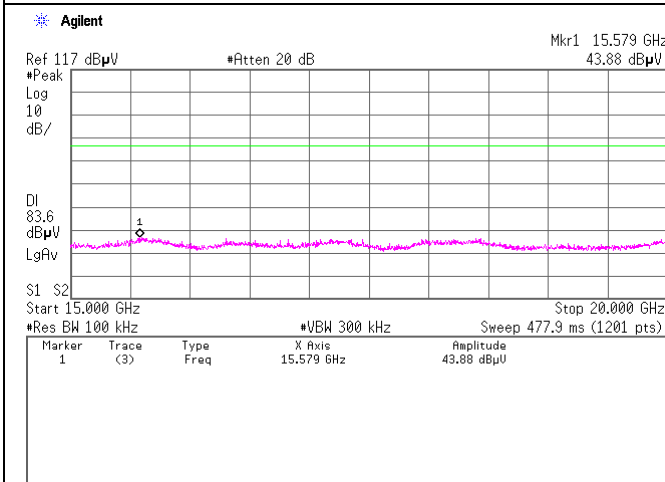
5GHz - 10GHz



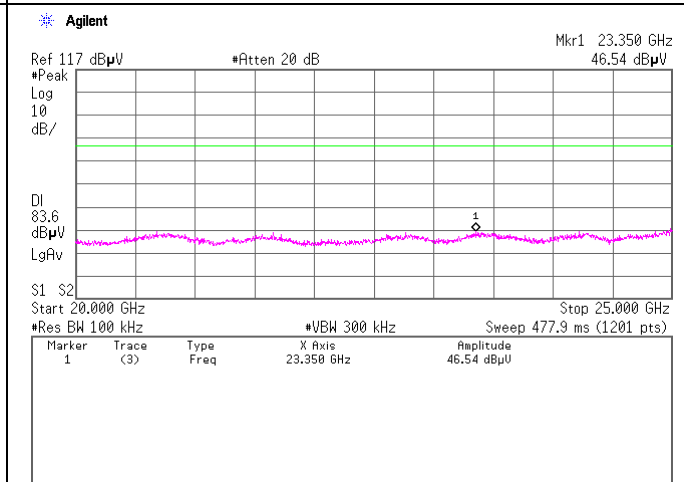
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



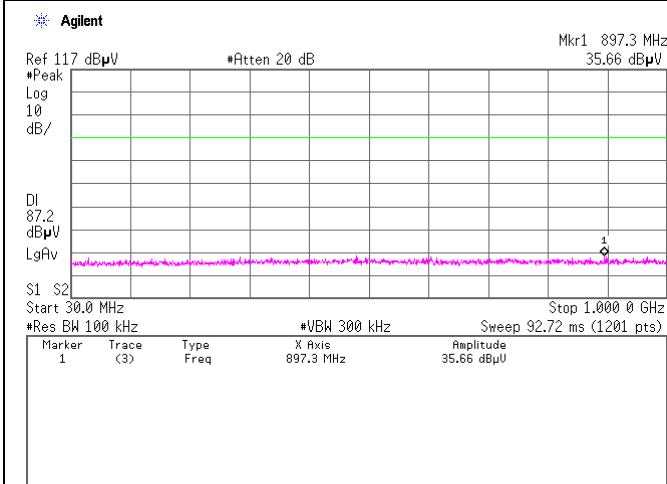
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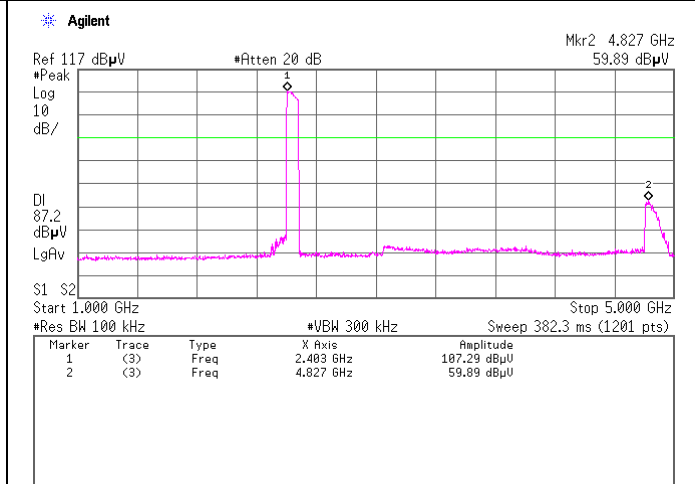
Spurious emission (Conducted)

DH5,
Hopping

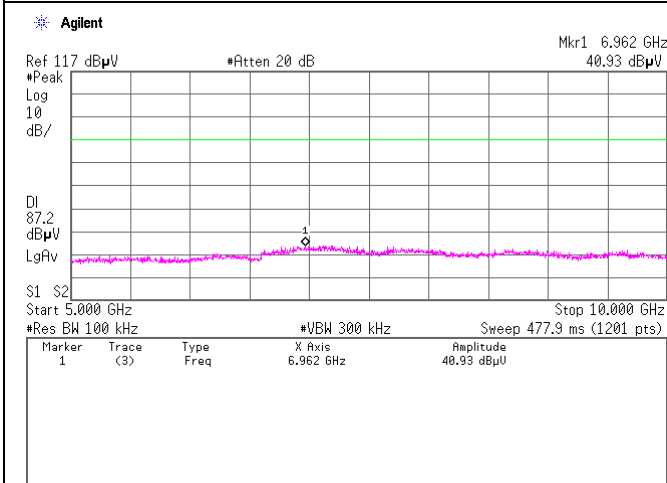
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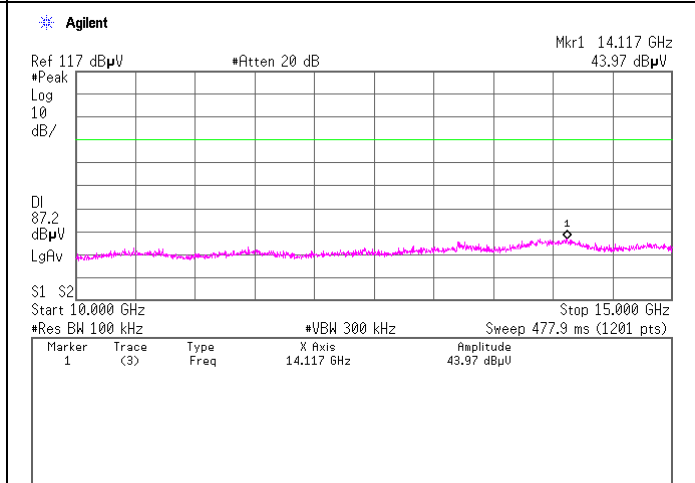
1GHz - 5GHz



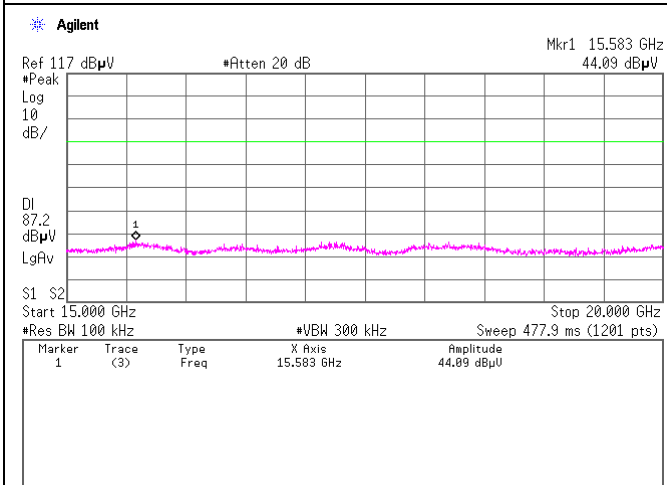
5GHz - 10GHz



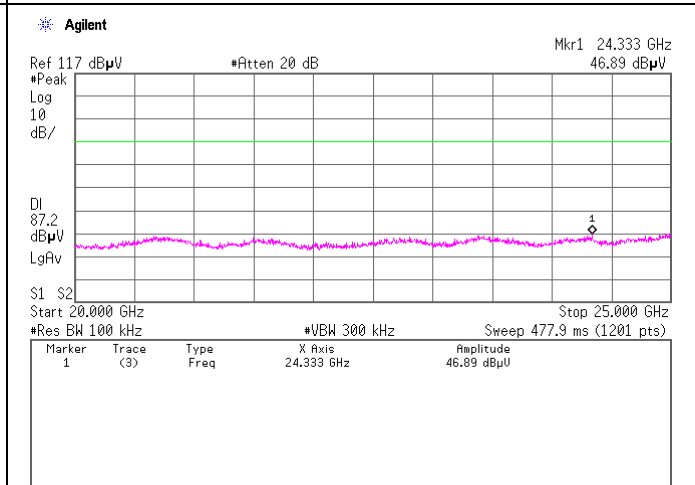
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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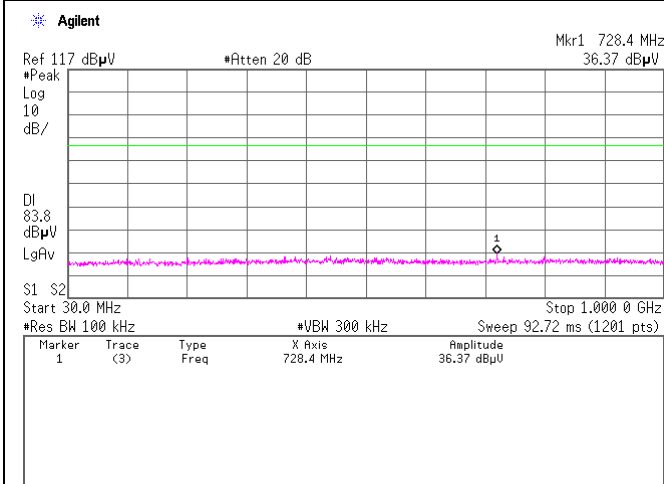
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Spurious emission (Conducted)

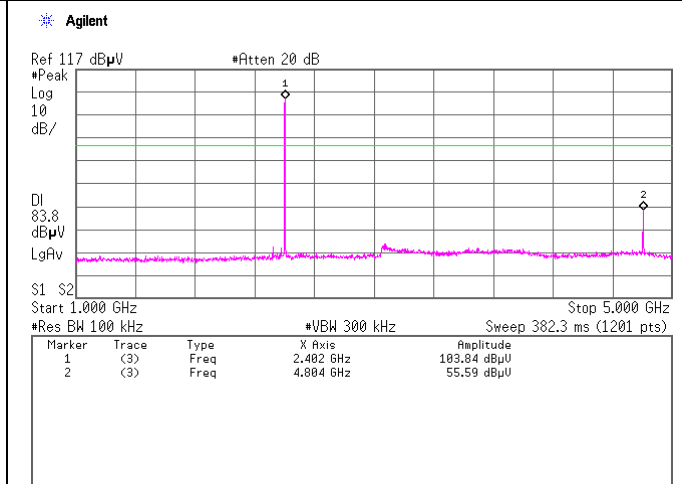
3-DH5,

Tx, 2402MHz

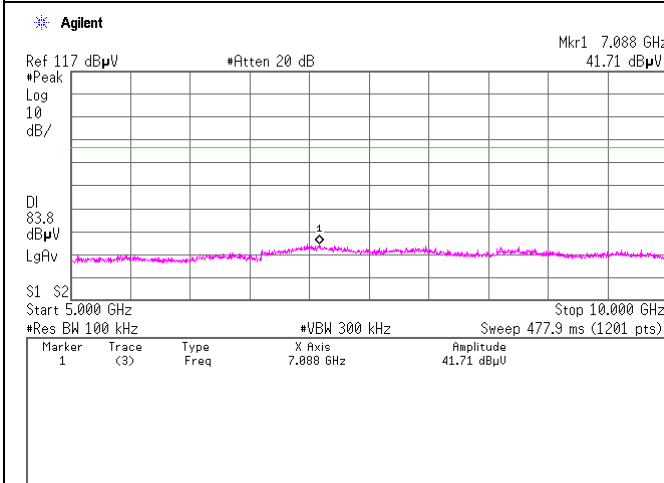
30MHz - 1GHz



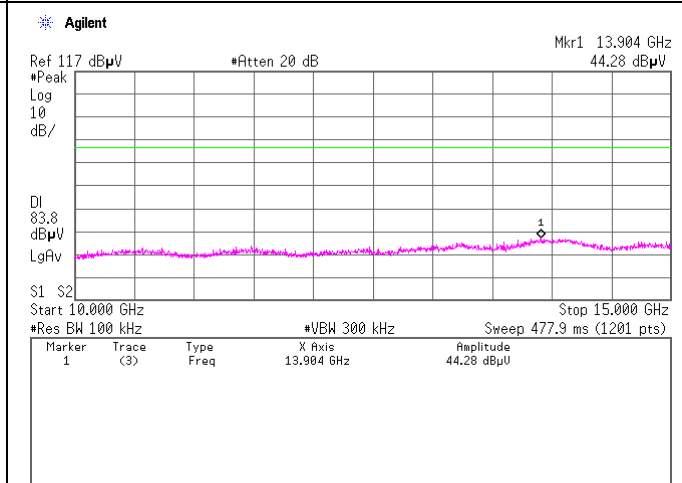
1GHz - 5GHz



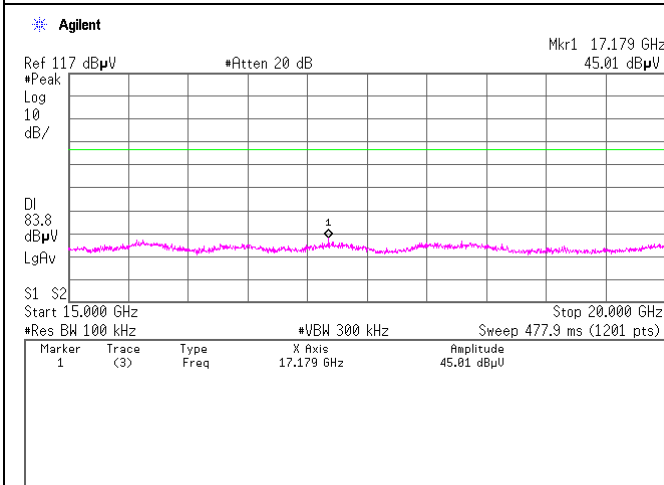
5GHz - 10GHz



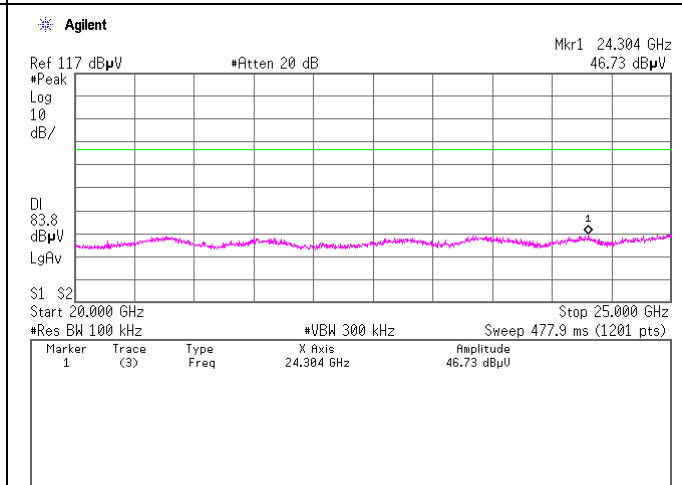
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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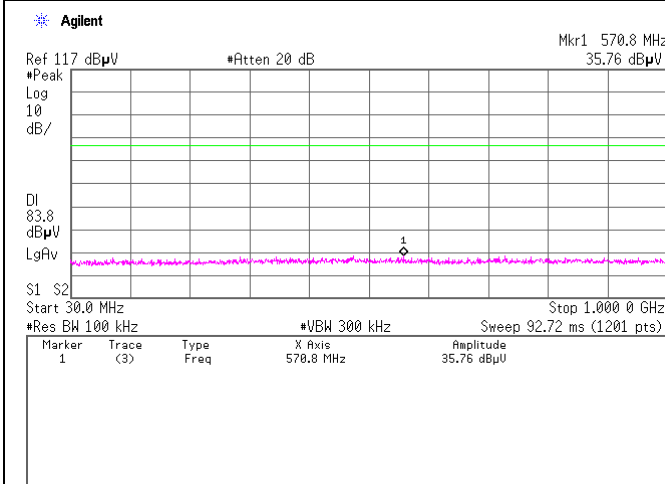
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Spurious emission (Conducted)

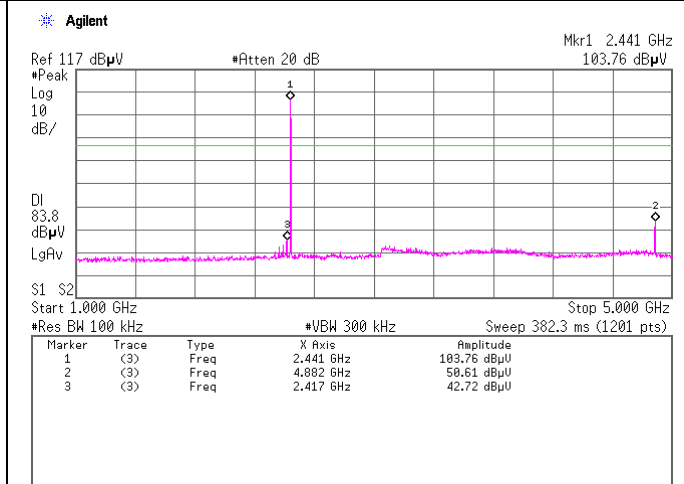
3-DH5,

Tx, 2441MHz

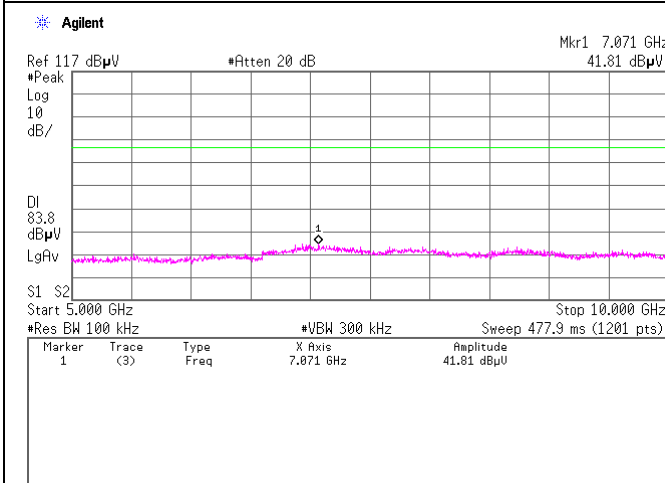
30MHz - 1GHz



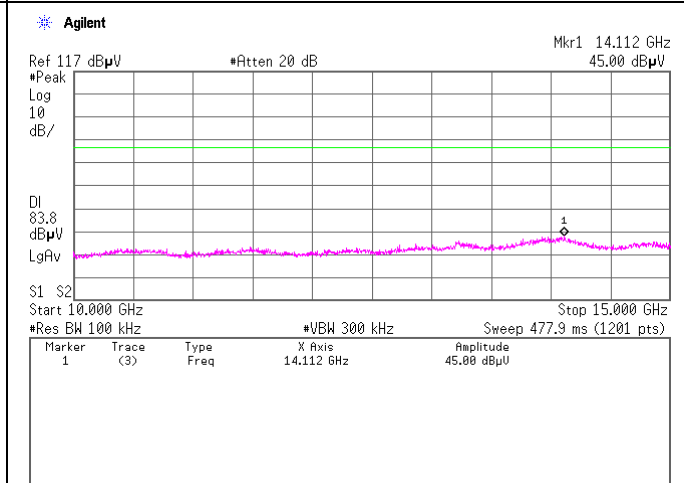
1GHz - 5GHz



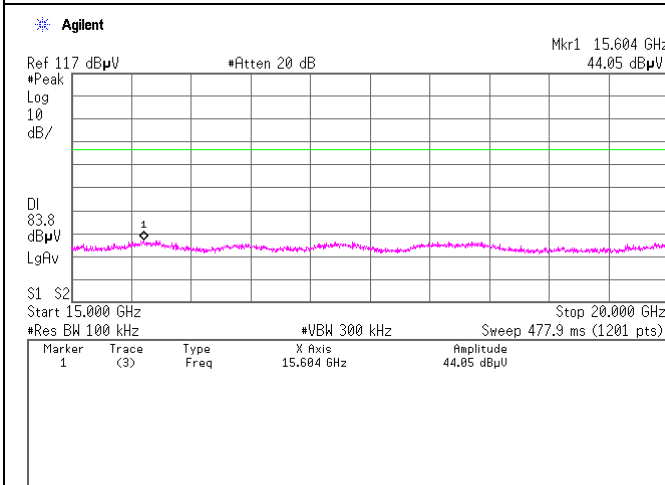
5GHz - 10GHz



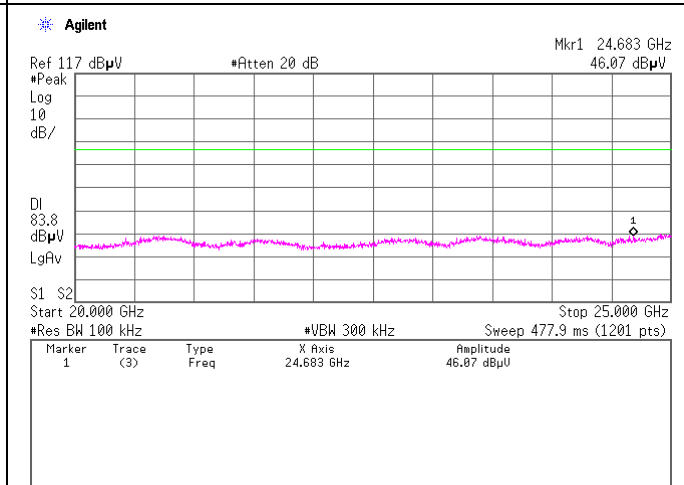
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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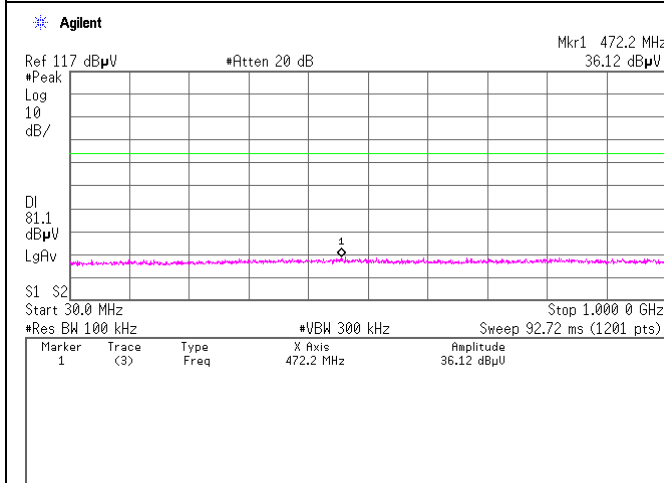
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Spurious emission (Conducted)

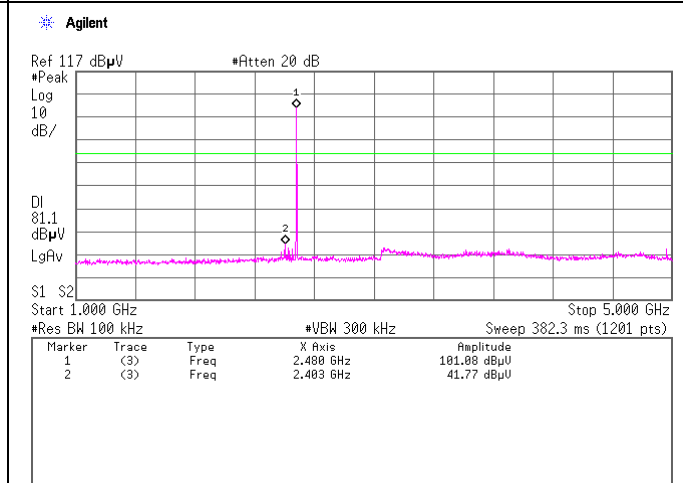
3-DH5,

Tx, 2480MHz

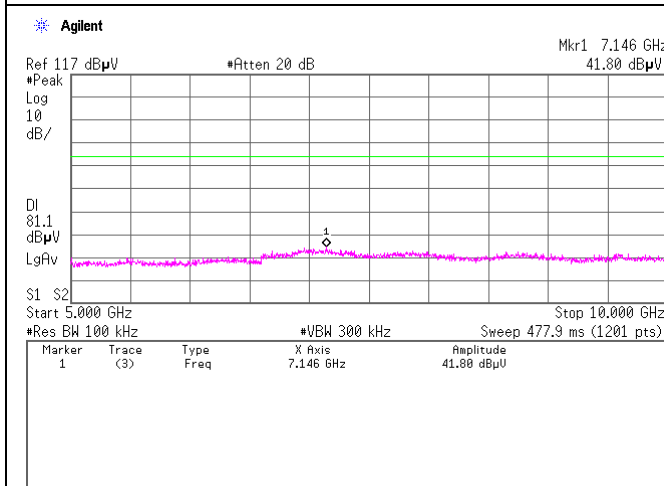
30MHz - 1GHz



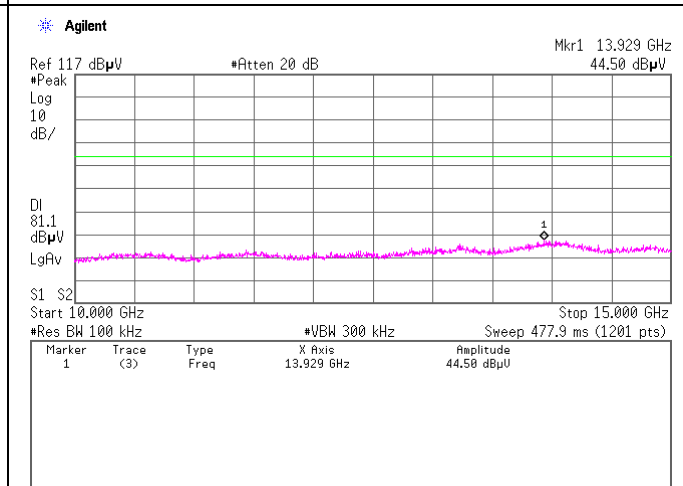
1GHz - 5GHz



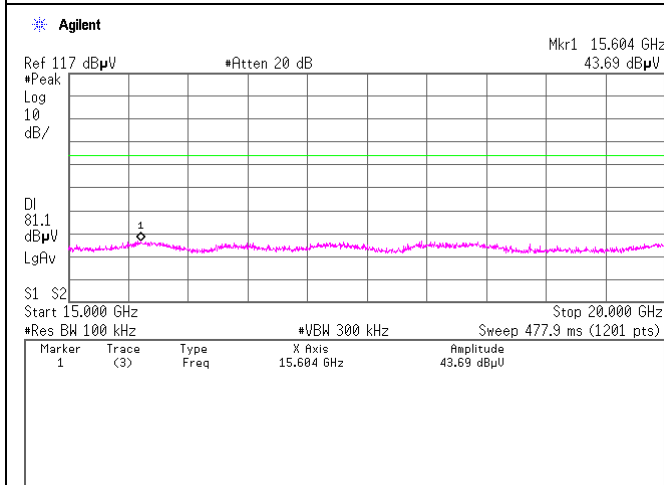
5GHz - 10GHz



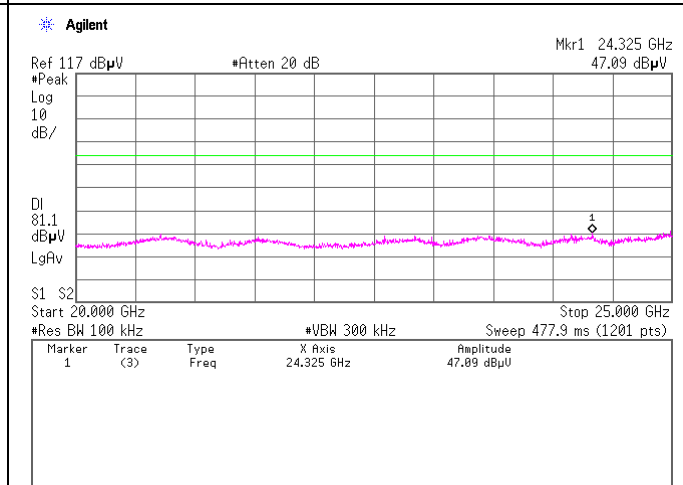
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



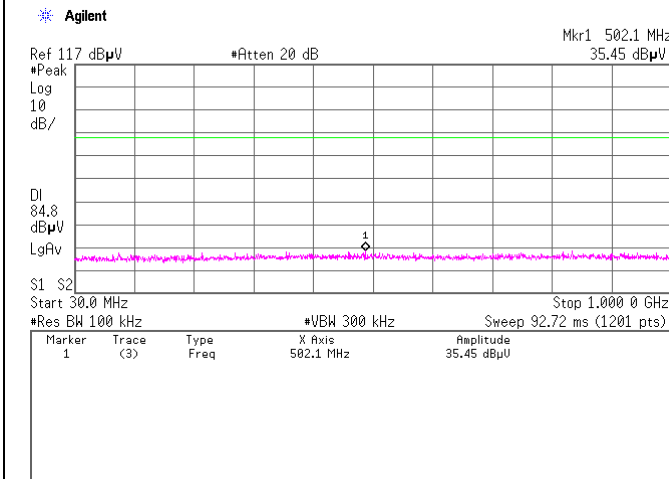
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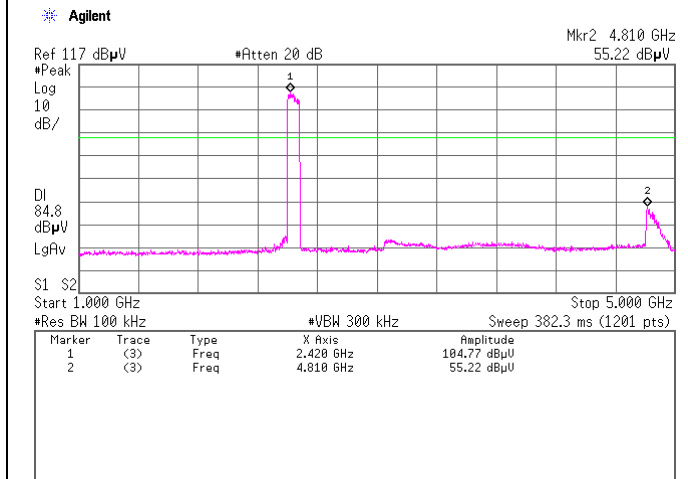
Spurious emission (Conducted)

3-DH5,
Hopping

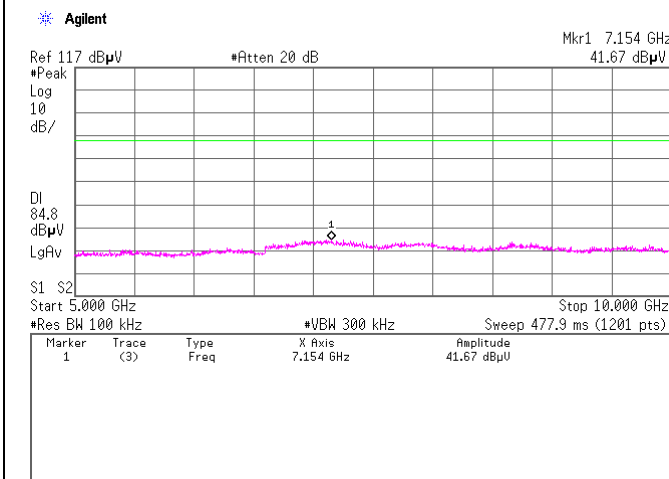
30MHz - 1GHz



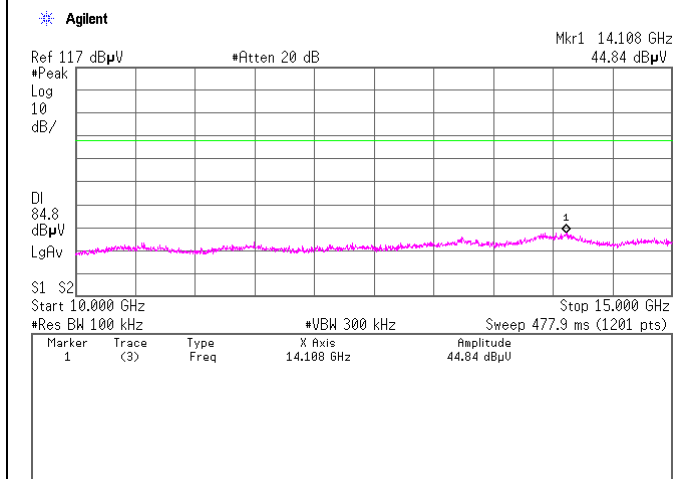
1GHz - 5GHz



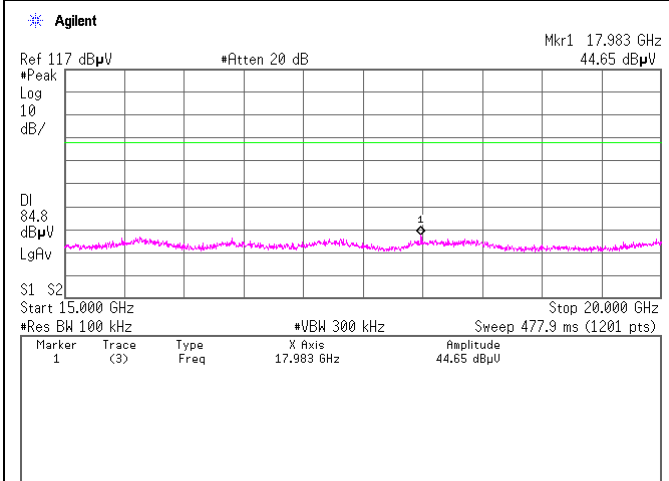
5GHz - 10GHz



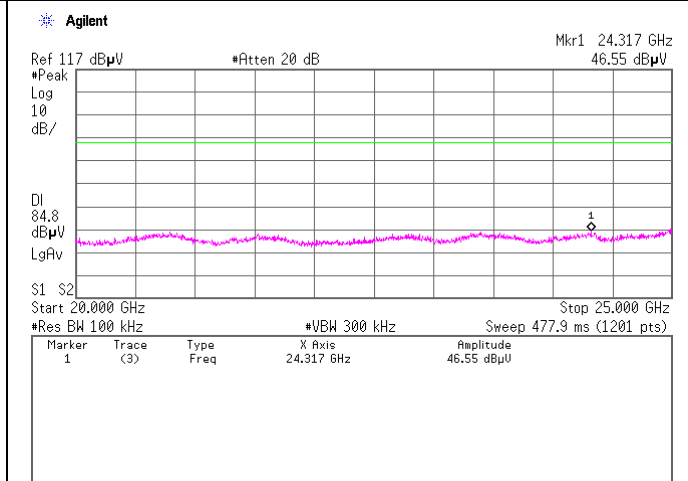
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



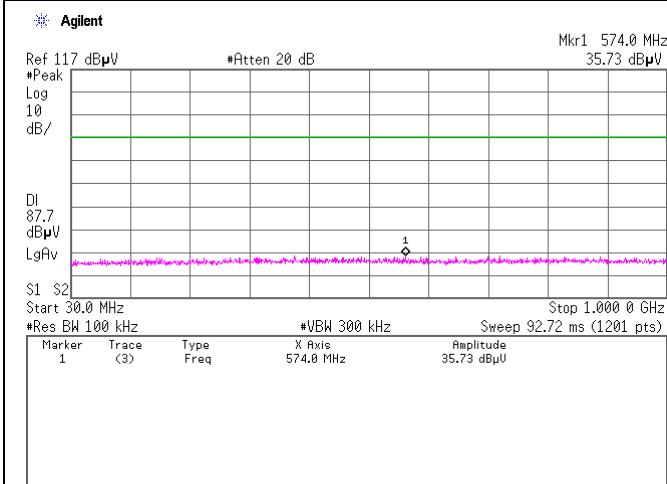
UL Japan, Inc.
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

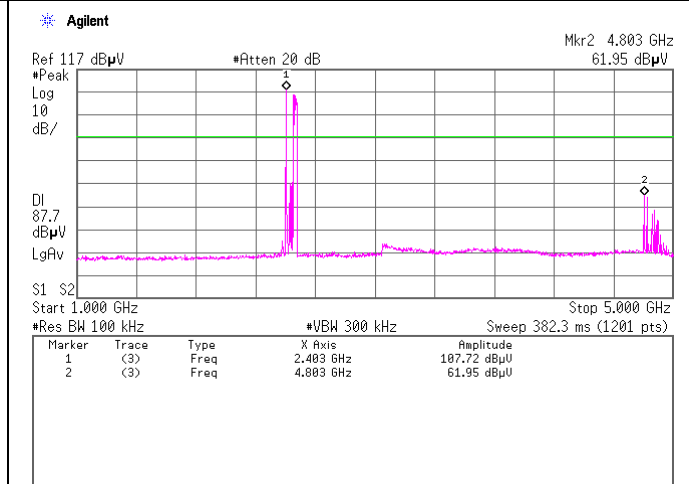
Spurious emission (Conducted)

Inquiry

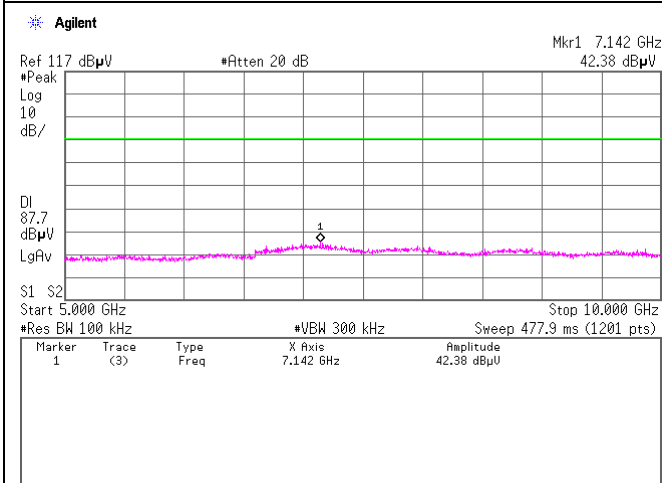
30MHz - 1GHz



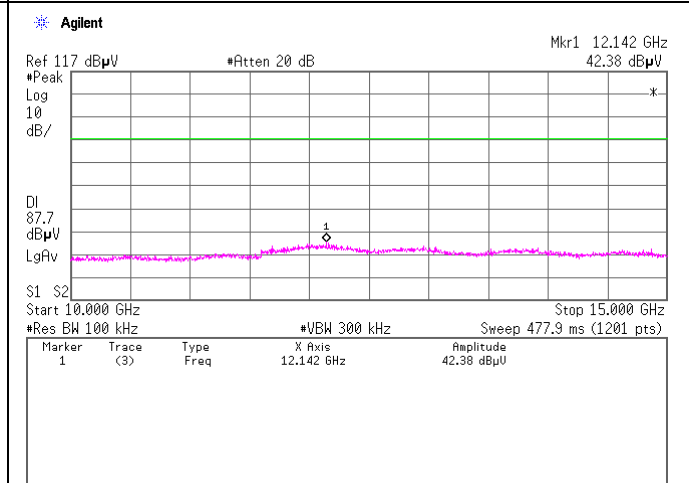
1GHz - 5GHz



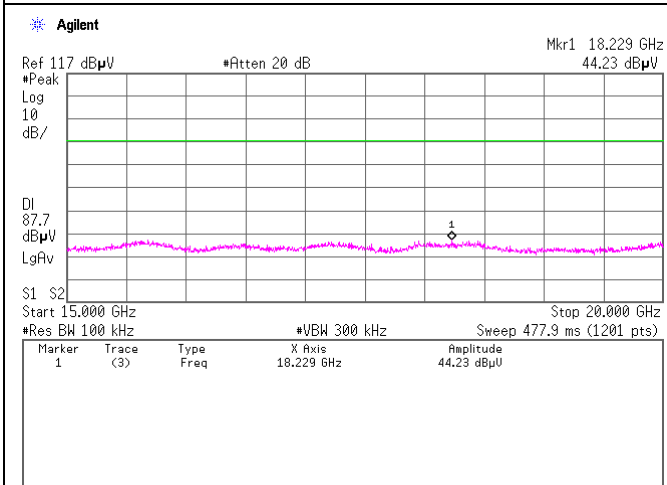
5GHz - 10GHz



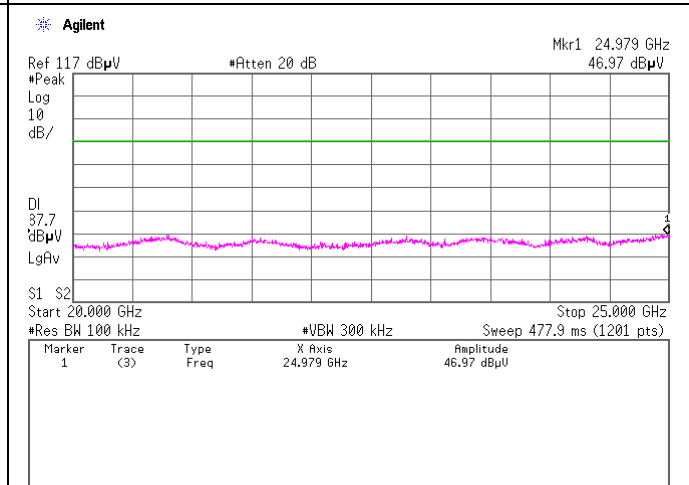
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



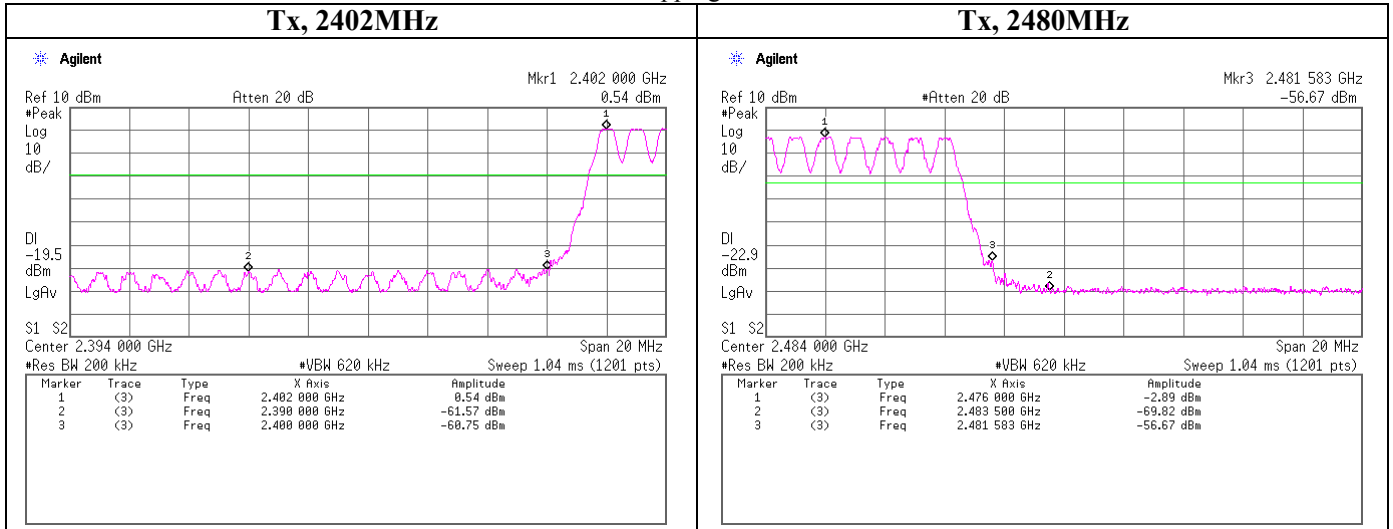
UL Japan, Inc.
Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

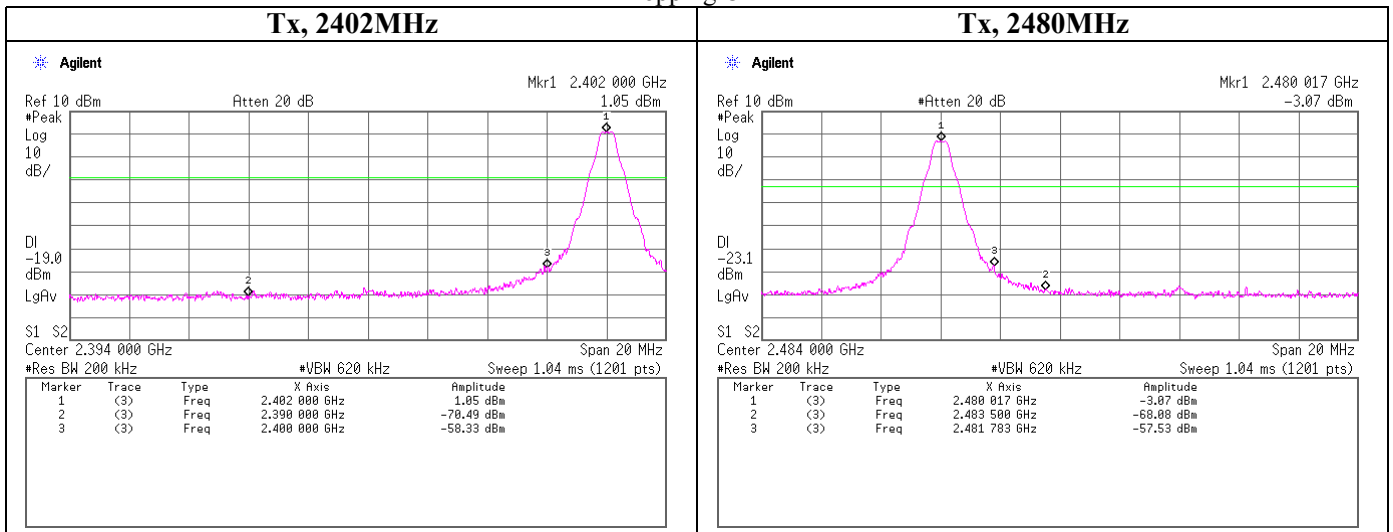
Spurious emission (Conducted)

Band Edge compliance
DH5,

Hopping ON



Hopping OFF

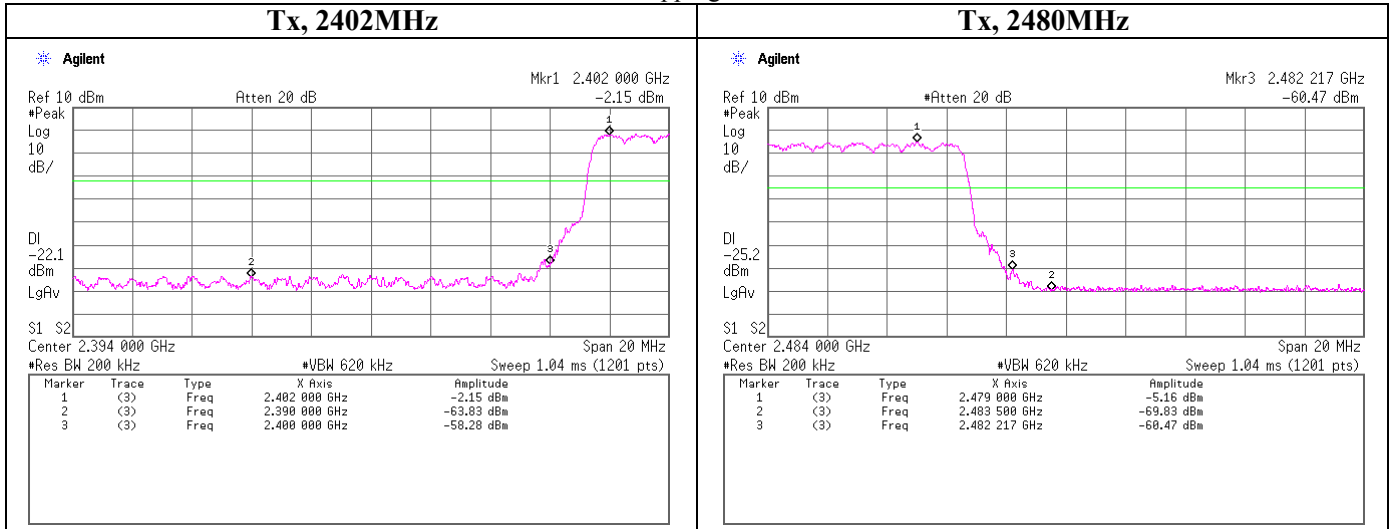


Spurious emission (Conducted)

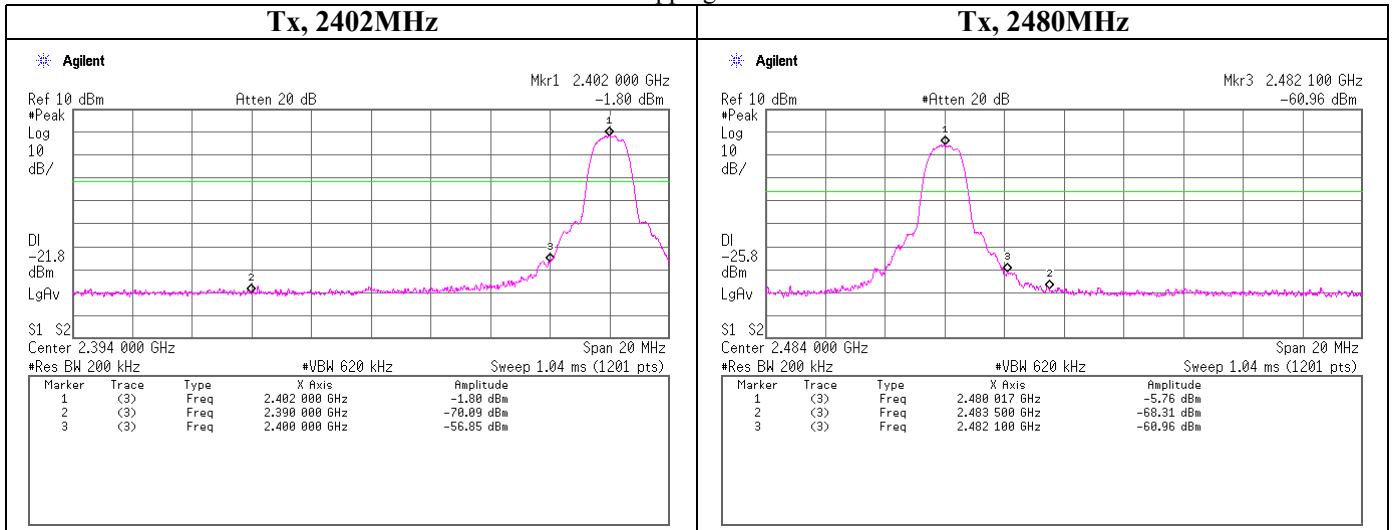
Band Edge compliance

3-DH5,

Hopping ON



Hopping OFF



DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

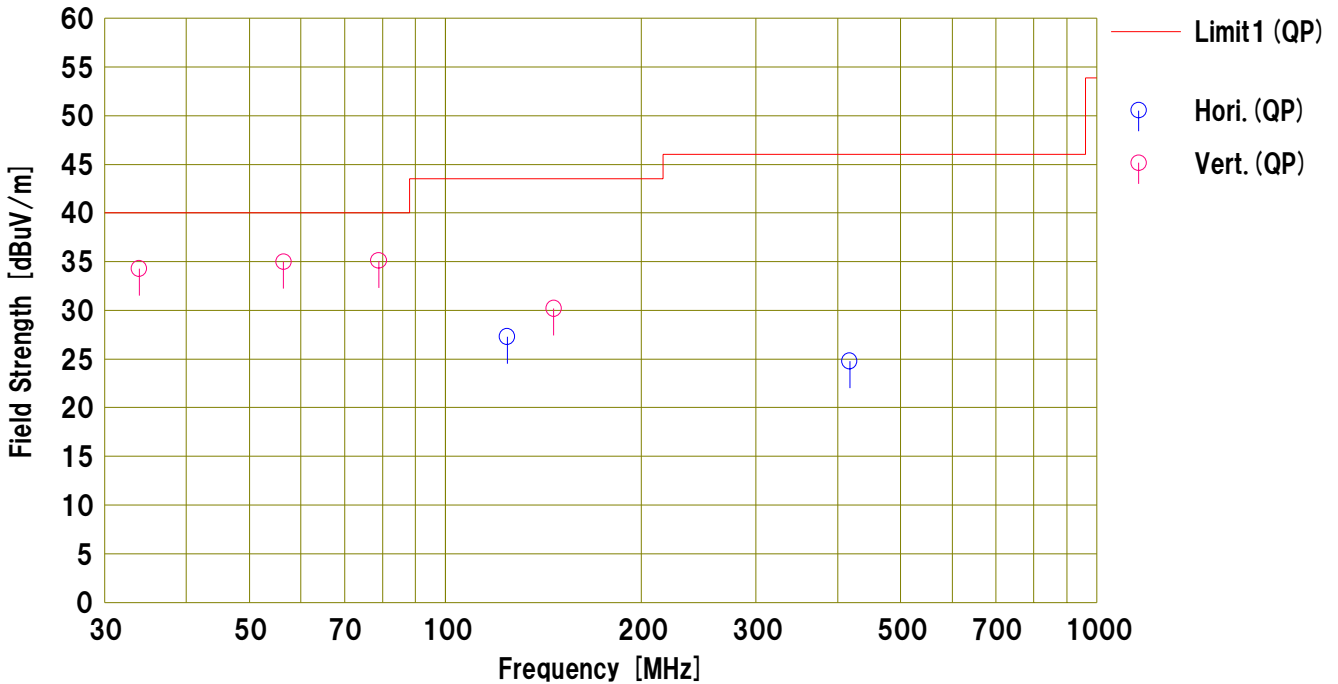
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2402MHz DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	124.380	38.7	13.3	7.3	32.0	27.3	43.5	16.2	Hori	362	191	BC	
2	417.621	31.6	16.3	8.8	31.9	24.8	46.0	21.2	Hori	100	280	LP	
3	33.870	42.9	16.9	6.6	32.1	34.3	40.0	5.7	Vert.	100	135	BC	
4	56.449	50.8	9.5	6.8	32.1	35.0	40.0	5.0	Vert.	100	117	BC	
5	79.032	53.8	6.4	7.0	32.1	35.1	40.0	4.9	Vert.	104	89	BC	
6	146.640	40.2	14.5	7.5	32.0	30.2	43.5	13.3	Vert.	100	236	BC	

Calculation:Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) - Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna, SHA** :Horn Antenna

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

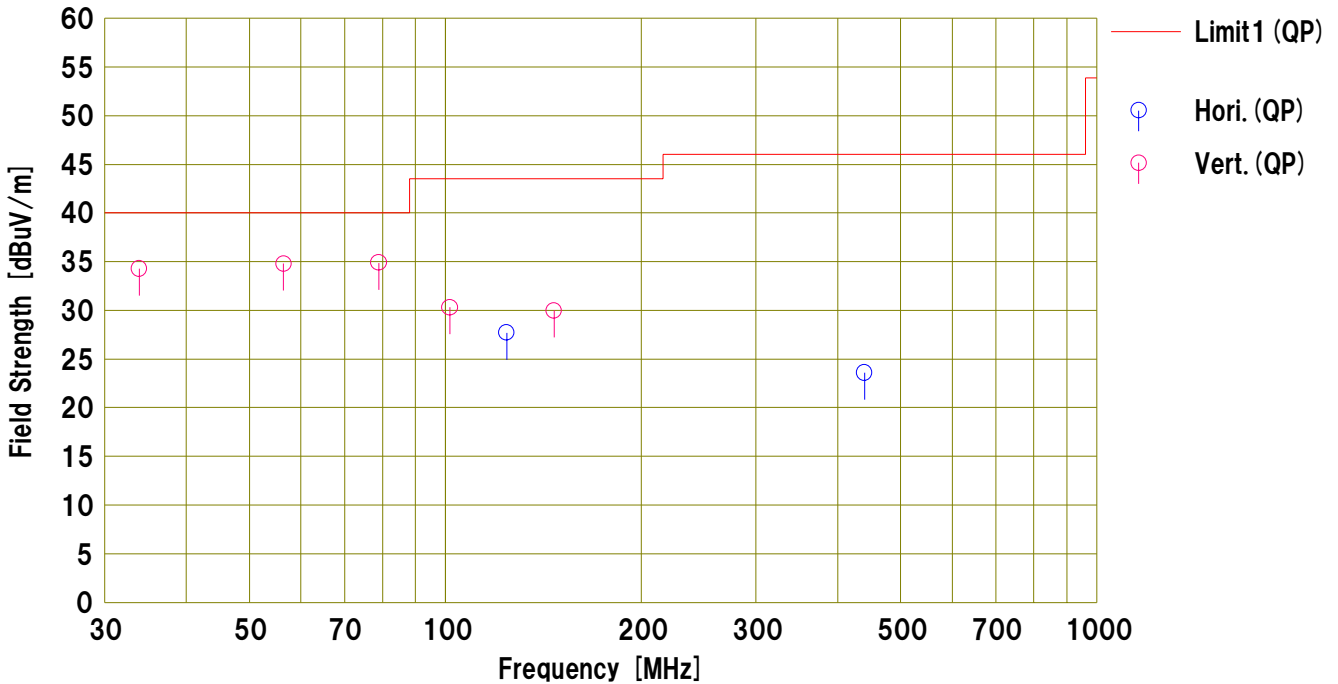
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2441MHz DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dBuV/m]	<QP> [dB]					
1	124.182	39.1	13.3	7.3	32.0	27.7	43.5	15.8	Hori	359	178	BC	
2	440.288	30.1	16.6	8.8	31.9	23.6	46.0	22.4	Hori	100	298	LP	
3	33.869	42.9	16.9	6.6	32.1	34.3	40.0	5.7	Vert.	100	127	BC	
4	56.448	50.6	9.5	6.8	32.1	34.8	40.0	5.2	Vert.	100	100	BC	
5	79.029	53.6	6.4	7.0	32.1	34.9	40.0	5.1	Vert.	148	81	BC	
6	101.611	44.7	10.5	7.2	32.1	30.3	43.5	13.2	Vert.	100	231	BC	
7	146.769	40.0	14.5	7.5	32.0	30.0	43.5	13.5	Vert.	100	260	BC	

Calculation:Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) - Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna, SHA**:Horn Antenna

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

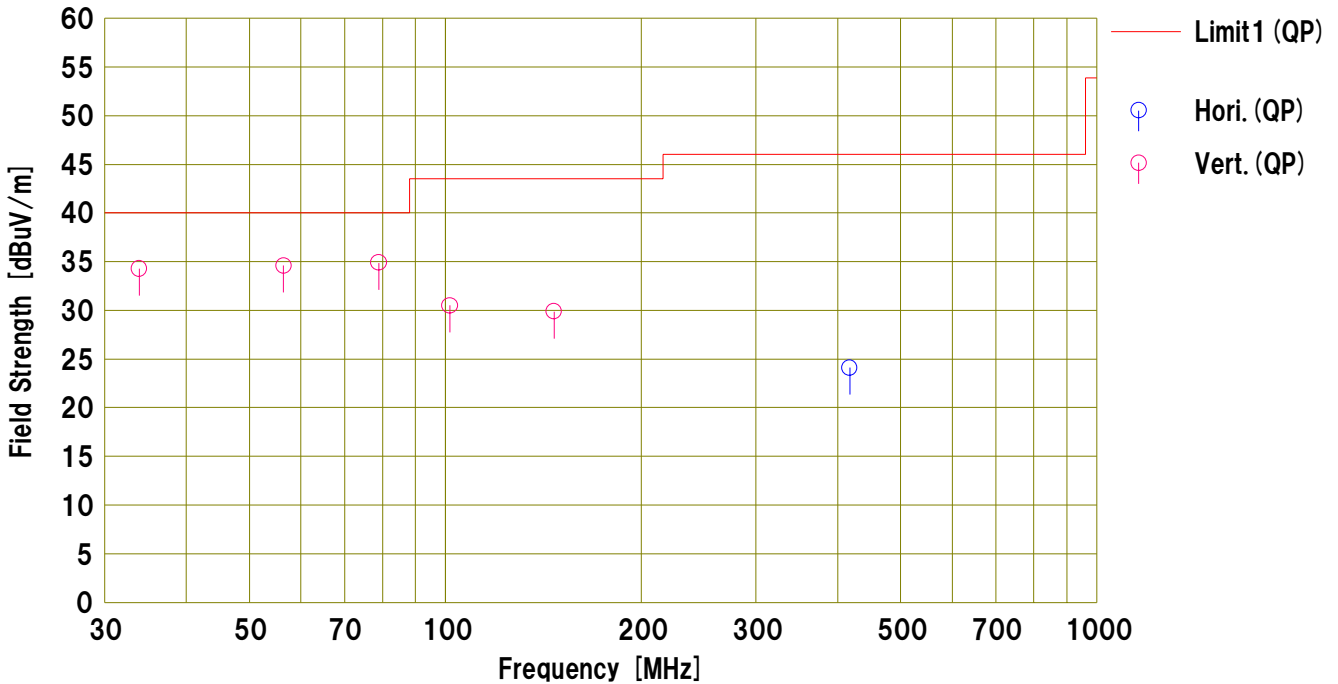
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2480MHz DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP>				<QP>	<QP>	<QP>					
		[dBuV]				[dBuV/m]	[dBuV/m]	[dB]					
1	417.717	30.9	16.3	8.8	31.9	24.1	46.0	21.9	Hori.	100	248	LP	
2	33.865	42.9	16.9	6.6	32.1	34.3	40.0	5.7	Vert.	101	120	BC	
3	56.460	50.4	9.5	6.8	32.1	34.6	40.0	5.4	Vert.	100	109	BC	
4	79.028	53.6	6.4	7.0	32.1	34.9	40.0	5.1	Vert.	128	80	BC	
5	101.607	44.9	10.5	7.2	32.1	30.5	43.5	13.0	Vert.	100	241	BC	
6	146.765	39.9	14.5	7.5	32.0	29.9	43.5	13.6	Vert.	100	242	BC	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

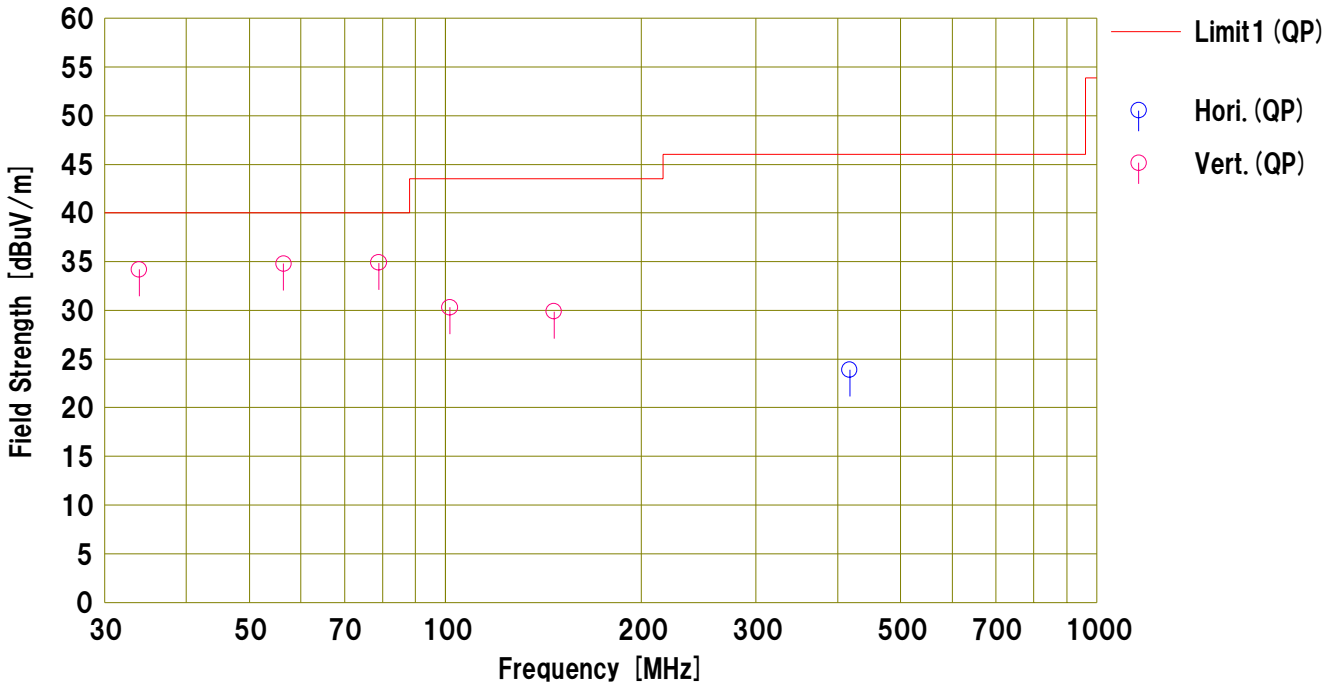
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2402MHz 3DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	417.713	30.7	16.3	8.8	31.9	23.9	46.0	22.1	Hori.	100	261	LP	
2	33.865	42.8	16.9	6.6	32.1	34.2	40.0	5.8	Vert.	100	113	BC	
3	56.447	50.6	9.5	6.8	32.1	34.8	40.0	5.2	Vert.	100	103	BC	
4	79.031	53.6	6.4	7.0	32.1	34.9	40.0	5.1	Vert.	144	83	BC	
5	101.603	44.7	10.5	7.2	32.1	30.3	43.5	13.2	Vert.	111	230	BC	
6	146.764	39.9	14.5	7.5	32.0	29.9	43.5	13.6	Vert.	101	246	BC	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

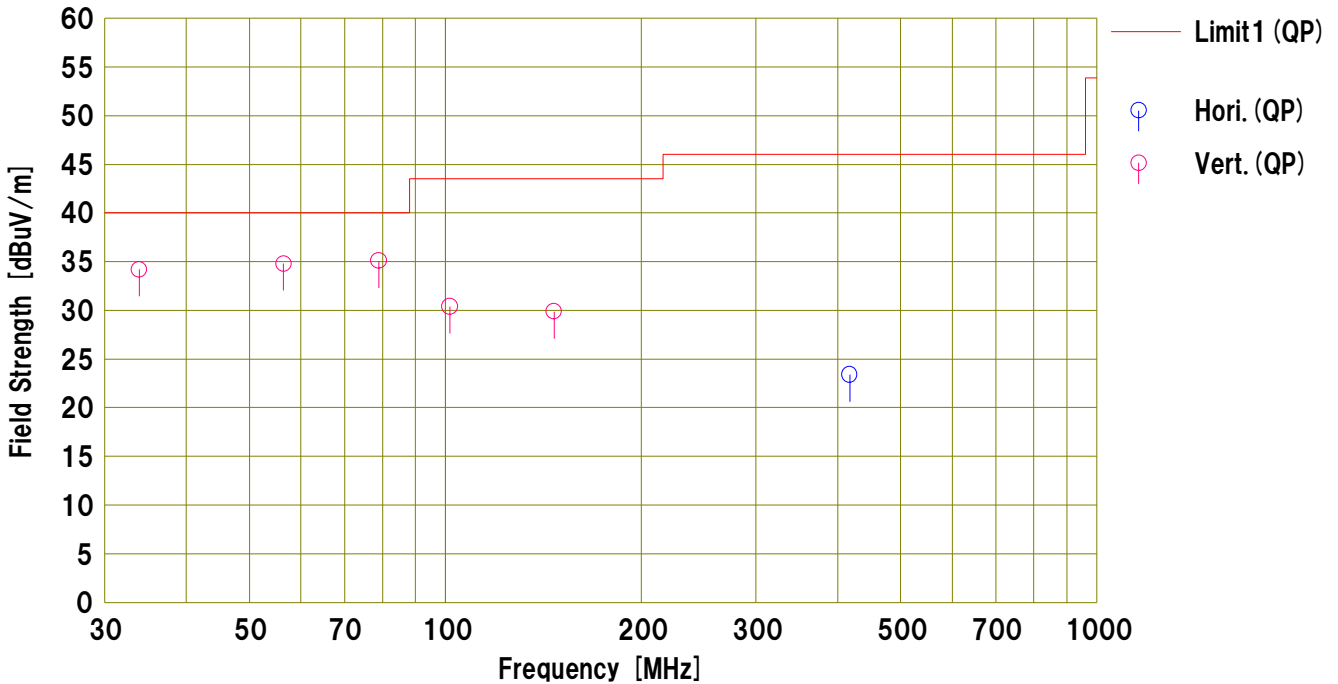
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2441MHz 3DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	417.717	30.2	16.3	8.8	31.9	23.4	46.0	22.6	Hori	100	281	LP	
2	33.868	42.8	16.9	6.6	32.1	34.2	40.0	5.8	Vert.	102	124	BC	
3	56.443	50.6	9.5	6.8	32.1	34.8	40.0	5.2	Vert.	100	96	BC	
4	79.028	53.8	6.4	7.0	32.1	35.1	40.0	4.9	Vert.	130	84	BC	
5	101.603	44.8	10.5	7.2	32.1	30.4	43.5	13.1	Vert.	100	240	BC	
6	146.763	39.9	14.5	7.5	32.0	29.9	43.5	13.6	Vert.	100	239	BC	

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2009/11/13

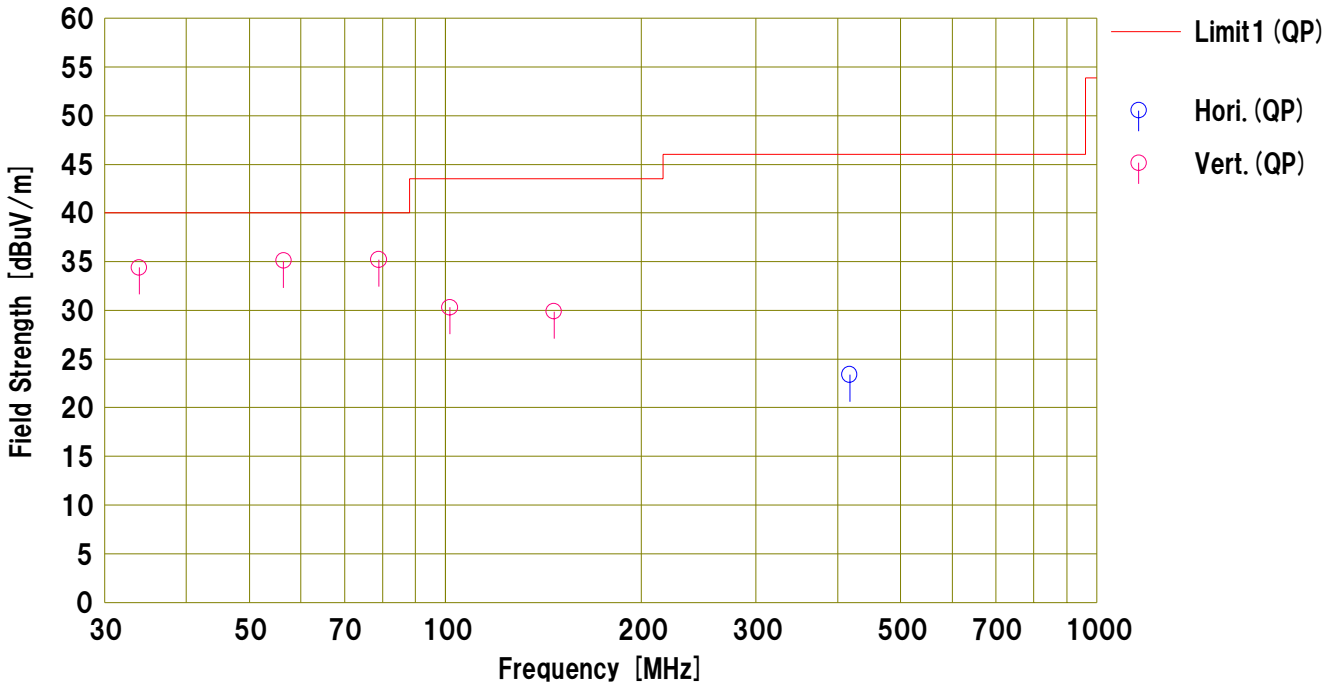
Company : ALPINE ELECTRONICS, INC.
Kind of EUT : Bluetooth Module
Model No. : PF240009
Serial No. : P1040114AA

Mode : Transmitting 2480MHz 3DH5
Report No. : 29HE0111-YK-01-A
Power : DC3.4V
Temp./Humi. : 23deg.C. / 37%

Remarks : module:Y axis, antenna:Z axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading	Ant.Fac [dB/m]	Loss [dB]	Gain [dB]	Result	Limit	Margin	Pola. [H/V]	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP> [dBuV]				<QP> [dBuV/m]	<QP> [dB]						
1	417.716	30.2	16.3	8.8	31.9	23.4	46.0	22.6	Hori.	100	295	LP	
2	33.872	43.0	16.9	6.6	32.1	34.4	40.0	5.6	Vert.	100	107	BC	
3	56.448	50.9	9.5	6.8	32.1	35.1	40.0	4.9	Vert.	100	79	BC	
4	79.028	53.9	6.4	7.0	32.1	35.2	40.0	4.8	Vert.	114	91	BC	
5	101.607	44.7	10.5	7.2	32.1	30.3	43.5	13.2	Vert.	100	232	BC	
6	146.763	39.9	14.5	7.5	32.0	29.9	43.5	13.6	Vert.	100	225	BC	

Calculation:Result [dBuV/m] = Reading [dBuV] + Ant.Fac [dB/m] + Loss (Cable+ATT) - Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna, LP:Logperiodic Antenna, SHA** :Horn Antenna

Radiated Emission

Test place : UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2009/11/9
 Temperature / Humidity : 20deg.C. , 57%
 Engineer : Makoto Hosaka
 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.	2323.000	PK	49.0	27.4	13.7	40.2	49.9	73.9	24.0	100	0	
Hori.	2377.000	PK	48.7	27.6	13.7	40.2	49.8	73.9	24.1	100	0	
Hori.	2390.000	PK	46.0	27.6	13.8	39.8	47.6	73.9	26.3	100	0	
Hori.	2400.000	PK	51.2	27.6	14.0	39.8	53.0	73.9	20.9	100	0	
Hori.	4804.000	PK	56.7	30.6	6.1	39.5	53.9	73.9	20.0	100	151	
Hori.	7206.000	PK	46.4	36.0	7.4	38.3	51.5	73.9	22.4	100	0	
Hori.	9608.000	PK	43.4	38.4	8.5	36.9	53.4	73.9	20.5	100	0	
Hori.	12010.000	PK	44.0	39.7	9.5	38.0	55.2	73.9	18.7	100	0	
Vert.	2323.000	PK	48.2	27.4	13.7	40.2	49.1	73.9	24.8	100	0	
Vert.	2377.000	PK	48.6	27.6	13.7	40.2	49.7	73.9	24.2	100	0	
Vert.	2390.000	PK	45.7	27.6	13.8	39.8	47.3	73.9	26.6	100	0	
Vert.	2400.000	PK	50.6	27.6	14.0	39.8	52.4	73.9	21.5	100	0	
Vert.	4804.000	PK	62.2	30.6	6.1	39.5	59.4	73.9	14.5	100	274	
Vert.	7206.000	PK	45.5	36.0	7.4	38.3	50.6	73.9	23.3	100	0	
Vert.	9608.000	PK	42.9	38.4	8.5	36.9	52.9	73.9	21.0	100	0	
Vert.	12010.000	PK	44.4	39.7	9.5	38.0	55.6	73.9	18.3	100	0	

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

*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.

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.	2323.000	PK	49.0	27.4	13.7	40.2	-24.9	25.0	53.9	28.9	
Hori.	2377.000	PK	48.7	27.6	13.7	40.2	-24.9	24.9	53.9	29.0	
Hori.	2390.000	PK	46.0	27.6	13.8	39.8	-24.9	22.7	53.9	31.2	
Hori.	2400.000	PK	51.2	27.6	14.0	39.8	-24.9	28.1	53.9	25.8	
Hori.	4804.000	PK	56.7	30.6	6.1	39.5	-24.9	29.0	53.9	24.9	
Hori.	7206.000	PK	46.4	36.0	7.4	38.3	-24.9	26.6	53.9	27.3	
Hori.	9608.000	PK	43.4	38.4	8.5	36.9	-24.9	28.5	53.9	25.4	
Hori.	12010.000	PK	44.0	39.7	9.5	38.0	-24.9	30.3	53.9	23.6	
Vert.	2323.000	PK	48.2	27.4	13.7	40.2	-24.9	24.2	53.9	29.7	
Vert.	2377.000	PK	48.6	27.6	13.7	40.2	-24.9	24.8	53.9	29.1	
Vert.	2390.000	PK	45.7	27.6	13.8	39.8	-24.9	22.4	53.9	31.5	
Vert.	2400.000	PK	50.6	27.6	14.0	39.8	-24.9	27.5	53.9	26.4	
Vert.	4804.000	PK	62.2	30.6	6.1	39.5	-24.9	34.5	53.9	19.4	
Vert.	7206.000	PK	45.5	36.0	7.4	38.3	-24.9	25.7	53.9	28.2	
Vert.	9608.000	PK	42.9	38.4	8.5	36.9	-24.9	28.0	53.9	25.9	
Vert.	12010.000	PK	44.4	39.7	9.5	38.0	-24.9	30.7	53.9	23.2	

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

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

*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.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date 2009/11/9
 Temperature / Humidity 20deg.C. , 57%
 Engineer Makoto Hosaka
 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.	2363.000	PK	50.0	27.5	13.7	40.2	51.0	73.9	22.9	100	0	
Hori.	4882.000	PK	50.1	30.9	6.3	39.5	47.8	73.9	26.1	118	221	
Hori.	7323.000	PK	46.0	36.0	7.5	38.4	51.1	73.9	22.8	100	0	
Hori.	9764.000	PK	44.6	38.4	8.6	37.0	54.6	73.9	19.3	100	0	
Hori.	12205.000	PK	45.3	39.7	9.8	37.7	57.1	73.9	16.8	100	0	
Vert.	2363.000	PK	50.3	27.5	13.7	40.2	51.3	73.9	22.6	100	0	
Vert.	4882.000	PK	54.1	30.9	6.3	39.5	51.8	73.9	22.1	100	273	
Vert.	7323.000	PK	45.4	36.0	7.5	38.4	50.5	73.9	23.4	100	0	
Vert.	9764.000	PK	43.7	38.4	8.6	37.0	53.7	73.9	20.2	100	0	
Vert.	12205.000	PK	45.2	39.7	9.8	37.7	57.0	73.9	16.9	100	0	

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

*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.

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.	2363.000	PK	50.0	27.5	13.7	40.2	-24.9	26.1	53.9	27.8	
Hori.	4882.000	PK	50.1	30.9	6.3	39.5	-24.9	22.9	53.9	31.0	
Hori.	7323.000	PK	46.0	36.0	7.5	38.4	-24.9	26.2	53.9	27.7	
Hori.	9764.000	PK	44.6	38.4	8.6	37.0	-24.9	29.7	53.9	24.2	
Hori.	12205.000	PK	45.3	39.7	9.8	37.7	-24.9	32.2	53.9	21.7	
Vert.	2363.000	PK	50.3	27.5	13.7	40.2	-24.9	32.5	53.9	27.5	
Vert.	4882.000	PK	54.1	30.9	6.3	39.5	-24.9	26.9	53.9	27.0	
Vert.	7323.000	PK	45.4	36.0	7.5	38.4	-24.9	25.6	53.9	28.3	
Vert.	9764.000	PK	43.7	38.4	8.6	37.0	-24.9	28.8	53.9	25.1	
Vert.	12205.000	PK	45.2	39.7	9.8	37.7	-24.9	32.1	53.9	21.8	

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

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

*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.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date 2009/11/9
 Temperature / Humidity 20deg.C , 57%
 Engineer Makoto Hosaka
 Mode Tx, 2480 MHz
 Bluetooth, DHS,

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.	2483.500	PK	46.1	27.9	14.0	39.8	48.2	73.9	25.7	100	0	
Hori.	4960.000	PK	46.9	31.1	6.4	39.4	45.0	73.9	28.9	108	247	
Hori.	7440.000	PK	46.3	35.9	7.7	38.5	51.4	73.9	22.5	100	0	
Hori.	9920.000	PK	43.6	38.3	8.6	37.1	53.4	73.9	20.5	100	0	
Hori.	12400.000	PK	44.4	39.7	10.3	37.4	57.0	73.9	16.9	100	0	
Vert.	2483.500	PK	46.0	27.9	14.0	39.8	48.1	73.9	25.8	100	0	
Vert.	4960.000	PK	47.7	31.1	6.4	39.4	45.8	73.9	28.1	100	149	
Vert.	7440.000	PK	45.7	35.9	7.7	38.5	50.8	73.9	23.1	100	0	
Vert.	9920.000	PK	44.8	38.3	8.6	37.1	54.6	73.9	19.3	100	0	
Vert.	12400.000	PK	45.5	39.7	10.3	37.4	58.1	73.9	15.8	100	0	

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

*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.

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	PK	46.1	27.9	14.0	39.8	-24.9	23.3	53.9	30.6	
Hori.	4960.000	PK	46.9	31.1	6.4	39.4	-24.9	20.1	53.9	33.8	
Hori.	7440.000	PK	46.3	35.9	7.7	38.5	-24.9	26.5	53.9	27.4	
Hori.	9920.000	PK	43.6	38.3	8.6	37.1	-24.9	28.5	53.9	25.4	
Hori.	12400.000	PK	44.4	39.7	10.3	37.4	-24.9	32.1	53.9	21.8	
Vert.	2483.500	PK	46.0	27.9	14.0	39.8	-24.9	23.2	53.9	30.7	
Vert.	4960.000	PK	47.7	31.1	6.4	39.4	-24.9	20.9	53.9	33.0	
Vert.	7440.000	PK	45.7	35.9	7.7	38.5	-24.9	25.9	53.9	28.0	
Vert.	9920.000	PK	44.8	38.3	8.6	37.1	-24.9	29.7	53.9	24.2	
Vert.	12400.000	PK	45.5	39.7	10.3	37.4	-24.9	33.2	53.9	20.7	

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

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

*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 2009/11/9
 Temperature / Humidity 20deg.C , 57%
 Engineer Makoto Hosaka
 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.	2390.000	PK	45.8	27.6	13.8	39.8	47.4	73.9	26.5	100	0	
Hori.	2400.000	PK	57.6	27.6	14.0	39.8	59.4	73.9	14.5	100	0	
Hori.	4804.000	PK	56.2	30.6	6.1	39.5	53.4	73.9	20.5	117	231	
Hori.	7206.000	PK	46.6	36.0	7.4	38.3	51.7	73.9	22.3	100	0	
Hori.	9608.000	PK	43.7	38.4	8.5	36.9	53.7	73.9	20.2	100	0	
Hori.	12010.000	PK	45.1	39.7	9.5	38.0	56.3	73.9	17.6	100	0	
Vert.	2390.000	PK	45.5	27.6	13.8	39.8	47.1	73.9	26.8	100	0	
Vert.	2400.000	PK	58.7	27.6	14.0	39.8	60.5	73.9	13.4	105	181	
Vert.	4804.000	PK	58.9	30.6	6.1	39.5	56.1	73.9	17.8	106	136	
Vert.	7206.000	PK	45.8	36.0	7.4	38.3	50.9	73.9	23.0	100	0	
Vert.	9608.000	PK	43.9	38.4	8.5	36.9	53.9	73.9	20.0	100	0	
Vert.	12010.000	PK	44.7	39.7	9.5	38.0	55.9	73.9	18.0	100	0	

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

*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.

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	PK	45.8	27.6	13.8	39.8	-24.7	22.7	53.9	31.2	
Hori.	2400.000	PK	57.6	27.6	14.0	39.8	-24.7	34.7	53.9	19.2	
Hori.	4804.000	PK	56.2	30.6	6.1	39.5	-24.7	28.7	53.9	25.2	
Hori.	7206.000	PK	46.6	36.0	7.4	38.3	-24.7	27.0	53.9	26.9	
Hori.	9608.000	PK	43.7	38.4	8.5	36.9	-24.7	29.0	53.9	24.9	
Hori.	12010.000	PK	45.1	39.7	9.5	38.0	-24.7	31.6	53.9	22.3	
Vert.	2390.000	PK	45.5	27.6	13.8	39.8	-24.7	22.4	53.9	31.5	
Vert.	2400.000	PK	58.7	27.6	14.0	39.8	-24.7	35.8	53.9	18.1	
Vert.	4804.000	PK	58.9	30.6	6.1	39.5	-24.7	31.4	53.9	22.5	
Vert.	7206.000	PK	45.8	36.0	7.4	38.3	-24.7	26.2	53.9	27.7	
Vert.	9608.000	PK	43.9	38.4	8.5	36.9	-24.7	29.2	53.9	24.7	
Vert.	12010.000	PK	44.7	39.7	9.5	38.0	-24.7	31.2	53.9	22.7	

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

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

*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 2009/11/9
 Temperature / Humidity 20deg.C. , 57%
 Engineer Makoto Hosaka
 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.	4882.000	PK	49.5	30.9	6.3	39.5	47.2	73.9	26.7	103	223	
Hori.	7323.000	PK	45.0	36.0	7.5	38.4	50.1	73.9	23.8	100	0	
Hori.	9764.000	PK	44.4	38.4	8.6	37.0	54.4	73.9	19.5	100	0	
Hori.	12205.000	PK	44.6	39.7	9.8	37.7	56.4	73.9	17.6	100	0	
Vert.	4882.000	PK	51.8	30.9	6.3	39.5	49.5	73.9	24.4	100	232	
Vert.	7323.000	PK	44.9	36.0	7.5	38.4	50.0	73.9	23.9	100	0	
Vert.	9764.000	PK	43.8	38.4	8.6	37.0	53.8	73.9	20.1	100	0	
Vert.	12205.000	PK	44.9	39.7	9.8	37.7	56.7	73.9	17.2	100	0	

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

*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.

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	PK	49.5	30.9	6.3	39.5	-24.7	22.5	53.9	31.4	
Hori.	7323.000	PK	45.0	36.0	7.5	38.4	-24.7	25.4	53.9	28.5	
Hori.	9764.000	PK	44.4	38.4	8.6	37.0	-24.7	29.7	53.9	24.2	
Hori.	12205.000	PK	44.6	39.7	9.8	37.7	-24.7	31.7	53.9	22.2	
Vert.	4882.000	PK	51.8	30.9	6.3	39.5	-24.7	24.8	53.9	29.1	
Vert.	7323.000	PK	44.9	36.0	7.5	38.4	-24.7	25.3	53.9	28.6	
Vert.	9764.000	PK	43.8	38.4	8.6	37.0	-24.7	29.1	53.9	24.8	
Vert.	12205.000	PK	44.9	39.7	9.8	37.7	-24.7	32.0	53.9	21.9	

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

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

*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 2009/11/9
 Temperature / Humidity 20deg.C. , 57%
 Engineer Makoto Hosaka
 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.	2483.500	PK	45.8	27.9	14.0	39.8	47.9	73.9	26.0	100	0	
Hori.	4960.000	PK	47.0	31.1	6.4	39.4	45.1	73.9	28.8	100	281	
Hori.	7440.000	PK	46.1	35.9	7.7	38.5	51.2	73.9	22.7	100	0	
Hori.	9920.000	PK	43.8	38.3	8.6	37.1	53.6	73.9	20.3	100	0	
Hori.	12400.000	PK	44.5	39.7	10.3	37.4	57.1	73.9	16.8	100	0	
Vert.	2483.500	PK	46.5	27.9	14.0	39.8	48.6	73.9	25.3	100	0	
Vert.	4960.000	PK	48.5	31.1	6.4	39.4	46.6	73.9	27.3	101	156	
Vert.	7440.000	PK	45.5	35.9	7.7	38.5	50.6	73.9	23.4	100	0	
Vert.	9920.000	PK	43.6	38.3	8.6	37.1	53.4	73.9	20.5	100	0	
Vert.	12400.000	PK	45.1	39.7	10.3	37.4	57.7	73.9	16.2	100	0	

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

*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.

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	PK	45.8	27.9	14.0	39.8	-24.7	23.2	53.9	30.7	
Hori.	4960.000	PK	47.0	31.1	6.4	39.4	-24.7	20.4	53.9	33.5	
Hori.	7440.000	PK	46.1	35.9	7.7	38.5	-24.7	26.5	53.9	27.4	
Hori.	9920.000	PK	43.8	38.3	8.6	37.1	-24.7	28.9	53.9	25.0	
Hori.	12400.000	PK	44.5	39.7	10.3	37.4	-24.7	32.4	53.9	21.5	
Vert.	2483.500	PK	46.5	27.9	14.0	39.8	-24.7	23.9	53.9	30.0	
Vert.	4960.000	PK	48.5	31.1	6.4	39.4	-24.7	21.9	53.9	32.0	
Vert.	7440.000	PK	45.5	35.9	7.7	38.5	-24.7	25.9	53.9	28.0	
Vert.	9920.000	PK	43.6	38.3	8.6	37.1	-24.7	28.7	53.9	25.2	
Vert.	12400.000	PK	45.1	39.7	10.3	37.4	-24.7	33.0	53.9	20.9	

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

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

*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.

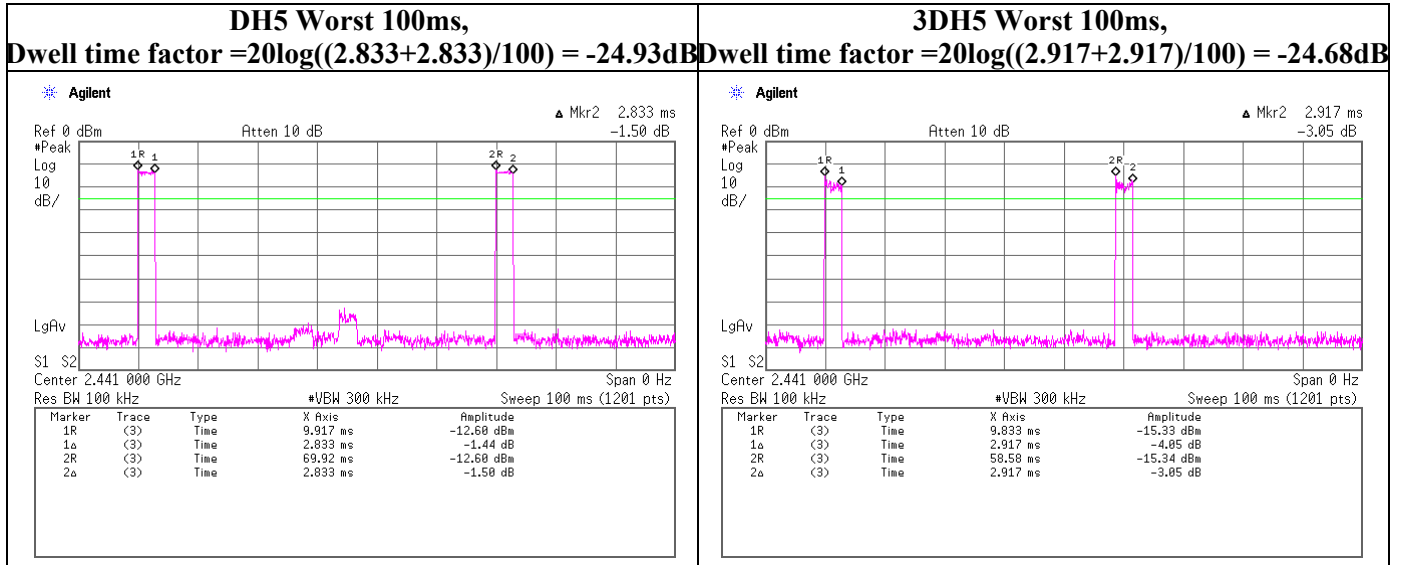
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Dwell time factor

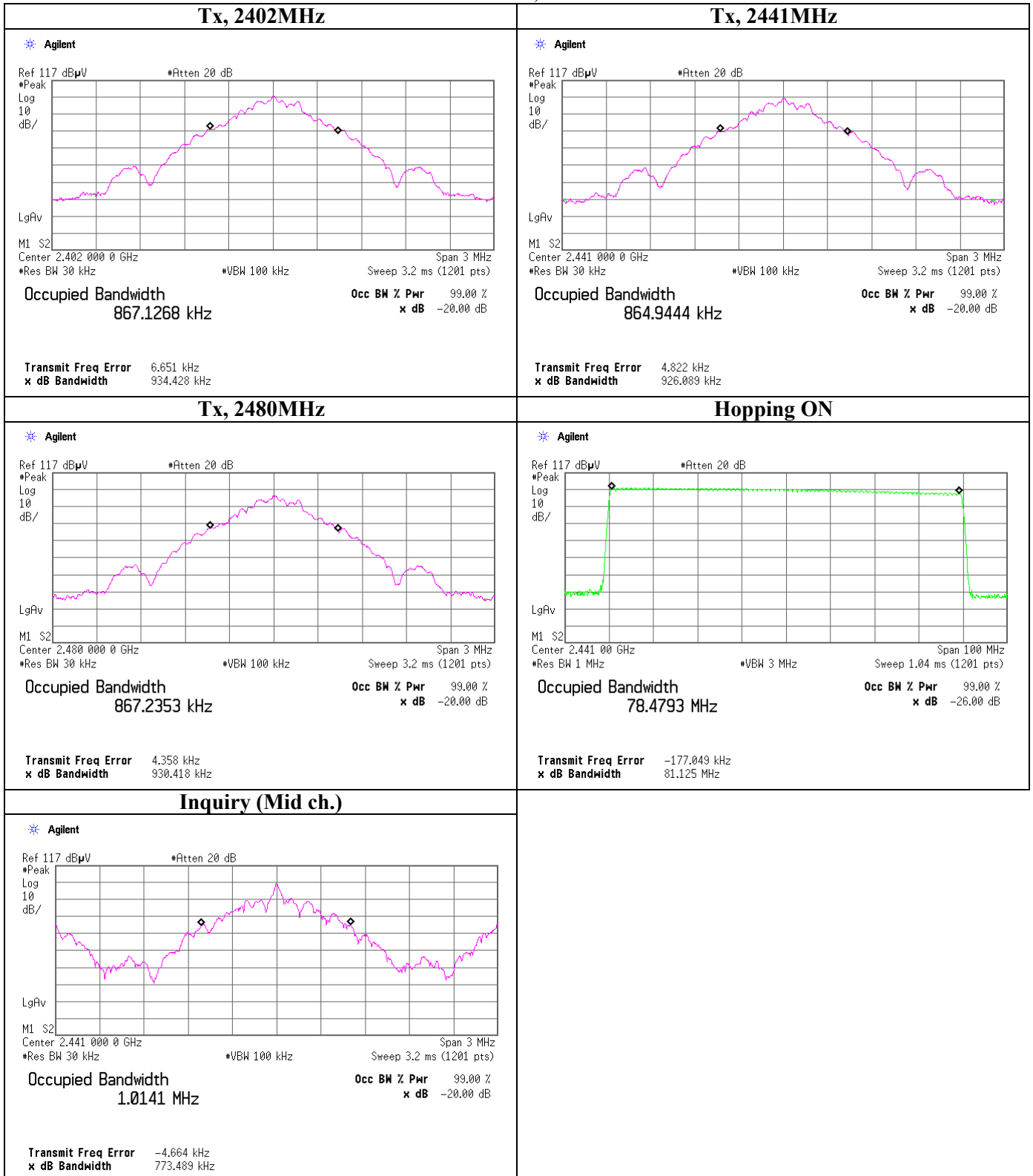


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99% Occupied Bandwidth

DH5,

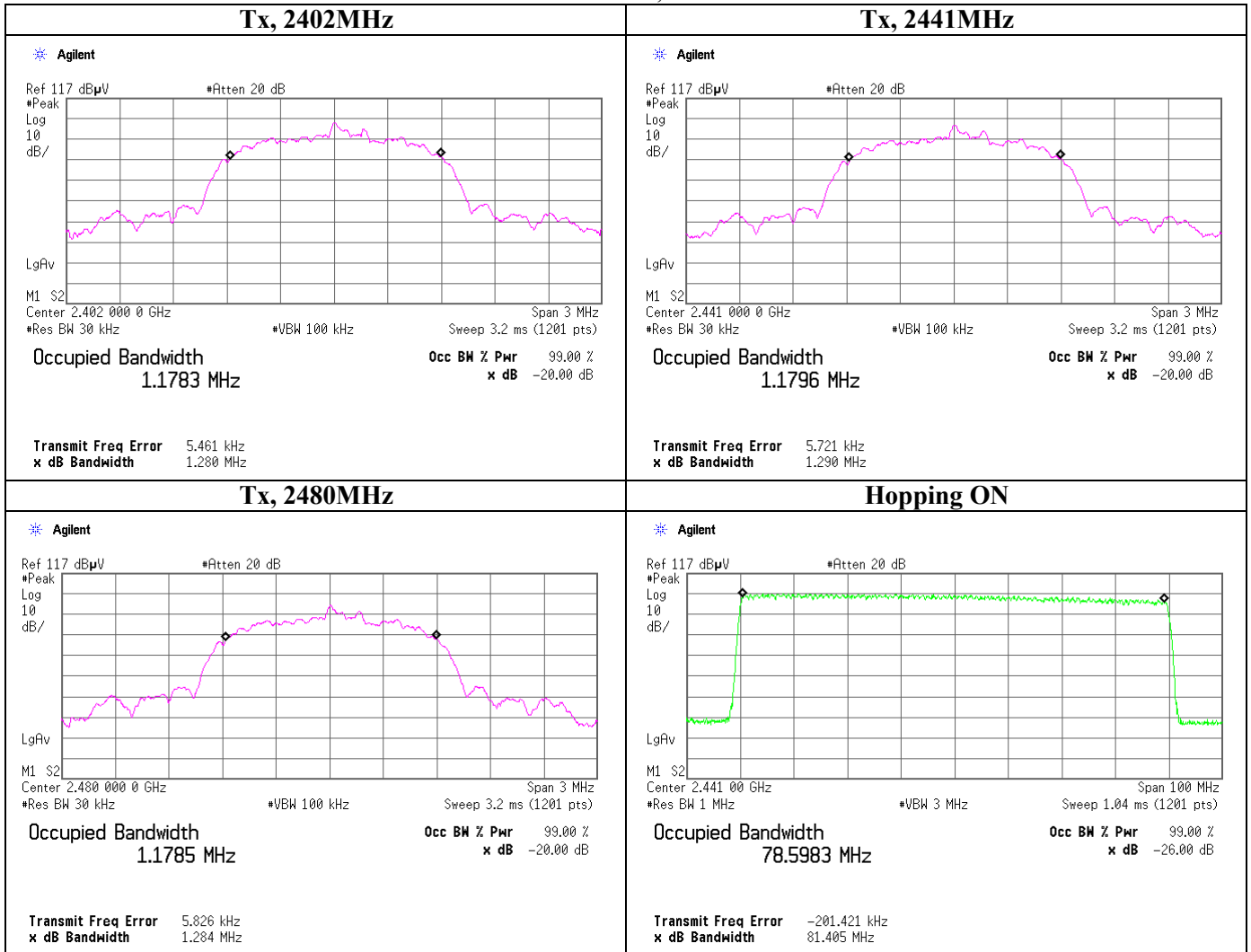


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99% Occupied Bandwidth

3-DH5,



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