

Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date 2010/12/13
 Temperature / Humidity 26deg.C. , 38%
 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	1.39	0.95	0.00	2.34	1.71	20.96	125	18.62
Mid	2441.0	1.33	0.96	0.00	2.29	1.69	20.96	125	18.67
High	2480.0	-0.15	0.97	0.00	0.82	1.21	20.96	125	20.14

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	0.94	0.95	0.00	1.89	1.55	20.96	125	19.07
Mid	2441.0	0.81	0.96	0.00	1.77	1.50	20.96	125	19.19
High	2480.0	-0.71	0.97	0.00	0.26	1.06	20.96	125	20.70

EDR (3-DH5)

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	1.41	0.95	0.00	2.36	1.72	20.96	125	18.60
Mid	2441.0	1.31	0.96	0.00	2.27	1.69	20.96	125	18.69
High	2480.0	-0.16	0.97	0.00	0.81	1.21	20.96	125	20.15

Sample Calculation:

Result = Reading + Cable Loss + 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.

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 : 2010/12/14 2010/12/15
Temperature / Humidity : 24deg.C. , 40% 24deg.C. , 33%
Engineer : Akio Hayashi Akio Hayashi
Mode : Tx, 2402 MHz
Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	81.849	QP	47.5	6.5	7.0	32.1	28.9	40.0	11.1	237	0	
Hori.	175.006	QP	45.4	15.6	7.7	32.0	36.7	43.5	6.8	184	181	
Hori.	180.023	QP	43.8	15.8	7.7	32.0	35.3	43.5	8.2	207	146	
Hori.	229.512	QP	43.2	16.8	8.0	32.0	36.0	46.0	10.0	158	359	
Hori.	236.249	QP	44.7	16.9	8.1	32.0	37.7	46.0	8.3	179	359	
Hori.	239.631	QP	45.2	16.9	8.1	32.0	38.2	46.0	7.8	196	0	
Hori.	243.006	QP	46.8	17.0	8.1	32.0	39.9	46.0	6.1	201	358	
Hori.	300.006	QP	49.6	14.0	8.4	31.9	40.1	46.0	5.9	112	244	
Hori.	959.940	QP	30.2	21.3	10.8	30.5	31.8	46.0	14.2	100	329	
Hori.	960.029	QP	39	21.3	10.9	30.5	40.7	53.9	13.2	100	329	
Hori.	1920.057	PK	49.0	26.8	13.0	40.3	48.5	73.9	25.4	100	47	
Hori.	2390.000	PK	44.8	27.5	13.3	40.2	45.4	73.9	28.5	100	85	
Hori.	2400.000	PK	54.7	27.5	13.3	40.2	55.3	73.9	18.6	100	85	
Hori.	3399.617	PK	56.0	29.5	4.8	41.2	49.1	73.9	24.8	126	167	
Hori.	4804.000	PK	47.1	31.5	5.5	40.1	44.0	73.9	29.9	100	0	Not Detected
Hori.	7206.000	PK	46.6	36.4	6.7	38.3	51.4	73.9	22.5	100	0	Not Detected
Hori.	9608.000	PK	44.9	37.9	7.8	37.3	53.3	73.9	20.6	100	66	
Hori.	12060.000	PK	45.9	39.3	9.0	38.3	55.9	73.9	18.0	100	0	Not Detected
Hori.	1920.057	AV	40.5	26.8	13.0	40.3	40.0	53.9	13.9	100	47	VBW:10Hz
Hori.	2390.000	AV	34.7	27.5	13.3	40.2	35.3	53.9	18.6	100	85	VBW:300Hz
Hori.	2400.000	AV	40.7	27.5	13.3	40.2	41.3	53.9	12.6	100	85	VBW:300Hz
Hori.	3399.617	AV	53.6	29.5	4.8	41.2	46.7	53.9	7.2	126	167	VBW:10Hz
Hori.	4804.000	AV	34.5	31.5	5.5	40.1	31.4	53.9	22.5	100	0	Not Detected
Hori.	7206.000	AV	34.7	36.4	6.7	38.3	39.5	53.9	14.4	100	0	Not Detected
Hori.	9608.000	AV	32.9	37.9	7.8	37.3	41.3	53.9	12.6	100	66	VBW:300Hz
Hori.	12060.000	AV	33.4	39.3	9.0	38.3	43.4	53.9	10.5	100	0	Not Detected
Vert.	49.110	QP	38.7	11.2	6.7	32.1	24.5	40.0	15.5	100	209	
Vert.	500.010	QP	43	17.2	9.3	31.9	37.6	46.0	8.4	114	27	
Vert.	1920.057	PK	48.9	26.8	13.0	40.3	48.4	73.9	25.5	130	71	
Vert.	2390.000	PK	44.9	27.5	13.3	40.2	45.5	73.9	28.4	134	305	
Vert.	2400.000	PK	50.5	27.5	13.3	40.2	51.1	73.9	22.8	134	305	
Vert.	3399.617	PK	54.6	29.5	4.8	41.2	47.7	73.9	26.2	130	222	
Vert.	4804.000	PK	47.2	31.5	5.5	40.1	44.1	73.9	29.8	100	0	Not Detected
Vert.	7206.000	PK	46.6	36.4	6.7	38.3	51.4	73.9	22.5	100	0	Not Detected
Vert.	9608.000	PK	45.4	37.9	7.8	37.3	53.8	73.9	20.1	100	359	
Vert.	12060.000	PK	46.2	39.3	9.0	38.3	56.2	73.9	17.7	100	0	Not Detected
Vert.	1920.057	AV	41.2	26.8	13.0	40.3	40.7	53.9	13.2	130	71	VBW:10Hz
Vert.	2390.000	AV	34.7	27.5	13.3	40.2	35.3	53.9	18.6	134	305	VBW:300Hz
Vert.	2400.000	AV	41.1	27.5	13.3	40.2	41.7	53.9	12.2	134	305	VBW:300Hz
Vert.	3399.617	AV	52.2	29.5	4.8	41.2	45.3	53.9	8.6	130	222	VBW:10Hz
Vert.	4804.000	AV	34.3	31.5	5.5	40.1	31.2	53.9	22.7	100	0	Not Detected
Vert.	7206.000	AV	34.7	36.4	6.7	38.3	39.5	53.9	14.4	100	0	Not Detected
Vert.	9608.000	AV	31.5	37.9	7.8	37.3	39.9	53.9	14.0	100	359	VBW:300Hz
Vert.	12060.000	AV	33.7	39.3	9.0	38.3	43.7	53.9	10.2	100	0	Not Detected

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 third order harmonics.

Radiated Emission

Test place : UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date : 2010/12/14 2010/12/15
Temperature / Humidity : 24deg.C. , 40% 24deg.C. , 33%
Engineer : Akio Hayashi Akio Hayashi
Mode : Tx, 2441 MHz
Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	81.840	QP	45.8	6.5	7.0	32.1	27.2	40.0	12.8	234	9	
Hori.	175.008	QP	45.1	15.6	7.7	32.0	36.4	43.5	7.1	186	154	
Hori.	180.021	QP	44.2	15.8	7.7	32.0	35.7	43.5	7.8	188	149	
Hori.	232.877	QP	45.5	16.8	8.1	32.0	38.4	46.0	7.6	142	173	
Hori.	239.629	QP	45.6	16.9	8.1	32.0	38.6	46.0	7.4	137	16	
Hori.	243.005	QP	46.1	17.0	8.1	32.0	39.2	46.0	6.8	180	17	
Hori.	246.381	QP	44.1	17.0	8.1	32.0	37.2	46.0	8.8	196	8	
Hori.	300.005	QP	49.2	14.0	8.4	32.0	39.6	46.0	6.4	152	276	
Hori.	602.106	QP	40.8	18.3	9.7	31.9	36.9	46.0	9.1	152	276	
Hori.	959.940	QP	29.8	21.3	10.8	30.5	31.4	46.0	14.6	100	327	
Hori.	960.029	QP	38.9	21.3	10.9	30.5	40.6	53.9	13.3	100	327	
Hori.	1919.840	PK	48.5	26.8	13.0	40.3	48.0	73.9	25.9	107	175	
Hori.	3399.699	PK	56.6	29.5	4.8	41.2	49.7	73.9	24.2	118	177	
Hori.	4882.000	PK	48.5	31.7	5.6	40.0	45.8	73.9	28.1	100	0	
Hori.	7323.000	PK	48.3	36.7	6.9	38.5	53.4	73.9	20.5	100	0	Not Detected
Hori.	9764.000	PK	46.1	38.2	7.8	37.4	54.7	73.9	19.2	100	65	
Hori.	12205.000	PK	46.6	39.2	9.1	38.1	56.8	73.9	17.1	100	0	Not Detected
Hori.	1919.840	AV	39.4	26.8	13.0	40.3	38.9	53.9	15.0	107	175	VBW:10Hz
Hori.	3399.699	AV	53.5	29.5	4.8	41.2	46.6	53.9	7.3	118	177	VBW:10Hz
Hori.	4882.000	AV	35.7	31.7	5.6	40.0	33.0	53.9	20.9	100	0	VBW:300Hz
Hori.	7323.000	AV	34.3	36.7	6.9	38.5	39.4	53.9	14.5	100	0	Not Detected
Hori.	9764.000	AV	34.3	38.2	7.8	37.4	42.9	53.9	11.0	100	65	VBW:300Hz
Hori.	12205.000	AV	33.8	39.2	9.1	38.1	44.0	53.9	9.9	100	0	Not Detected
Vert.	49.106	QP	42.1	11.2	6.7	32.1	27.9	40.0	12.1	100	247	
Vert.	500.009	QP	42.1	17.2	9.3	31.9	36.7	46.0	9.3	114	33	
Vert.	1919.840	PK	49.8	26.8	13.0	40.3	49.3	73.9	24.6	112	72	
Vert.	3399.699	PK	55.8	29.5	4.8	41.2	48.9	73.9	25.0	118	355	
Vert.	4882.000	PK	47.6	31.7	5.6	40.0	44.9	73.9	29.0	100	26	
Vert.	7323.000	PK	45.9	36.7	6.9	38.5	51.0	73.9	22.9	100	0	Not Detected
Vert.	9764.000	PK	45.5	38.2	7.8	37.4	54.1	73.9	19.8	100	0	
Vert.	12205.000	PK	45.6	39.2	9.1	38.1	55.8	73.9	18.1	100	0	Not Detected
Vert.	1919.840	AV	43.1	26.8	13.0	40.3	42.6	53.9	11.3	112	72	VBW:10Hz
Vert.	3399.699	AV	52.4	29.5	4.8	41.2	45.5	53.9	8.4	118	355	VBW:10Hz
Vert.	4882.000	AV	36.4	31.7	5.6	40.0	33.7	53.9	20.2	100	26	VBW:300Hz
Vert.	7323.000	AV	34.6	36.7	6.9	38.5	39.7	53.9	14.2	100	0	Not Detected
Vert.	9764.000	AV	32.7	38.2	7.8	37.4	41.3	53.9	12.6	100	0	VBW:300Hz
Vert.	12205.000	AV	33.6	39.2	9.1	38.1	43.8	53.9	10.1	100	0	Not Detected

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 third order harmonics.

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Shonan EMC Lab.

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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 2010/12/14 2010/12/15
Temperature / Humidity 24deg.C. , 40% 24deg.C. , 33%
Engineer Akio Hayashi Akio Hayashi
Mode Tx, 2480 MHz
Bluetooth, DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	175.012	QP	43.6	15.6	7.7	32.0	34.9	43.5	8.6	190	190	
Hori.	180.022	QP	43.2	15.8	7.7	32.0	34.7	43.5	8.8	174	173	
Hori.	232.878	QP	46.1	16.8	8.1	32.0	39.0	46.0	7.0	141	186	
Hori.	236.252	QP	45.6	16.9	8.1	32.0	38.6	46.0	7.4	144	15	
Hori.	239.630	QP	45.7	16.9	8.1	32.0	38.7	46.0	7.3	153	16	
Hori.	243.002	QP	46.5	17.0	8.1	32.0	39.6	46.0	6.4	143	9	
Hori.	300.007	QP	49.5	14.0	8.4	31.9	40.0	46.0	6.0	107	246	
Hori.	959.940	QP	30.2	21.3	10.8	30.5	31.8	46.0	14.2	100	330	
Hori.	960.031	QP	39.1	21.3	10.9	30.5	40.8	53.9	13.1	100	330	
Hori.	1920.119	PK	45.8	26.8	13.0	40.3	45.3	73.9	28.6	116	204	
Hori.	2483.500	PK	45.4	27.6	13.4	40.1	46.3	73.9	27.6	100	56	
Hori.	3399.715	PK	54.8	29.5	4.8	41.2	47.9	73.9	26.0	100	210	
Hori.	4960.000	PK	46.4	31.9	5.6	40.0	43.9	73.9	30.0	100	0	Not Detected
Hori.	7440.000	PK	46.2	36.9	7.1	38.7	51.5	73.9	22.4	100	0	Not Detected
Hori.	9920.000	PK	42.3	38.4	8.0	37.5	51.2	73.9	22.7	100	358	
Hori.	12400.000	PK	45.6	39.1	9.4	37.9	56.2	73.9	17.7	100	0	Not Detected
Hori.	1920.119	AV	38.3	26.8	13.0	40.3	37.8	53.9	16.1	116	204	VBW:10Hz
Hori.	2483.500	AV	34.9	27.6	13.4	40.1	35.8	53.9	18.1	100	56	VBW:300Hz
Hori.	3399.715	AV	50.1	29.5	4.8	41.2	43.2	53.9	10.7	100	210	VBW:10Hz
Hori.	4960.000	AV	35.9	31.9	5.6	40.0	33.4	53.9	20.5	100	0	Not Detected
Hori.	7440.000	AV	36.4	36.9	7.1	38.7	41.7	53.9	12.2	100	0	Not Detected
Hori.	9920.000	AV	33.0	38.4	8.0	37.5	41.9	53.9	12.0	100	358	VBW:300Hz
Hori.	12400.000	AV	34.6	39.1	9.4	37.9	45.2	53.9	8.7	100	0	Not Detected
Vert.	49.105	QP	44.1	11.2	6.7	32.1	29.9	40.0	10.1	100	212	
Vert.	81.850	QP	46.7	6.5	7.0	32.1	28.1	40.0	11.9	100	85	
Vert.	500.009	QP	41.9	17.2	9.3	31.9	36.5	46.0	9.5	110	32	
Vert.	1920.119	PK	48.7	26.8	13.0	40.3	48.2	73.9	25.7	114	228	
Vert.	2483.500	PK	44.5	27.6	13.4	40.1	45.4	73.9	28.5	108	108	
Vert.	3399.715	PK	57.1	29.5	4.8	41.2	50.2	73.9	23.7	100	190	
Vert.	4960.000	PK	46.9	31.9	5.6	40.0	44.4	73.9	29.5	100	0	Not Detected
Vert.	7440.000	PK	46.4	36.9	7.1	38.7	51.7	73.9	22.2	100	0	Not Detected
Vert.	9920.000	PK	43.9	38.4	8.0	37.5	52.8	73.9	21.1	100	0	
Vert.	12400.000	PK	44.5	39.1	9.4	37.9	55.1	73.9	18.8	100	0	Not Detected
Vert.	1920.119	AV	40.7	26.8	13.0	40.3	40.2	53.9	13.7	114	228	VBW:10Hz
Vert.	2483.500	AV	34.8	27.6	13.4	40.1	35.7	53.9	18.2	108	108	VBW:300Hz
Vert.	3399.715	AV	54.6	29.5	4.8	41.2	47.7	53.9	6.2	100	190	VBW:10Hz
Vert.	4960.000	AV	36.2	31.9	5.6	40.0	33.7	53.9	20.2	100	0	Not Detected
Vert.	7440.000	AV	36.4	36.9	7.1	38.7	41.7	53.9	12.2	100	0	Not Detected
Vert.	9920.000	AV	32.2	38.4	8.0	37.5	41.1	53.9	12.8	100	0	VBW:300Hz
Vert.	12400.000	AV	34.6	39.1	9.4	37.9	45.2	53.9	8.7	100	0	Not Detected

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 third order harmonics.

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date 2010/12/14 2010/12/15
Temperature / Humidity 24deg.C. , 40% 24deg.C. , 33%
Engineer Akio Hayashi Akio Hayashi
Mode Tx, 2402 MHz
Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	175.009	QP	43.2	15.6	7.7	32.0	34.5	43.5	9.0	185	188	
Hori.	180.022	QP	43.6	15.8	7.7	32.0	35.1	43.5	8.4	186	150	
Hori.	236.260	QP	44.5	16.9	8.1	32.0	37.5	46.0	8.5	145	12	
Hori.	239.621	QP	45.0	16.9	8.1	32.0	38.0	46.0	8.0	142	12	
Hori.	243.004	QP	45.9	17.0	8.1	32.0	39.0	46.0	7.0	198	9	
Hori.	246.382	QP	43.8	17.0	8.1	32.0	36.9	46.0	9.1	128	9	
Hori.	300.006	QP	49.3	14.0	8.4	31.9	39.8	46.0	6.2	105	246	
Hori.	602.103	QP	39.6	18.3	9.7	31.9	35.7	46.0	10.3	127	254	
Hori.	959.940	QP	30.3	21.3	10.8	30.5	31.9	46.0	14.1	100	327	
Hori.	960.030	QP	39.4	21.3	10.9	30.5	41.1	53.9	12.8	100	327	
Hori.	2390.000	PK	43.9	27.5	13.3	40.2	44.5	73.9	29.4	100	86	
Hori.	2400.000	PK	56.7	27.5	13.3	40.2	57.3	73.9	16.6	100	86	
Hori.	3399.736	PK	54.5	29.5	4.8	41.2	47.6	73.9	26.3	100	184	
Hori.	4804.000	PK	46.4	31.5	5.5	40.1	43.3	73.9	30.6	100	0	Not Detected
Hori.	7206.000	PK	46.7	36.4	6.7	38.3	51.5	73.9	22.4	100	68	
Hori.	9608.000	PK	45.6	37.9	7.8	37.3	54.0	73.9	19.9	100	0	Not Detected
Hori.	12010.000	PK	45.4	39.4	9.0	38.4	55.4	73.9	18.5	100	0	Not Detected
Hori.	2390.000	AV	34.6	27.5	13.3	40.2	35.2	53.9	18.7	100	86	VBW:300Hz
Hori.	2400.000	AV	45.7	27.5	13.3	40.2	46.3	53.9	7.6	100	86	VBW:300Hz
Hori.	3399.736	AV	51.1	29.5	4.8	41.2	44.2	53.9	9.7	100	184	VBW:10Hz
Hori.	4804.000	AV	34.4	31.5	5.5	40.1	31.3	53.9	22.6	100	0	Not Detected
Hori.	7206.000	AV	34.6	36.4	6.7	38.3	39.4	53.9	14.5	100	68	VBW:300Hz
Hori.	9608.000	AV	35.0	37.9	7.8	37.3	43.4	53.9	10.5	100	0	Not Detected
Hori.	12010.000	AV	33.4	39.4	9.0	38.4	43.4	53.9	10.5	100	0	Not Detected
Vert.	49.108	QP	44.1	11.2	6.7	32.1	29.9	40.0	10.1	100	219	
Vert.	81.846	QP	47.5	6.5	7.0	32.1	28.9	40.0	11.1	123	91	
Vert.	500.007	QP	41.6	17.2	9.3	31.9	36.2	46.0	9.8	126	27	
Vert.	2390.000	PK	43.0	27.5	13.3	40.2	43.6	73.9	30.3	132	297	
Vert.	2400.000	PK	52.4	27.5	13.3	40.2	53.0	73.9	20.9	132	297	
Vert.	3399.736	PK	56.9	29.5	4.8	41.2	50.0	73.9	23.9	100	188	
Vert.	4804.000	PK	46.2	31.5	5.5	40.1	43.1	73.9	30.8	100	0	Not Detected
Vert.	7206.000	PK	46.6	36.4	6.7	38.3	51.4	73.9	22.5	100	0	Not Detected
Vert.	9608.000	PK	44.8	37.9	7.8	37.3	53.2	73.9	20.7	100	330	
Vert.	12010.000	PK	45.6	39.4	9.0	38.4	55.6	73.9	18.3	100	0	Not Detected
Vert.	2390.000	AV	34.7	27.5	13.3	40.2	35.3	53.9	18.6	132	297	VBW:300Hz
Vert.	2400.000	AV	43.8	27.5	13.3	40.2	44.4	53.9	9.5	132	297	VBW:300Hz
Vert.	3399.736	AV	53.7	29.5	4.8	41.2	46.8	53.9	7.1	100	188	VBW:10Hz
Vert.	4804.000	AV	34.3	31.5	5.5	40.1	31.2	53.9	22.7	100	0	Not Detected
Vert.	7206.000	AV	34.7	36.4	6.7	38.3	39.5	53.9	14.4	100	0	Not Detected
Vert.	9608.000	AV	32.7	37.9	7.8	37.3	41.1	53.9	12.8	100	330	VBW:300Hz
Vert.	12010.000	AV	33.3	39.4	9.0	38.4	43.3	53.9	10.6	100	0	Not Detected

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 third order harmonics.

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date 2010/12/14 2010/12/15
Temperature / Humidity 24deg.C. , 40% 24deg.C. , 33%
Engineer Akio Hayashi Akio Hayashi
Mode Tx, 2441 MHz
 Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	57.981	QP	44.1	8.6	6.8	32.1	27.4	40.0	12.6	400	88	
Hori.	173.926	QP	42.5	15.6	7.7	32.0	33.8	43.5	9.7	159	158	
Hori.	180.023	QP	43.8	15.8	7.7	32.0	35.3	43.5	8.2	186	157	
Hori.	229.497	QP	46.2	16.8	8.0	32.0	39.0	46.0	7.0	194	180	
Hori.	236.253	QP	45.0	16.9	8.1	32.0	38.0	46.0	8.0	141	9	
Hori.	240.843	QP	43.9	16.9	8.1	32.0	36.9	46.0	9.1	132	201	
Hori.	243.000	QP	46.1	17.0	8.1	32.0	39.2	46.0	6.8	185	16	
Hori.	300.007	QP	49.8	14.0	8.4	31.9	40.3	46.0	5.7	106	243	
Hori.	366.673	QP	43.3	15.3	8.7	31.9	35.4	46.0	10.6	100	254	
Hori.	959.940	QP	29.3	21.3	10.8	30.5	30.9	46.0	15.1	100	331	
Hori.	960.033	QP	38.0	21.3	10.9	30.5	39.7	53.9	14.2	100	331	
Hori.	3399.739	PK	54.5	29.5	4.8	41.2	47.6	73.9	26.3	100	183	
Hori.	4882.000	PK	47.6	31.7	5.6	40.0	44.9	73.9	29.0	100	0	Not Detected
Hori.	7323.000	PK	47.9	36.7	6.9	38.5	53.0	73.9	20.9	100	0	Not Detected
Hori.	9764.000	PK	45.2	38.2	7.8	37.4	53.8	73.9	20.1	100	70	
Hori.	12205.000	PK	45.8	39.2	9.1	38.1	56.0	73.9	17.9	100	0	Not Detected
Hori.	3399.739	AV	51.6	29.5	4.8	41.2	44.7	53.9	9.2	100	183	VBW:10Hz
Hori.	4882.000	AV	34.5	31.7	5.6	40.0	31.8	53.9	22.1	100	0	Not Detected
Hori.	7323.000	AV	34.1	36.7	6.9	38.5	39.2	53.9	14.7	100	0	Not Detected
Hori.	9764.000	AV	33.5	38.2	7.8	37.4	42.1	53.9	11.8	100	70	VBW:300Hz
Hori.	12205.000	AV	33.9	39.2	9.1	38.1	44.1	53.9	9.8	100	0	Not Detected
Vert.	49.105	QP	46.8	11.2	6.7	32.1	32.6	40.0	7.4	100	240	
Vert.	81.848	QP	48.4	6.5	7.0	32.1	29.8	40.0	10.2	100	93	
Vert.	500.006	QP	42.6	17.2	9.3	31.9	37.2	46.0	8.8	118	357	
Vert.	3399.739	PK	56.7	29.5	4.8	41.2	49.8	73.9	24.1	100	189	
Vert.	4882.000	PK	47.9	31.7	5.6	40.0	45.2	73.9	28.7	100	0	Not Detected
Vert.	7323.000	PK	46.4	36.7	6.9	38.5	51.5	73.9	22.4	100	0	Not Detected
Vert.	9764.000	PK	45.1	38.2	7.8	37.4	53.7	73.9	20.2	100	324	
Vert.	12205.000	PK	45.9	39.2	9.1	38.1	56.1	73.9	17.8	100	0	Not Detected
Vert.	3399.739	AV	54.0	29.5	4.8	41.2	47.1	53.9	6.8	100	189	VBW:10Hz
Vert.	4882.000	AV	34.6	31.7	5.6	40.0	31.9	53.9	22.0	100	0	Not Detected
Vert.	7323.000	AV	34.4	36.7	6.9	38.5	39.5	53.9	14.4	100	0	Not Detected
Vert.	9764.000	AV	32.7	38.2	7.8	37.4	41.3	53.9	12.6	100	324	VBW:300Hz
Vert.	12205.000	AV	33.8	39.2	9.1	38.1	44.0	53.9	9.9	100	0	Not Detected

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 third order harmonics.

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date 2010/12/14 2010/12/15
Temperature / Humidity 24deg.C. , 40% 24deg.C. , 33%
Engineer Akio Hayashi Akio Hayashi
Mode Tx, 2480 MHz
Bluetooth, 3-DH5,

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	175.010	QP	175.0	15.6	7.7	32.0	34.2	43.5	9.3	196	133	
Hori.	180.023	QP	180.0	15.8	7.7	32.0	34.5	43.5	9.0	103	150	
Hori.	232.876	QP	232.9	16.8	8.1	32.0	38.8	46.0	7.2	137	178	
Hori.	239.622	QP	239.6	16.9	8.1	32.0	38.8	46.0	7.2	145	13	
Hori.	243.000	QP	243.0	17.0	8.1	32.0	39.8	46.0	6.2	189	15	
Hori.	246.376	QP	246.4	17.0	8.1	32.0	37.5	46.0	8.5	153	12	
Hori.	300.003	QP	300.0	14.0	8.4	32.0	40.4	46.0	5.6	106	249	
Hori.	959.940	QP	959.9	21.3	10.8	30.5	30.9	46.0	15.1	100	330	
Hori.	960.030	QP	960.0	21.3	10.9	30.5	39.7	53.9	14.2	100	330	
Hori.	2483.500	PK	44.3	27.6	13.4	40.1	45.2	73.9	28.7	127	359	
Hori.	3396.393	PK	54.2	29.5	4.8	41.2	47.3	73.9	26.6	100	211	
Hori.	4960.000	PK	44.5	31.9	5.6	40.0	42.0	73.9	31.9	100	0	Not Detected
Hori.	7440.000	PK	46.3	36.9	7.1	38.7	51.6	73.9	22.3	100	0	Not Detected
Hori.	9920.000	PK	46.1	38.4	8.0	37.5	55.0	73.9	18.9	100	75	
Hori.	12400.000	PK	44.5	39.1	9.4	37.9	55.1	73.9	18.8	100	0	Not Detected
Hori.	2483.500	AV	34.9	27.6	13.4	40.1	35.8	53.9	18.1	127	359	VBW:300Hz
Hori.	3396.393	AV	50.8	29.5	4.8	41.2	43.9	53.9	10.0	100	211	VBW:10Hz
Hori.	4960.000	AV	34.1	31.9	5.6	40.0	31.6	53.9	22.3	100	0	Not Detected
Hori.	7440.000	AV	34.5	36.9	7.1	38.7	39.8	53.9	14.1	100	0	Not Detected
Hori.	9920.000	AV	33.3	38.4	8.0	37.5	42.2	53.9	11.7	100	75	VBW:300Hz
Hori.	12400.000	AV	32.5	39.1	9.4	37.9	43.1	53.9	10.8	100	0	Not Detected
Vert.	49.107	QP	48.0	11.2	6.7	32.1	33.8	40.0	6.2	100	231	
Vert.	81.846	QP	50.0	6.5	7.0	32.1	31.4	40.0	8.6	100	261	
Vert.	500.004	QP	42.5	17.2	9.3	31.9	37.1	46.0	8.9	114	0	
Vert.	959.940	QP	29.3	21.3	10.8	30.5	30.9	46.0	15.1	100	64	
Vert.	960.030	QP	37.8	21.3	10.9	30.5	39.5	53.9	14.4	100	64	
Vert.	2483.500	PK	43.8	27.6	13.4	40.1	44.7	73.9	29.2	106	86	
Vert.	3396.393	PK	56.3	29.5	4.8	41.2	49.4	73.9	24.5	100	192	
Vert.	4960.000	PK	46.4	31.9	5.6	40.0	43.9	73.9	30.0	100	0	Not Detected
Vert.	7440.000	PK	47.1	36.9	7.1	38.7	52.4	73.9	21.5	100	0	Not Detected
Vert.	9920.000	PK	45.4	38.4	8.0	37.5	54.3	73.9	19.6	100	188	
Vert.	12400.000	PK	44.8	39.1	9.4	37.9	55.4	73.9	18.5	100	0	Not Detected
Vert.	2483.500	AV	34.7	27.6	13.4	40.1	35.6	53.9	18.3	106	86	VBW:300Hz
Vert.	3396.393	AV	53.7	29.5	4.8	41.2	46.8	53.9	7.1	100	192	VBW:10Hz
Vert.	4960.000	AV	34.5	31.9	5.6	40.0	32.0	53.9	21.9	100	0	Not Detected
Vert.	7440.000	AV	34.5	36.9	7.1	38.7	39.8	53.9	14.1	100	0	Not Detected
Vert.	9920.000	AV	32.9	38.4	8.0	37.5	41.8	53.9	12.1	100	188	VBW:300Hz
Vert.	12400.000	AV	32.5	39.1	9.4	37.9	43.1	53.9	10.8	100	0	Not Detected

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).

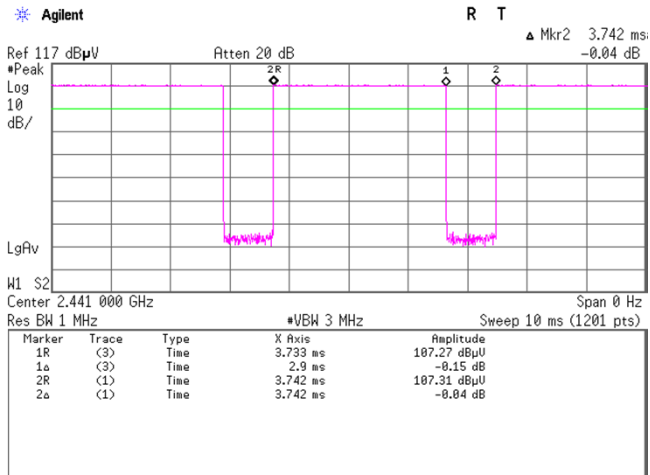
*No noise was detected above the third order harmonics.

Spurious emission (Radiated)

DH5

VBW (AV) Calculation

VBW: $1/x = 267\text{Hz} < 300\text{Hz}$
x: (Tx on+Tx off) = 3.742ms



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 (Radiated)

3-DH5,

VBW (AV) Calculation



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Spurious emission (Conducted)

DH5

Tx, 2402MHz



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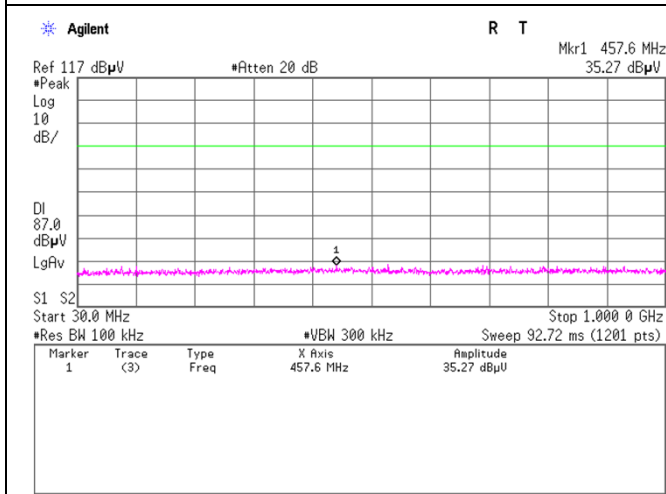
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 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

Spurious emission (Conducted)

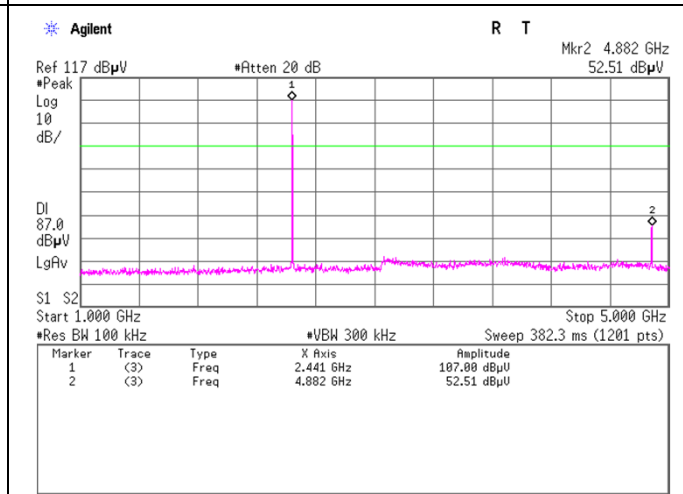
DH5

Tx, 2441MHz

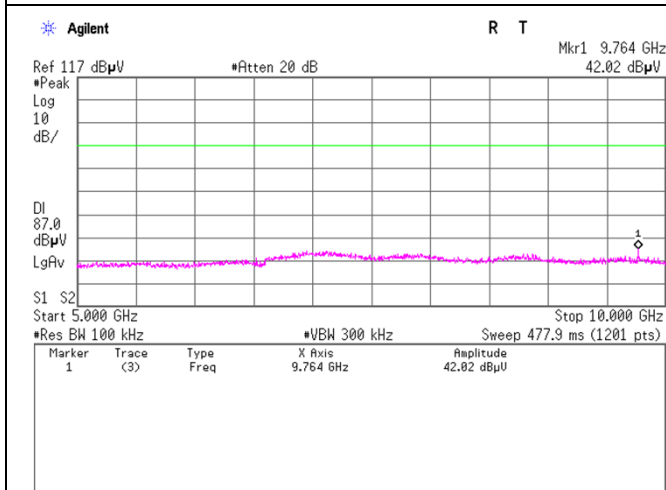
30MHz - 1GHz



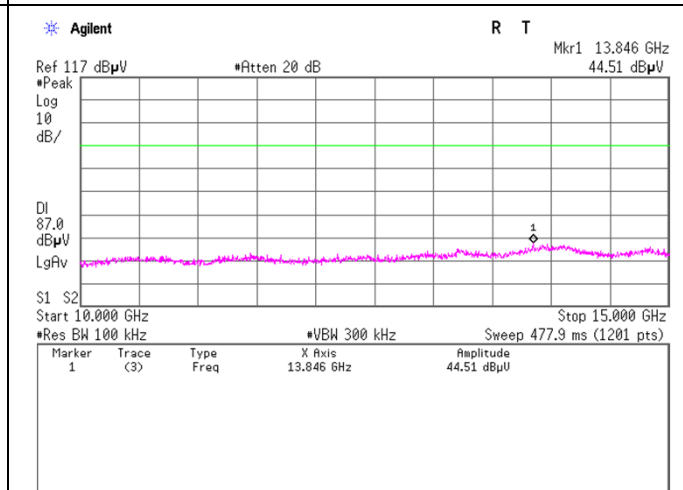
1GHz - 5GHz



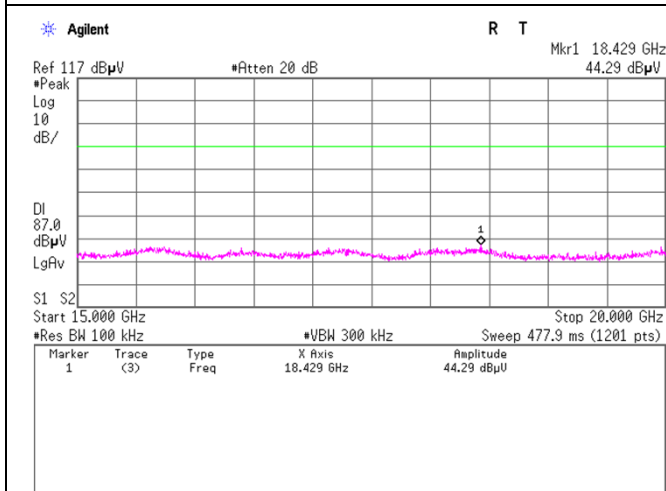
5GHz - 10GHz



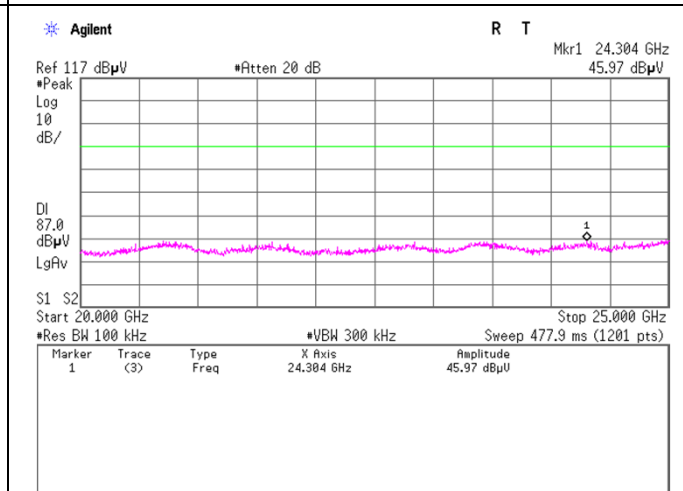
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



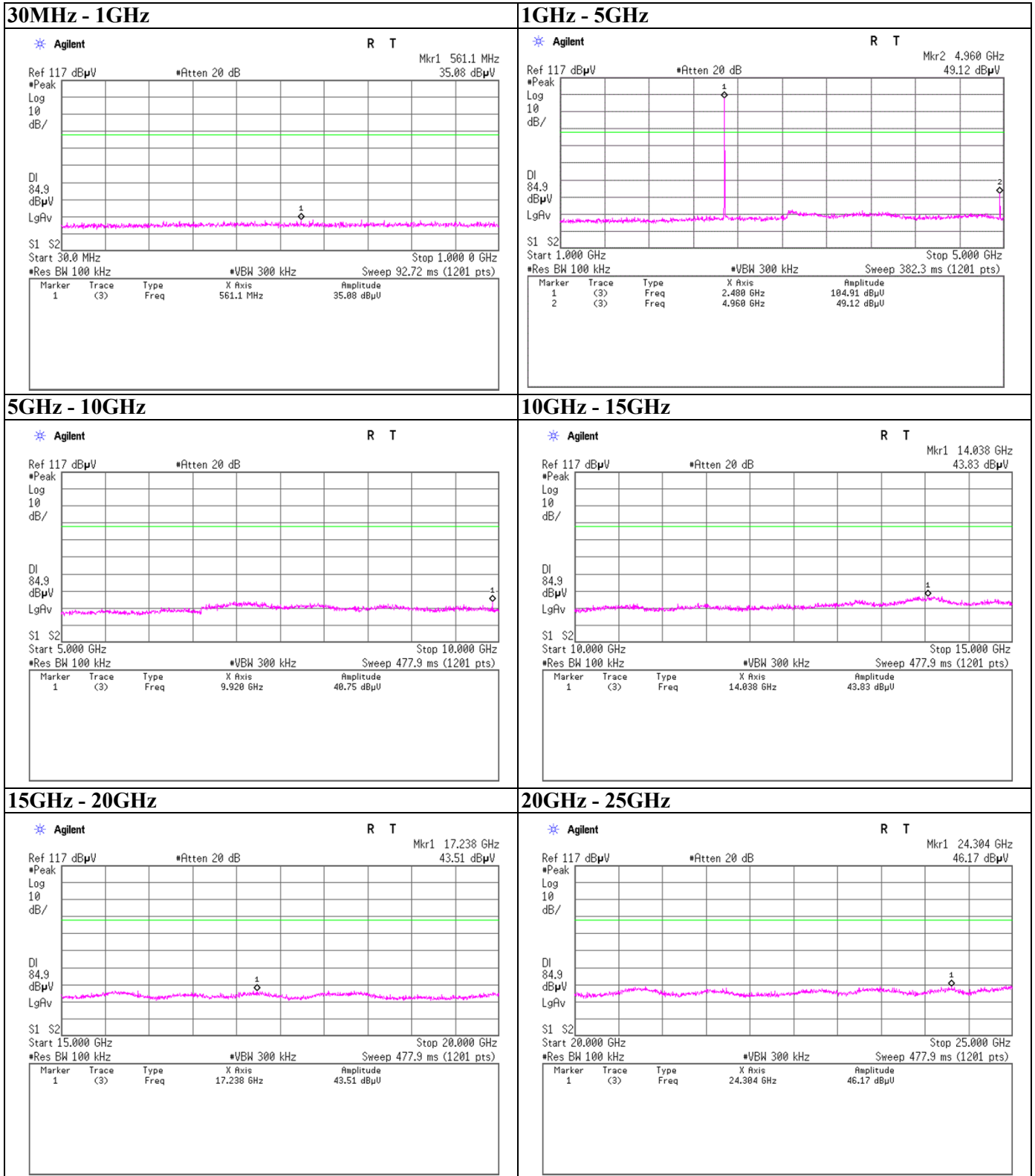
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Spurious emission (Conducted)

DH5

Tx, 2480MHz



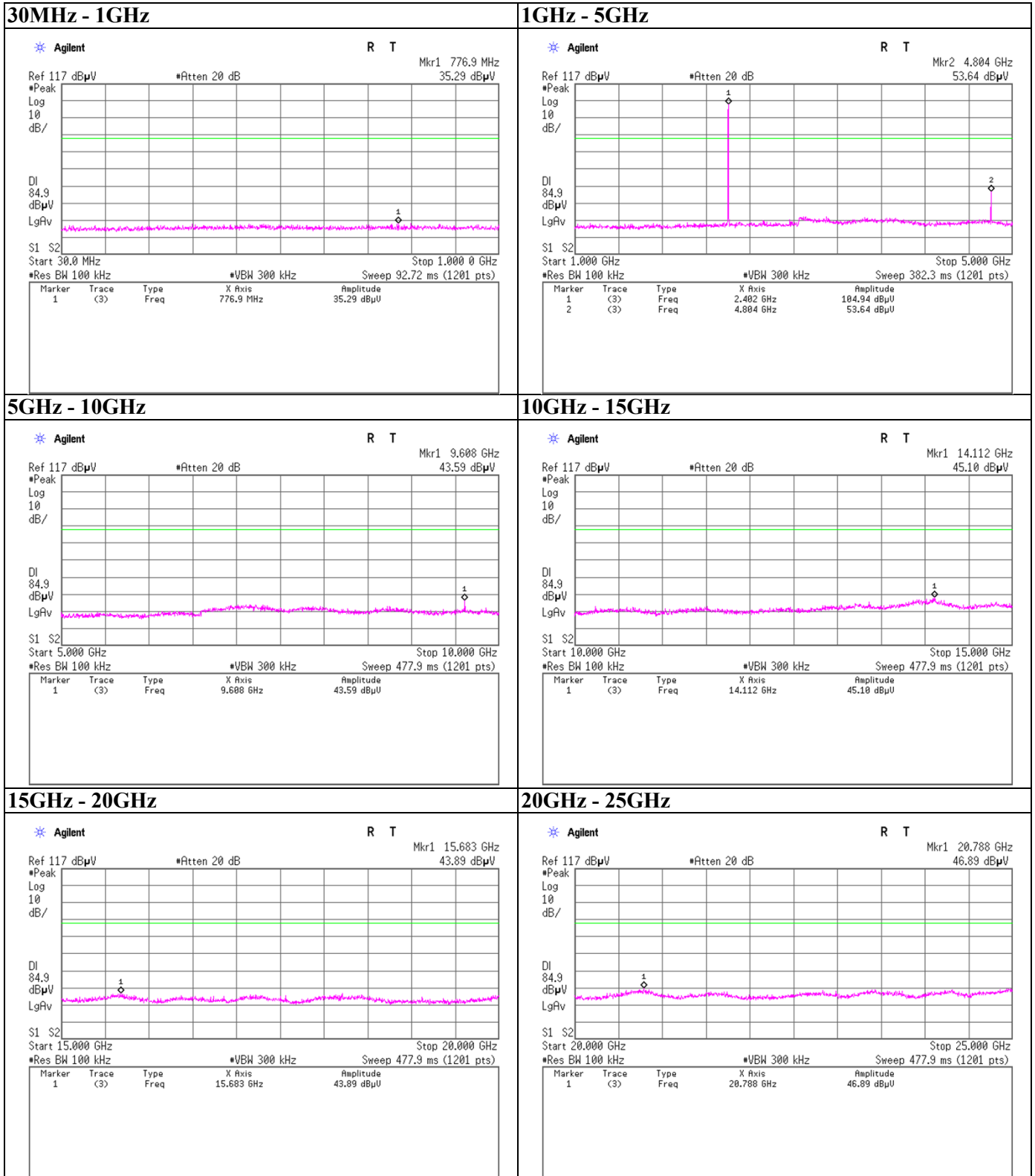
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Spurious emission (Conducted)

3-DH5

Tx, 2402MHz



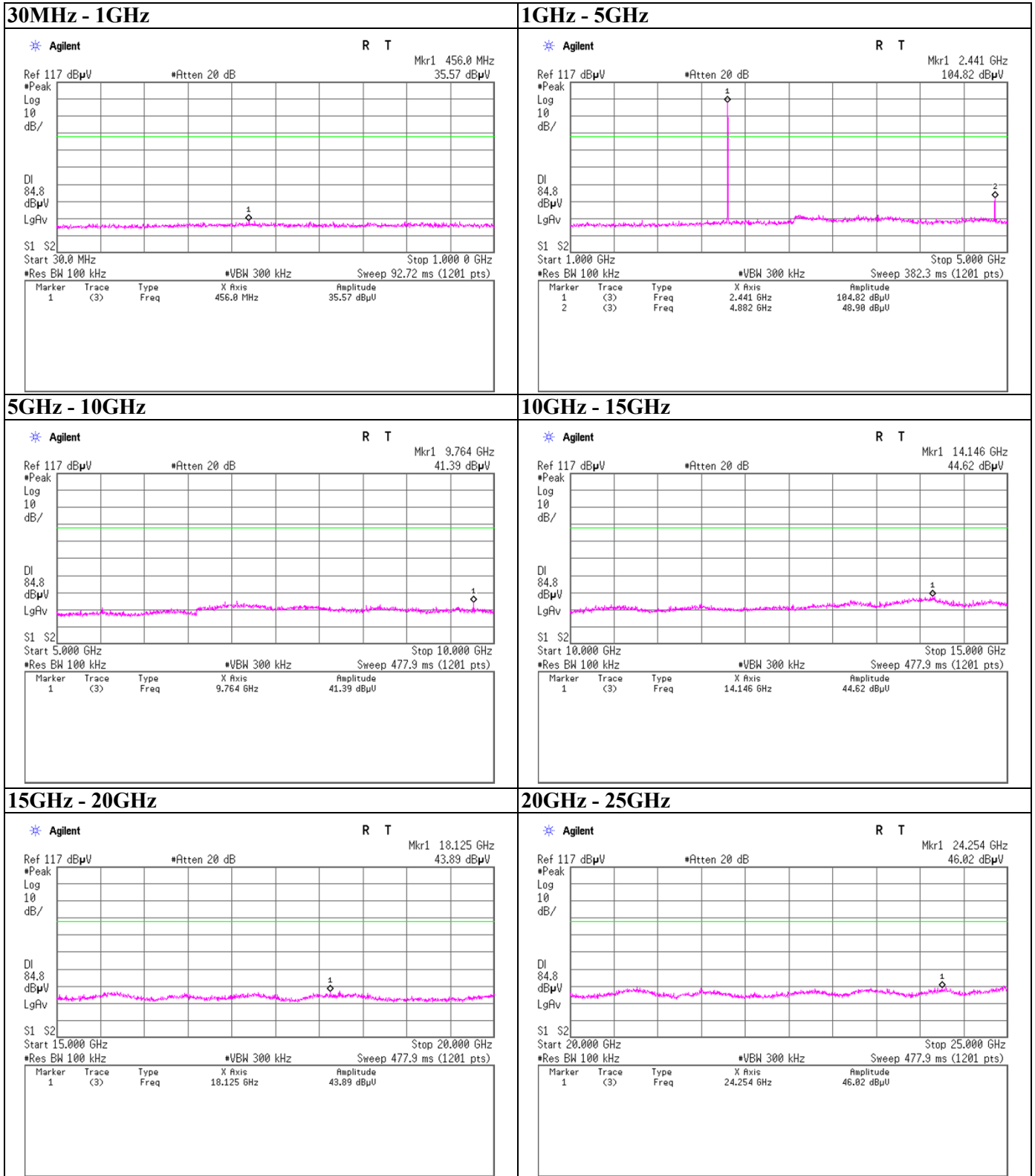
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Spurious emission (Conducted)

3-DH5

Tx, 2441MHz



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 Shonan EMC Lab.

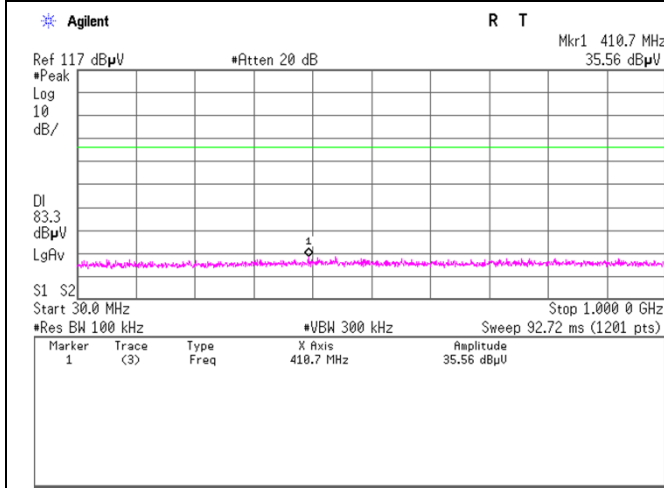
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

Spurious emission (Conducted)

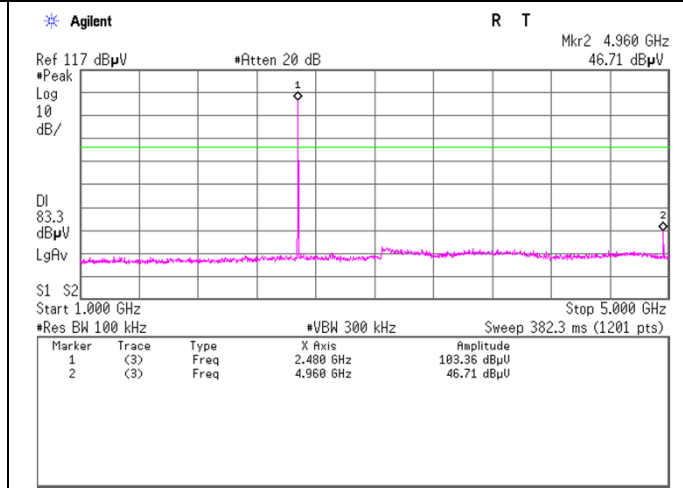
3-DH5

Tx, 2480MHz

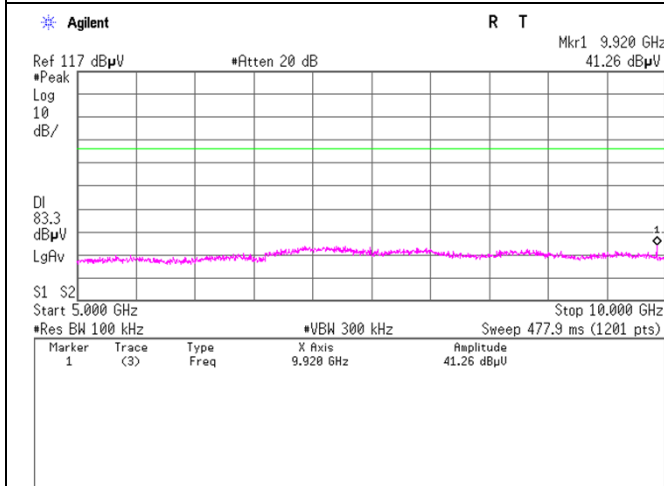
30MHz - 1GHz



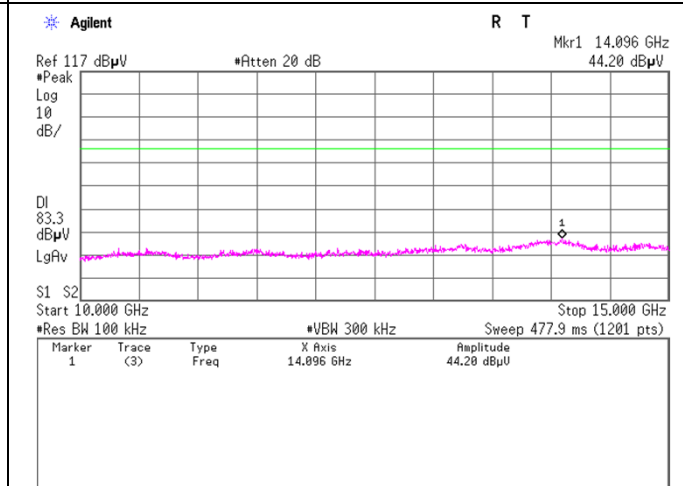
1GHz - 5GHz



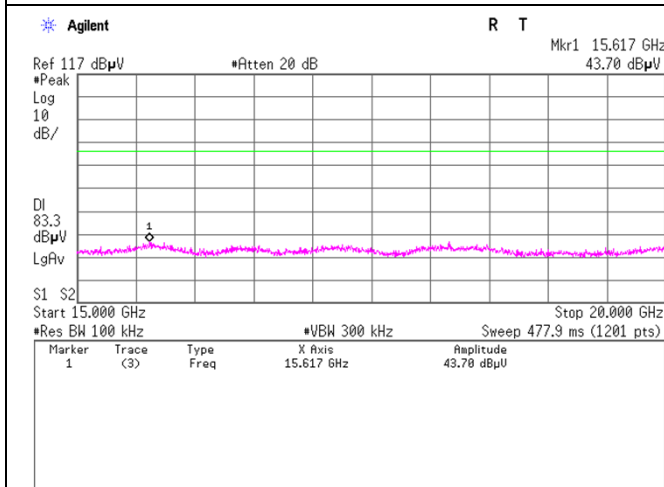
5GHz - 10GHz



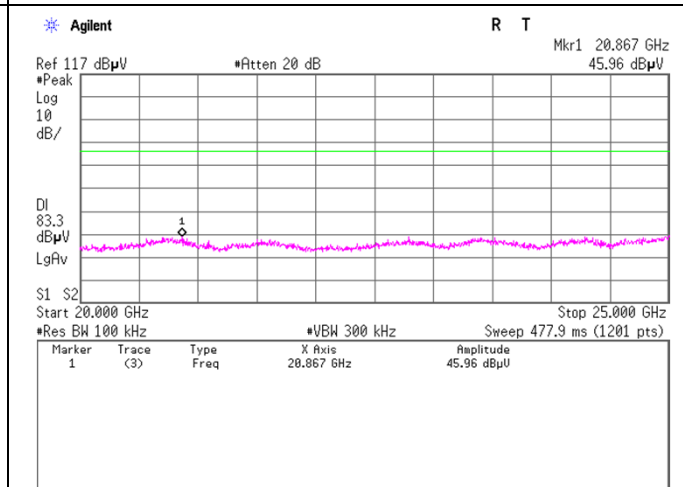
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



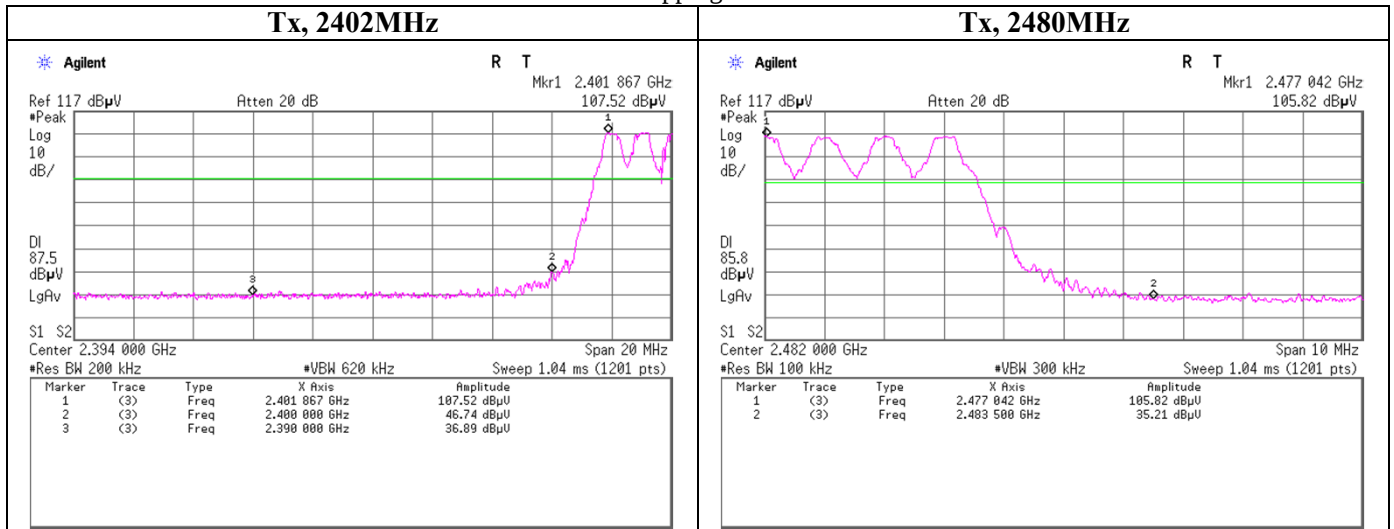
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Shonan EMC Lab.

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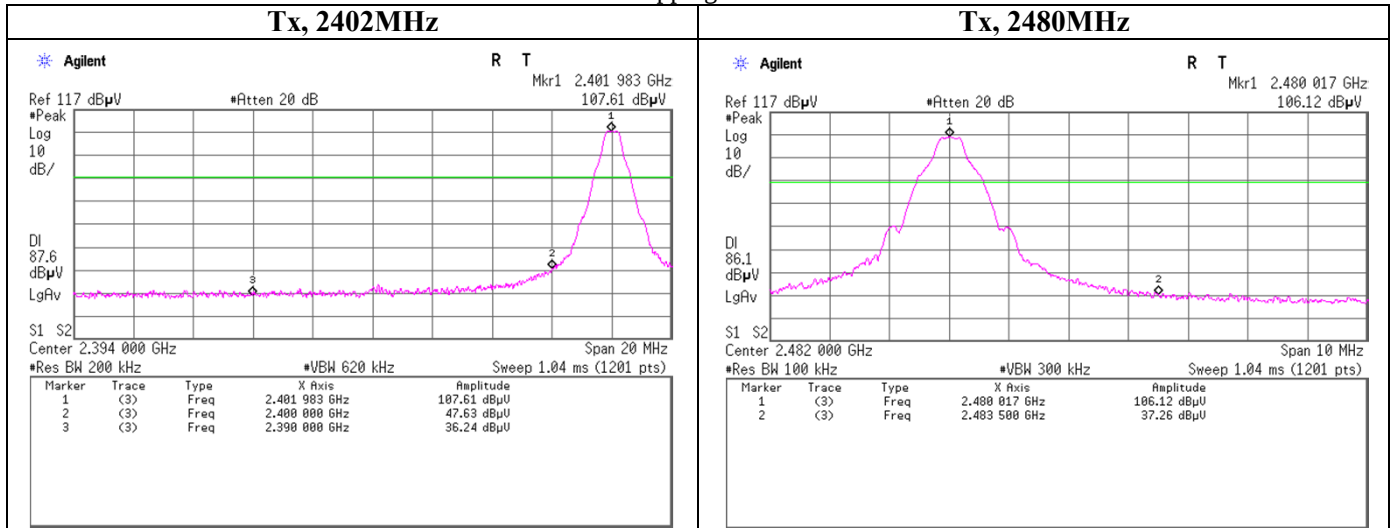
Spurious emission (Conducted)

Band Edge compliance
DH5

Hopping ON



Hopping OFF



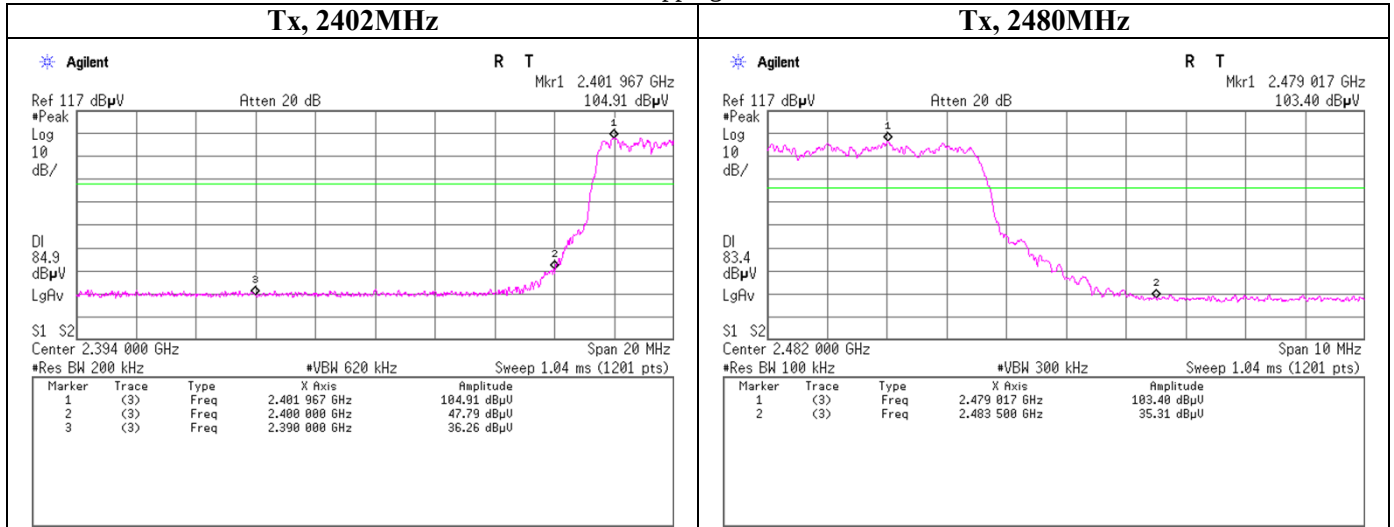
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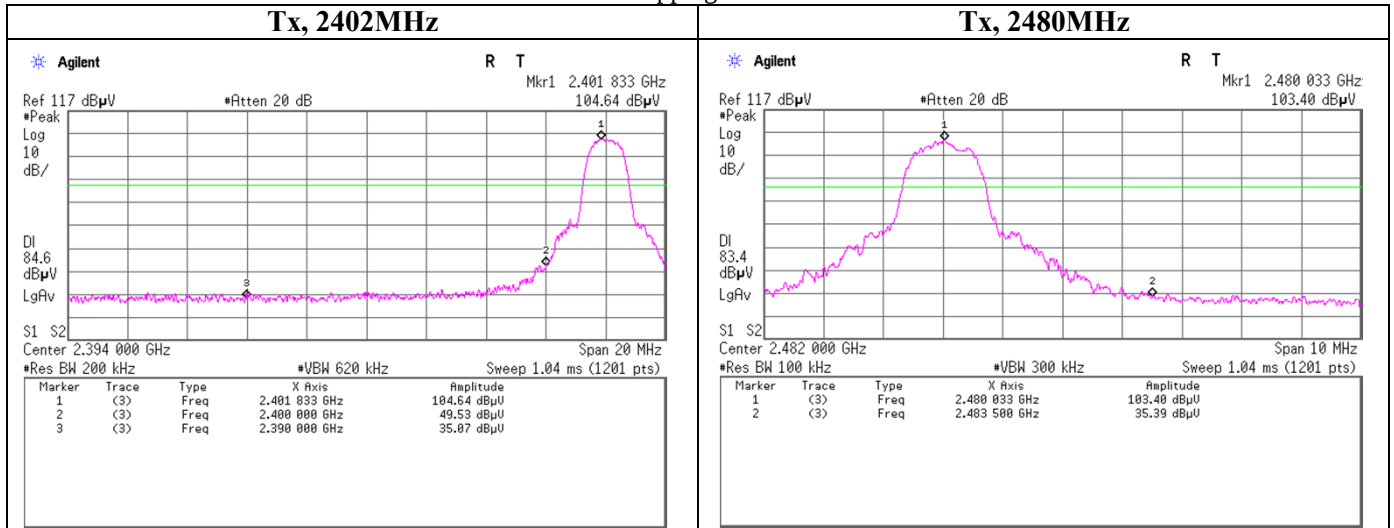
Spurious emission (Conducted)

Band Edge compliance
3-DH5

Hopping ON



Hopping OFF

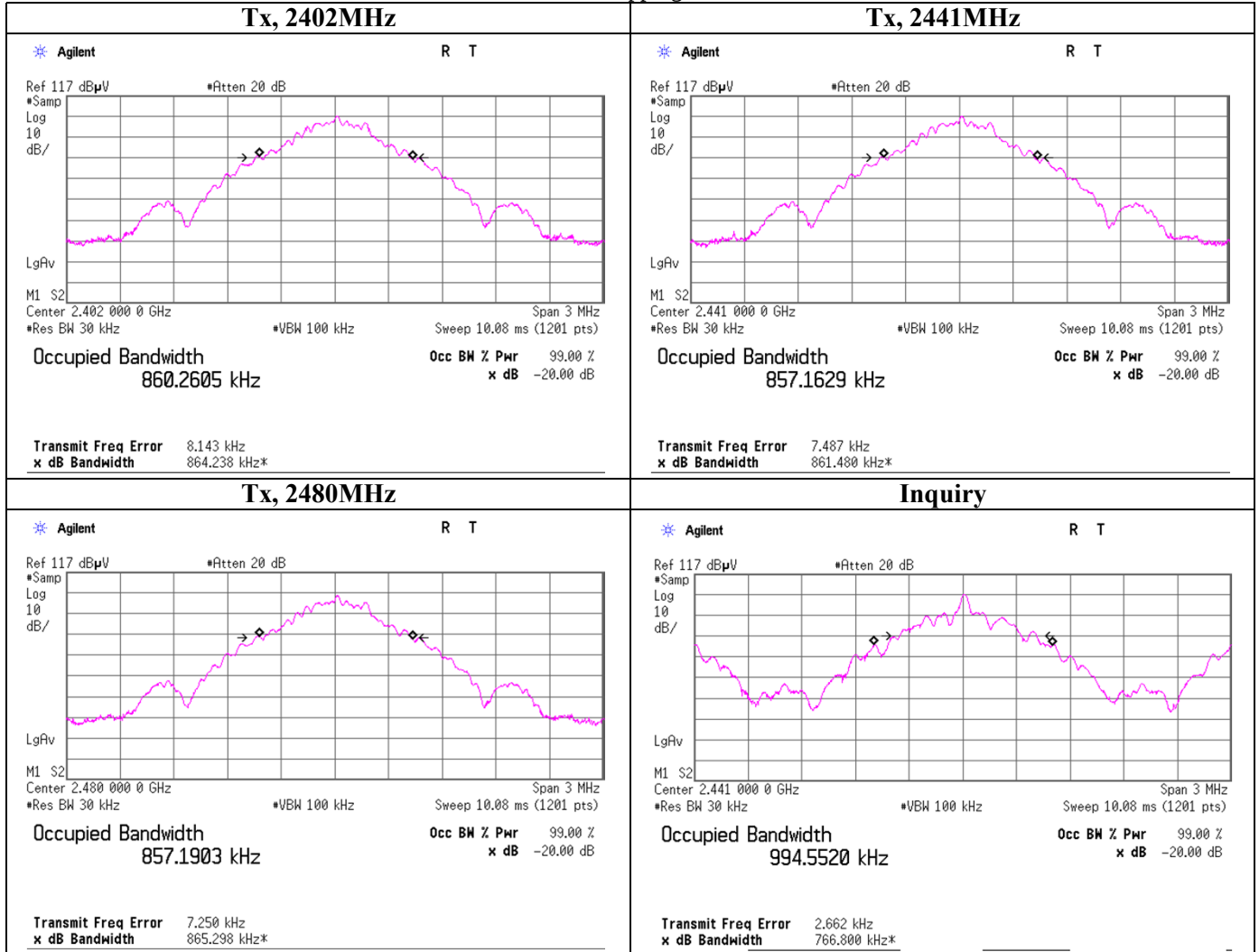


UL Japan, Inc.
Shonan EMC Lab.

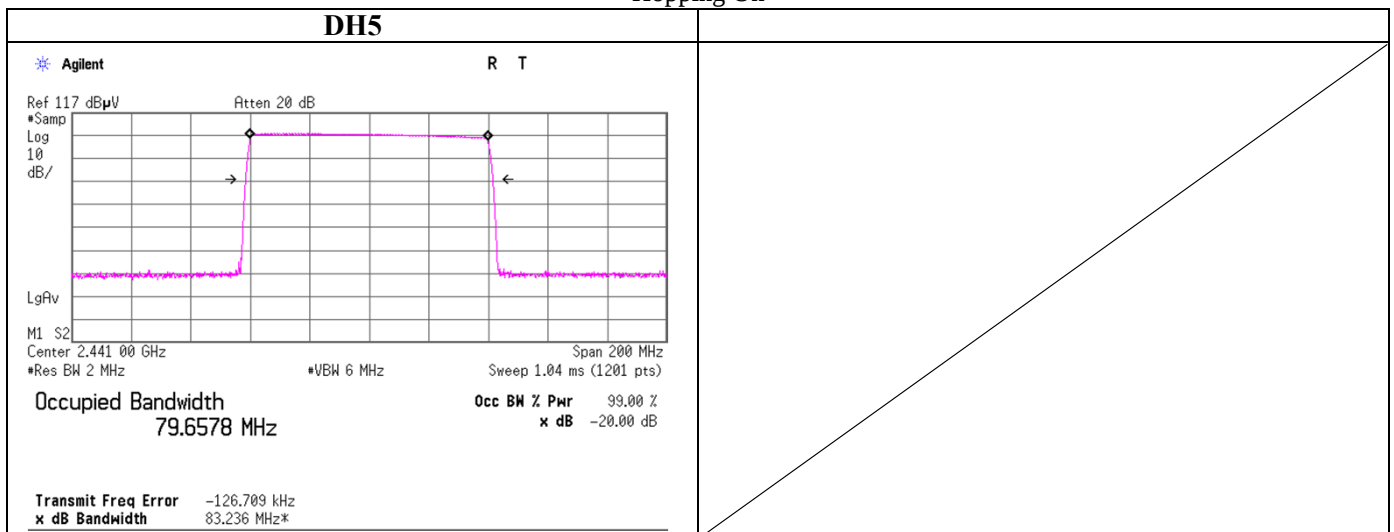
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99% Occupied Bandwidth

DH5, Hopping Off



Hopping On

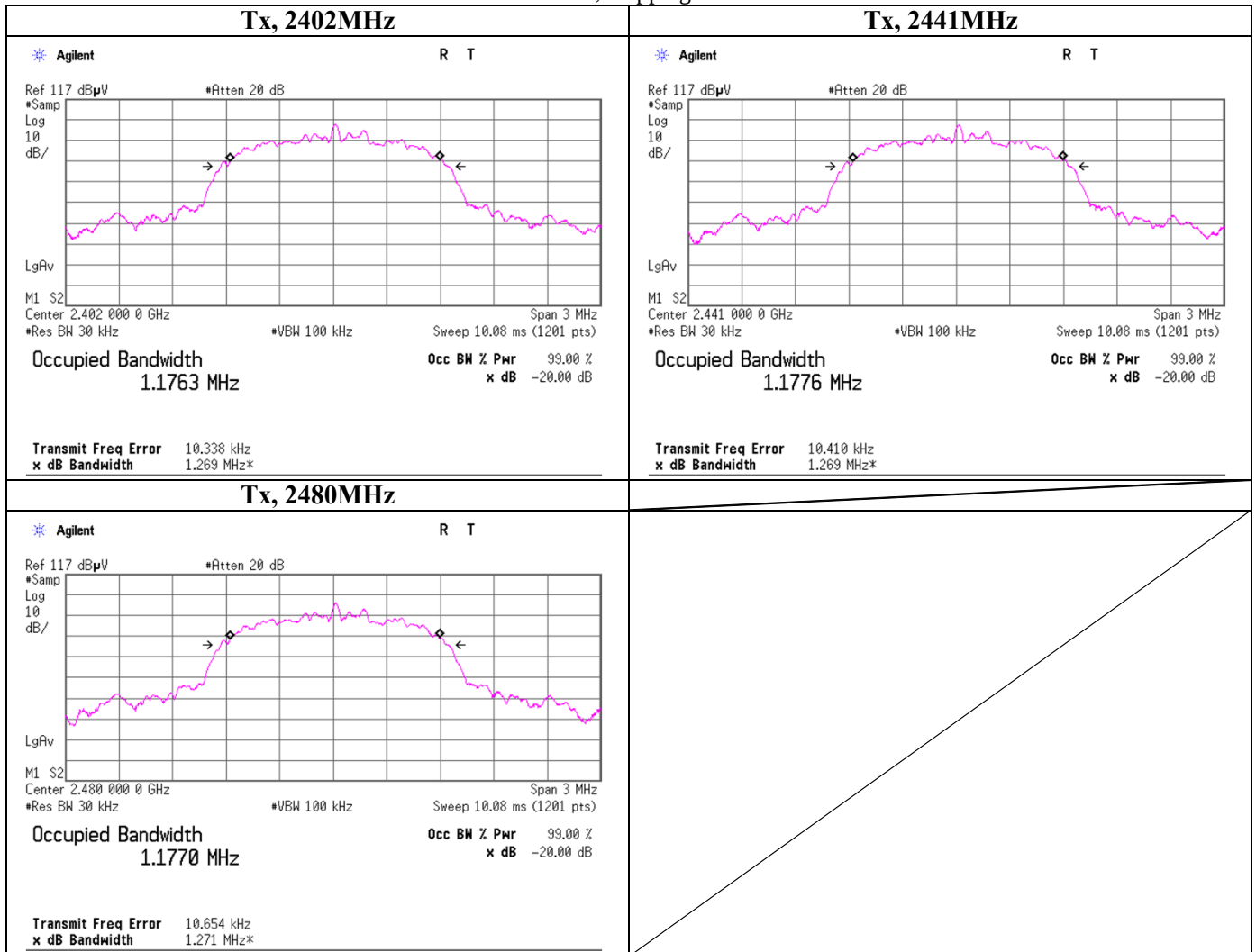


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 Shonan EMC Lab.

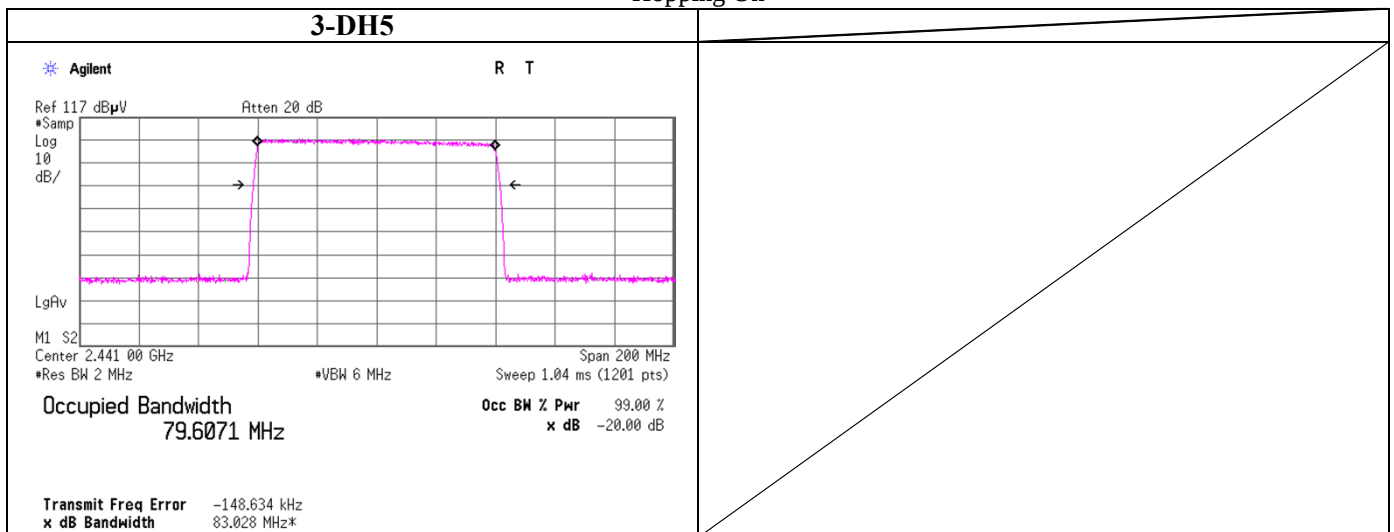
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

99% Occupied Bandwidth

3-DH5, Hopping Off



Hopping On



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

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2010/02/17 * 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
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2010/11/16 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2010/03/09 * 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
STR-03	Test Receiver	Rohde & Schwarz	ES140	100054/040	RE	2010/07/21 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV	-	RE	-
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 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
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2010/03/02 * 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-A 0901	RE	2010/10/15 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2010/09/13 * 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 :

RE: Radiated emission test

AT: Antenna terminal conducted test