

# DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room  
Date : 2010/10/09

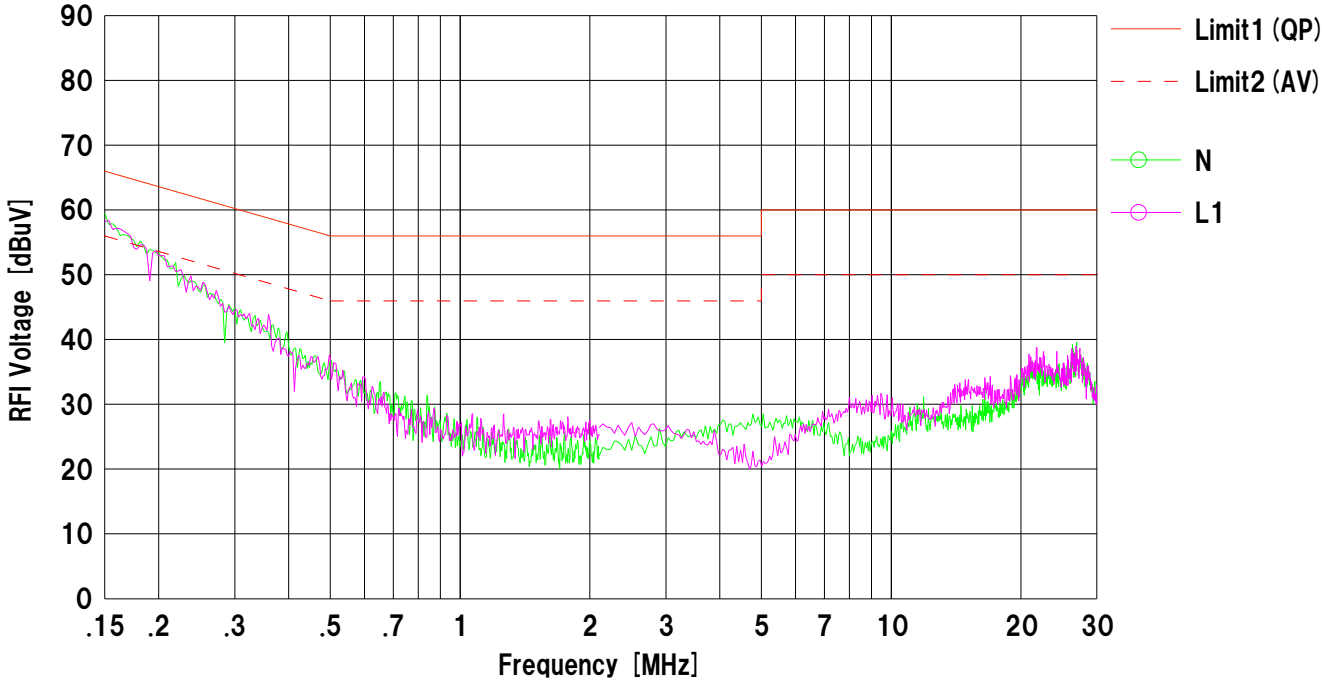
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx DH5 2402MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



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

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Date : 2010/10/09

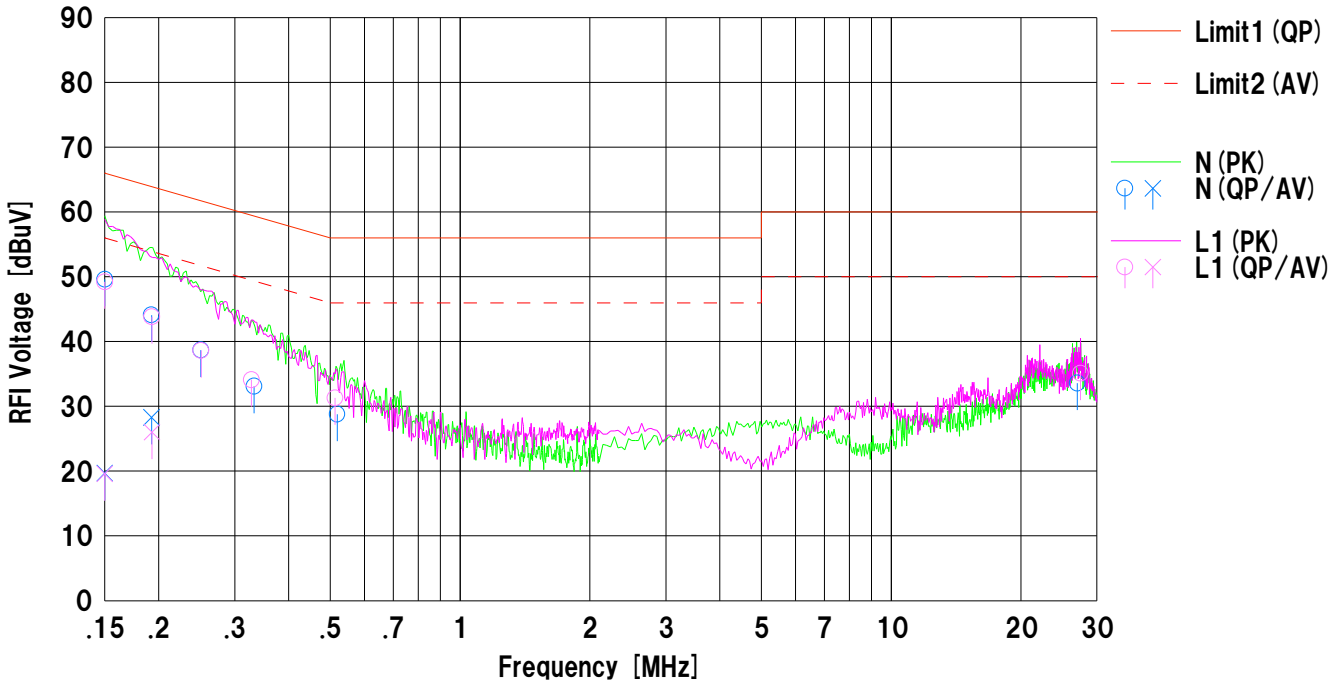
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx DH5 2441MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	37.0	7.1	12.6	49.6	19.7	66.0	56.0	16.4	36.3	N	
2	0.19238	31.5	15.7	12.6	44.1	28.3	63.9	53.9	19.8	25.6	N	
3	0.25048	26.1	---	12.6	38.7	---	61.7	51.7	23.0	---	N	
4	0.33268	20.5	---	12.6	33.1	---	59.3	49.3	26.2	---	N	
5	0.51870	16.2	---	12.6	28.8	---	56.0	46.0	27.2	---	N	
6	27.02644	19.9	---	13.7	33.6	---	60.0	50.0	26.4	---	N	
7	0.15000	36.6	7.0	12.6	49.2	19.6	66.0	56.0	16.8	36.4	L1	
8	0.19269	31.2	13.4	12.6	43.8	26.0	63.9	53.9	20.1	27.9	L1	
9	0.25072	26.0	---	12.6	38.6	---	61.7	51.7	23.1	---	L1	
10	0.32804	21.5	---	12.6	34.1	---	59.5	49.5	25.4	---	L1	
11	0.51266	18.7	---	12.6	31.3	---	56.0	46.0	24.7	---	L1	
12	27.51659	21.4	---	13.7	35.1	---	60.0	50.0	24.9	---	L1	

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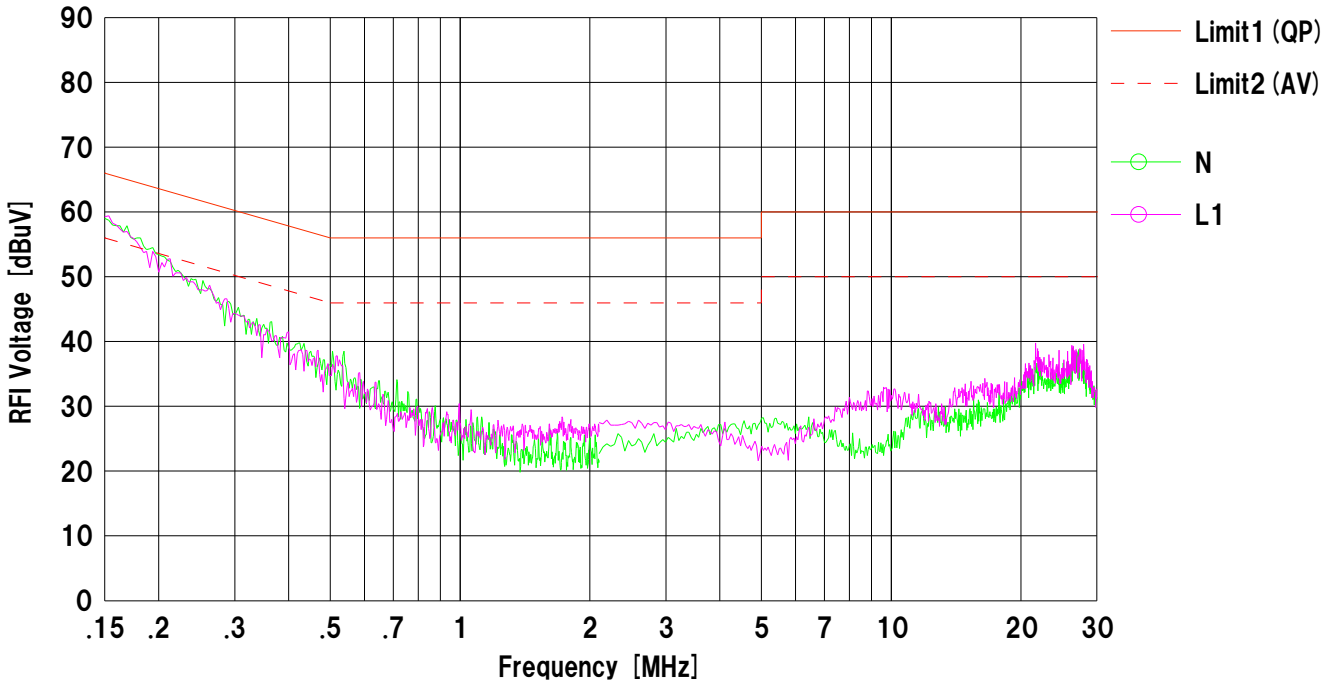
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx DH5 2480MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



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

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Date : 2010/10/09

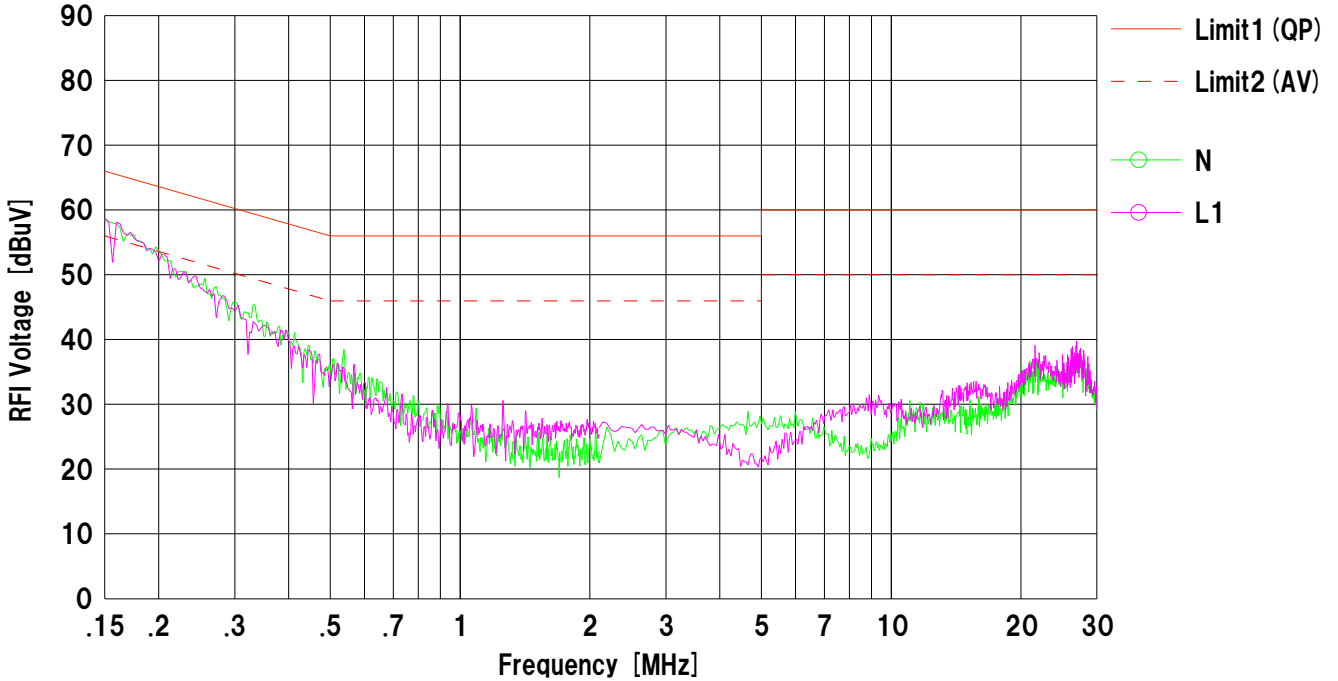
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx 3DH5 2402MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



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

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Date : 2010/10/09

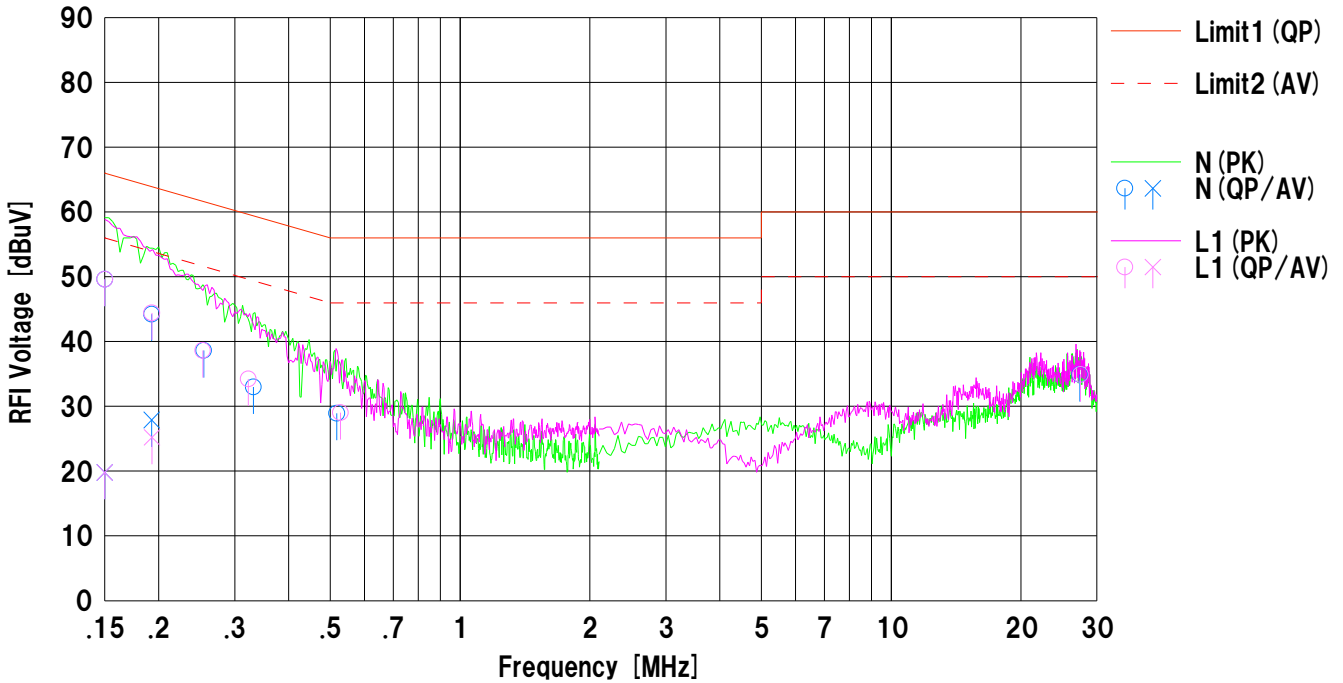
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx 3DH5 2441MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



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	37.0	7.2	12.6	49.6	19.8	66.0	56.0	16.4	36.2	N	
2	0.19256	31.6	15.3	12.6	44.2	27.9	63.9	53.9	19.7	26.0	N	
3	0.25433	26.0	---	12.6	38.6	---	61.6	51.6	23.0	---	N	
4	0.33165	20.4	---	12.6	33.0	---	59.4	49.4	26.4	---	N	
5	0.51795	16.3	---	12.6	28.9	---	56.0	46.0	27.1	---	N	
6	27.41919	21.2	---	13.7	34.9	---	60.0	50.0	25.1	---	N	
7	0.15000	37.0	7.2	12.6	49.6	19.8	66.0	56.0	16.4	36.2	L1	
8	0.19275	31.8	12.6	12.6	44.4	25.2	63.9	53.9	19.5	28.7	L1	
9	0.25296	26.0	---	12.6	38.6	---	61.6	51.6	23.0	---	L1	
10	0.32248	21.6	---	12.6	34.2	---	59.6	49.6	25.4	---	L1	
11	0.52772	16.4	---	12.6	29.0	---	56.0	46.0	27.0	---	L1	
12	27.51450	21.2	---	13.7	34.9	---	60.0	50.0	25.1	---	L1	

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Date : 2010/10/09

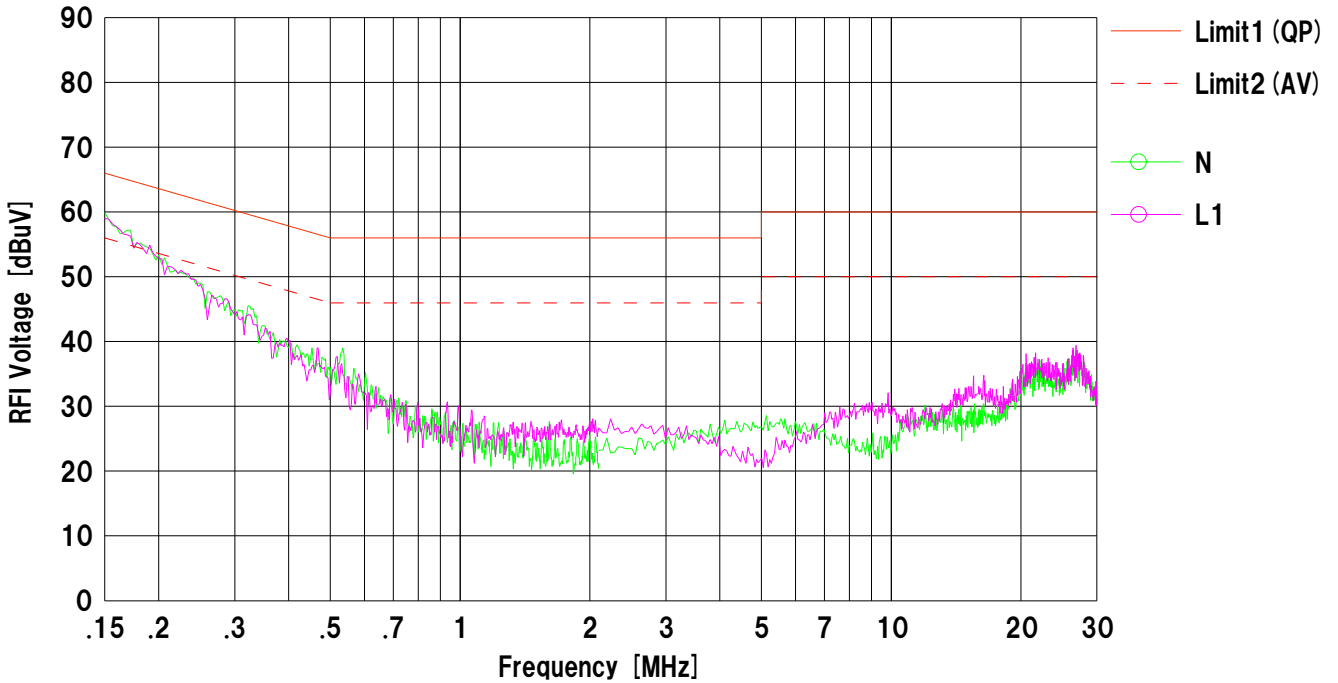
Company : FUJITSU COMPONENT LIMITED  
Kind of EUT : Bluetooth Module

Mode : Tx 3DH5 2480MHz  
Report No. : 31AE0037- -05  
Power : DC5V  
Temp./Humi. : 24deg.C / 52%

Remarks : HOST PC (AC120V/60Hz)

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

Engineer : Shinichi Takano



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

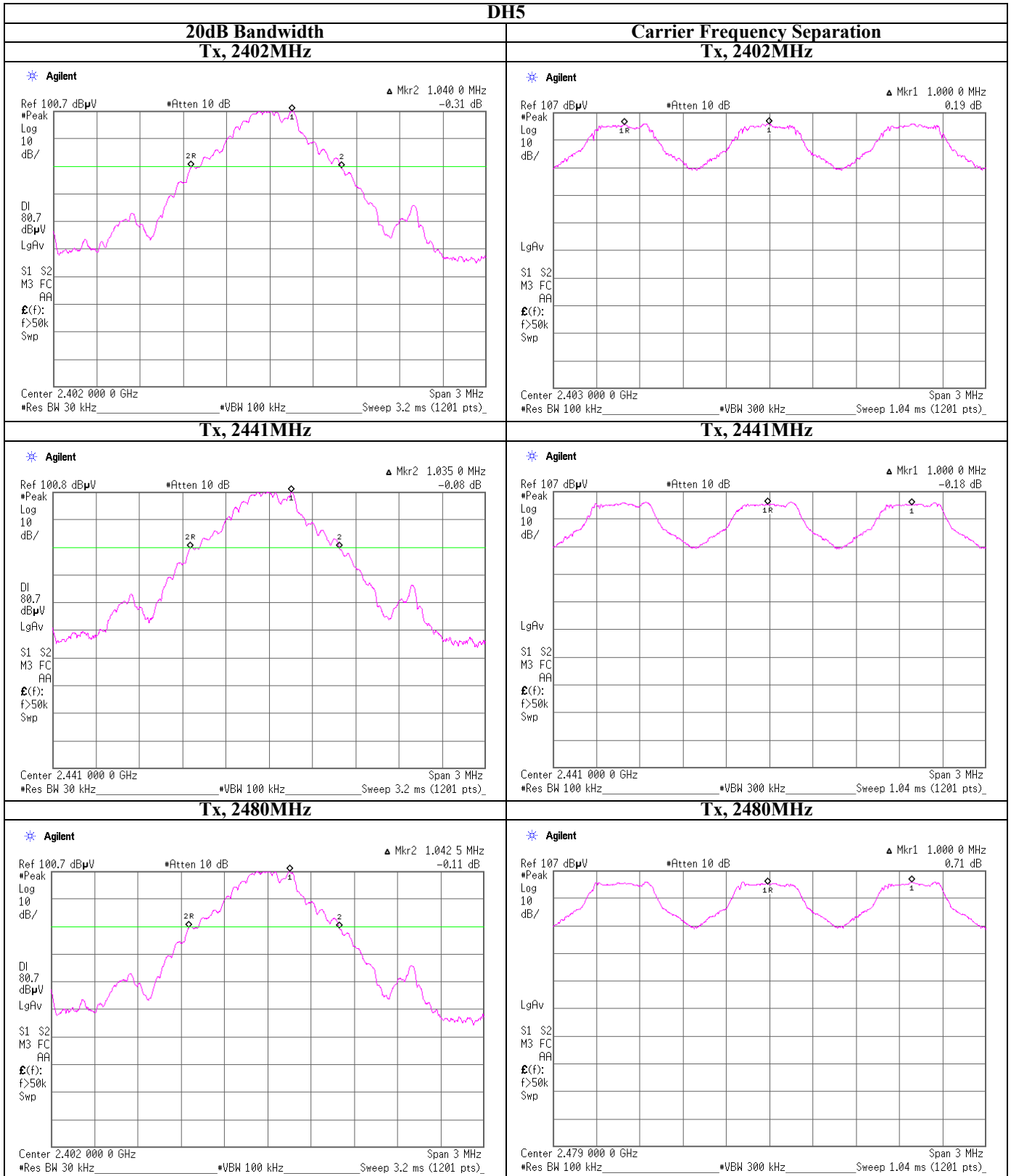
**20dB Bandwidth and Carrier Frequency Separation**

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.3 Shielded Room  
 Date                                      2010/10/4  
 Temperature / Humidity              22deg.C.              , 51%  
 Engineer                              Akio Hayashi  
 Mode                                      Tx

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	1.040	1.000	>= 0.693
DH5	2441.0	1.035	1.000	>= 0.690
DH5	2480.0	1.043	1.000	>= 0.695
3DH5	2402.0	1.325	1.000	>= 0.883
3DH5	2441.0	1.320	1.000	>= 0.880
3DH5	2480.0	1.318	1.000	>= 0.878
Inquiry	2441.0	0.840	2.000	>= 0.560

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

## 20dB Bandwidth and Carrier Frequency Separation

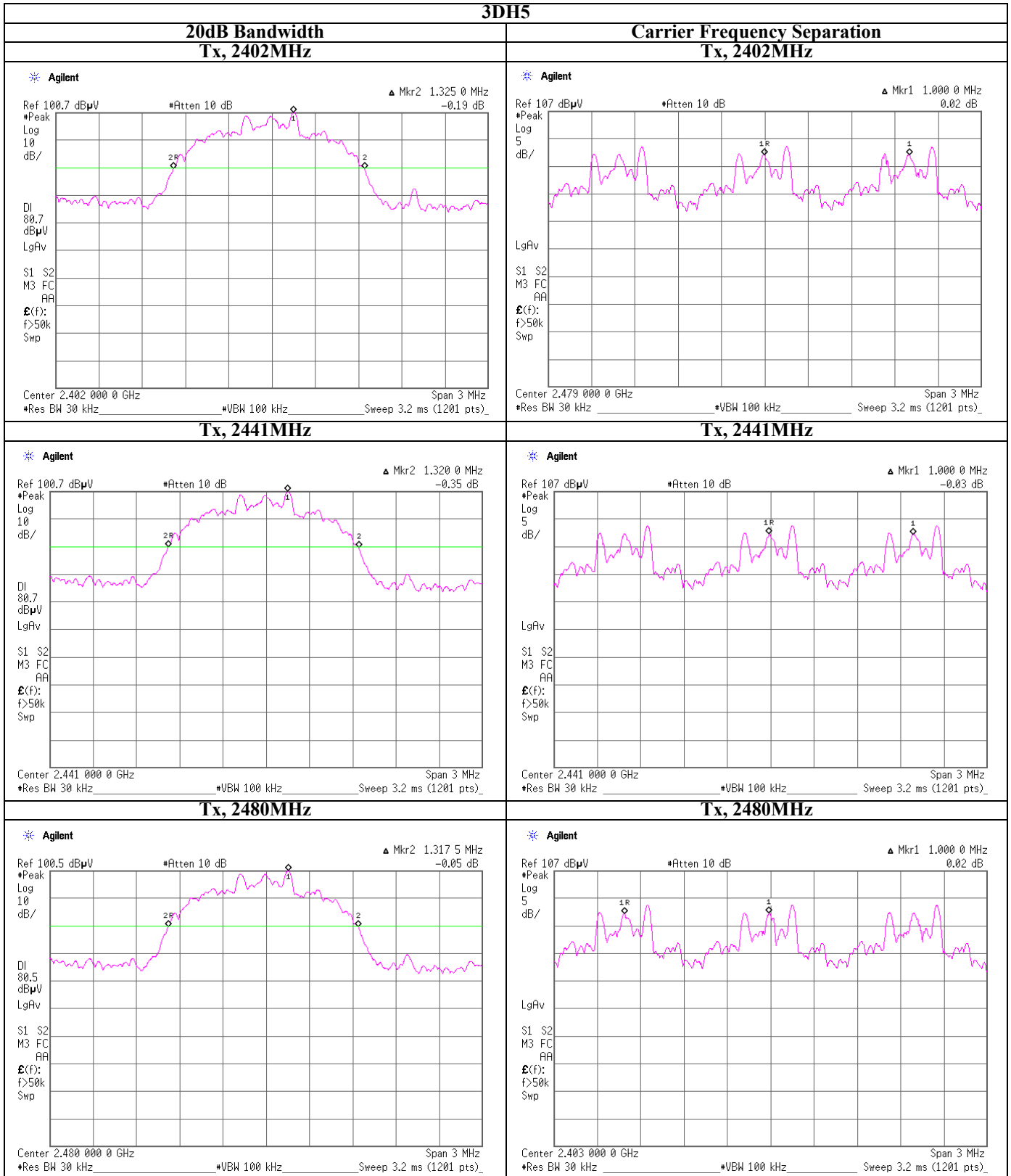


**UL Japan, Inc.**  
**Shonan EMC Lab.**

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



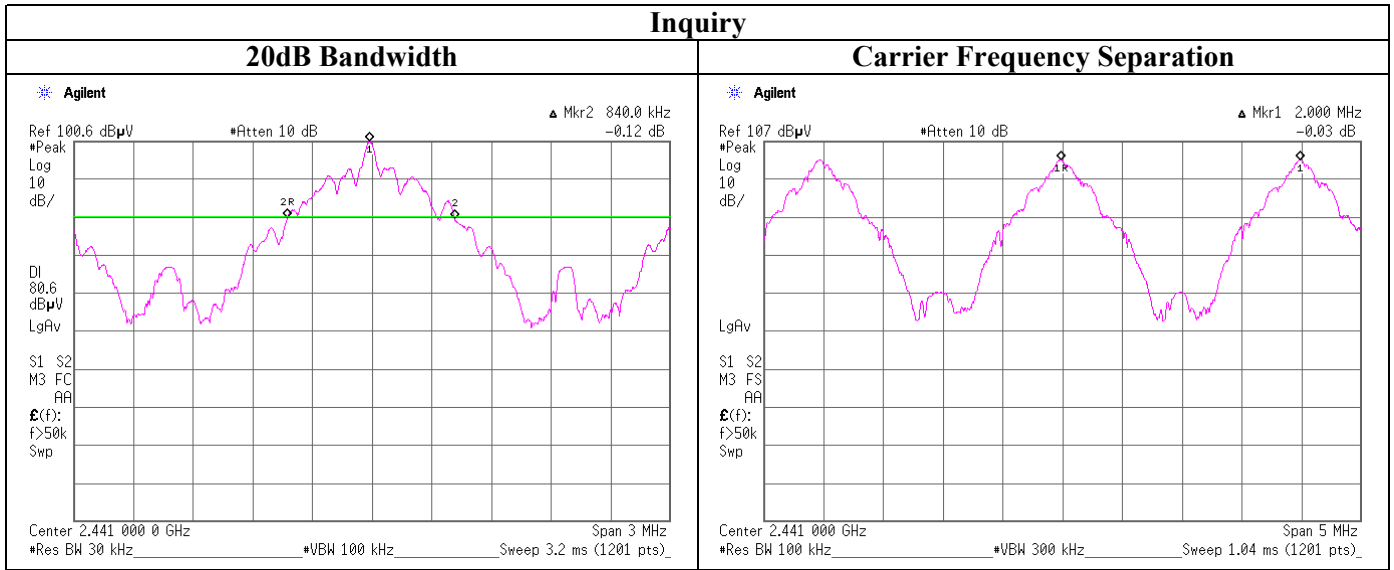
## 20dB Bandwidth and Carrier Frequency Separation



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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.3 Shielded Room  
Date 2010/10/4  
Temperature / Humidity 22deg.C. , 51%  
Engineer Akio Hayashi  
Mode Tx

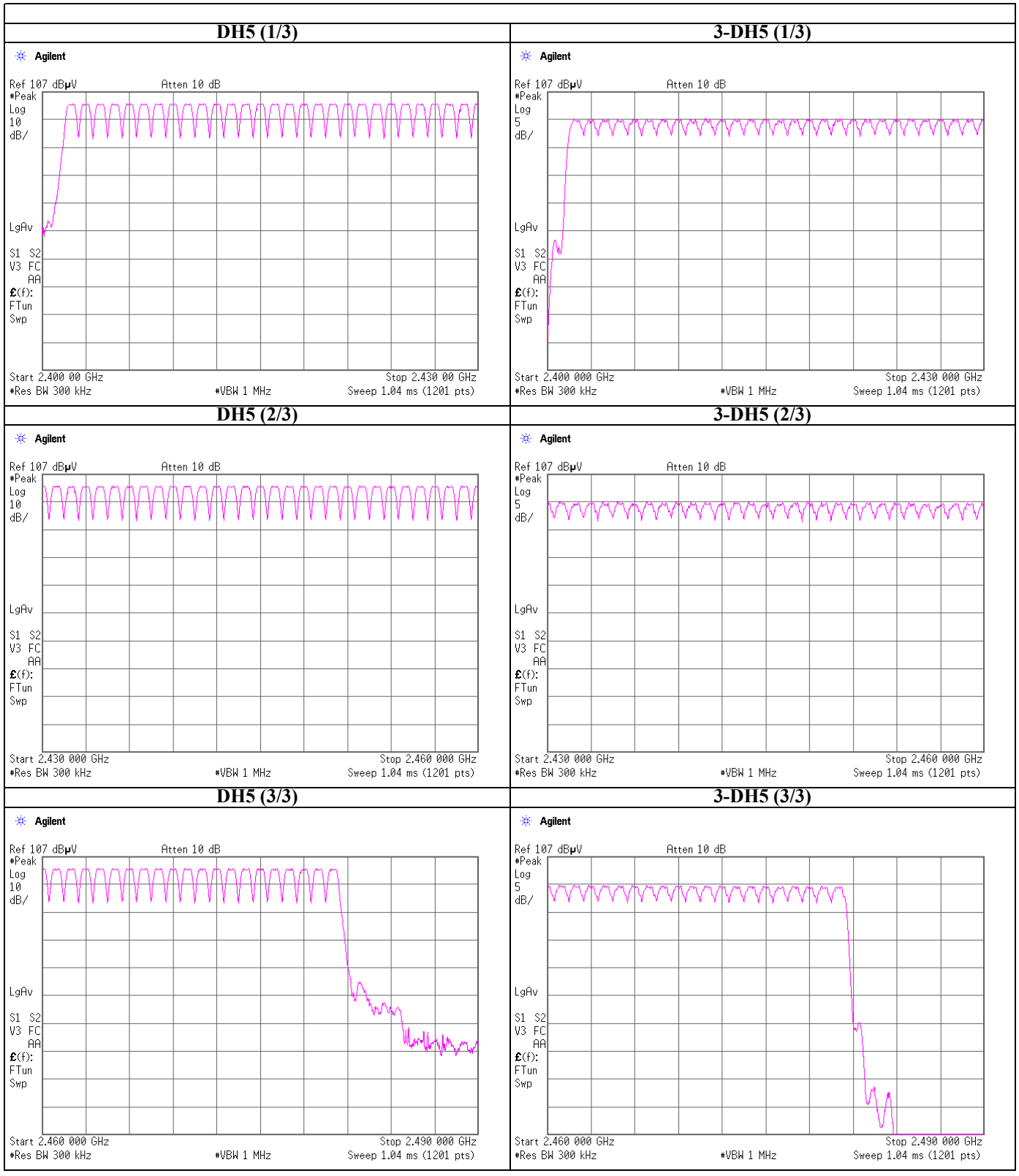
Mode	Number of Channel [times]	Limit [times]
DH5	79	>=15
3-DH5	79	>=15
Inquiry	32	>=15

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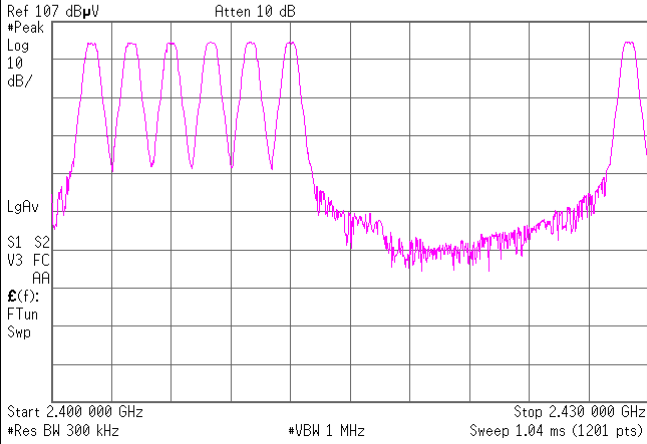
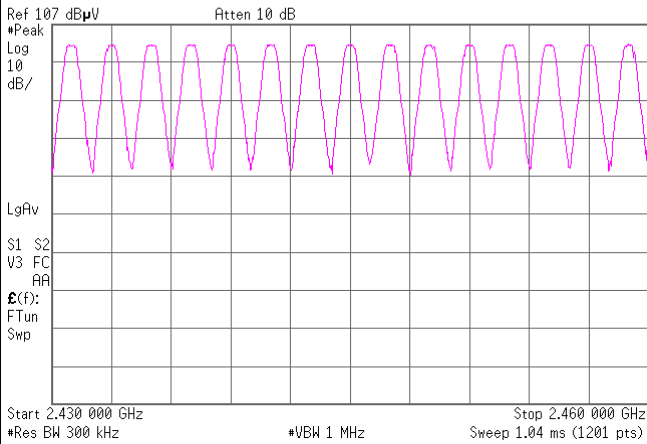
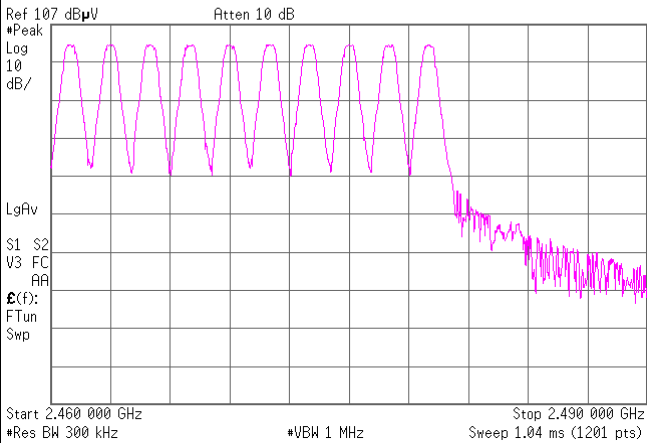
## Number of Hopping Frequency



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## Number of Hopping Frequency

<b>Inquiry (1/3)</b>	
<p>※ Agilent</p> 	
<b>Inquiry (2/3)</b>	
<p>※ Agilent</p> 	
<b>Inquiry (3/3)</b>	
<p>※ Agilent</p> 	

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## Dwell Time (Conducted)

Test place                   UL Japan, Inc. Shonan EMC Lab.      No.3 Shielded Room  
 Date                            2010/10/4  
 Temperature / Humidity    22deg.C.   , 51%  
 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	0.384	124	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	0.398	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	115	400

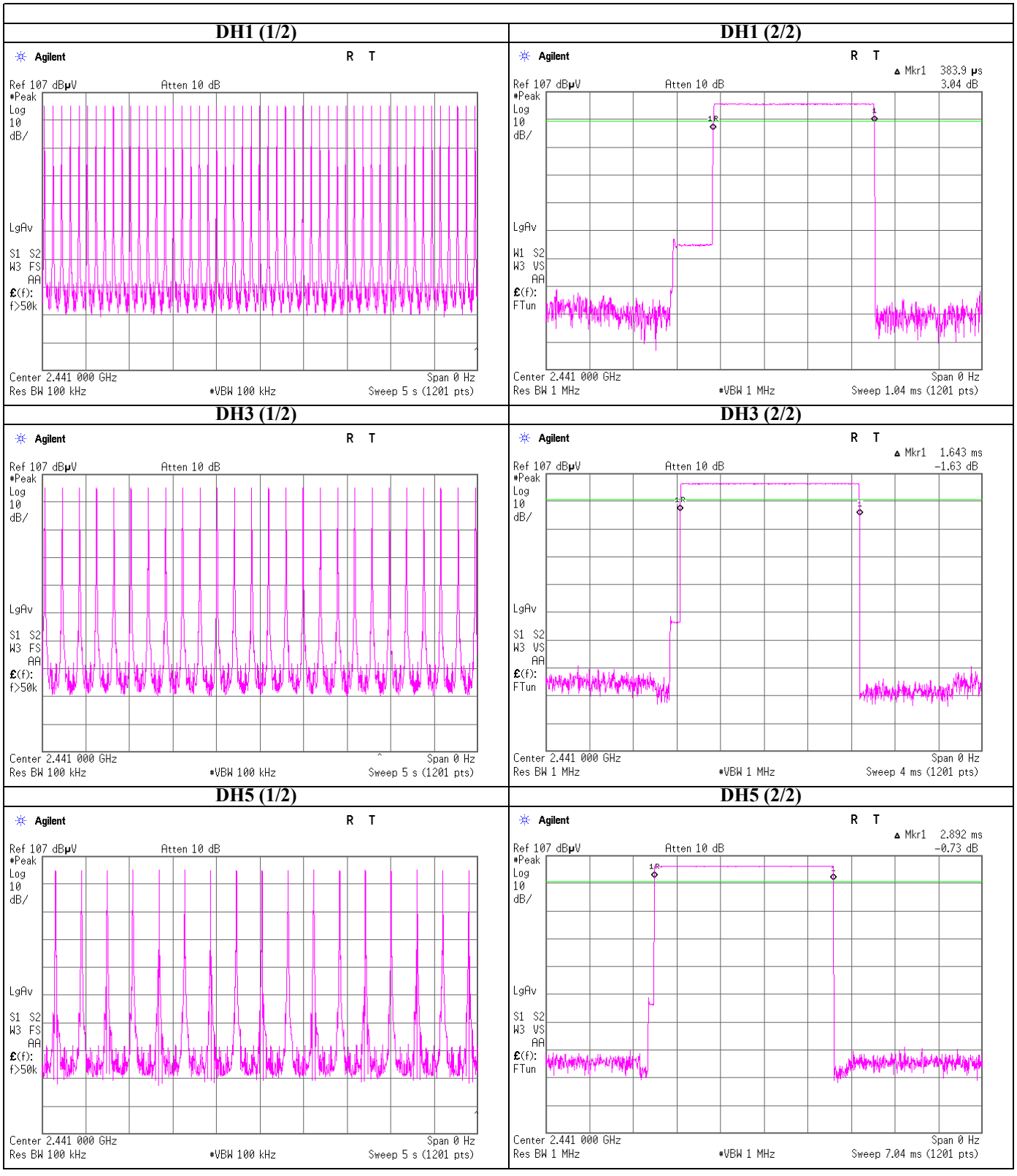
Sample Calculation

Result = Number of transmission x Length of transmission time

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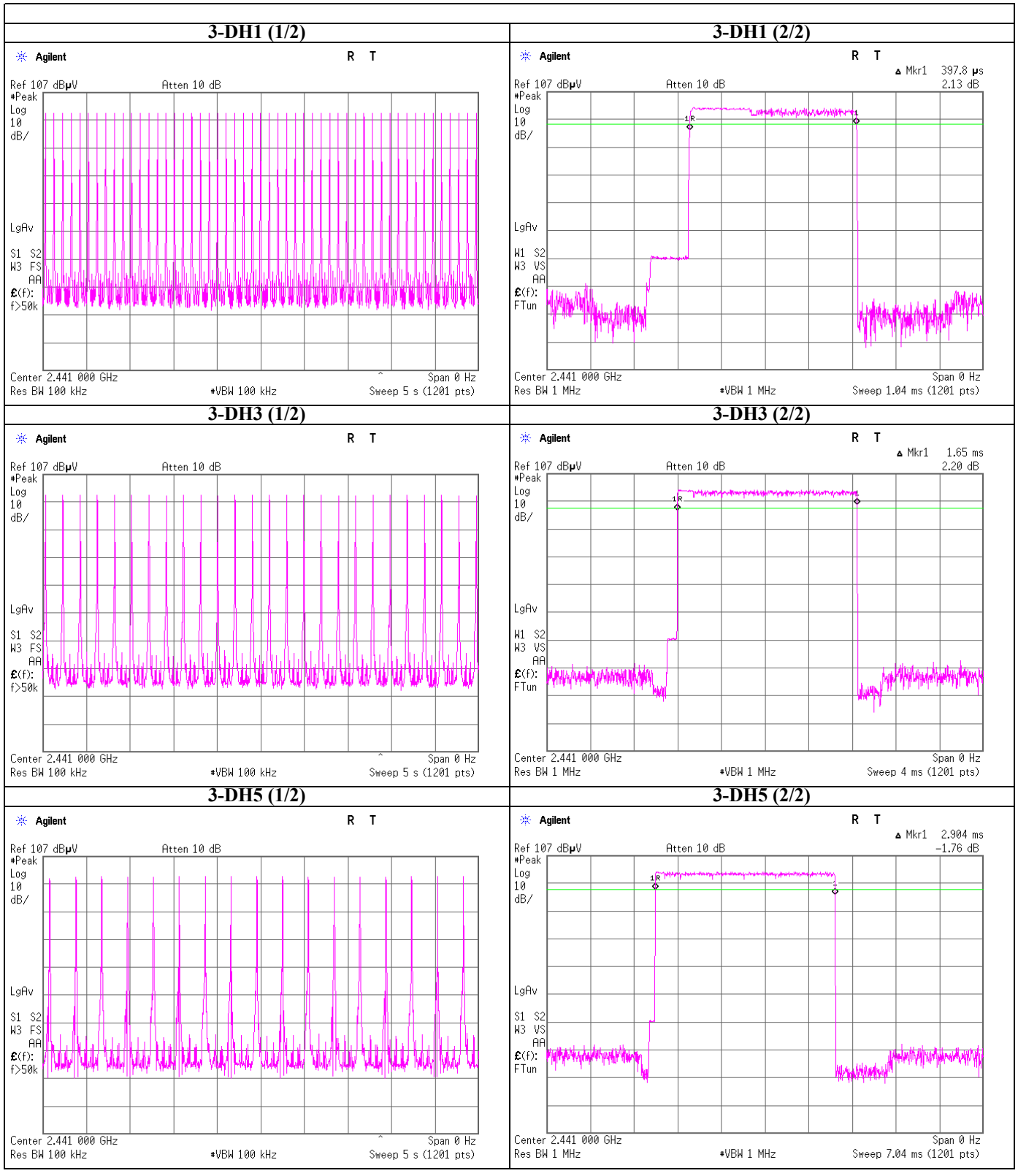
## Dwell time



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## Dwell time

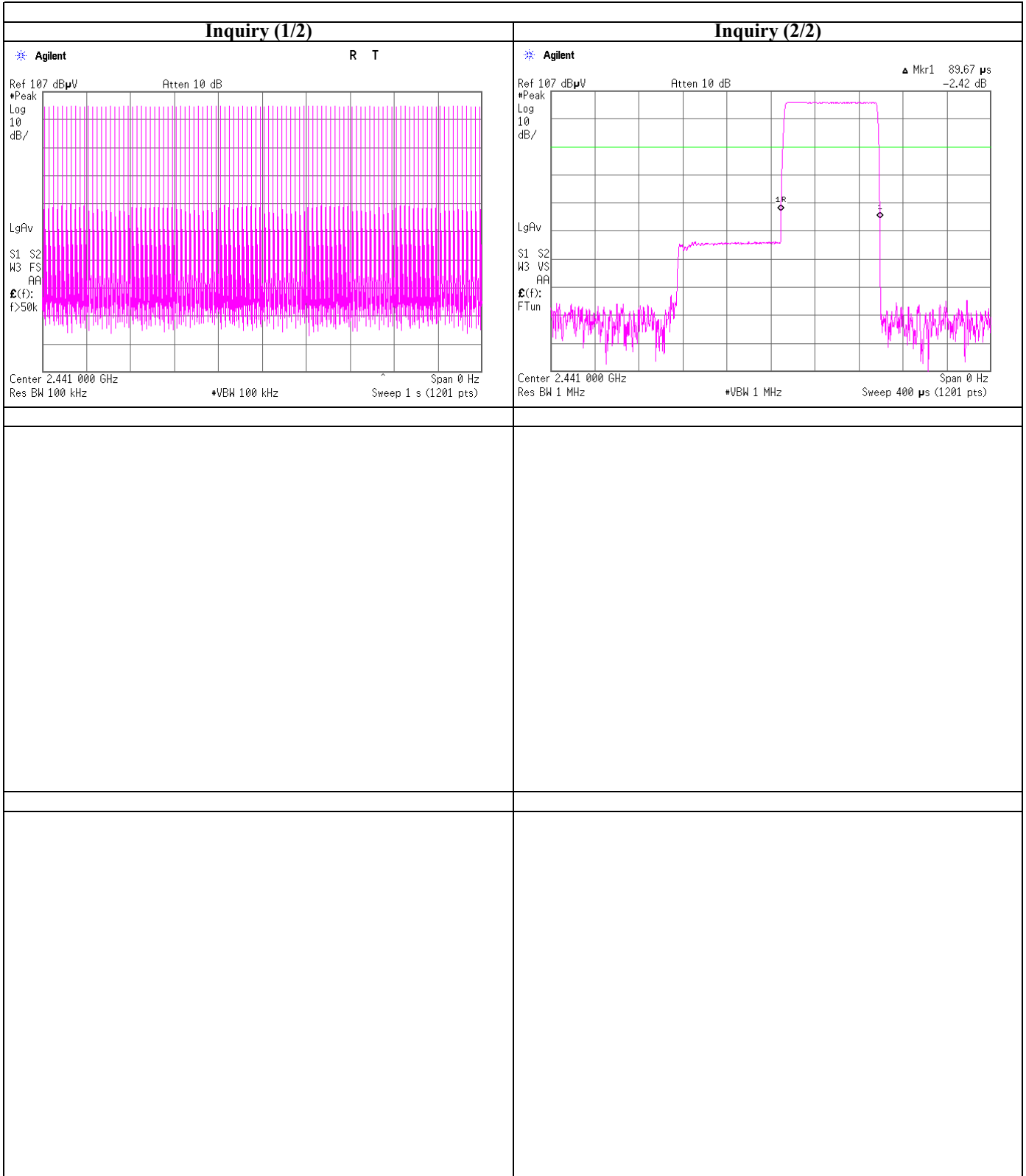


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## Dwell time



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## Peak Output Power (Conducted)

Test place                   UL Japan, Inc. Shonan EMC Lab.       No.3 Shielded Room  
 Date                            2010/10/4  
 Temperature / Humidity    22deg.C.       , 51%  
 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	-4.55	1.09	20.16	16.70	46.77	20.96	125	4.26
Mid	2441.0	-4.65	1.09	20.16	16.60	45.71	20.96	125	4.36
High	2480.0	-4.63	1.09	20.16	16.62	45.92	20.96	125	4.34

### 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	-6.10	1.09	20.16	15.15	32.73	20.96	125	5.81
Mid	2441.0	-6.44	1.09	20.16	14.81	30.27	20.96	125	6.15
High	2480.0	-7.07	1.09	20.16	14.18	26.18	20.96	125	6.78

### 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	-6.06	1.09	20.16	15.19	33.04	20.96	125	5.77
Mid	2441.0	-6.37	1.09	20.16	14.88	30.76	20.96	125	6.08
High	2480.0	-7.05	1.09	20.16	14.20	26.30	20.96	125	6.76

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 (EUT Model:MBH7BTZ45)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chambe  
 Date 2010/10/20 2010/10/21 2010/10/22  
 Temperature / Humidity 27deg.C. , 45% 20deg.C. , 59% 23deg.C. , 48%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	144.003	QP	47.1	13.9	7.5	32.1	36.4	43.5	7.1	242	143	Axis:X
Hori.	192.005	QP	46.1	16.1	7.8	32.0	38.0	43.5	5.5	172	312	Axis:X
Hori.	432.014	QP	41.8	16.3	9.0	31.9	35.2	46.0	10.8	100	254	Axis:X
Hori.	672.011	QP	35.8	19.4	9.9	31.9	33.2	46.0	12.8	150	225	Axis:X
Hori.	1601.998	PK	49.8	25.5	22.9	40.1	58.1	73.9	15.8	103	164	Axis:X
Hori.	2390.000	PK	46.4	27.5	23.5	40.2	57.2	73.9	16.7	118	324	Axis:X
Hori.	3204.000	PK	49.0	29.2	4.9	41.1	42.0	73.9	31.9	105	245	Axis:X
Hori.	4804.000	PK	62.4	31.5	5.5	40.1	59.3	73.9	14.6	126	255	Axis:X
Hori.	7206.000	PK	63.8	36.4	6.7	38.3	68.6	73.9	5.3	141	98	Axis:X
Hori.	9608.000	PK	51.3	37.9	7.8	37.3	59.7	73.9	14.2	101	101	Axis:X
Hori.	12010.000	PK	54.5	39.4	9.0	38.4	64.5	73.9	9.4	101	138	Axis:X
Hori.	14412.000	PK	48.5	41.2	0.5	38.3	51.9	74.0	22.1	100	7	Axis:X
Hori.	16814.000	PK	48.2	39.9	1.1	37.4	51.8	74.0	22.2	100	359	Axis:X
Hori.	19216.000	PK	51.8	40.0	-3.0	47.6	41.2	74.0	32.8	100	6	Axis:X
Hori.	1601.998	AV	43.7	25.5	22.9	40.1	52.0	53.9	1.9	103	164	Axis:X , VBW:10Hz
Hori.	3204.000	AV	38.8	29.2	4.9	41.1	31.8	53.9	22.1	105	245	Axis:X , VBW:10Hz
Vert.	35.982	QP	43.7	16.2	6.6	32.1	34.4	40.0	5.6	100	260	Axis:X
Vert.	95.998	QP	50.6	9.2	7.2	32.1	34.9	43.5	8.6	100	143	Axis:X
Vert.	144.006	QP	46.7	13.9	7.5	32.1	36.0	43.5	7.5	100	22	Axis:X
Vert.	672.011	QP	35.7	19.4	9.9	31.9	33.1	46.0	12.9	100	163	Axis:X
Vert.	1601.995	PK	48.0	25.5	22.9	40.1	56.3	73.9	17.6	112	88	Axis:Y
Vert.	2390.000	PK	47.0	27.5	23.5	40.2	57.8	73.9	16.1	124	286	Axis:Y
Vert.	3204.000	PK	50.8	29.2	4.9	41.1	43.8	73.9	30.1	120	158	Axis:Z
Vert.	4804.000	PK	65.4	31.5	5.5	40.1	62.3	73.9	11.6	117	193	Axis:Z
Vert.	7206.000	PK	64.3	36.4	6.7	38.3	69.1	73.9	4.8	102	181	Axis:Z
Vert.	9608.000	PK	51.0	37.9	7.8	37.3	59.4	73.9	14.5	102	140	Axis:Z
Vert.	12010.000	PK	54.5	39.4	9.0	38.4	64.5	73.9	9.4	182	175	Axis:Z
Vert.	19216.000	PK	51.5	40.0	-3.0	47.6	40.9	74.0	33.1	100	7	Axis:Z
Vert.	1601.995	AV	40.5	25.5	22.9	40.1	48.8	53.9	5.1	112	88	Axis:Y , VBW:10Hz
Vert.	3204.000	AV	41.0	29.2	4.9	41.1	34.0	53.9	19.9	120	158	Axis:Z , 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	95.4	27.5	23.5	40.2	106.2	-	-	Carrier , Axis:X
Hori.	2399.483	PK	50.3	27.5	23.5	40.2	61.1	86.2	25.1	Axis:X
Vert.	2402.000	PK	95.9	27.5	23.5	40.2	106.7	-	-	Carrier , Axis:Y
Vert.	2399.483	PK	50.3	27.5	23.5	40.2	61.1	86.7	25.6	Axis:Y

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	35.0	27.5	23.5	40.2	-24.7	21.1	53.9	32.8	Axis:X , VBW:300Hz
Hori.	4804.000	AV	60.0	31.5	5.5	40.1	-24.7	32.2	53.9	21.7	Axis:X , VBW:300Hz
Hori.	7206.000	AV	59.5	36.4	6.7	38.3	-24.7	39.6	53.9	14.3	Axis:X , VBW:300Hz
Hori.	9608.000	AV	41.8	37.9	7.8	37.3	-24.7	25.5	53.9	28.4	Axis:X , VBW:300Hz
Hori.	12010.000	AV	46.3	39.4	9.0	38.4	-24.7	31.6	53.9	22.3	Axis:X , VBW:300Hz
Hori.	14412.000	AV	38.0	41.2	0.5	38.3	-24.7	16.7	53.9	37.2	Axis:X , VBW:300Hz
Hori.	16814.000	AV	38.2	39.9	1.1	37.4	-24.7	17.1	53.9	36.8	Axis:X , VBW:300Hz
Hori.	19216.000	AV	43.3	40.0	-3.0	47.6	-24.7	8.0	53.9	45.9	Axis:X , VBW:300Hz
Vert.	2390.000	AV	35.0	27.5	23.5	40.2	-24.7	21.1	53.9	32.8	Axis:Y , VBW:300Hz
Vert.	4804.000	AV	63.0	31.5	5.5	40.1	-24.7	35.2	53.9	18.7	Axis:Z , VBW:300Hz
Vert.	7206.000	AV	60.0	36.4	6.7	38.3	-24.7	40.1	53.9	13.8	Axis:Z , VBW:300Hz
Vert.	9608.000	AV	43.0	37.9	7.8	37.3	-24.7	26.7	53.9	27.2	Axis:Z , VBW:300Hz
Vert.	12010.000	AV	46.8	39.4	9.0	38.4	-24.7	32.1	53.9	21.8	Axis:Z , VBW:300Hz
Vert.	19216.000	AV	42.2	40.0	-3.0	47.6	-24.7	6.9	53.9	47.0	Axis:Z , VBW:300Hz

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 8th order harmonics.

**Radiated Emission (EUT Model:MBH7BTZ45)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/20 2010/10/21 2010/10/22  
 Temperature / Humidity 27deg.C. , 45% 20deg.C. , 59% 23deg.C. , 48%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 Mode Tx, 2441 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.	143.991	QP	46.8	13.9	7.5	32.1	36.1	43.5	7.4	232	139	Axis:X
Hori.	191.995	QP	45.8	16.1	7.8	32.0	37.7	43.5	5.8	174	313	Axis:X
Hori.	432.004	QP	41.6	16.3	9.0	31.9	35.0	46.0	11.0	100	264	Axis:X
Hori.	671.991	QP	35.5	19.4	9.9	31.9	32.9	46.0	13.1	150	234	Axis:X
Hori.	1627.988	PK	49.4	25.6	22.9	40.1	57.8	73.9	16.1	103	165	Axis:X
Hori.	3256.007	PK	49.8	29.3	4.8	41.1	42.8	73.9	31.1	100	126	Axis:X
Hori.	4882.000	PK	61.9	31.7	5.6	40.0	59.2	73.9	14.7	100	155	Axis:X
Hori.	7323.000	PK	65.3	36.7	6.9	38.5	70.4	73.9	3.5	100	22	Axis:X
Hori.	9764.000	PK	57.2	38.2	7.8	37.4	65.8	73.9	8.1	100	348	Axis:X
Hori.	12205.000	PK	45.9	39.2	9.1	38.1	56.1	73.9	17.8	100	0	Axis:X , No noise detected
Hori.	14646.000	PK	47.0	41.6	0.5	38.3	50.8	74.0	23.2	100	359	Axis:X
Hori.	17087.000	PK	45.6	40.9	1.4	37.5	50.4	74.0	23.6	100	359	Axis:X
Hori.	19528.000	PK	63.1	40.1	-2.9	47.4	52.9	74.0	21.1	100	12	Axis:X
Hori.	21969.000	PK	50.7	40.2	-2.4	47.3	41.2	74.0	32.8	100	24	Axis:X
Hori.	24410.000	PK	48.2	40.0	-2.1	46.5	39.6	74.0	34.4	100	99	Axis:X
Hori.	1627.988	AV	42.5	25.6	22.9	40.1	50.9	53.9	3.0	103	165	Axis:X , VBW:10Hz
Hori.	3256.007	AV	38.9	29.3	4.8	41.1	31.9	53.9	22.0	100	126	Axis:X , VBW:10Hz
Vert.	36.004	QP	44.0	16.2	6.6	32.1	34.7	40.0	5.3	100	258	Axis:X
Vert.	95.991	QP	50.1	9.2	7.2	32.1	34.4	43.5	9.1	100	162	Axis:X
Vert.	143.986	QP	46.1	13.9	7.5	32.1	35.4	43.5	8.1	100	15	Axis:X
Vert.	672.004	QP	36.1	19.4	9.9	31.9	33.5	46	12.5	100	181	Axis:X
Vert.	1627.991	PK	49	25.6	22.9	40.1	57.4	73.9	16.5	166	141	Axis:Y
Vert.	3256.003	PK	48.6	29.3	4.8	41.1	41.6	73.9	32.3	100	186	Axis:Z
Vert.	4882.000	PK	65.7	31.7	5.6	40	63	73.9	10.9	100	225	Axis:Z
Vert.	7323.000	PK	66.3	36.7	6.9	38.5	71.4	73.9	2.5	121	59	Axis:Z
Vert.	9764.000	PK	55.9	38.2	7.8	37.4	64.5	73.9	9.4	107	133	Axis:Z
Vert.	12205.000	PK	46.5	39.2	9.1	38.1	56.7	73.9	17.2	100	0	Axis:Z , No noise detected
Vert.	19528.000	PK	57.3	40.1	-2.9	47.4	47.1	74	26.9	100	102	Axis:Z
Vert.	21969.000	PK	50.5	40.2	-2.4	47.3	41	74	33.0	100	11	Axis:Z
Vert.	24410.000	PK	49.9	40	-2.1	46.5	41.3	74	32.7	100	324	Axis:Z
Vert.	1627.991	AV	42.3	25.6	22.9	40.1	50.7	53.9	3.2	166	141	Axis:Y , VBW:10Hz
Vert.	3256.003	AV	37.8	29.3	4.8	41.1	30.8	53.9	23.1	100	186	Axis:Z , 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	59.4	31.7	5.6	40.0	-24.7	32.0	53.9	21.9	Axis:X , VBW:300Hz
Hori.	7323.000	AV	61.1	36.7	6.9	38.5	-24.7	41.5	53.9	12.4	Axis:X , VBW:300Hz
Hori.	9764.000	AV	50.5	38.2	7.8	37.4	-24.7	34.4	53.9	19.5	Axis:X , VBW:300Hz
Hori.	12205.000	AV	34.8	39.2	9.1	38.1	-24.7	20.3	53.9	33.6	Axis:X , VBW:300Hz
Hori.	14646.000	AV	37.7	41.6	0.5	38.3	-24.7	16.8	53.9	37.1	Axis:X , VBW:300Hz
Hori.	17087.000	AV	36.4	40.9	1.4	37.5	-24.7	16.5	53.9	37.4	Axis:X , VBW:300Hz
Hori.	19528.000	AV	56.0	40.1	-2.9	47.4	-24.7	21.1	53.9	32.8	Axis:X , VBW:300Hz
Hori.	21969.000	AV	41.6	40.2	-2.4	47.3	-24.7	7.4	53.9	46.5	Axis:X , VBW:300Hz
Hori.	24410.000	AV	38.0	40.0	-2.1	46.5	-24.7	4.7	53.9	49.2	Axis:X , VBW:300Hz
Vert.	4882.000	AV	63.5	31.7	5.6	40.0	-24.7	36.1	53.9	17.8	Axis:Z , VBW:300Hz
Vert.	7323.000	AV	62.1	36.7	6.9	38.5	-24.7	42.5	53.9	11.4	Axis:Z , VBW:300Hz
Vert.	9764.000	AV	48.8	38.2	7.8	37.4	-24.7	32.7	53.9	21.2	Axis:Z , VBW:300Hz
Vert.	12205.000	AV	34.7	39.2	9.1	38.1	-24.7	20.2	53.9	33.7	Axis:Z , VBW:300Hz
Vert.	19528.000	AV	49.8	40.1	-2.9	47.4	-24.7	14.9	53.9	39.0	Axis:Z , VBW:300Hz
Vert.	21969.000	AV	41.5	40.2	-2.4	47.3	-24.7	7.3	53.9	46.6	Axis:Z , VBW:300Hz
Vert.	24410.000	AV	40.5	40.0	-2.1	46.5	-24.7	7.2	53.9	46.7	Axis:Z , VBW:300Hz

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).

UL Japan, Inc.

Shonan EMC Lab.

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Facsimile : +81 463 50 6401

**Radiated Emission (EUT Model:MBH7BTZ45)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chambe  
 Date 2010/10/20 2010/10/21 2010/10/22  
 Temperature / Humidity 27deg.C. , 45% 20deg.C. , 59% 23deg.C. , 48%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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	47.3	13.9	7.5	32.1	36.6	43.5	6.9	247	150	Axis:X
Hori.	191.982	QP	45.3	16.1	7.8	32.0	37.2	43.5	6.3	174	319	Axis:X
Hori.	432.018	QP	41.8	16.3	9.0	31.9	35.2	46.0	10.8	100	256	Axis:X
Hori.	672.008	QP	35.7	19.4	9.9	31.9	33.1	46.0	12.9	146	232	Axis:X
Hori.	1653.998	PK	48.8	25.7	23.0	40.2	57.3	73.9	16.6	102	163	Axis:X
Hori.	3308.006	PK	50.4	29.3	4.9	41.1	43.5	73.9	30.4	100	125	Axis:X
Hori.	4960.000	PK	61.1	31.9	5.6	40.0	58.6	73.9	15.3	106	256	Axis:X
Hori.	7440.000	PK	67.9	36.9	7.1	38.7	73.2	73.9	0.7	117	29	Axis:X
Hori.	9920.000	PK	58.2	38.4	8.0	37.5	67.1	73.9	6.8	120	349	Axis:X
Hori.	12400.000	PK	44.8	39.1	9.4	37.9	55.4	73.9	18.5	100	0	Axis:X , No noise detected
Hori.	14880.000	PK	48.4	41.9	0.3	37.9	52.7	74.0	21.3	105	76	Axis:X
Hori.	17360.000	PK	46.9	43.2	1.6	37.5	54.2	74.0	19.8	100	14	Axis:X
Hori.	19840.000	PK	56.8	40.2	-2.9	47.4	46.7	74.0	27.3	100	14	Axis:X
Hori.	22320.000	PK	51.8	40.0	-2.4	47.3	42.1	74.0	31.9	100	23	Axis:X
Hori.	24800.000	PK	46.4	40.4	-2.1	46.6	38.1	74.0	35.9	100	182	Axis:X
Hori.	1653.998	AV	40.9	25.7	23.0	40.2	49.4	53.9	4.5	102	163	Axis:X , VBW:10Hz
Hori.	3308.006	AV	40.9	29.3	4.9	41.1	34.0	53.9	19.9	100	125	Axis:X , VBW:10Hz
Vert.	36.002	QP	43.1	16.2	6.6	32.1	33.8	40.0	6.2	100	251	Axis:X
Vert.	95.986	QP	50.3	9.2	7.2	32.1	34.6	43.5	8.9	100	154	Axis:X
Vert.	143.986	QP	46.6	13.9	7.5	32.1	35.9	43.5	7.6	100	13	Axis:X
Vert.	671.982	QP	35.9	19.4	9.9	31.9	33.3	46.0	12.7	100	175	Axis:X
Vert.	1654.005	PK	48.9	25.7	23.0	40.2	57.4	73.9	16.5	112	145	Axis:Y
Vert.	3307.995	PK	48.6	29.3	4.9	41.1	41.7	73.9	32.2	119	155	Axis:Z
Vert.	4960.000	PK	63	31.9	5.6	40	60.5	73.9	13.4	100	23	Axis:Z
Vert.	7440.000	PK	68.3	36.9	7.1	38.7	73.6	73.9	0.3	100	33	Axis:Z
Vert.	9920.000	PK	55	38.4	8	37.5	63.9	73.9	10.0	174	180	Axis:Z
Vert.	12400.000	PK	47.9	39.1	9.4	37.9	58.5	73.9	15.4	100	359	Axis:Z
Vert.	14880.000	PK	46.6	41.9	0.3	37.9	50.9	74	23.1	100	195	Axis:Z
Vert.	17360.000	PK	45.2	43.2	1.6	37.5	52.5	74	21.5	100	159	Axis:Z
Vert.	19840.000	PK	56	40.2	-2.9	47.4	45.9	74	28.1	100	16	Axis:Z
Vert.	22320.000	PK	49.8	40	-2.4	47.3	40.1	74	33.9	100	80	Axis:Z
Vert.	24800.000	PK	47.6	40.4	-2.1	46.6	39.3	74	34.7	100	32	Axis:Z
Vert.	1654.005	AV	41.9	25.7	23	40.2	50.4	53.9	3.5	112	145	Axis:Y , VBW:10Hz
Vert.	3307.995	AV	39	29.3	4.9	41.1	32.1	53.9	21.8	119	155	Axis:Z , 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	58.3	31.9	5.6	40.0	-24.7	31.1	53.9	22.8	Axis:X , VBW:300Hz
Hori.	7440.000	AV	64.0	36.9	7.1	38.7	-24.7	44.6	53.9	9.3	Axis:X , VBW:300Hz
Hori.	9920.000	AV	51.9	38.4	8.0	37.5	-24.7	36.1	53.9	17.8	Axis:X , VBW:300Hz
Hori.	12400.000	AV	33.9	39.1	9.4	37.9	-24.7	19.8	53.9	34.1	Axis:X , VBW:300Hz
Hori.	14880.000	AV	38.7	41.9	0.3	37.9	-24.7	18.3	53.9	35.6	Axis:X , VBW:300Hz
Hori.	17360.000	AV	37.8	43.2	1.6	37.5	-24.7	20.4	53.9	33.5	Axis:X , VBW:300Hz
Hori.	19840.000	AV	49.4	40.2	-2.9	47.4	-24.7	14.6	53.9	39.3	Axis:X , VBW:300Hz
Hori.	22320.000	AV	42.8	40.0	-2.4	47.3	-24.7	8.4	53.9	45.5	Axis:X , VBW:300Hz
Hori.	24800.000	AV	36.7	40.4	-2.1	46.6	-24.7	3.7	53.9	50.2	Axis:X , VBW:300Hz
Vert.	4960.000	AV	60.6	31.9	5.6	40.0	-24.7	33.4	53.9	20.5	Axis:Z , VBW:300Hz
Vert.	7440.000	AV	65.7	36.9	7.1	38.7	-24.7	46.3	53.9	7.6	Axis:Z , VBW:300Hz
Vert.	9920.000	AV	48.1	38.4	8.0	37.5	-24.7	32.3	53.9	21.6	Axis:Z , VBW:300Hz
Vert.	12400.000	AV	37.0	39.1	9.4	37.9	-24.7	22.9	53.9	31.0	Axis:Z , VBW:300Hz
Vert.	14880.000	AV	37.9	41.9	0.3	37.9	-24.7	17.5	53.9	36.4	Axis:Z , VBW:300Hz
Vert.	17360.000	AV	35.2	43.2	1.6	37.5	-24.7	17.8	53.9	36.1	Axis:Z , VBW:300Hz
Vert.	19840.000	AV	48.6	40.2	-2.9	47.4	-24.7	13.8	53.9	40.1	Axis:Z , VBW:300Hz
Vert.	22320.000	AV	40.2	40.0	-2.4	47.3	-24.7	5.8	53.9	48.1	Axis:Z , VBW:300Hz
Vert.	24800.000	AV	36.9	40.4	-2.1	46.6	-24.7	3.9	53.9	50.0	Axis:Z , VBW:300Hz

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).

**Radiated emission(EUT Model:MBH7BTZ45) (Band Edge Compliance)**  
 (for Marker Delta Method)

Bluetooth, DH5, Tx 2480MHz

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

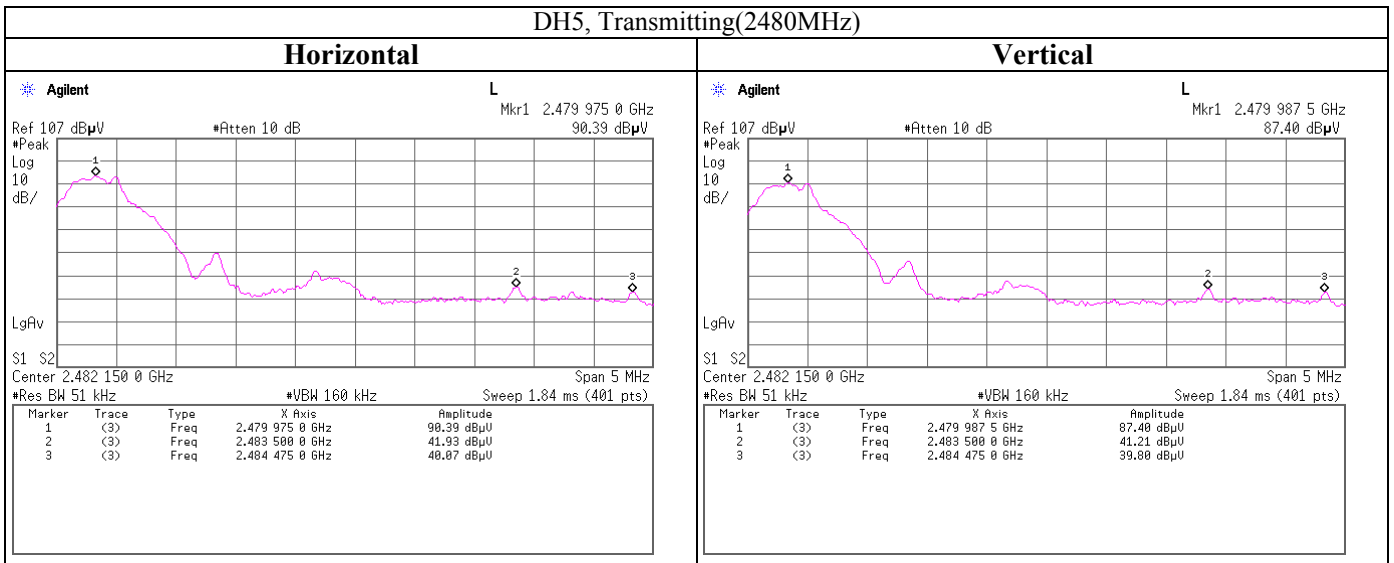
		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			RBW / VBW	[dBuV] Reading	[dBuV/m] Result	[dBuV] Reading		[dBuV/m] Result	RBW / VBW	[dBuV] Reading	[dBuV/m] Result
Step1	Fundamental(2480.000MHz)	1M / 3MHz	90.6	101.7	87.5	98.6	1M / 300Hz	90.0	101.1	87.2	98.3
Step2	Fundamental(2480.000MHz)	51k / 160kHz	90.4	101.5	87.4	98.5	-	-	-	-	-
	Band-edge	51k / 160kHz	41.9	53.0	41.2	52.3	-	-	-	-	-
	Amplitude delta[dB]	-	-	48.5	-	46.2	-	-	48.5	-	46.2
Step3	Field strength of band-edge	-	-	53.2	-	52.4	-	-	52.6	-	52.1
Step4	Dwell time factor (-24.73dB)	-	-	-	-	-	-	-	27.9	-	27.4
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	20.7	-	21.5	-	-	26.0	-	26.5

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:2484.475MHz

		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	90.6	101.7	87.5	98.6	1M / 300Hz	90.0	101.1	87.2	98.3
Step2	Fundamental(2480.000MHz)	51k / 160kHz	90.4	101.5	87.4	98.5	-	-	-	-	-
	Band-edge	51k / 160kHz	40.1	51.2	39.8	50.9	-	-	-	-	-
	Amplitude delta[dB]	-	-	50.3	-	47.6	-	-	50.3	-	47.6
Step3	Field strength of band-edge	-	-	51.4	-	51.0	-	-	50.8	-	50.7
Step4	Dwell time factor (-24.73dB)	-	-	-	-	-	-	-	26.1	-	26.0
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	22.5	-	22.9	-	-	27.8	-	27.9

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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**Shonan EMC Lab.**

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**Radiated Emission (EUT Model:MBH7BTZ45)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/20 2010/10/21 2010/10/22  
 Temperature / Humidity 27deg.C. , 45% 20deg.C. , 59% 23deg.C. , 48%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	144.022	QP	47.0	13.9	7.5	32.1	36.3	43.5	7.2	249	140	Axis:X
Hori.	191.998	QP	46.1	16.1	7.8	32.0	38.0	43.5	5.5	164	314	Axis:X
Hori.	432.000	QP	42.2	16.3	9.0	31.9	35.6	46.0	10.4	100	257	Axis:X
Hori.	672.014	QP	35.8	19.4	9.9	31.9	33.2	46.0	12.8	137	227	Axis:X
Hori.	1603.000	PK	49.9	25.5	22.9	40.1	58.2	73.9	15.7	103	164	Axis:X
Hori.	2390.000	PK	46.6	27.5	23.5	40.2	57.4	73.9	16.5	118	324	Axis:X
Hori.	3204.010	PK	48.7	29.2	4.9	41.1	41.7	73.9	32.2	108	238	Axis:X
Hori.	4804.000	PK	63.5	31.5	5.5	40.1	60.4	73.9	13.5	110	251	Axis:X
Hori.	7206.000	PK	60.8	36.4	6.7	38.3	65.6	73.9	8.3	100	112	Axis:X
Hori.	9608.000	PK	47.0	37.9	7.8	37.3	55.4	73.9	18.5	100	0	Axis:X , No noise detected
Hori.	12010.000	PK	46.7	39.4	9.0	38.4	56.7	73.9	17.2	100	0	Axis:X , No noise detected
Hori.	1603.000	AV	43.6	25.5	22.9	40.1	51.9	53.9	2.0	103	164	Axis:X , VBW:10Hz
Hori.	3204.010	AV	39.0	29.2	4.9	41.1	32.0	53.9	21.9	108	238	Axis:X , VBW:10Hz
Vert.	36.006	QP	44.0	16.2	6.6	32.1	34.7	40.0	5.3	100	245	Axis:X
Vert.	95.990	QP	50.8	9.2	7.2	32.1	35.1	43.5	8.4	100	160	Axis:X
Vert.	143.998	QP	46.8	13.9	7.5	32.1	36.1	43.5	7.4	100	15	Axis:X
Vert.	672.016	QP	36.3	19.4	9.9	31.9	33.7	46.0	12.3	100	172	Axis:X
Vert.	1601.993	PK	48.4	25.5	22.9	40.1	56.7	73.9	17.2	112	88	Axis:Y
Vert.	2390.000	PK	46.9	27.5	23.5	40.2	57.7	73.9	16.2	124	285	Axis:Y
Vert.	3204.005	PK	50.1	29.2	4.9	41.1	43.1	73.9	30.8	118	164	Axis:Z
Vert.	4804.000	PK	65.6	31.5	5.5	40.1	62.5	73.9	11.4	119	228	Axis:Z
Vert.	7206.000	PK	61.8	36.4	6.7	38.3	66.6	73.9	7.3	165	51	Axis:Z
Vert.	9608.000	PK	45.5	37.9	7.8	37.3	53.9	73.9	20.0	100	0	Axis:Z , No noise detected
Vert.	12010.000	PK	47.3	39.4	9.0	38.4	57.3	73.9	16.6	100	0	Axis:Z , No noise detected
Vert.	1601.993	AV	40.9	25.5	22.9	40.1	49.2	53.9	4.7	112	88	Axis:Y , VBW:10Hz
Vert.	3204.005	AV	40.5	29.2	4.9	41.1	33.5	53.9	20.4	118	164	Axis:Z , 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	93.7	27.5	23.5	40.2	104.5	-	-	Carrier , Axis:X
Hori.	2400.000	PK	50.1	27.5	23.5	40.2	60.9	84.5	23.6	Axis:X
Vert.	2402.000	PK	94.3	27.5	23.5	40.2	105.1	-	-	Carrier , Axis:Y
Vert.	2400.000	PK	51.1	27.5	23.5	40.2	61.9	85.1	23.2	Axis:Y

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	35.0	27.5	23.5	40.2	-24.7	21.1	53.9	32.8	Axis:X , VBW:300Hz
Hori.	4804.000	AV	57.7	31.5	5.5	40.1	-24.7	29.9	53.9	24.0	Axis:X , VBW:300Hz
Hori.	7206.000	AV	52.9	36.4	6.7	38.3	-24.7	33.0	53.9	20.9	Axis:X , VBW:300Hz
Hori.	9608.000	AV	33.9	37.9	7.8	37.3	-24.7	17.6	53.9	36.3	Axis:X , VBW:300Hz
Hori.	12010.000	AV	36.2	39.4	9.0	38.4	-24.7	21.5	53.9	32.4	Axis:X , VBW:300Hz
Vert.	2390.000	AV	35.2	27.5	23.5	40.2	-24.7	21.3	53.9	32.6	Axis:Y , VBW:300Hz
Vert.	4804.000	AV	59.5	31.5	5.5	40.1	-24.7	31.7	53.9	22.2	Axis:Z , VBW:300Hz
Vert.	7206.000	AV	54.6	36.4	6.7	38.3	-24.7	34.7	53.9	19.2	Axis:Z , VBW:300Hz
Vert.	9608.000	AV	33.8	37.9	7.8	37.3	-24.7	17.5	53.9	36.4	Axis:Z , VBW:300Hz
Vert.	12010.000	AV	36.6	39.4	9.0	38.4	-24.7	21.9	53.9	32.0	Axis:Z , VBW:300Hz

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 (EUT Model:MBH7BTZ45)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2010/10/20	2010/10/21
Temperature / Humidity	27deg.C. , 45%	20deg.C. , 59%
Engineer	Shinichi Takano	Shinichi Takano
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.	144.012	QP	46.1	13.9	7.5	32.1	35.4	43.5	8.1	234	137	Axis:X
Hori.	191.998	QP	45.7	16.1	7.8	32.0	37.6	43.5	5.9	171	310	Axis:X
Hori.	432.018	QP	42.1	16.3	9.0	31.9	35.5	46.0	10.5	100	258	Axis:X
Hori.	672.040	QP	35.3	19.4	9.9	31.9	32.7	46.0	13.3	134	232	Axis:X
Hori.	1627.998	PK	50.9	25.6	22.9	40.1	59.3	73.9	14.6	102	162	Axis:X
Hori.	3255.980	PK	48.7	29.3	4.8	41.1	41.7	73.9	32.2	104	115	Axis:X
Hori.	4882.000	PK	57.8	31.7	5.6	40.0	55.1	73.9	18.8	100	153	Axis:X
Hori.	7323.000	PK	53.5	36.7	6.9	38.5	58.6	73.9	15.3	100	99	Axis:X
Hori.	9764.000	PK	47.8	38.2	7.8	37.4	56.4	73.9	17.5	100	359	Axis:X
Hori.	12205.000	PK	46.8	39.2	9.1	38.1	57.0	73.9	16.9	100	0	Axis:X , No noise detected
Hori.	1627.998	AV	42.9	25.6	22.9	40.1	51.3	53.9	2.6	102	162	Axis:X , VBW:10Hz
Hori.	3255.980	AV	38.5	29.3	4.8	41.1	31.5	53.9	22.4	104	115	Axis:X , VBW:10Hz
Vert.	35.893	QP	44.1	16.2	6.6	32.1	34.8	40.0	5.2	100	245	Axis:X
Vert.	96.026	QP	50.2	9.2	7.2	32.1	34.5	43.5	9.0	100	166	Axis:X
Vert.	144.034	QP	45.5	13.9	7.5	32.1	34.8	43.5	8.7	100	16	Axis:X
Vert.	672.002	QP	36.0	19.4	9.9	31.9	33.4	46.0	12.6	100	176	Axis:X
Vert.	1627.994	PK	50.0	25.6	22.9	40.1	58.4	73.9	15.5	164	140	Axis:Y
Vert.	3256.000	PK	47.8	29.3	4.8	41.1	40.8	73.9	33.1	100	192	Axis:Z
Vert.	4882.000	PK	60.3	31.7	5.6	40.0	57.6	73.9	16.3	100	216	Axis:Z
Vert.	7323.000	PK	56.3	36.7	6.9	38.5	61.4	73.9	12.5	103	60	Axis:Z
Vert.	9764.000	PK	48.0	38.2	7.8	37.4	56.6	73.9	17.3	156	95	Axis:Z
Vert.	12205.000	PK	50.3	39.2	9.1	38.1	60.5	73.9	13.4	108	354	Axis:Z
Vert.	1627.994	AV	42.8	25.6	22.9	40.1	51.2	53.9	2.7	164	140	Axis:Y , VBW:10Hz
Vert.	3256.000	AV	38.1	29.3	4.8	41.1	31.1	53.9	22.8	100	192	Axis:Z , VBW:10Hz

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

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

#### Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Dwell Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4882.000	AV	50.7	31.7	5.6	40.0	-24.7	23.3	53.9	30.6	Axis:X , VBW:300Hz
Hori.	7323.000	AV	43.0	36.7	6.9	38.5	-24.7	23.4	53.9	30.5	Axis:X , VBW:300Hz
Hori.	9764.000	AV	36.0	38.2	7.8	37.4	-24.7	19.9	53.9	34.0	Axis:X , VBW:300Hz
Hori.	12205.000	AV	34.6	39.2	9.1	38.1	-24.7	20.1	53.9	33.8	Axis:X , VBW:300Hz
Vert.	4882.000	AV	53.2	31.7	5.6	40.0	-24.7	25.8	53.9	28.1	Axis:Z , VBW:300Hz
Vert.	7323.000	AV	45.5	36.7	6.9	38.5	-24.7	25.9	53.9	28.0	Axis:Z , VBW:300Hz
Vert.	9764.000	AV	36.8	38.2	7.8	37.4	-24.7	20.7	53.9	33.2	Axis:Z , VBW:300Hz
Vert.	12205.000	AV	37.8	39.2	9.1	38.1	-24.7	23.3	53.9	30.6	Axis:Z , VBW:300Hz

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.



### Radiated Emission (EUT Model:MBH7BTZ45)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2010/10/20	2010/10/21
Temperature / Humidity	27deg.C. , 45%	20deg.C. , 59%
Engineer	Shinichi Takano	Shinichi Takano
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.	144.017	QP	46.0	13.9	7.5	32.1	35.3	43.5	8.2	227	142	Axis:X
Hori.	191.986	QP	45.3	16.1	7.8	32.0	37.2	43.5	6.3	169	321	Axis:X
Hori.	432.000	QP	42.3	16.3	9.0	31.9	35.7	46.0	10.3	100	253	Axis:X
Hori.	672.030	QP	35.7	19.4	9.9	31.9	33.1	46.0	12.9	152	229	Axis:X
Hori.	1653.998	PK	49.5	25.7	23.0	40.2	58.0	73.9	15.9	100	162	Axis:X
Hori.	3307.995	PK	49.5	29.3	4.9	41.1	42.6	73.9	31.3	103	118	Axis:X
Hori.	4960.000	PK	52.9	31.9	5.6	40.0	50.4	73.9	23.5	105	260	Axis:X
Hori.	7440.000	PK	56.9	36.9	7.1	38.7	62.2	73.9	11.7	118	31	Axis:X
Hori.	9920.000	PK	49.9	38.4	8.0	37.5	58.8	73.9	15.1	100	359	Axis:X
Hori.	12400.000	PK	47.8	39.1	9.4	37.9	58.4	73.9	15.5	109	134	Axis:X
Hori.	1653.998	AV	41.3	25.7	23.0	40.2	49.8	53.9	4.1	100	162	Axis:X , VBW:10Hz
Hori.	3307.995	AV	40.6	29.3	4.9	41.1	33.7	53.9	20.2	103	118	Axis:X , VBW:10Hz
Vert.	36.001	QP	44.2	16.2	6.6	32.1	34.9	40.0	5.1	100	239	Axis:X
Vert.	96.021	QP	51.2	9.2	7.2	32.1	35.5	43.5	8.0	100	167	Axis:X
Vert.	144.042	QP	46.1	13.9	7.5	32.1	35.4	43.5	8.1	100	23	Axis:X
Vert.	672.013	QP	35.4	19.4	9.9	31.9	32.8	46.0	13.2	100	182	Axis:X
Vert.	1654.008	PK	49.3	25.7	23.0	40.2	57.8	73.9	16.1	114	148	Axis:Y
Vert.	3308.000	PK	49.7	29.3	4.9	41.1	42.8	73.9	31.1	112	158	Axis:Z
Vert.	4960.000	PK	54.9	31.9	5.6	40.0	52.4	73.9	21.5	100	22	Axis:Z
Vert.	7440.000	PK	61.3	36.9	7.1	38.7	66.6	73.9	7.3	100	36	Axis:Z
Vert.	9920.000	PK	47.6	38.4	8.0	37.5	56.5	73.9	17.4	100	178	Axis:Z
Vert.	12400.000	PK	46.8	39.1	9.4	37.9	57.4	73.9	16.5	146	344	Axis:Z
Vert.	1654.008	AV	41.6	25.7	23	40.2	50.1	53.9	3.8	114	148	Axis:Y , VBW:10Hz
Vert.	3308.000	AV	39.8	29.3	4.9	41.1	32.9	53.9	21.0	112	158	Axis:Z , 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	42.8	31.9	5.6	40.0	-24.7	15.6	53.9	38.3	Axis:X , VBW:300Hz
Hori.	7440.000	AV	46.1	36.9	7.1	38.7	-24.7	26.7	53.9	27.2	Axis:X , VBW:300Hz
Hori.	9920.000	AV	37.7	38.4	8.0	37.5	-24.7	21.9	53.9	32.0	Axis:X , VBW:300Hz
Hori.	12400.000	AV	36.4	39.1	9.4	37.9	-24.7	22.3	53.9	31.6	Axis:X , VBW:300Hz
Vert.	4960.000	AV	44.5	31.9	5.6	40.0	-24.7	17.3	53.9	36.6	Axis:Z , VBW:300Hz
Vert.	7440.000	AV	51.1	36.9	7.1	38.7	-24.7	31.7	53.9	22.2	Axis:Z , VBW:300Hz
Vert.	9920.000	AV	36.6	38.4	8.0	37.5	-24.7	20.8	53.9	33.1	Axis:Z , VBW:300Hz
Vert.	12400.000	AV	37.1	39.1	9.4	37.9	-24.7	23.0	53.9	30.9	Axis:Z , VBW:300Hz

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.

**Radiated emission(EUT Model:MBH7BTZ45) (Band Edge Compliance)**  
 (for Marker Delta Method)

Bluetooth, 3DH5, Tx 2480MHz

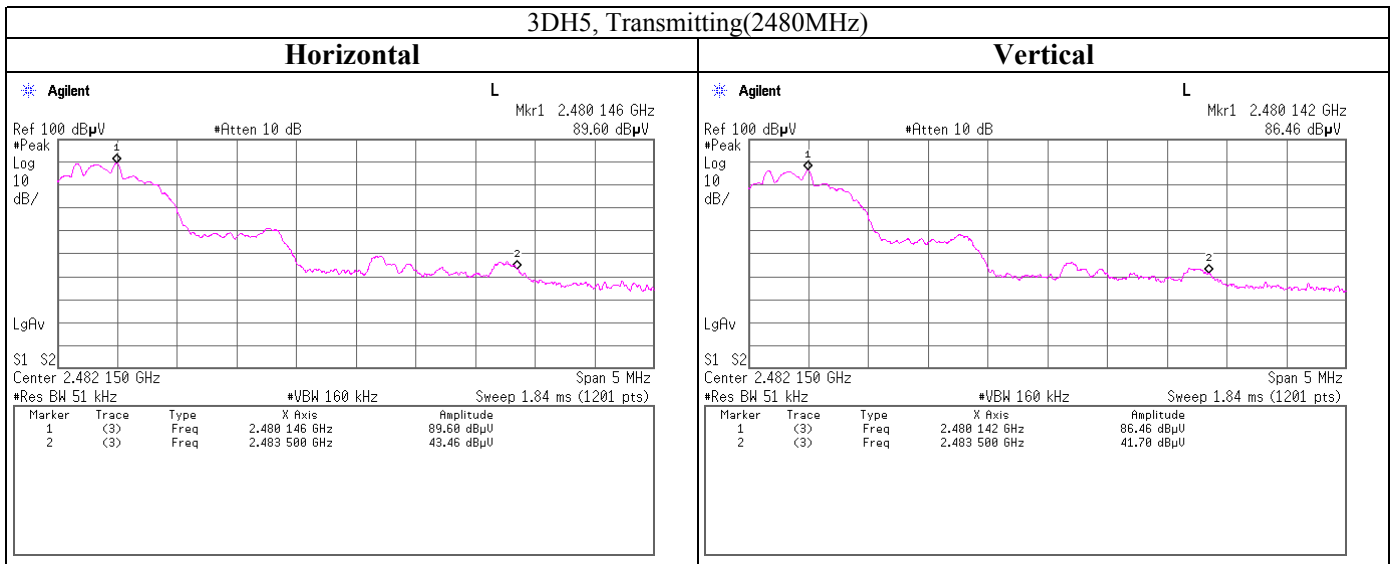
**Marker Delta Method(Test distance 3meters)**  
 Frequency of Band-edge:2483.500MHz

	Polarity	PK				AV					
		RBW / VBW	Hor.		Ver.		RBW / VBW	Hor.		Ver.	
			[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]		[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]
Step1	Fundamental(2480.000MHz)	1M / 3MHz	89.7	100.8	86.6	97.7	1M / 300Hz	86.9	98.0	83.7	94.8
Step2	Fundamental(2480.000MHz)	51k / 160kHz	89.6	100.7	86.5	97.6	-	-	-	-	-
	Band-edge	51k / 160kHz	43.5	54.6	41.7	52.8	-	-	-	-	-
	Amplitude delta[dB]	-	46.1		44.8		-	46.1		44.8	
Step3	Field strength of band-edge	-	-	54.7	-	52.9	-	-	51.9	-	50.0
Step4	Dwell time factor (-24.69dB)	-	-	-	-	-	-	-	27.2	-	25.3
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	19.2		21.0		-	26.7		28.6	

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)



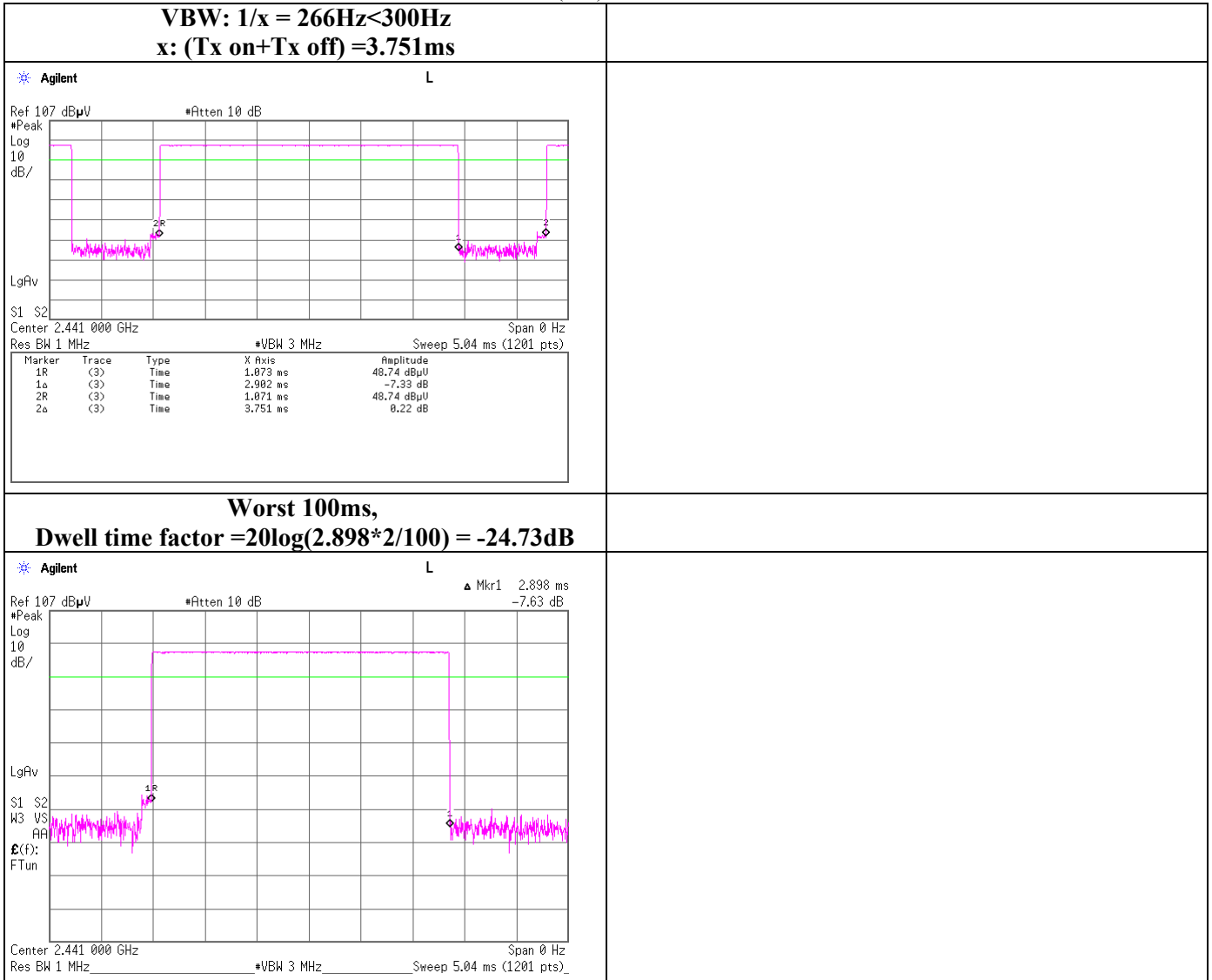
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**Radiated Emission (EUT Model:MBH7BTZ45)**

DH5,

VBW (AV) Calculation



ON time of some channel during 100ms: Twice  
 This is the worst case in hopping sequence of Bluetooth.

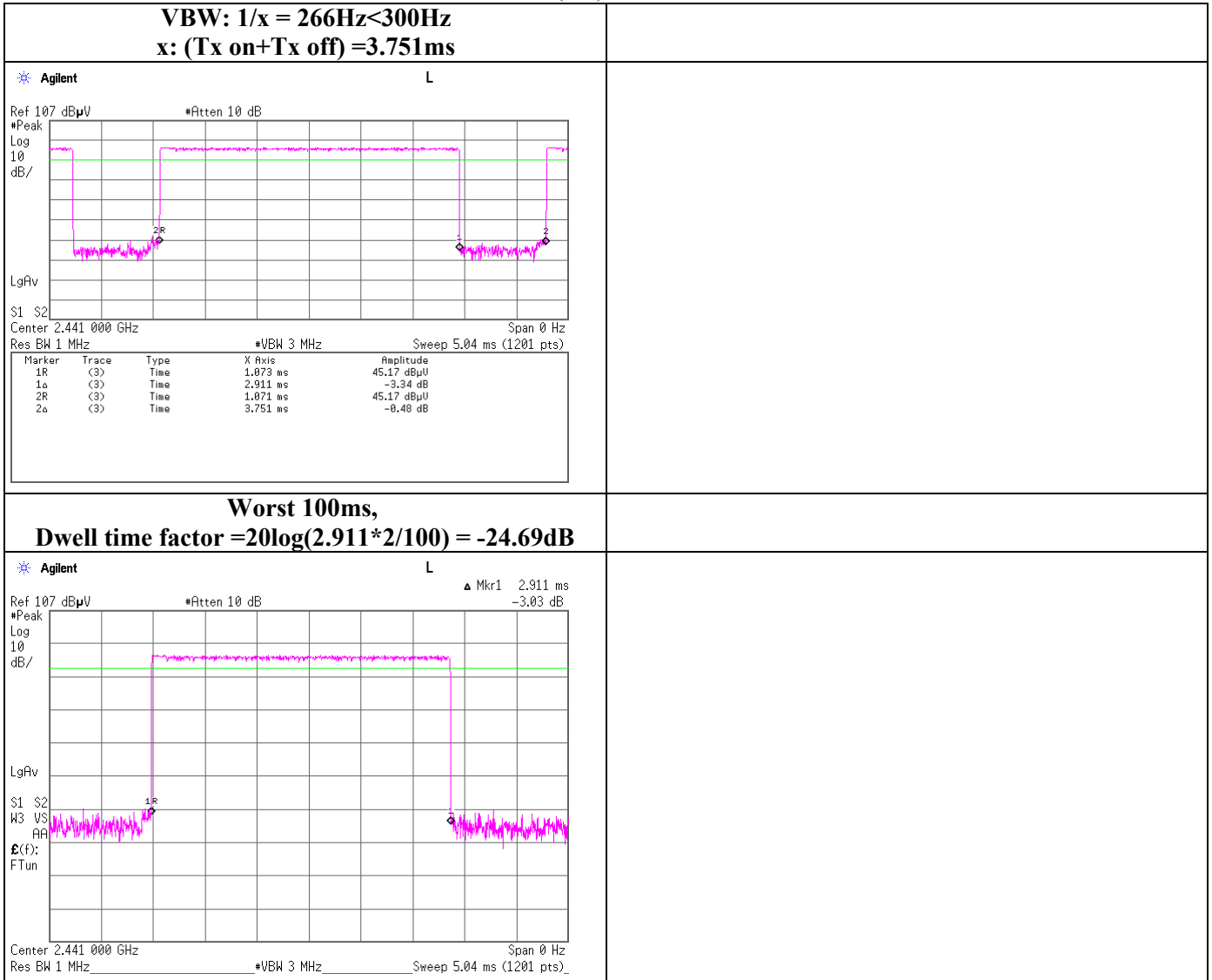
**UL Japan, Inc.**  
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**Radiated Emission (EUT Model:MBH7BTZ45)**

3-DH5,

VBW (AV) Calculation



ON time of some channel during 100ms: Twice  
 This is the worst case in hopping sequence of Bluetooth.

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

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**Radiated Emission (EUT Model:MBH7BTZ46)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/6 2010/10/7 2010/10/8  
 Temperature / Humidity 24deg.C. , 61% 24deg.C. , 47% 27deg.C. , 49%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 Mode Tx, 2402 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.	192.010	QP	39.9	16.5	7.8	32.0	32.2	43.5	11.3	175	274	Axis:X
Hori.	311.900	QP	44.2	14.1	8.5	31.9	34.9	46.0	11.1	100	193	Axis:X
Hori.	384.000	QP	42.0	16.2	8.8	31.9	35.1	46.0	10.9	100	228	Axis:X
Hori.	432.300	QP	38.8	16.8	9.0	31.9	32.7	46.0	13.3	100	211	Axis:X
Hori.	444.200	QP	26.7	16.9	9.1	31.9	20.8	46.0	25.2	100	249	Axis:X
Hori.	1602.025	PK	48.5	25.5	22.9	40.1	56.8	73.9	17.1	106	161	Axis:X
Hori.	2390.000	PK	51.6	27.5	23.5	40.2	62.4	73.9	11.5	123	322	Axis:X
Hori.	3200.000	PK	50.1	29.2	4.9	41.1	43.1	73.9	30.8	100	75	Axis:X
Hori.	4804.000	PK	57.6	31.5	5.5	40.1	54.5	73.9	19.4	100	45	Axis:X
Hori.	7206.000	PK	49.3	36.4	6.7	38.3	54.1	73.9	19.8	100	71	Axis:X , No noise detected
Hori.	9608.000	PK	49.3	37.9	7.8	37.3	57.7	73.9	16.2	100	93	Axis:X , No noise detected
Hori.	12010.000	PK	48.3	39.4	9.0	38.4	58.3	73.9	15.6	100	203	Axis:X , No noise detected
Hori.	1602.025	AV	40.2	25.5	22.9	40.1	48.5	53.9	5.4	106	161	Axis:X , VBW:10Hz
Hori.	3200.000	AV	39.8	29.2	4.9	41.1	32.8	53.9	21.1	100	75	Axis:X , VBW:10Hz
Vert.	143.998	QP	43.3	14.8	7.5	32.1	33.5	43.5	10.0	100	167	Axis:X
Vert.	798.150	QP	30.6	20.7	10.4	31.6	30.1	46.0	15.9	100	103	Axis:X
Vert.	1602.025	PK	48.7	25.5	22.9	40.1	57.0	73.9	16.9	114	146	Axis:Z
Vert.	2390.000	PK	54.3	27.5	23.5	40.2	65.1	73.9	8.8	125	282	Axis:Y
Vert.	3200.000	PK	50.3	29.2	4.9	41.1	43.3	73.9	30.6	100	80	Axis:Z
Vert.	4804.000	PK	52.7	31.5	5.5	40.1	49.6	73.9	24.3	100	139	Axis:Z
Vert.	7206.000	PK	49.1	36.4	6.7	38.3	53.9	73.9	20.0	100	116	Axis:Z , No noise detected
Vert.	9608.000	PK	47.0	37.9	7.8	37.3	55.4	73.9	18.5	100	3	Axis:Z , No noise detected
Vert.	12010.000	PK	47.2	39.4	9.0	38.4	57.2	73.9	16.7	100	171	Axis:Z , No noise detected
Vert.	1602.025	AV	40.0	25.5	22.9	40.1	48.3	53.9	5.6	114	146	Axis:Z , VBW:10Hz
Vert.	3200.000	AV	38.7	29.2	4.9	41.1	31.7	53.9	22.2	100	80	Axis:Z , 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	103.8	27.5	23.5	40.2	114.6	-	-	Carrier , Axis:X
Hori.	2399.483	PK	59.8	27.5	23.5	40.2	70.6	94.6	24.0	Axis:X
Vert.	2402.000	PK	102.5	27.5	23.5	40.2	113.3	-	-	Carrier , Axis:Y
Vert.	2399.483	PK	60.0	27.5	23.5	40.2	70.8	93.3	22.5	Axis:Y

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	37.2	27.5	23.5	40.2	-24.7	23.3	53.9	30.6	Axis:X , VBW:300Hz
Hori.	4804.000	AV	52.7	31.5	5.5	40.1	-24.7	24.9	53.9	29.0	Axis:X , VBW:300Hz
Hori.	7206.000	AV	37.5	36.4	6.7	38.3	-24.7	17.6	53.9	36.3	Axis:X , VBW:300Hz
Hori.	9608.000	AV	35.6	37.9	7.8	37.3	-24.7	19.3	53.9	34.6	Axis:X , VBW:300Hz
Hori.	12010.000	AV	36.2	39.4	9.0	38.4	-24.7	21.5	53.9	32.4	Axis:X , VBW:300Hz
Vert.	2390.000	AV	37.1	27.5	23.5	40.2	-24.7	23.2	53.9	30.7	Axis:Y , VBW:300Hz
Vert.	4804.000	AV	45.7	31.5	5.5	40.1	-24.7	17.9	53.9	36.0	Axis:Z , VBW:300Hz
Vert.	7206.000	AV	39.6	36.4	6.7	38.3	-24.7	19.7	53.9	34.2	Axis:Z , VBW:300Hz
Vert.	9608.000	AV	35.8	37.9	7.8	37.3	-24.7	19.5	53.9	34.4	Axis:Z , VBW:300Hz
Vert.	12010.000	AV	35.9	39.4	9.0	38.4	-24.7	21.2	53.9	32.7	Axis:Z , VBW:300Hz

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.

**Radiated Emission (EUT Model:MBH7BTZ46)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/7 2010/10/8 2010/10/9  
 Temperature / Humidity 24deg.C. , 47% 27deg.C. , 49% 24deg.C. , 52%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	192.000	QP	39.6	16.5	7.8	32.0	31.9	43.5	11.6	169	132	Axis:X
Hori.	311.990	QP	44.0	14.1	8.5	31.9	34.7	46.0	11.3	100	234	Axis:X
Hori.	384.000	QP	42.2	16.2	8.8	31.9	35.3	46.0	10.7	100	242	Axis:X
Hori.	408.012	QP	32.8	16.7	8.9	31.9	26.5	46.0	19.5	100	219	Axis:X
Hori.	432.029	QP	39.0	16.8	9.0	31.9	32.9	46.0	13.1	100	221	Axis:X
Hori.	1627.990	PK	47.4	25.6	22.9	40.1	55.8	73.9	18.1	104	230	Axis:X
Hori.	3256.000	PK	50.1	29.3	4.8	41.1	43.1	73.9	30.8	100	64	Axis:X
Hori.	4882.000	PK	54.6	31.7	5.6	40.0	51.9	73.9	22.0	100	358	Axis:X
Hori.	7323.000	PK	48.3	36.7	6.9	38.5	53.4	73.9	20.5	100	10	Axis:X
Hori.	9764.000	PK	51.6	38.2	7.8	37.4	60.2	73.9	13.7	100	56	Axis:X
Hori.	12205.000	PK	51.6	39.2	9.1	38.1	61.8	73.9	12.1	100	100	Axis:X , No noise detected
Hori.	1627.990	AV	37.6	25.6	22.9	40.1	46.0	53.9	7.9	104	230	Axis:X , VBW:10Hz
Hori.	3256.000	AV	41.4	29.3	4.8	41.1	34.4	53.9	19.5	100	64	Axis:X , VBW:10Hz
Vert.	144.010	QP	43.4	14.8	7.5	32.1	33.6	43.5	9.9	100	134	Axis:X
Vert.	798.150	QP	30.8	20.7	10.4	31.6	30.3	46.0	15.7	100	102	Axis:X
Vert.	1627.990	PK	47.5	25.6	22.9	40.1	55.9	73.9	18.0	113	126	Axis:Z
Vert.	3256.000	PK	50.3	29.3	4.8	41.1	43.3	73.9	30.6	100	70	Axis:Z
Vert.	4882.000	PK	55.6	31.7	5.6	40.0	52.9	73.9	21.0	116	181	Axis:Z
Vert.	7323.000	PK	49.0	36.7	6.9	38.5	54.1	73.9	19.8	100	190	Axis:Z
Vert.	9764.000	PK	47.5	38.2	7.8	37.4	56.1	73.9	17.8	100	200	Axis:Z
Vert.	12205.000	PK	47.2	39.2	9.1	38.1	57.4	73.9	16.5	100	210	Axis:Z , No noise detected
Vert.	1627.990	AV	37.4	25.6	22.9	40.1	45.8	53.9	8.1	113	126	Axis:Z , VBW:10Hz
Vert.	3256.000	AV	41.6	29.3	4.8	41.1	34.6	53.9	19.3	100	70	Axis:Z , 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	48.8	31.7	5.6	40.0	-24.7	21.4	53.9	32.5	Axis:X , VBW:300Hz
Hori.	7323.000	AV	41.7	36.7	6.9	38.5	-24.7	22.1	53.9	31.8	Axis:X , VBW:300Hz
Hori.	9764.000	AV	39.6	38.2	7.8	37.4	-24.7	23.5	53.9	30.4	Axis:X , VBW:300Hz
Hori.	12205.000	AV	38.7	39.2	9.1	38.1	-24.7	24.2	53.9	29.7	Axis:X , VBW:300Hz
Vert.	4882.000	AV	51.7	31.7	5.6	40.0	-24.7	24.3	53.9	29.6	Axis:Z , VBW:300Hz
Vert.	7323.000	AV	39.3	36.7	6.9	38.5	-24.7	19.7	53.9	34.2	Axis:Z , VBW:300Hz
Vert.	9764.000	AV	37.0	38.2	7.8	37.4	-24.7	20.9	53.9	33.0	Axis:Z , VBW:300Hz
Vert.	12205.000	AV	36.4	39.2	9.1	38.1	-24.7	21.9	53.9	32.0	Axis:Z , VBW:300Hz

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.

**Radiated Emission (EUT Model:MBH7BTZ46)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/7 2010/10/8 2010/10/10  
 Temperature / Humidity 24deg.C. , 47% 27deg.C. , 49% 20deg.C. , 60%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	192.008	QP	39.4	16.5	7.8	32.0	31.7	43.5	11.8	172	141	Axis:X
Hori.	312.002	QP	44.5	14.1	8.5	31.9	35.2	46.0	10.8	111	190	Axis:X
Hori.	384.000	QP	42.1	16.2	8.8	31.9	35.2	46.0	10.8	102	225	Axis:X
Hori.	432.028	QP	38.7	16.8	9.0	31.9	32.6	46.0	13.4	100	216	Axis:X
Hori.	1654.005	PK	47.3	25.7	23.0	40.2	55.8	73.9	18.1	100	19	Axis:X
Hori.	3304.000	PK	52.7	29.3	4.9	41.1	45.8	73.9	28.1	100	53	Axis:X
Hori.	4960.000	PK	53.2	31.9	5.6	40.0	50.7	73.9	23.2	100	221	Axis:X
Hori.	7440.000	PK	50.8	36.9	7.1	38.7	56.1	73.9	17.8	100	217	Axis:X
Hori.	9920.000	PK	50.3	38.4	8.0	37.5	59.2	73.9	14.7	100	90	Axis:X
Hori.	12400.000	PK	47.8	39.1	9.4	37.9	58.4	73.9	15.5	100	51	Axis:X , No noise detected
Hori.	1654.005	AV	38.9	25.7	23.0	40.2	47.4	53.9	6.5	100	19	Axis:X , VBW:10Hz
Hori.	3304.000	AV	45.3	29.3	4.9	41.1	38.4	53.9	15.5	100	53	Axis:X , VBW:10Hz
Vert.	144.016	QP	43.0	14.8	7.5	32.1	33.2	43.5	10.3	100	149	Axis:X
Vert.	469.700	QP	24.0	17.0	9.2	31.9	18.3	46.0	27.7	100	155	Axis:X
Vert.	798.150	QP	30.3	20.7	10.4	31.6	29.8	46.0	16.2	100	118	Axis:X
Vert.	1654.005	PK	46.6	25.7	23.0	40.2	55.1	73.9	18.8	146	162	Axis:Z
Vert.	3304.000	PK	53.2	29.3	4.9	41.1	46.3	73.9	27.6	100	0	Axis:Z
Vert.	4960.000	PK	53.1	31.9	5.6	40.0	50.6	73.9	23.3	100	357	Axis:Z
Vert.	7440.000	PK	48.2	36.9	7.1	38.7	53.5	73.9	20.4	100	219	Axis:Z
Vert.	9920.000	PK	48.8	38.4	8.0	37.5	57.7	73.9	16.2	100	58	Axis:Z
Vert.	12400.000	PK	47.4	39.1	9.4	37.9	58.0	73.9	15.9	100	173	Axis:Z , No noise detected
Vert.	1654.005	AV	37.3	25.7	23.0	40.2	45.8	53.9	8.1	146	162	Axis:Z , VBW:10Hz
Vert.	3304.000	AV	45.8	29.3	4.9	41.1	38.9	53.9	15.0	100	0	Axis:Z , 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	45.4	31.9	5.6	40.0	-24.7	18.2	53.9	35.7	Axis:X , VBW:300Hz
Hori.	7440.000	AV	42.0	36.9	7.1	38.7	-24.7	22.6	53.9	31.3	Axis:X , VBW:300Hz
Hori.	9920.000	AV	41.7	38.4	8.0	37.5	-24.7	25.9	53.9	28.0	Axis:X , VBW:300Hz
Hori.	12400.000	AV	35.7	39.1	9.4	37.9	-24.7	21.6	53.9	32.3	Axis:X , VBW:300Hz
Vert.	4960.000	AV	46.0	31.9	5.6	40.0	-24.7	18.8	53.9	35.1	Axis:Z , VBW:300Hz
Vert.	7440.000	AV	39.6	36.9	7.1	38.7	-24.7	20.2	53.9	33.7	Axis:Z , VBW:300Hz
Vert.	9920.000	AV	40.9	38.4	8.0	37.5	-24.7	25.1	53.9	28.8	Axis:Z , VBW:300Hz
Vert.	12400.000	AV	35.9	39.1	9.4	37.9	-24.7	21.8	53.9	32.1	Axis:Z , VBW:300Hz

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.

**Radiated emission(EUT Model:MBH7BTZ46) (Band Edge Compliance)**  
 (for Marker Delta Method)

Bluetooth, DH5, Tx 2480MHz

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

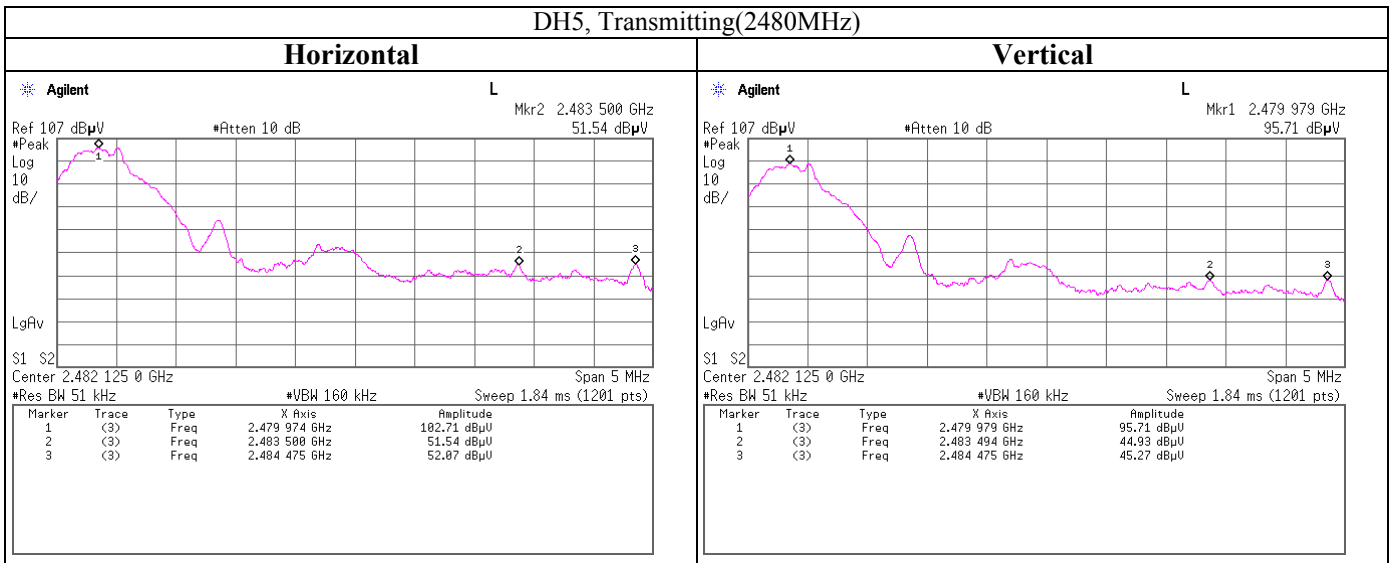
		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			Reading	Result	Reading	Result		Reading	Result	Reading	Result
Step1	Fundamental(2480.000MHz)	1M / 3MHz	102.9	114.0	95.8	106.9	1M / 300Hz	102.3	113.4	95.4	106.5
Step2	Fundamental(2480.000MHz)	51k / 160kHz	102.7	113.8	95.7	106.8	-	-	-	-	-
	Band-edge	51k / 160kHz	51.5	62.6	44.9	56.0	-	-	-	-	-
	Amplitude delta[dB]	-	-	51.2	-	50.8	-	-	51.2	-	50.8
Step3	Field strength of band-edge	-	-	62.8	-	56.1	-	-	62.2	-	55.7
Step4	Dwell time factor (-24.73dB)	-	-	-	-	-	-	-	37.5	-	31.0
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	11.1	-	17.8	-	-	16.4	-	22.9

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:2484.475MHz

		PK				AV					
		Polarity	Hor.		Ver.		Polarity	Hor.		Ver.	
			Reading	Result	Reading	Result		Reading	Result	Reading	Result
Step1	Fundamental(2480.000MHz)	1M / 3MHz	102.9	114.0	95.8	106.9	1M / 300Hz	102.3	113.4	95.4	106.5
Step2	Fundamental(2480.000MHz)	51k / 160kHz	102.7	113.8	95.7	106.8	-	-	-	-	-
	Band-edge	51k / 160kHz	52.1	63.2	45.3	56.4	-	-	-	-	-
	Amplitude delta[dB]	-	-	50.6	-	50.4	-	-	50.6	-	50.4
Step3	Field strength of band-edge	-	-	63.4	-	56.5	-	-	62.8	-	56.1
Step4	Dwell time factor (-24.73dB)	-	-	-	-	-	-	-	38.1	-	31.4
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	-	10.5	-	17.4	-	-	15.8	-	22.5

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)



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

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 Telephone : +81 463 50 6400  
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**Radiated Emission (EUT Model:MBH7BTZ46)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/6 2010/10/7 2010/10/8  
 Temperature / Humidity 24deg.C. , 61% 24deg.C. , 47% 27deg.C. , 49%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	192.000	QP	39.0	16.5	7.8	32.0	31.3	43.5	12.2	184	283	Axis:X
Hori.	311.993	QP	44.3	14.1	8.5	31.9	35.0	46.0	11.0	100	17	Axis:X
Hori.	383.989	QP	42.0	16.2	8.8	31.9	35.1	46.0	10.9	100	260	Axis:X
Hori.	432.008	QP	38.6	16.8	9.0	31.9	32.5	46.0	13.5	100	218	Axis:X
Hori.	1602.000	PK	48.2	25.5	22.9	40.1	56.5	73.9	17.4	104	164	Axis:X
Hori.	2390.000	PK	50.3	27.5	23.5	40.2	61.1	73.9	12.8	121	320	Axis:X
Hori.	3200.000	PK	49.6	29.2	4.9	41.1	42.6	73.9	31.3	100	68	Axis:X
Hori.	4804.000	PK	56.4	31.5	5.5	40.1	53.3	73.9	20.6	100	48	Axis:X
Hori.	7206.000	PK	48.9	36.4	6.7	38.3	53.7	73.9	20.2	100	126	Axis:X
Hori.	9608.000	PK	47.6	37.9	7.8	37.3	56.0	73.9	17.9	100	156	Axis:X , No noise detected
Hori.	12010.000	PK	47.1	39.4	9.0	38.4	57.1	73.9	16.8	100	237	Axis:X , No noise detected
Hori.	1602.000	AV	39.8	25.5	22.9	40.1	48.1	53.9	5.8	104	164	Axis:X , No noise detected
Hori.	3200.000	AV	40.3	29.2	4.9	41.1	33.3	53.9	20.6	100	68	Axis:X , VBW:10Hz
Vert.	144.006	QP	43.1	14.8	7.5	32.1	33.3	43.5	10.2	100	159	Axis:X , VBW:10Hz
Vert.	349.290	QP	23.9	15.2	8.7	31.9	15.9	46.0	30.1	100	228	Axis:X
Vert.	798.667	QP	31.0	20.7	10.4	31.6	30.5	46.0	15.5	100	54	Axis:X
Vert.	1601.990	PK	49.1	25.5	22.9	40.1	57.4	73.9	16.5	161	114	Axis:Z
Vert.	2390.000	PK	49.8	27.5	23.5	40.2	60.6	73.9	13.3	124	263	Axis:Y
Vert.	3200.000	PK	49.8	29.2	4.9	41.1	42.8	73.9	31.1	100	86	Axis:Z
Vert.	4804.000	PK	52.9	31.5	5.5	40.1	49.8	73.9	24.1	100	153	Axis:Z
Vert.	7206.000	PK	48.1	36.4	6.7	38.3	52.9	73.9	21.0	100	177	Axis:Z , No noise detected
Vert.	9608.000	PK	47.6	37.9	7.8	37.3	56.0	73.9	17.9	100	234	Axis:Z , No noise detected
Vert.	12010.000	PK	47.4	39.4	9.0	38.4	57.4	73.9	16.5	100	264	Axis:Z , No noise detected
Vert.	1601.990	AV	38.5	25.5	22.9	40.1	46.8	53.9	7.1	161	114	Axis:Z , VBW:10Hz
Vert.	3200.000	AV	40.8	29.2	4.9	41.1	33.8	53.9	20.1	100	86	Axis:Z , 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	102.9	27.5	23.5	40.2	113.7	-	-	Carrier , Axis:X
Hori.	2400.000	PK	59.8	27.5	23.5	40.2	70.6	93.7	23.1	Axis:X
Vert.	2402.000	PK	102.4	27.5	23.5	40.2	113.2	-	-	Carrier , Axis:Y
Vert.	2400.000	PK	61.3	27.5	23.5	40.2	72.1	93.2	21.1	Axis:Y

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	37.8	27.5	23.5	40.2	-24.7	23.9	53.9	30.0	Axis:X , VBW:300Hz
Hori.	4808.000	AV	49.3	31.5	5.5	40.1	-24.7	21.5	53.9	32.4	Axis:X , VBW:300Hz
Hori.	7206.000	AV	37.5	36.4	6.7	38.3	-24.7	17.6	53.9	36.3	Axis:X , VBW:300Hz
Hori.	9608.000	AV	35.6	37.9	7.8	37.3	-24.7	19.3	53.9	34.6	Axis:X , VBW:300Hz
Hori.	12010.000	AV	35.9	39.4	9.0	38.4	-24.7	21.2	53.9	32.7	Axis:X , VBW:300Hz
Vert.	2390.000	AV	38.0	27.5	23.5	40.2	-24.7	24.1	53.9	29.8	Axis:Y , VBW:300Hz
Vert.	4804.000	AV	42.8	31.5	5.5	40.1	-24.7	15.0	53.9	38.9	Axis:Z , VBW:300Hz
Vert.	7206.000	AV	38.2	36.4	6.7	38.3	-24.7	18.3	53.9	35.6	Axis:Z , VBW:300Hz
Vert.	9608.000	AV	35.9	37.9	7.8	37.3	-24.7	19.6	53.9	34.3	Axis:Z , VBW:300Hz
Vert.	12010.000	AV	36.7	39.4	9.0	38.4	-24.7	22.0	53.9	31.9	Axis:Z , VBW:300Hz

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.

**Radiated Emission (EUT Model:MBH7BTZ46)**

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber  
 Date 2010/10/7 2010/10/8 2010/10/9  
 Temperature / Humidity 24deg.C. , 47% 27deg.C. , 49% 24deg.C. , 52%  
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano  
 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.	192.000	QP	39.1	16.5	7.8	32.0	31.4	43.5	12.1	150	156	Axis:X
Hori.	311.993	QP	44.2	14.1	8.5	31.9	34.9	46.0	11.1	103	0	Axis:X
Hori.	384.000	QP	41.6	16.2	8.8	31.9	34.7	46.0	11.3	100	232	Axis:X
Hori.	431.989	QP	39.0	16.8	9.0	31.9	32.9	46.0	13.1	102	209	Axis:X
Hori.	480.206	QP	35.3	17.0	9.2	31.9	29.6	46.0	16.4	101	222	Axis:X
Hori.	1628.010	PK	47.3	25.6	22.9	40.1	55.7	73.9	18.2	104	25	Axis:X
Hori.	3256.000	PK	50.4	29.3	4.8	41.1	43.4	73.9	30.5	100	30	Axis:X
Hori.	4882.000	PK	52.0	31.7	5.6	40.0	49.3	73.9	24.6	100	18	Axis:X
Hori.	7323.000	PK	48.3	36.7	6.9	38.5	53.4	73.9	20.5	100	68	Axis:X , No noise detected
Hori.	9764.000	PK	47.3	38.2	7.8	37.4	55.9	73.9	18.0	100	121	Axis:X , No noise detected
Hori.	12205.000	PK	47.5	39.2	9.1	38.1	57.7	73.9	16.2	100	230	Axis:X , No noise detected
Hori.	1628.010	AV	38.8	25.6	22.9	40.1	47.2	53.9	6.7	104	25	Axis:X , VBW:10Hz
Hori.	3256.000	AV	40.5	29.3	4.8	41.1	33.5	53.9	20.4	100	30	Axis:X , VBW:10Hz
Vert.	144.010	QP	43.1	14.8	7.5	32.1	33.3	43.5	10.2	100	156	Axis:X
Vert.	798.677	QP	30.8	20.7	10.4	31.6	30.3	46.0	15.7	100	91	Axis:X
Vert.	1628.010	PK	46.5	25.6	22.9	40.1	54.9	73.9	19.0	108	129	Axis:Z
Vert.	3256.000	PK	50.3	29.3	4.8	41.1	43.3	73.9	30.6	100	46	Axis:Z
Vert.	4882.000	PK	51.4	31.7	5.6	40.0	48.7	73.9	25.2	100	205	Axis:Z
Vert.	7323.000	PK	49.4	36.7	6.9	38.5	54.5	73.9	19.4	100	260	Axis:Z , No noise detected
Vert.	9764.000	PK	47.9	38.2	7.8	37.4	56.5	73.9	17.4	100	318	Axis:Z , No noise detected
Vert.	12205.000	PK	47.9	39.2	9.1	38.1	58.1	73.9	15.8	100	354	Axis:Z , No noise detected
Vert.	1628.010	AV	36.6	25.6	22.9	40.1	45.0	53.9	8.9	108	129	Axis:Z , VBW:10Hz
Vert.	3256.000	AV	40.1	29.3	4.8	41.1	33.1	53.9	20.8	100	46	Axis:Z , 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	42.1	31.7	5.6	40.0	-24.7	14.7	53.9	39.2	Axis:X , VBW:300Hz
Hori.	7323.000	AV	36.9	36.7	6.9	38.5	-24.7	17.3	53.9	36.6	Axis:X , VBW:300Hz
Hori.	9764.000	AV	35.8	38.2	7.8	37.4	-24.7	19.7	53.9	34.2	Axis:X , VBW:300Hz
Hori.	12205.000	AV	35.9	39.2	9.1	38.1	-24.7	21.4	53.9	32.5	Axis:X , VBW:300Hz
Vert.	4882.000	AV	39.8	31.7	5.6	40.0	-24.7	12.4	53.9	41.5	Axis:Z , VBW:300Hz
Vert.	7323.000	AV	37.2	36.7	6.9	38.5	-24.7	17.6	53.9	36.3	Axis:Z , VBW:300Hz
Vert.	9764.000	AV	35.7	38.2	7.8	37.4	-24.7	19.6	53.9	34.3	Axis:Z , VBW:300Hz
Vert.	12205.000	AV	36.4	39.2	9.1	38.1	-24.7	21.9	53.9	32.0	Axis:Z , VBW:300Hz

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.

### Radiated Emission (EUT Model:MBH7BTZ46)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	2010/10/7	2010/10/8
Temperature / Humidity	24deg.C. , 47%	27deg.C. , 49%
Engineer	Shinichi Takano	Shinichi Takano
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.	191.998	QP	39.0	16.5	7.8	32.0	31.3	43.5	12.2	175	119	Axis:X
Hori.	312.005	QP	44.0	14.1	8.5	31.9	34.7	46.0	11.3	113	0	Axis:X
Hori.	384.000	QP	41.8	16.2	8.8	31.9	34.9	46.0	11.1	100	235	Axis:X
Hori.	432.027	QP	39.1	16.8	9.0	31.9	33.0	46.0	13.0	100	240	Axis:X
Hori.	1653.980	PK	47.4	25.7	23.0	40.2	55.9	73.9	18.0	102	19	Axis:X
Hori.	3307.975	PK	51.3	29.3	4.9	41.1	44.4	73.9	29.5	100	18	Axis:X
Hori.	4960.000	PK	48.6	31.9	5.6	40.0	46.1	73.9	27.8	100	75	Axis:X
Hori.	7440.000	PK	48.7	36.9	7.1	38.7	54.0	73.9	19.9	100	124	Axis:X , No noise detected
Hori.	9920.000	PK	47.8	38.4	8.0	37.5	56.7	73.9	17.2	100	173	Axis:X , No noise detected
Hori.	12400.000	PK	46.3	39.1	9.4	37.9	56.9	73.9	17.0	100	0	Axis:X , No noise detected
Hori.	1653.980	AV	38.3	25.7	23.0	40.2	46.8	53.9	7.1	102	19	Axis:X , VBW:10Hz
Hori.	3307.975	AV	41.6	29.3	4.9	41.1	34.7	53.9	19.2	100	18	Axis:X , VBW:10Hz
Vert.	144.004	QP	43.0	14.8	7.5	32.1	33.2	43.5	10.3	100	124	Axis:X
Vert.	797.954	QP	31.1	20.7	10.4	31.6	30.6	46.0	15.4	100	73	Axis:X
Vert.	827.800	QP	22.7	21.0	10.4	31.4	22.7	46.0	23.3	100	114	Axis:X
Vert.	1653.980	PK	47.0	25.7	23.0	40.2	55.5	73.9	18.4	112	128	Axis:Z
Vert.	3308.125	PK	51.7	29.3	4.9	41.1	44.8	73.9	29.1	100	307	Axis:Z
Vert.	4960.000	PK	49.0	31.9	5.6	40.0	46.5	73.9	27.4	100	31	Axis:Z
Vert.	7440.000	PK	49.6	36.9	7.1	38.7	54.9	73.9	19.0	100	56	Axis:Z , No noise detected
Vert.	9920.000	PK	47.4	38.4	8.0	37.5	56.3	73.9	17.6	100	77	Axis:Z , No noise detected
Vert.	12400.000	PK	47.2	39.1	9.4	37.9	57.8	73.9	16.1	100	0	Axis:Z , No noise detected
Vert.	1653.980	AV	36.7	25.7	23.0	40.2	45.2	53.9	8.7	112	128	Axis:Z , VBW:10Hz
Vert.	3308.125	AV	42.5	29.3	4.9	41.1	35.6	53.9	18.3	100	307	Axis:Z , 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	38.4	31.9	5.6	40.0	-24.7	11.2	53.9	42.7	Axis:X , VBW:300Hz
Hori.	7440.000	AV	37.3	36.9	7.1	38.7	-24.7	17.9	53.9	36.0	Axis:X , VBW:300Hz
Hori.	9920.000	AV	35.7	38.4	8.0	37.5	-24.7	19.9	53.9	34.0	Axis:X , VBW:300Hz
Hori.	12400.000	AV	35.7	39.1	9.4	37.9	-24.7	21.6	53.9	32.3	Axis:X , VBW:300Hz
Vert.	4960.000	AV	38.5	31.9	5.6	40.0	-24.7	11.3	53.9	42.6	Axis:Z , VBW:300Hz
Vert.	7440.000	AV	37.4	36.9	7.1	38.7	-24.7	18.0	53.9	35.9	Axis:Z , VBW:300Hz
Vert.	9920.000	AV	35.9	38.4	8.0	37.5	-24.7	20.1	53.9	33.8	Axis:Z , VBW:300Hz
Vert.	12400.000	AV	35.9	39.1	9.4	37.9	-24.7	21.8	53.9	32.1	Axis:Z , VBW:300Hz

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.

**Radiated emission(EUT Model:MBH7BTZ46) (Band Edge Compliance)**  
 (for Marker Delta Method)

Bluetooth, 3DH5, Tx 2480MHz

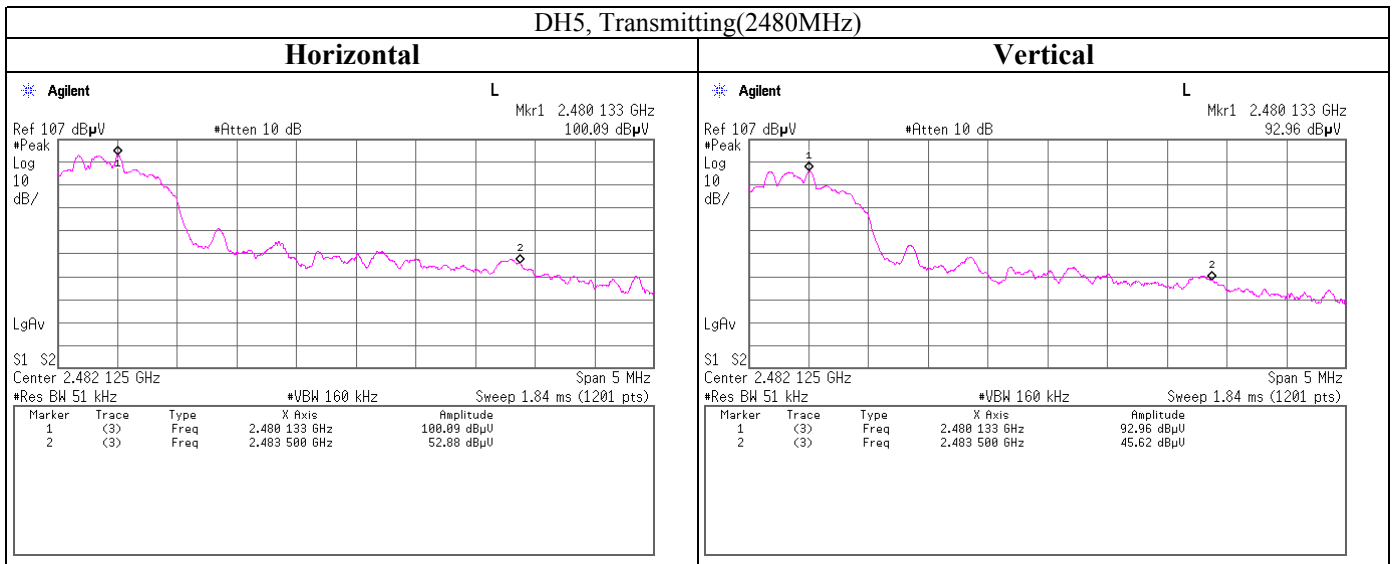
**Marker Delta Method(Test distance 3meters)**  
 Frequency of Band-edge:2483.500MHz

	Polarity	PK				AV					
		RBW / VBW	Hor.		Ver.		RBW / VBW	Hor.		Ver.	
			[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]		[dBuV]	[dBuV/m]	[dBuV]	[dBuV/m]
Step1	Fundamental(2480.000MHz)	1M / 3MHz	100.4	111.5	93.4	104.5	1M / 300Hz	96.3	107.4	89.4	100.5
Step2	Fundamental(2480.000MHz)	51k / 160kHz	100.1	111.2	93.0	104.1	-	-	-	-	-
	Band-edge	51k / 160kHz	52.9	64.0	45.6	56.7	-	-	-	-	-
	Amplitude delta[dB]	-	47.2		47.4		-	47.2		47.4	
Step3	Field strength of band-edge	-	-	64.3	-	57.1	-	-	60.2	-	53.1
Step4	Dwell time factor (-24.72dB)	-	-	-	-	-	-	-	35.5	-	28.4
	Limit	-	-	73.9	-	73.9	-	-	53.9	-	53.9
	Margin[dB]	-	9.6		16.8		-	-	18.4	-	25.5

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)



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

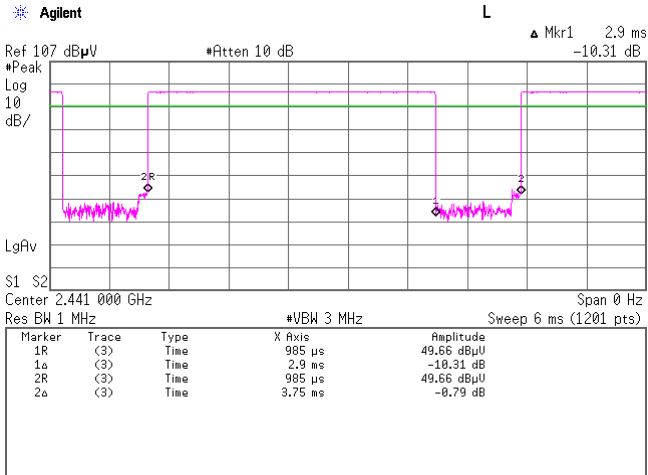
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN  
 Telephone : +81 463 50 6400  
 Facsimile : +81 463 50 6401

**Radiated Emission (EUT Model:MBH7BTZ46)**

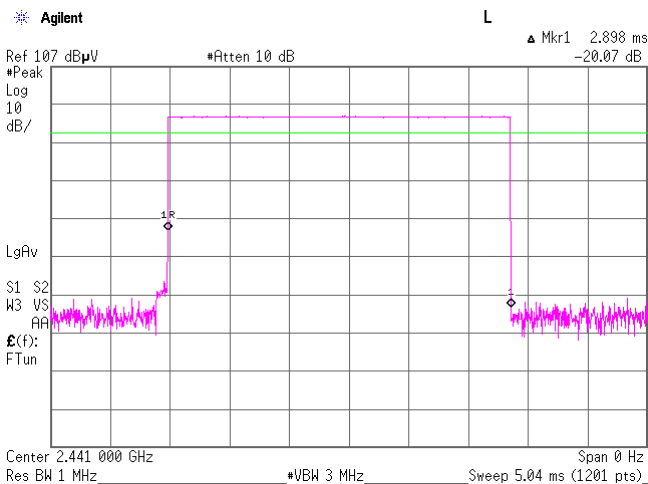
DH5,

VBW (AV) Calculation

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



**Worst 100ms,  
 Dwell time factor  $= 20\log(2.898*2/100) = -24.73\text{dB}$**



ON time of some channel during 100ms: Twice  
 This is the worst case in hopping sequence of Bluetooth.

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

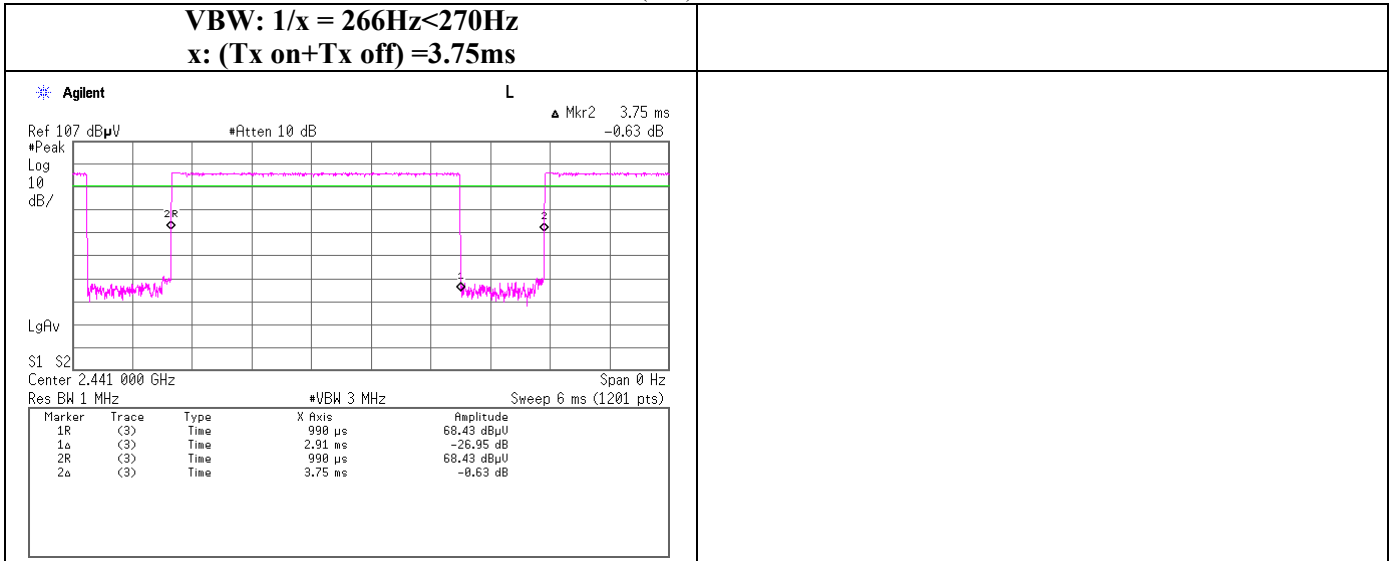
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN  
 Telephone : +81 463 50 6400  
 Facsimile : +81 463 50 6401

**Radiated Emission (EUT Model:MBH7BTZ46)**

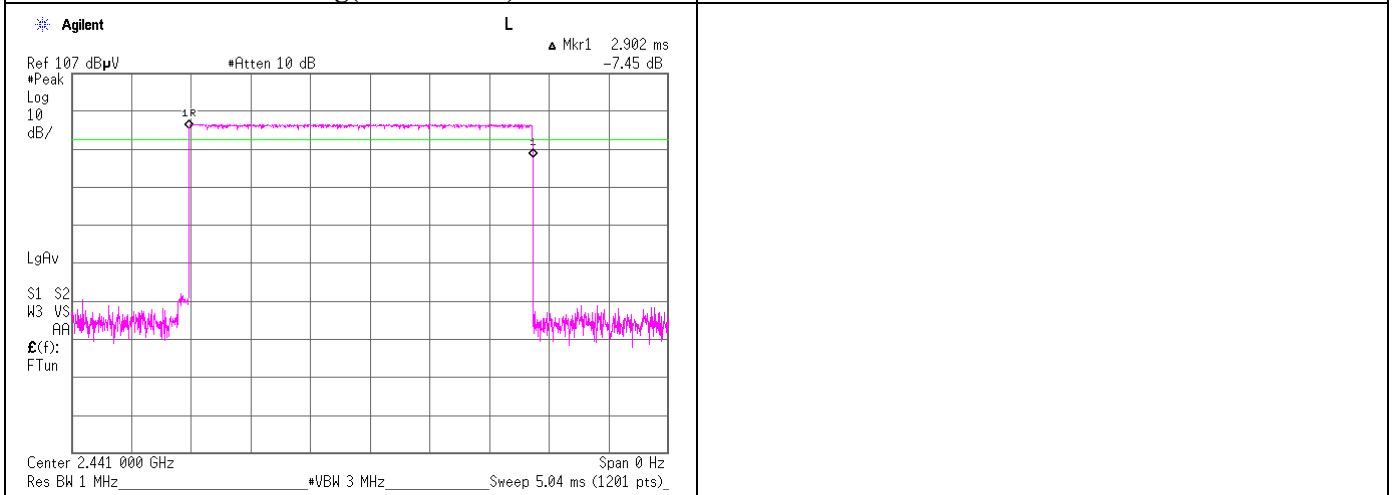
3-DH5,

VBW (AV) Calculation

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



**Worst 100ms,  
 Dwell time factor =  $20\log(2.902*2/100) = -24.72\text{dB}$**



ON time of some channel during 100ms: Twice  
 This is the worst case in hopping sequence of Bluetooth.

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

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## Spurious emission (Conducted)

DH5  
 Tx, 2402MHz

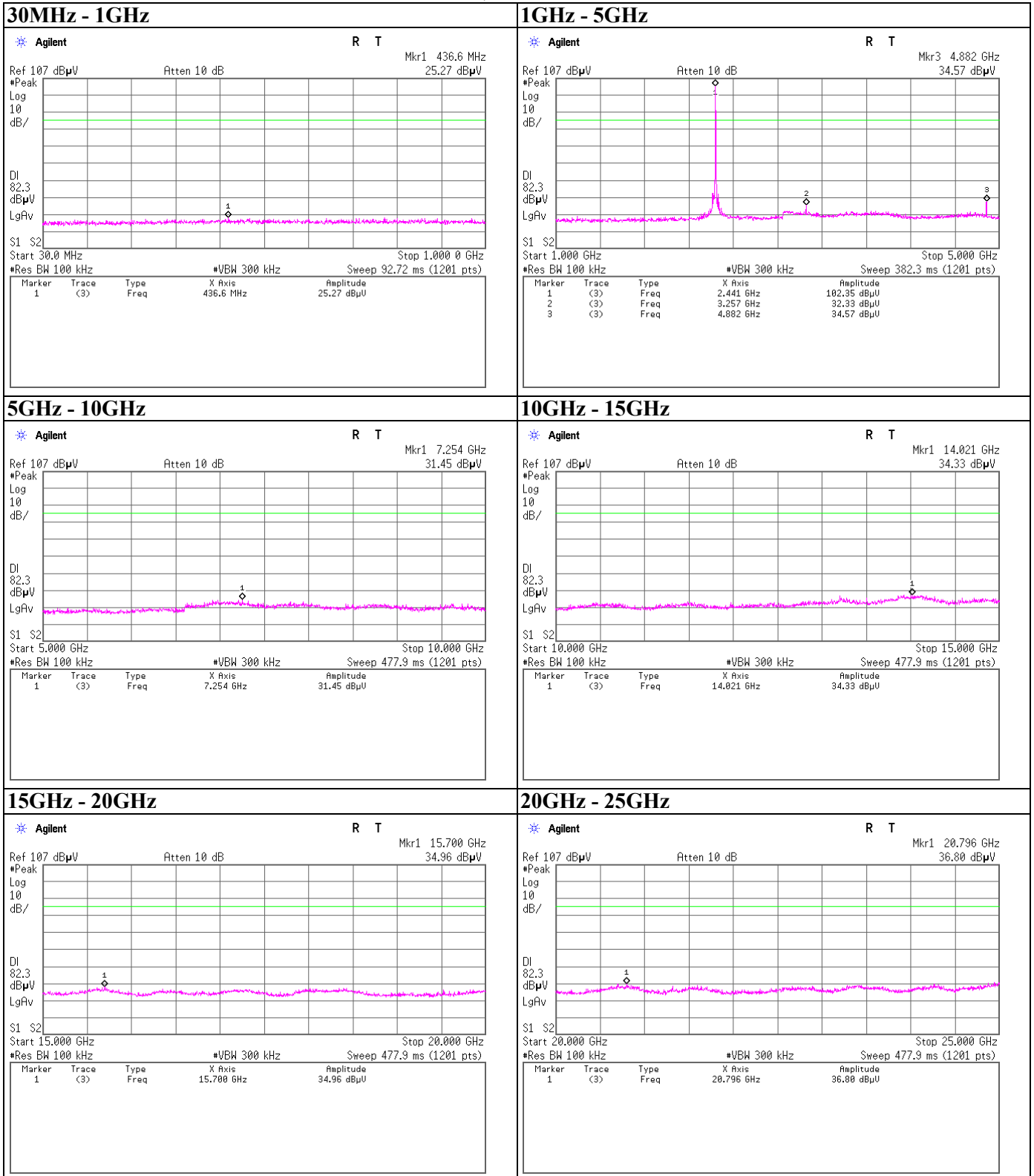


**UL Japan, Inc.**  
**Shonan EMC Lab.**

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 Facsimile : +81 463 50 6401

## Spurious emission (Conducted)

DH5  
 Tx, 2441MHz



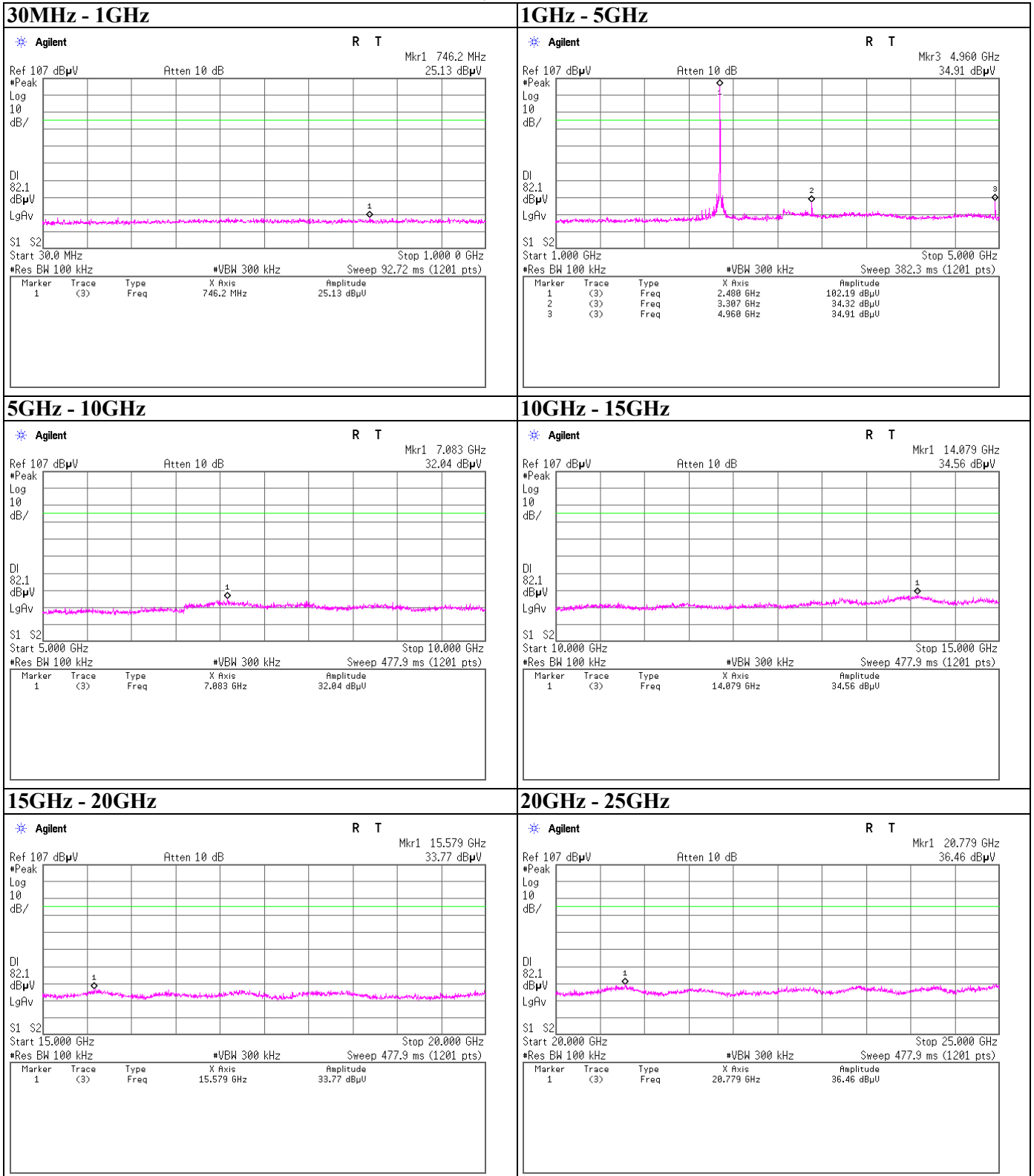
**UL Japan, Inc.**  
**Shonan EMC Lab.**

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



## Spurious emission (Conducted)

Tx, 2480MHz



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## Spurious emission (Conducted)

3-DH5

Tx, 2402MHz



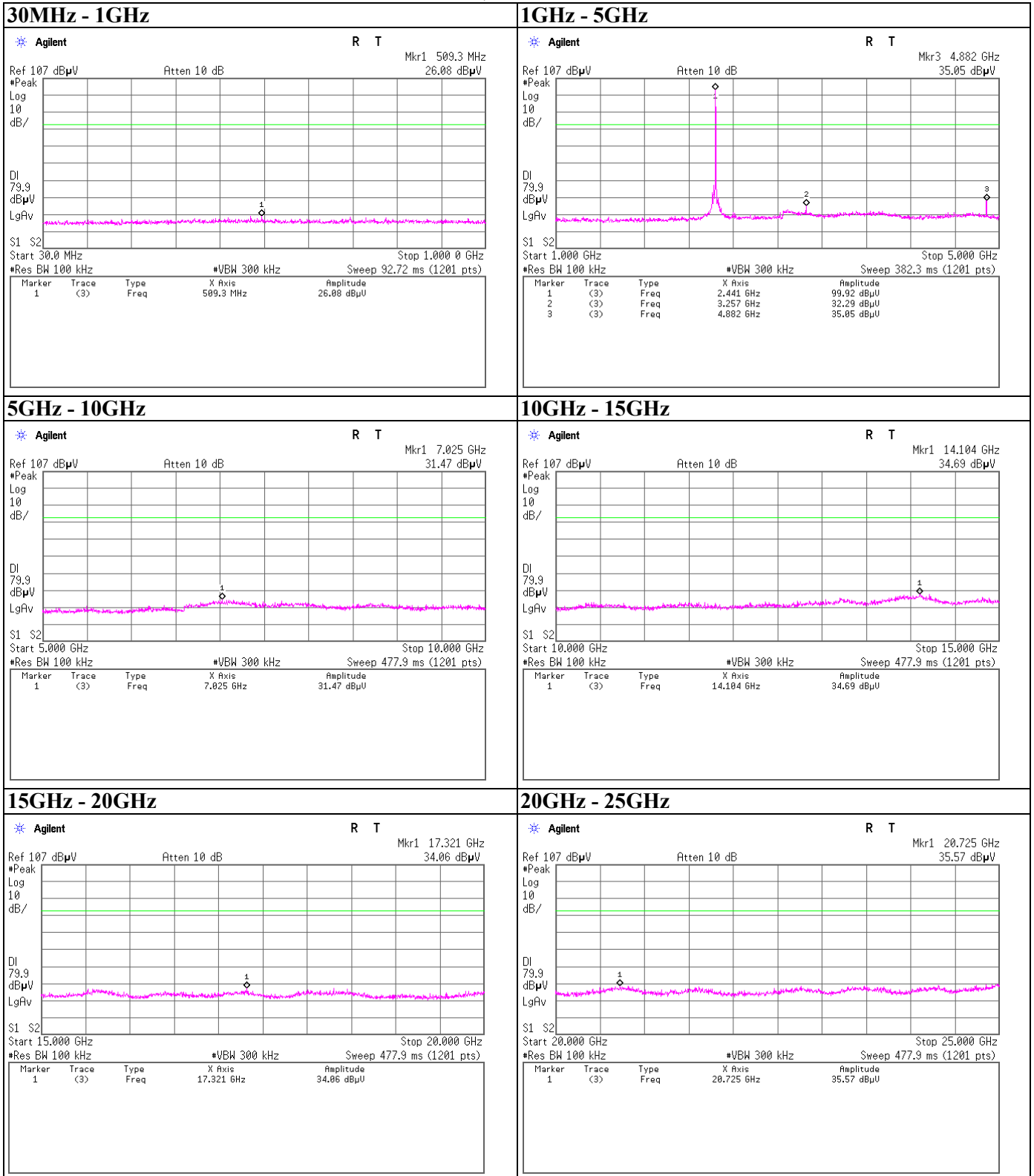
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## Spurious emission (Conducted)

3-DH5

Tx, 2441MHz



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## Spurious emission (Conducted)

3-DH5

Tx, 2480MHz



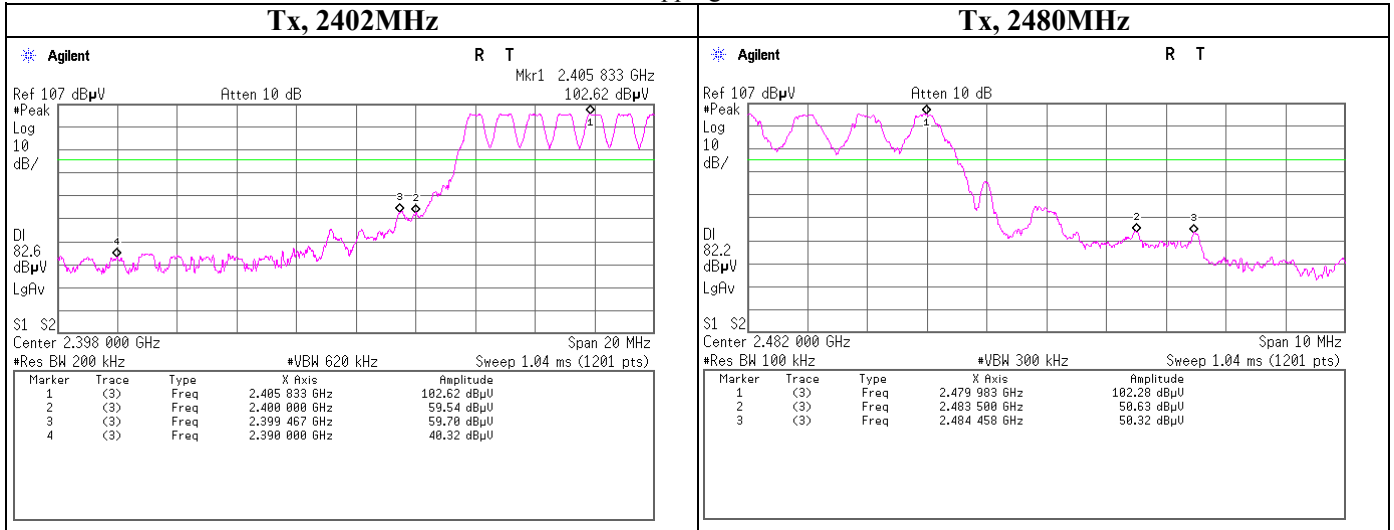
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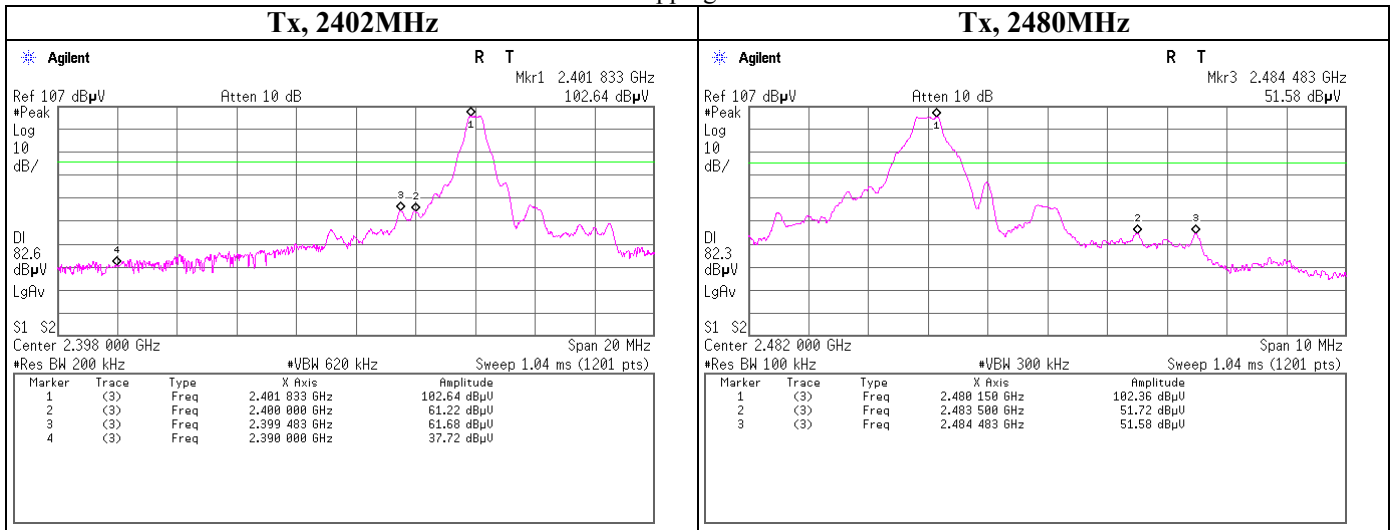
## Spurious emission (Conducted)

Band Edge compliance  
 DH5

Hopping ON



Hopping OFF



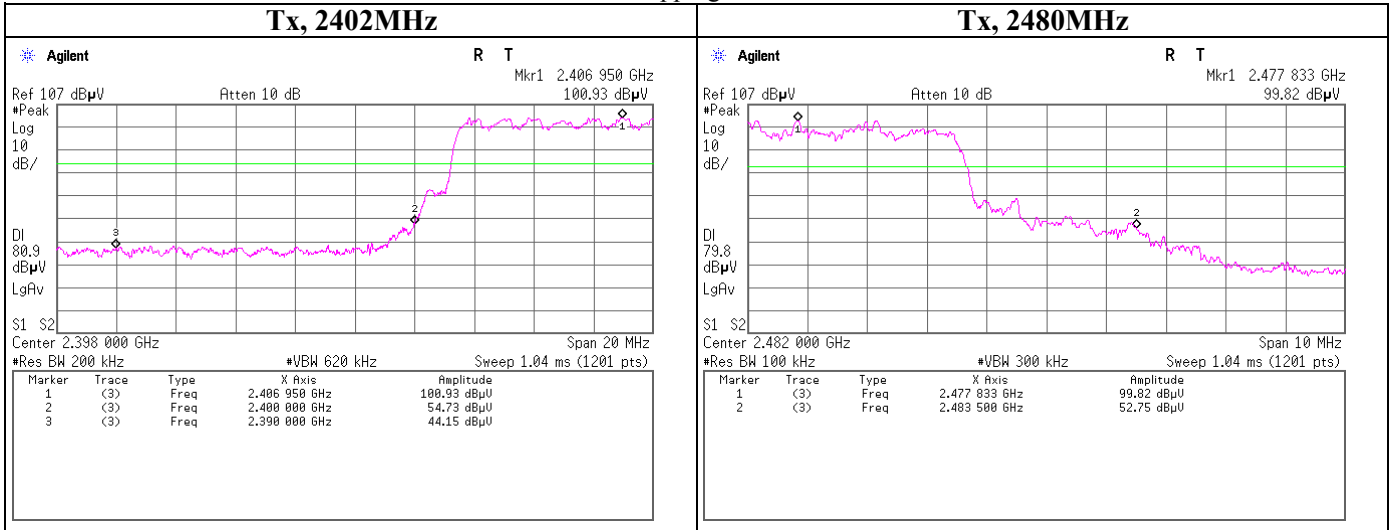
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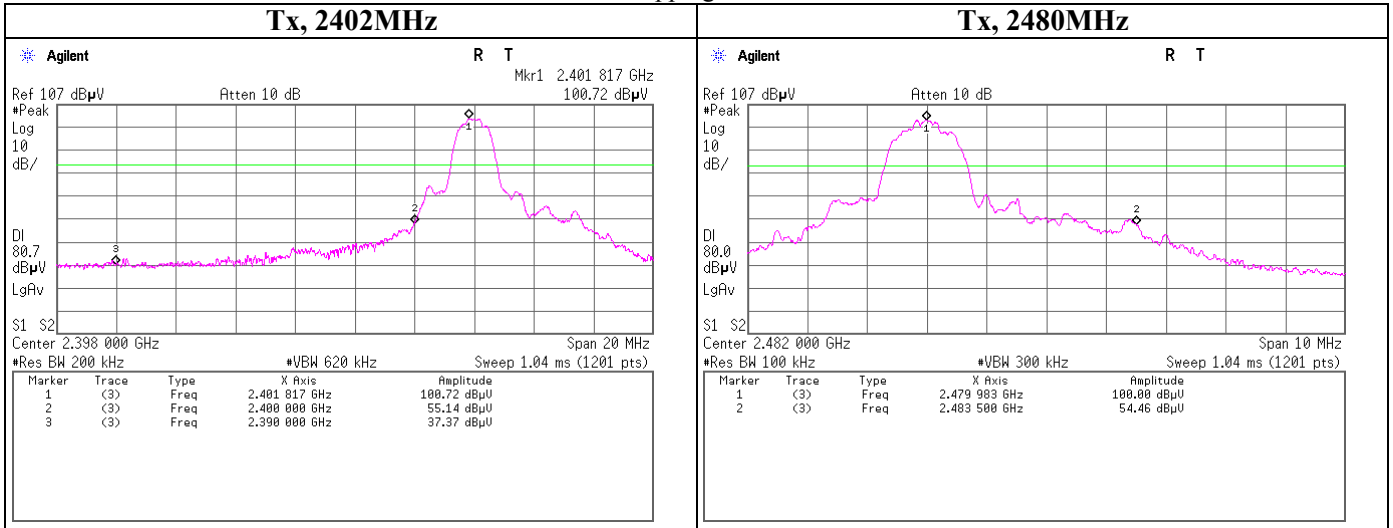
## Spurious emission (Conducted)

Band Edge compliance  
 3-DH5

Hopping ON



Hopping OFF

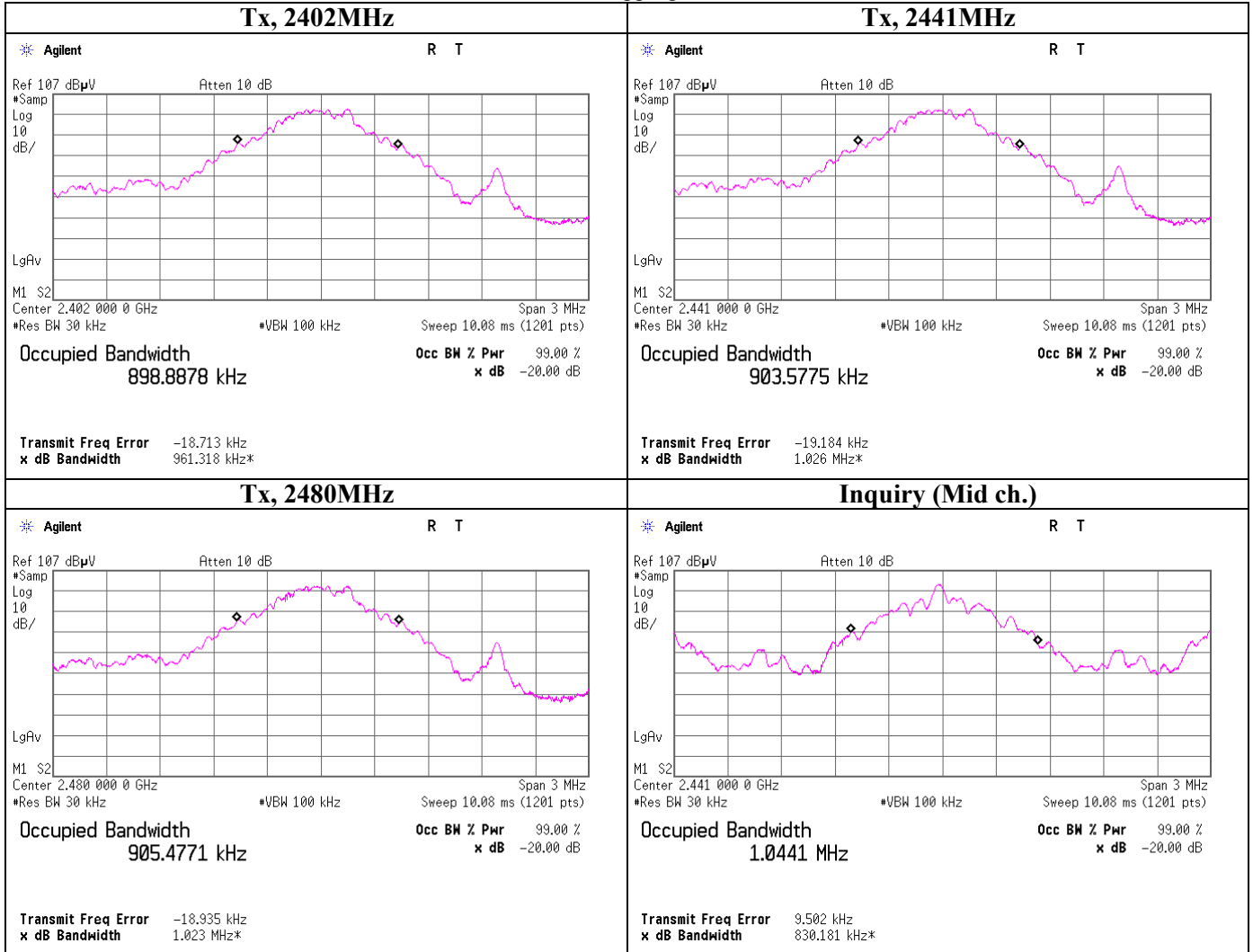


**UL Japan, Inc.**  
**Shonan EMC Lab.**

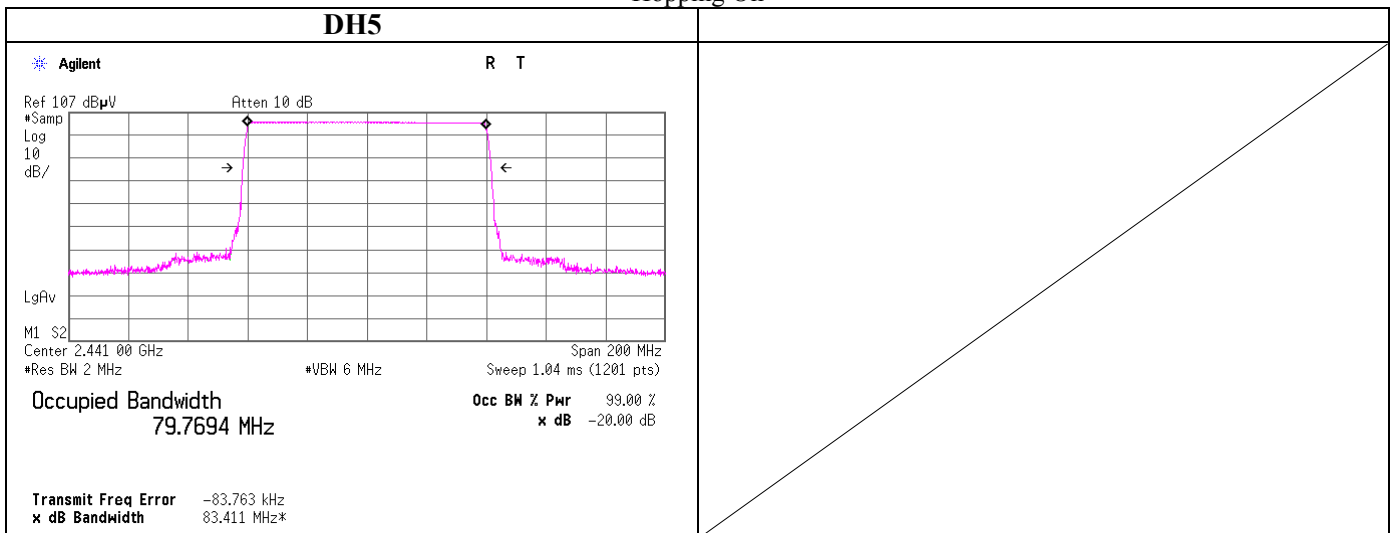
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**99% Occupied Bandwidth**

DH5, Hopping Off



Hopping On

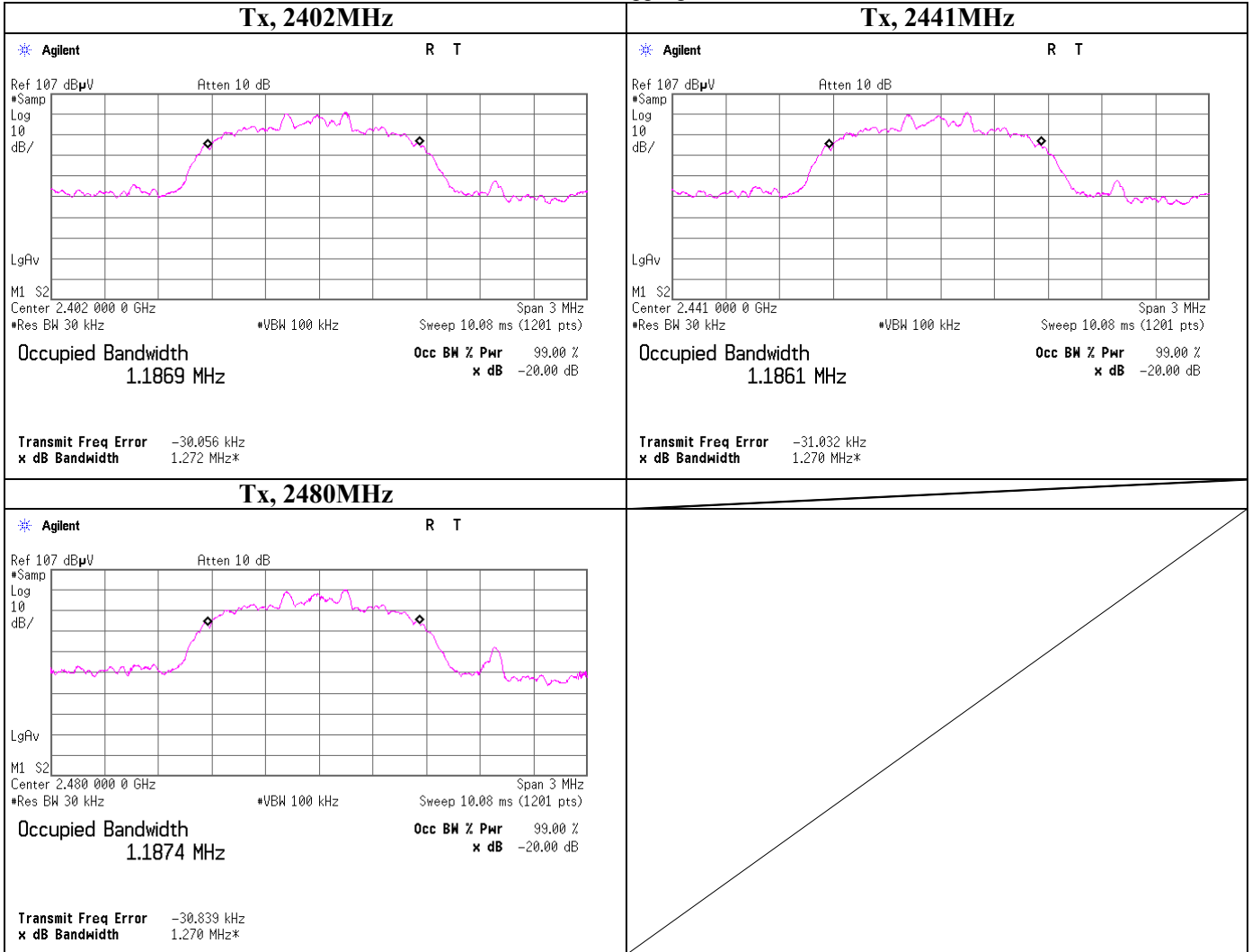


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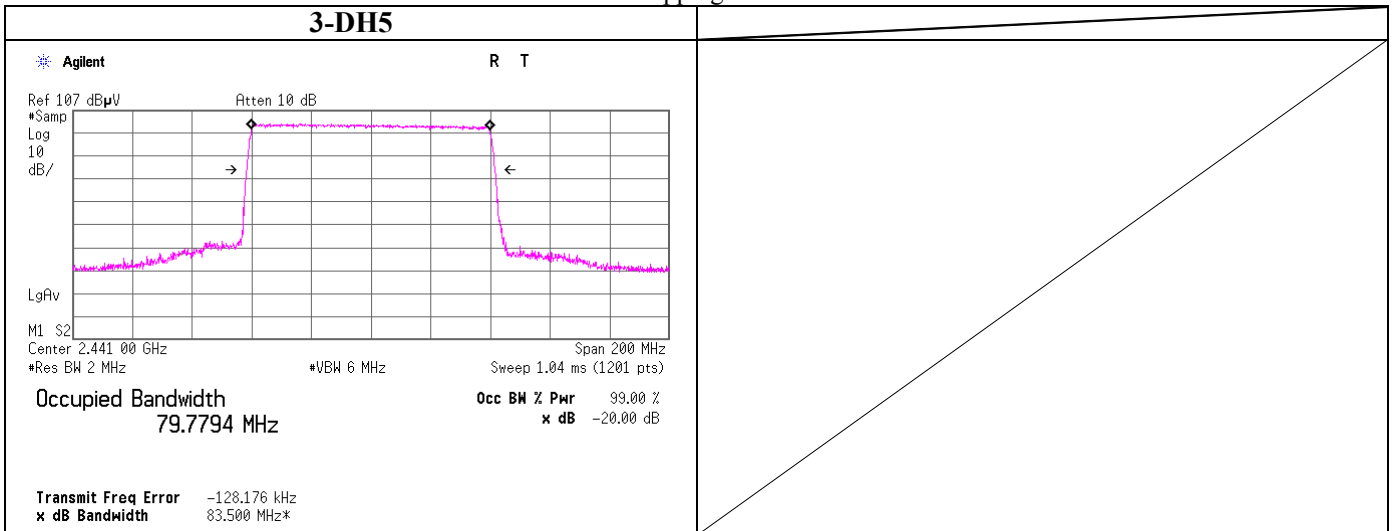
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**99% Occupied Bandwidth**

**3-DH5, Hopping Off**



**Hopping On**



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### APPENDIX 3 Test Instruments

#### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2010/11/16 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2010/03/09 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2010/04/16 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2010/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2010/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2010/02/09 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE,CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV	-	RE	-
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SAT20-01	Attenuator(above1GHz)	Agilent	8493C-020	74889	RE,AT	2010/12/15 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2010/02/06 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2010/02/06 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2010/10/15 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2010/04/02 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A0901	RE	2010/10/15 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	RE	2010/08/18 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2010/09/13 * 12
SAA-01	Audio Analyzer	Rohde & Schwarz	UPV	101292	RE	2010/03/01 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2010/03/02 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2010/03/29 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2010/03/02 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2010/11/16 * 12
SCC-G11	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	AT	2010/03/31 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2010/04/01 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2010/04/01 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2010/03/09 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2010/06/22 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-271(RF Selector)	CE	2010/04/02 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2010/02/19 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2010/02/06 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2010/02/17 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	CE	2010/07/21 * 12

The expiration date of the calibration is the end of the expired month .  
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with traceable calibrations . Each calibration is traceable to the national or international standards .

#### Test Item :

- CE: Conducted emission test
- RE: Radiated emission test
- AT: Antenna terminal conducted test