

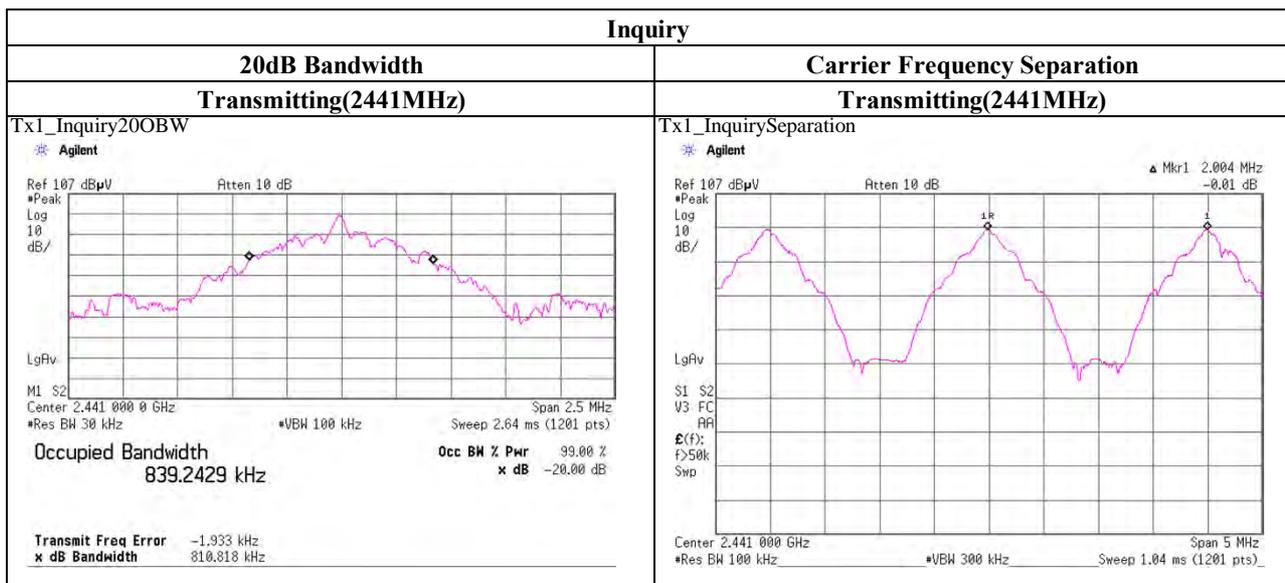
20dB Bandwidth and Carrier Frequency Separation

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 11, 2011	
Temperature / Humidity	28deg.C , 57%RH	
Engineer	Hikaru Shirasawa	
Mode	Tx, Bluetooth, BDR, PRBS9	

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
DH5	2402.0	0.930	1.003	>= 0.620
DH5	2441.0	0.933	1.000	>= 0.622
DH5	2480.0	0.934	1.008	>= 0.623
Inquiry	2441.0	0.811	2.004	>= 0.541

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.



UL Japan, Inc.

Shonan EMC Lab.

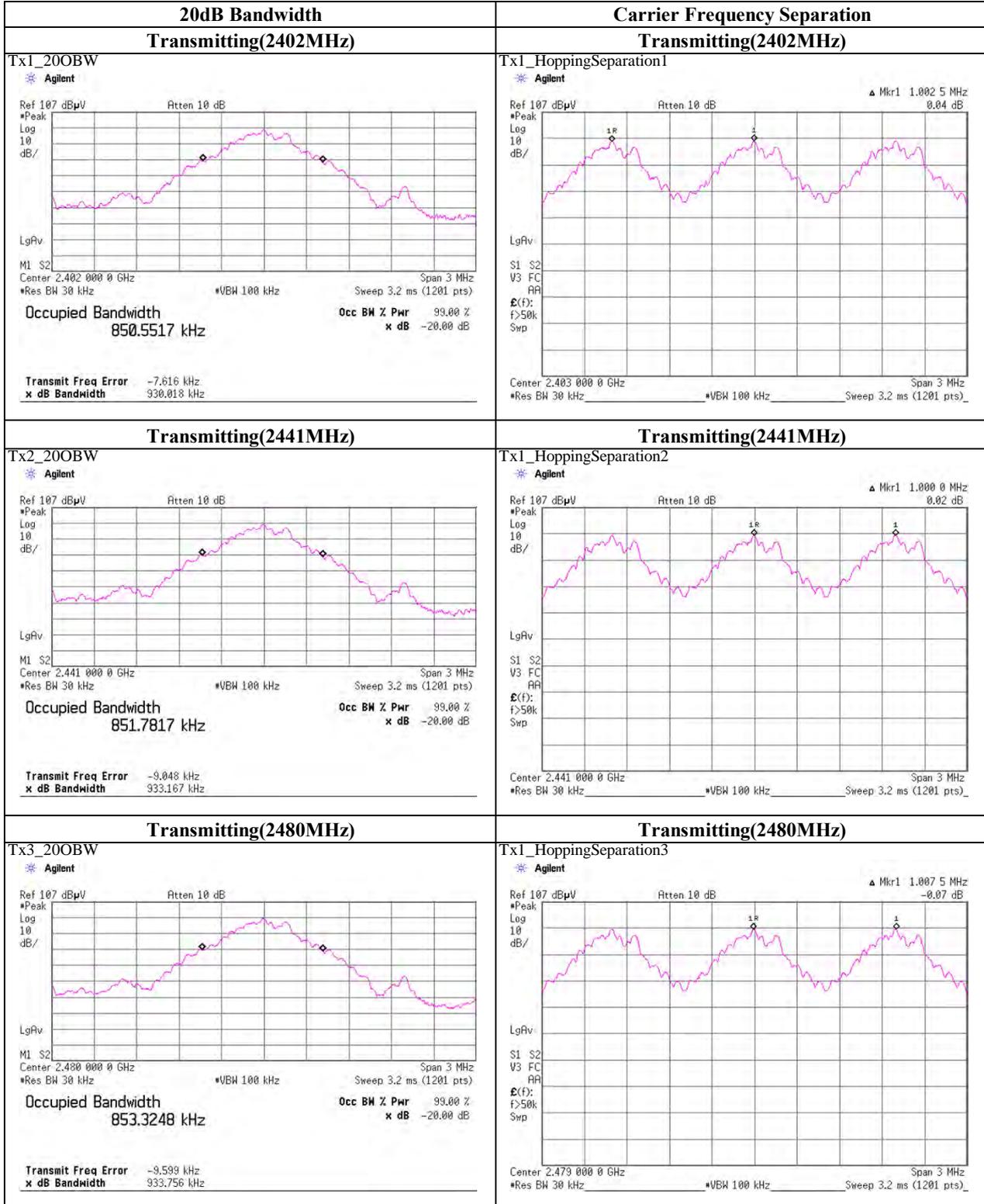
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20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, BDR (Worst: DH5), PRBS9



UL Japan, Inc.

Shonan EMC Lab.

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20dB Bandwidth and Carrier Frequency Separation

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 11, 2011
 Temperature / Humidity 28deg.C , 57%RH
 Engineer Hikaru Shirasawa
 Mode Tx, Bluetooth, EDR, PRBS9

Mode	Freq. [MHz]	20dB Bandwidth [MHz]	Carrier Frequency Separation [MHz]	Limit for Carrier Frequency Separation [MHz]
3-DH5	2402.0	1.273	1.003	>= 0.849
3-DH5	2441.0	1.273	1.000	>= 0.849
3-DH5	2480.0	1.270	1.000	>= 0.847

Limit: Two-thirds of 20dB Bandwidth or 25kHz (whichever is greater).

No limit applies to 20dB Bandwidth.

UL Japan, Inc.

Shonan EMC Lab.

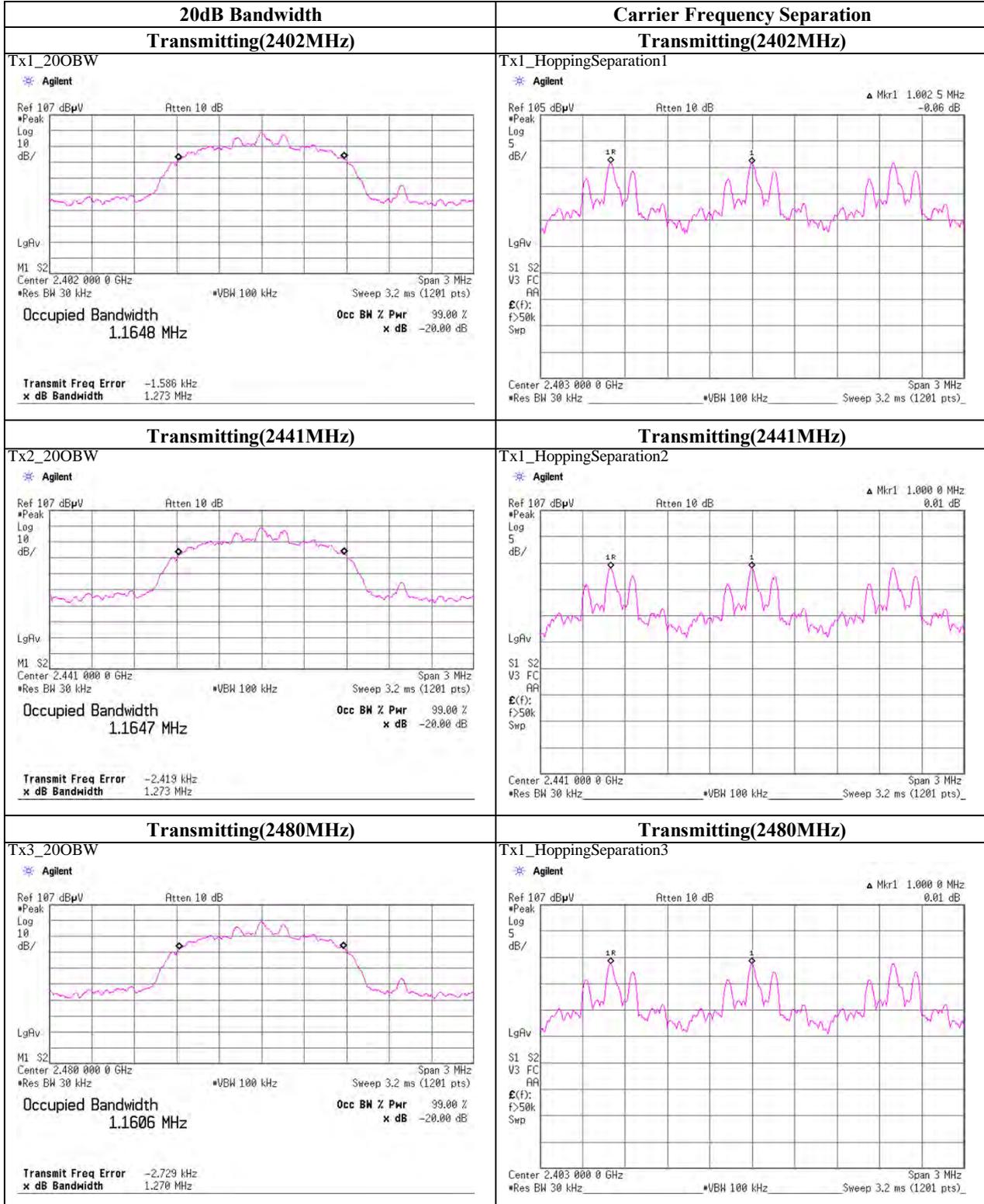
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20dB Bandwidth and Carrier Frequency Separation

Tx, Bluetooth, EDR, PRBS9



UL Japan, Inc.

Shonan EMC Lab.

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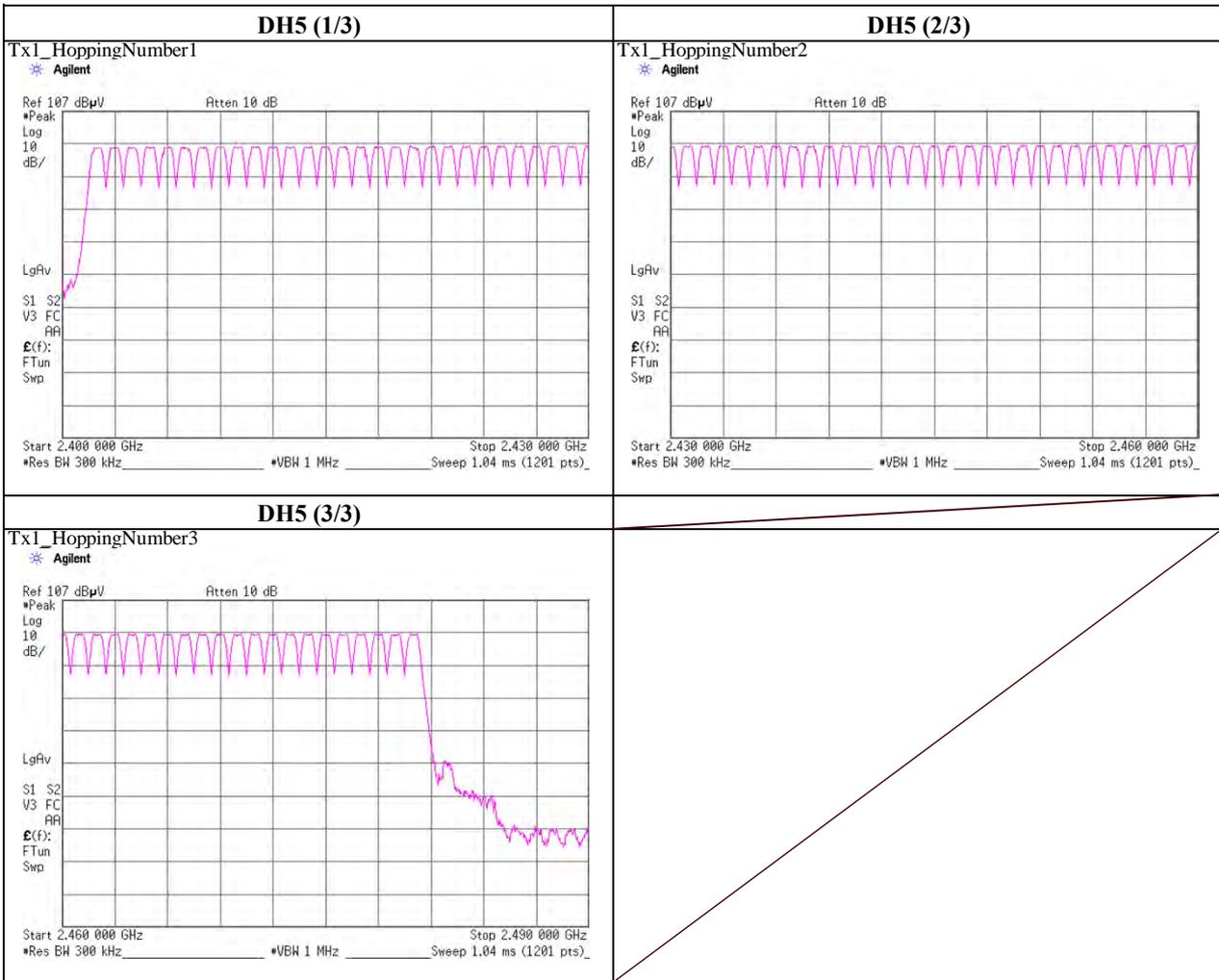
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Facsimile : +81 463 50 6401

Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.
Date	August 11, 2011
Temperature / Humidity	28deg.C , 57%RH
Engineer	Hikaru Shirasawa
Mode	Tx, Bluetooth, BDR, PRBS9

Mode	Number of Channel [times]	Limit [times]
DH5	79	>= 15



UL Japan, Inc.

Shonan EMC Lab.

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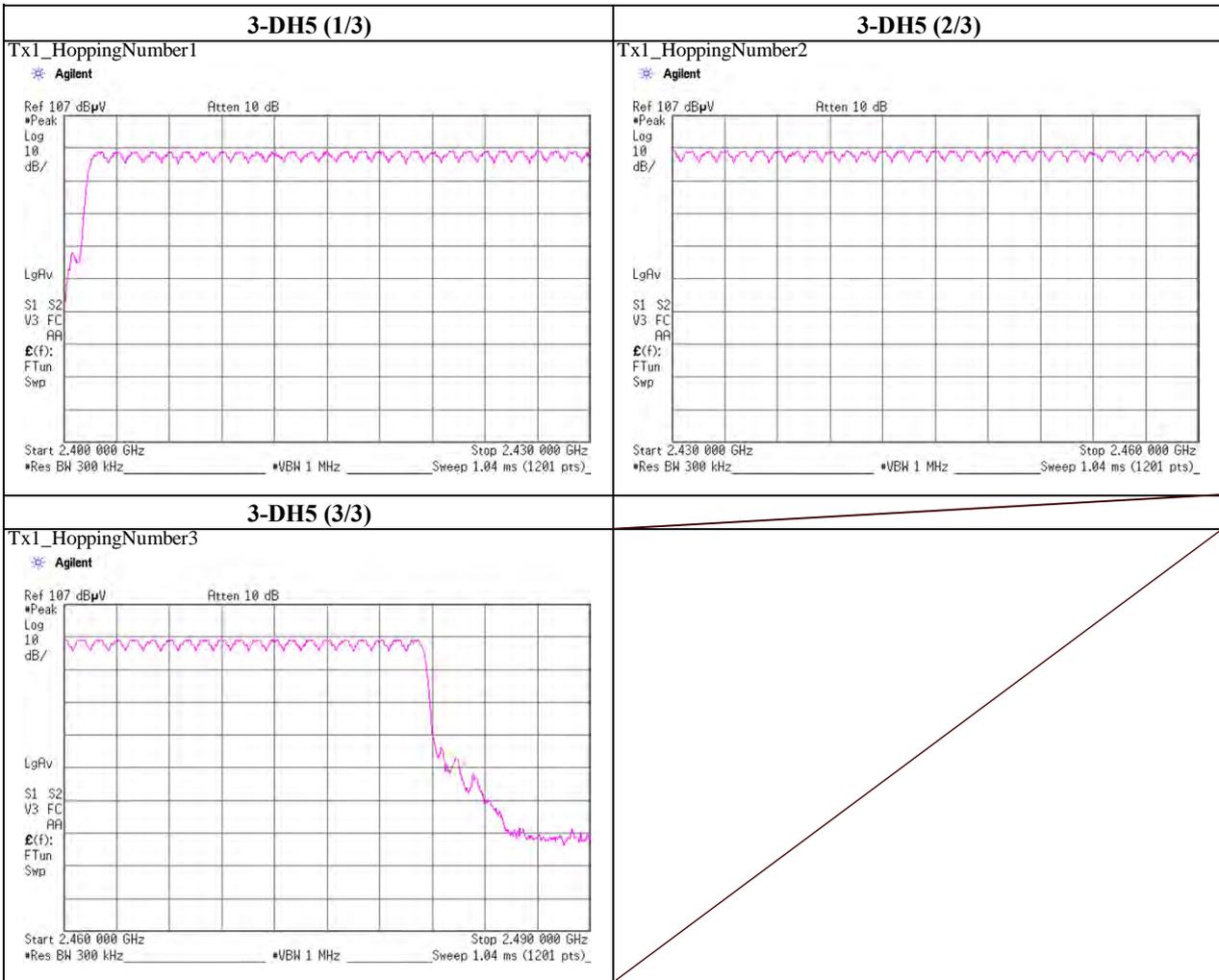
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Number of Hopping Frequency

Test place	UL Japan, Inc. Shonan EMC Lab.
Date	August 11, 2011
Temperature / Humidity	28deg.C , 57%RH
Engineer	Hikaru Shirasawa
Mode	Tx, Bluetooth, EDR, PRBS9

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



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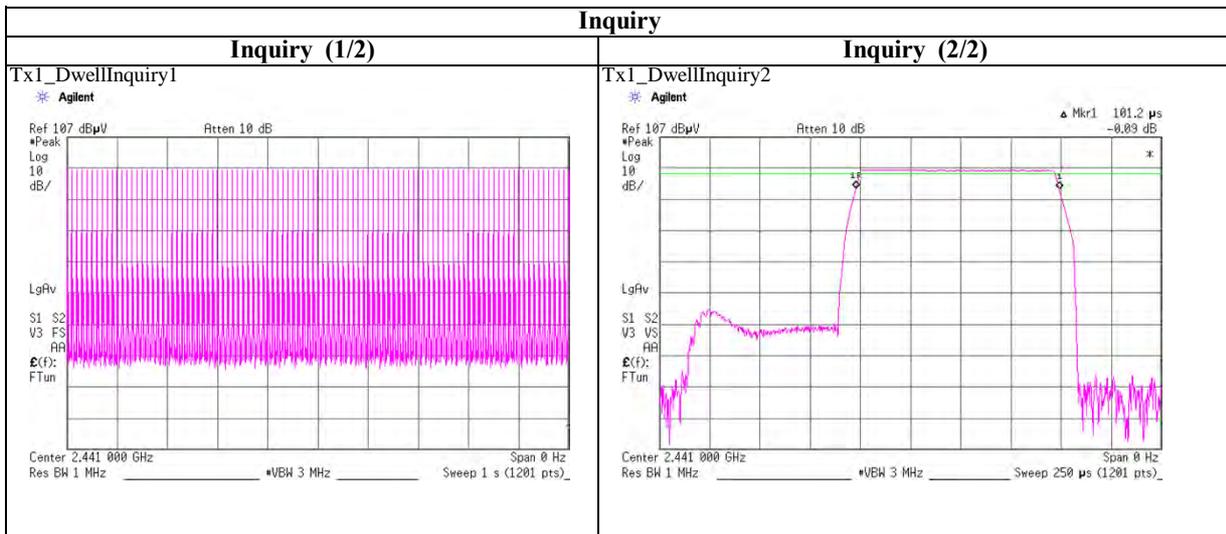
Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 11, 2011
 Temperature / Humidity 28deg.C , 57%RH
 Engineer Hikaru Shirasawa
 Mode Tx, Bluetooth, BDR, PRBS9

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	/ 5.0 sec. x 31.6 sec. = 323 times	0.400	129	400
DH3	25.0	/ 5.0 sec. x 31.6 sec. = 158 times	1.657	262	400
DH5	17.0	/ 5.0 sec. x 31.6 sec. = 108 times	2.910	314	400
Inquiry	100.0	/ 1.0 sec. x 12.8 sec. = 1280 times	0.102	131	400

Sample Calculation

Result = Number of transmission x Length of transmission time



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Shonan EMC Lab.

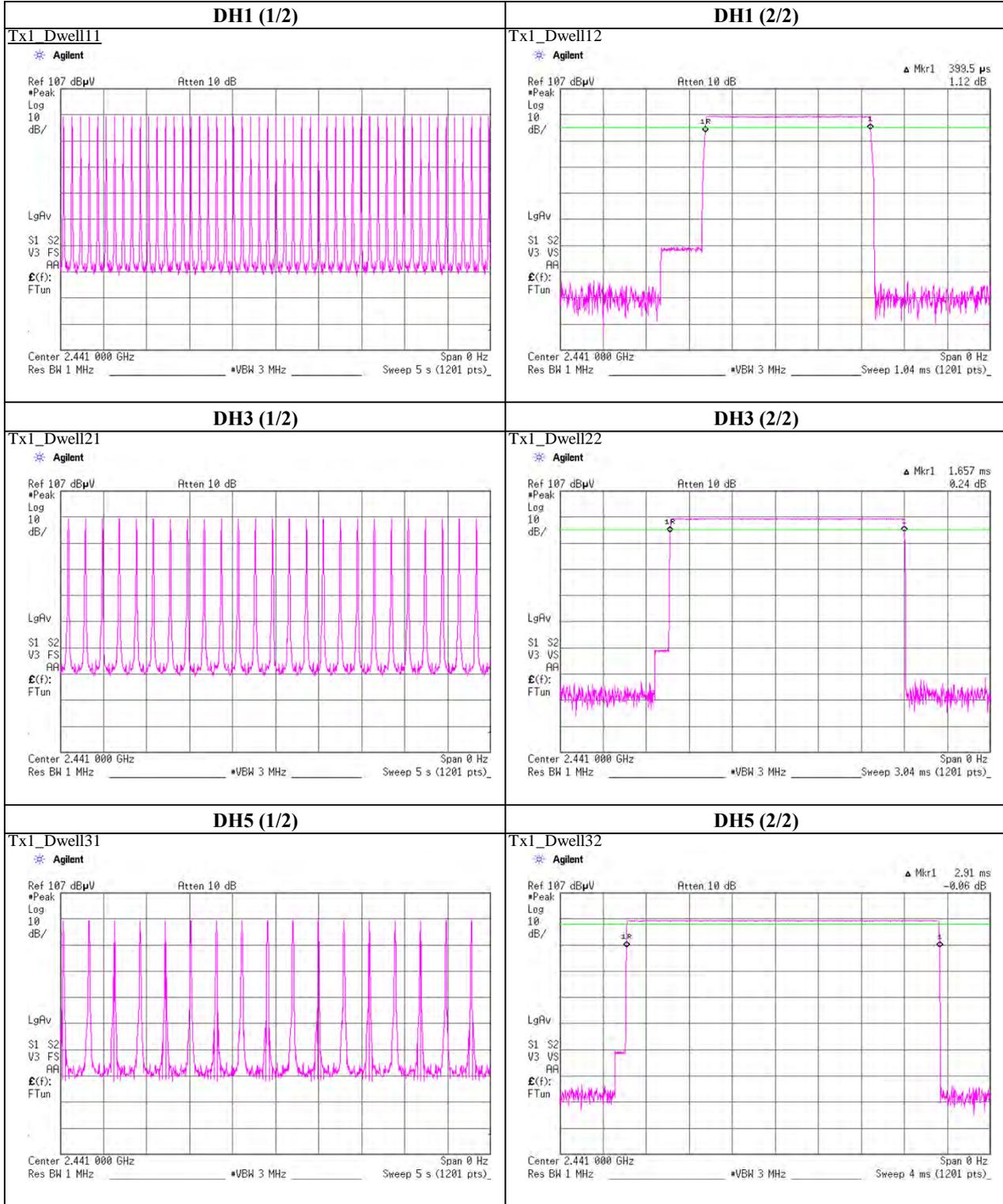
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Dwell time

Tx, Bluetooth, BDR, PRBS9



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Dwell Time

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 11, 2011
 Temperature / Humidity 28deg.C , 57%RH
 Engineer Hikaru Shirasawa
 Mode Tx, Bluetooth, EDR, PRBS9

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]
3-DH1	51.0	/ 5.0 sec.	x 31.6 sec. = 323 times	0.414	134	400
3-DH3	26.0	/ 5.0 sec.	x 31.6 sec. = 165 times	1.667	275	400
3-DH5	17.0	/ 5.0 sec.	x 31.6 sec. = 108 times	2.920	315	400

Sample Calculation

Result = Number of transmission x Length of transmission time

UL Japan, Inc.

Shonan EMC Lab.

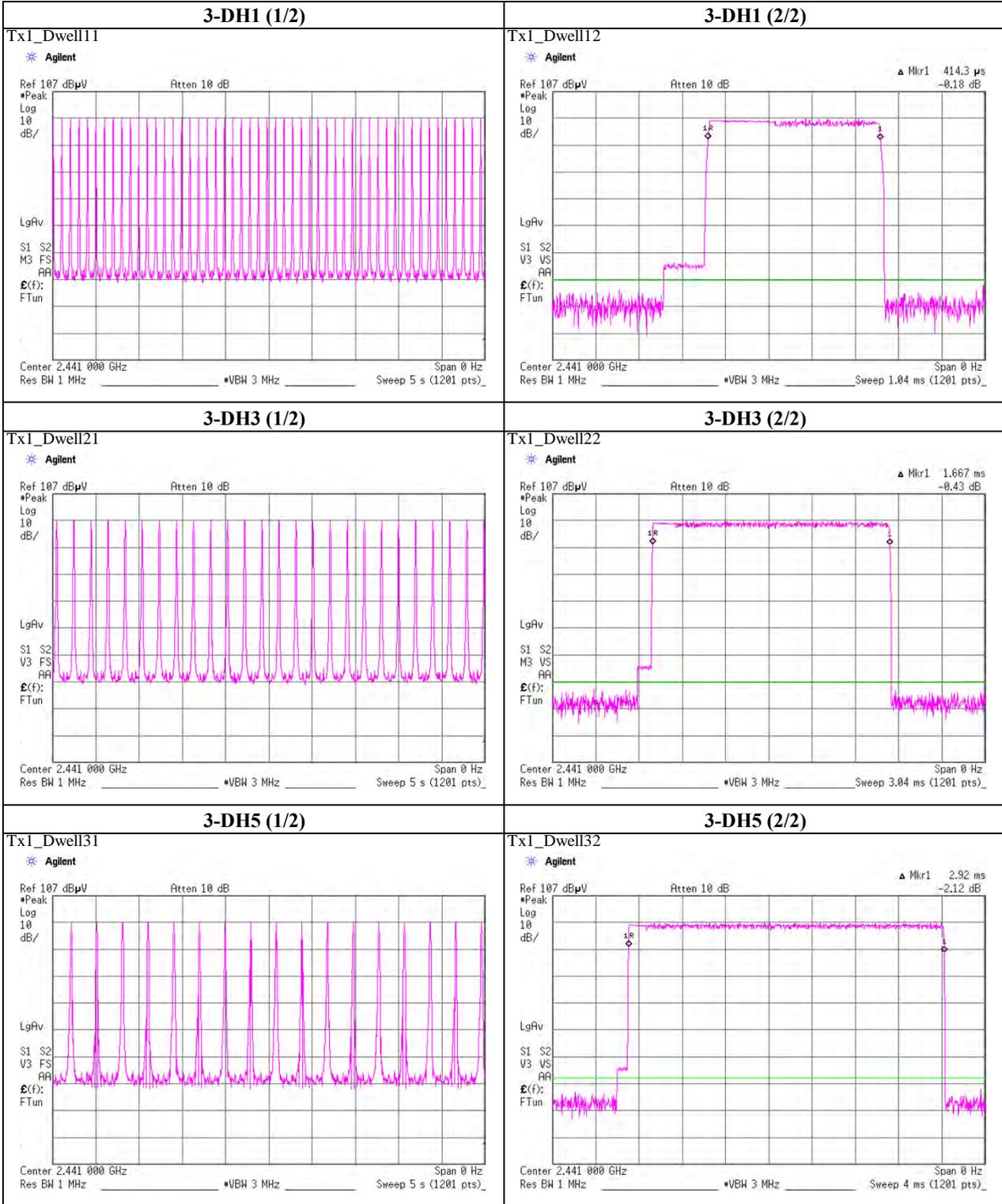
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Dwell time

Tx, Bluetooth, EDR, PRBS9



UL Japan, Inc.

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 9, 2011
 Temperature / Humidity 26deg.C , 57%RH
 Engineer Hikaru Shirasawa
 Mode Tx, Bluetooth

	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
DH5	2402.0	-10.56	1.44	9.97	0.85	1.22	20.97	125	20.12
DH5	2441.0	-10.20	1.43	9.97	1.20	1.32	20.97	125	19.77
DH5	2480.0	-10.02	1.44	9.97	1.39	1.38	20.97	125	19.58
2-DH5	2402.0	-9.85	1.44	9.97	1.56	1.43	20.97	125	19.41
2-DH5	2441.0	-9.54	1.43	9.97	1.86	1.53	20.97	125	19.11
2-DH5	2480.0	-9.59	1.44	9.97	1.82	1.52	20.97	125	19.15
3-DH5	2402.0	-9.73	1.44	9.97	1.68	1.47	20.97	125	19.29
3-DH5	2441.0	-9.44	1.43	9.97	1.96	1.57	20.97	125	19.01
3-DH5	2480.0	-9.47	1.44	9.97	1.94	1.56	20.97	125	19.03

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date August 11, 2011 August 12, 2011
 Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
 Engineer Tatsuya Arai Tatsuya Arai
 Mode Tx, 2402 MHz
 Tx, Bluetooth, BDR, PRBS9

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.	360.016	QP	44.8	15.1	9.0	31.9	37.0	46.0	9.0	100	117	
Hori.	480.180	QP	46.6	16.9	9.5	31.9	41.1	46.0	4.9	100	356	
Hori.	1602.016	PK	53.0	25.5	13.1	40.9	50.7	73.9	23.2	100	181	
Hori.	2350.000	PK	46.6	27.5	13.7	41.1	46.7	73.9	27.2	100	0	
Hori.	2377.000	PK	46.4	27.5	13.8	41.1	46.6	73.9	27.3	100	0	
Hori.	2390.000	PK	45.6	27.5	13.8	41.1	45.8	73.9	28.1	100	160	
Hori.	2400.000	PK	51.6	27.5	13.8	41.1	51.8	73.9	22.1	100	160	
Hori.	2427.000	PK	46.1	27.6	13.7	41.1	46.3	73.9	27.6	100	0	
Hori.	2453.000	PK	46.1	27.6	13.7	41.1	46.3	73.9	27.6	100	0	
Hori.	3203.000	PK	47.0	29.2	5.5	41.5	40.2	73.9	33.7	100	0	
Hori.	4007.000	PK	46.2	30.1	5.7	41.7	40.3	73.9	33.6	100	0	
Hori.	4804.000	PK	54.3	31.5	6.0	41.1	50.7	73.9	23.2	147	185	
Hori.	7206.000	PK	47.3	36.4	7.4	41.3	49.8	73.9	24.1	100	0	
Hori.	9608.000	PK	44.7	37.9	8.7	38.8	52.5	73.9	21.4	100	0	
Hori.	12010.000	PK	46.3	39.4	10.2	39.2	56.7	73.9	17.2	100	0	
Hori.	1602.016	AV	49.6	25.5	13.1	40.9	47.3	53.9	6.6	100	181	VBW:10Hz
Hori.	3203.000	AV	36.6	29.2	5.5	41.5	29.8	53.9	24.1	100	0	VBW:10Hz
Hori.	4007.000	AV	35.7	30.1	5.7	41.7	29.8	53.9	24.1	100	0	VBW:10Hz
Vert.	360.016	QP	41.7	15.1	9.0	31.9	33.9	46.0	12.1	116	189	
Vert.	480.018	QP	43.4	16.9	9.5	31.9	37.9	46.0	8.1	100	142	
Vert.	1602.016	PK	52.3	25.5	13.1	40.9	50.0	73.9	23.9	113	38	
Vert.	2350.000	PK	46.4	27.5	13.7	41.1	46.5	73.9	27.4	100	0	
Vert.	2377.000	PK	46.9	27.5	13.8	41.1	47.1	73.9	26.8	100	0	
Vert.	2390.000	PK	46.6	27.5	13.8	41.1	46.8	73.9	27.1	100	321	
Vert.	2400.000	PK	59.6	27.5	13.8	41.1	59.8	73.9	14.1	100	321	
Vert.	2427.000	PK	46.6	27.6	13.7	41.1	46.8	73.9	27.1	100	0	
Vert.	2453.000	PK	46.6	27.6	13.7	41.1	46.8	73.9	27.1	100	0	
Vert.	3203.000	PK	45.9	29.2	5.5	41.5	39.1	73.9	34.8	100	0	
Vert.	4007.000	PK	46.6	30.1	5.7	41.7	40.7	73.9	33.2	100	0	
Vert.	4804.000	PK	55.9	31.5	6.0	41.1	52.3	73.9	21.6	102	160	
Vert.	7206.000	PK	47.0	36.4	7.4	41.3	49.5	73.9	24.4	100	0	
Vert.	9608.000	PK	44.2	37.9	8.7	38.8	52.0	73.9	21.9	100	0	
Vert.	12010.000	PK	46.6	39.4	10.2	39.2	57.0	73.9	16.9	100	0	
Vert.	1602.016	AV	48.2	25.5	13.1	40.9	45.9	53.9	8.0	113	38	VBW:10Hz
Vert.	3203.000	AV	36.6	29.2	5.5	41.5	29.8	53.9	24.1	100	0	VBW:10Hz
Vert.	4007.000	AV	36.2	30.1	5.7	41.7	30.3	53.9	23.6	100	0	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).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date August 11, 2011 August 12, 2011
 Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
 Engineer Tatsuya Arai Tatsuya Arai
 Mode Tx, 2402 MHz
 Tx, Bluetooth, BDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2350.000	AV	36.4	27.5	13.7	41.1	-24.7	11.8	53.9	42.1	VBW:270Hz
Hori.	2377.000	AV	36.9	27.5	13.8	41.1	-24.7	12.4	53.9	41.5	VBW:270Hz
Hori.	2390.000	AV	35.7	27.5	13.8	41.1	-24.7	11.2	53.9	42.7	VBW:270Hz
Hori.	2400.000	AV	45.8	27.5	13.8	41.1	-24.7	21.3	53.9	32.6	VBW:270Hz
Hori.	2427.000	AV	36.4	27.6	13.7	41.1	-24.7	11.9	53.9	42.0	VBW:270Hz
Hori.	2453.000	AV	36.3	27.6	13.7	41.1	-24.7	11.8	53.9	42.1	VBW:270Hz
Hori.	4804.000	AV	50.0	31.5	6.0	41.1	-24.7	21.7	53.9	32.2	VBW:270Hz
Hori.	7206.000	AV	37.5	36.4	7.4	41.3	-24.7	15.3	53.9	38.6	VBW:270Hz
Hori.	9608.000	AV	34.2	37.9	8.7	38.8	-24.7	17.3	53.9	36.6	VBW:270Hz
Hori.	12010.000	AV	35.5	39.4	10.2	39.2	-24.7	21.2	53.9	32.7	VBW:270Hz
Vert.	2350.000	AV	36.1	27.5	13.7	41.1	-24.7	11.5	53.9	42.4	VBW:270Hz
Vert.	2377.000	AV	35.9	27.5	13.8	41.1	-24.7	11.4	53.9	42.5	VBW:270Hz
Vert.	2390.000	AV	36.7	27.5	13.8	41.1	-24.7	12.2	53.9	41.7	VBW:270Hz
Vert.	2400.000	AV	49.6	27.5	13.8	41.1	-24.7	25.1	53.9	28.8	VBW:270Hz
Vert.	2427.000	AV	36.0	27.6	13.7	41.1	-24.7	11.5	53.9	42.4	VBW:270Hz
Vert.	2453.000	AV	35.9	27.6	13.7	41.1	-24.7	11.4	53.9	42.5	VBW:270Hz
Vert.	4804.000	AV	52.1	31.5	6.0	41.1	-24.7	23.8	53.9	30.1	VBW:270Hz
Vert.	7206.000	AV	37.4	36.4	7.4	41.3	-24.7	15.2	53.9	38.7	VBW:270Hz
Vert.	9608.000	AV	34.3	37.9	8.7	38.8	-24.7	17.4	53.9	36.5	VBW:270Hz
Vert.	12010.000	AV	35.6	39.4	10.2	39.2	-24.7	21.3	53.9	32.6	VBW:270Hz

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

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

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

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Shonan EMC Lab.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2441 MHz
 Tx, Bluetooth, BDR, PRBS9

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.	360.008	QP	44.7	15.1	9.0	31.9	36.9	46.0	9.1	100	212	
Hori.	480.014	QP	46.7	16.9	9.5	31.9	41.2	46.0	4.8	100	147	
Hori.	1626.698	PK	52.1	25.6	13.1	40.9	49.9	73.9	24.0	100	179	
Hori.	2390.000	PK	46.2	27.5	13.8	41.1	46.4	73.9	27.5	100	0	
Hori.	2400.121	PK	54.8	27.5	13.8	41.1	55.0	73.9	18.9	100	70	
Hori.	2417.000	PK	46.0	27.6	13.7	41.1	46.2	73.9	27.7	100	0	
Hori.	2465.000	PK	46.5	27.6	13.7	41.1	46.7	73.9	27.2	100	0	
Hori.	2493.000	PK	46.9	27.6	13.7	41.1	47.1	73.9	26.8	100	0	
Hori.	3257.000	PK	47.4	29.3	5.4	41.6	40.5	73.9	33.4	100	0	
Hori.	4070.000	PK	46.8	30.1	5.7	41.7	40.9	73.9	33.0	100	0	
Hori.	4882.000	PK	56.5	31.7	6.0	40.9	53.3	73.9	20.6	105	206	
Hori.	7323.000	PK	47.2	36.7	7.4	41.4	49.9	73.9	24.0	100	0	
Hori.	9764.000	PK	45.0	38.2	8.7	38.8	53.1	73.9	20.8	100	0	
Hori.	12205.000	PK	45.6	39.2	10.3	39.2	55.9	73.9	18.0	100	0	
Hori.	1626.698	AV	48.5	25.6	13.1	40.9	46.3	53.9	7.6	100	179	VBW:10Hz
Hori.	2400.121	AV	50.5	27.5	13.8	41.1	50.7	53.9	3.2	100	70	VBW:10Hz
Hori.	3257.000	AV	36.5	29.3	5.4	41.6	29.6	53.9	24.3	100	0	VBW:10Hz
Hori.	4070.000	AV	36.4	30.1	5.7	41.7	30.5	53.9	23.4	100	0	VBW:10Hz
Vert.	360.008	QP	41.1	15.1	9.0	31.9	33.3	46.0	12.7	131	197	
Vert.	480.014	QP	43.9	16.9	9.5	31.9	38.4	46.0	7.6	235	143	
Vert.	1626.698	PK	52.2	25.6	13.1	40.9	50.0	73.9	23.9	112	39	
Vert.	2390.000	PK	47.1	27.5	13.8	41.1	47.3	73.9	26.6	100	0	
Vert.	2400.121	PK	51.4	27.5	13.8	41.1	51.6	73.9	22.3	100	160	
Vert.	2417.000	PK	48.1	27.6	13.7	41.1	48.3	73.9	25.6	100	319	
Vert.	2465.000	PK	48.6	27.6	13.7	41.1	48.8	73.9	25.1	100	19	
Vert.	2493.000	PK	47.2	27.6	13.7	41.1	47.4	73.9	26.5	100	0	
Vert.	3257.000	PK	47.4	29.3	5.4	41.6	40.5	73.9	33.4	100	0	
Vert.	4070.000	PK	46.7	30.1	5.7	41.7	40.8	73.9	33.1	100	0	
Vert.	4882.000	PK	56.7	31.7	6.0	40.9	53.5	73.9	20.4	102	136	
Vert.	7323.000	PK	48.9	36.7	7.4	41.4	51.6	73.9	22.3	100	0	
Vert.	9764.000	PK	45.0	38.2	8.7	38.8	53.1	73.9	20.8	100	0	
Vert.	12205.000	PK	45.1	39.2	10.3	39.2	55.4	73.9	18.5	100	0	
Vert.	1626.698	AV	48.5	25.6	13.1	40.9	46.3	53.9	7.6	112	39	VBW:10Hz
Vert.	2400.121	AV	46.2	27.5	13.8	41.1	46.4	53.9	7.5	100	160	VBW:10Hz
Vert.	3257.000	AV	36.5	29.3	5.4	41.6	29.6	53.9	24.3	100	0	VBW:10Hz
Vert.	4070.000	AV	36.4	30.1	5.7	41.7	30.5	53.9	23.4	100	0	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).

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

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 August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2441 MHz
 Tx, Bluetooth, BDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	36.1	27.5	13.8	41.1	-24.7	11.6	53.9	42.3	VBW:270Hz
Hori.	2417.000	AV	36.2	27.6	13.7	41.1	-24.7	11.7	53.9	42.2	VBW:270Hz
Hori.	2465.000	AV	36.2	27.6	13.7	41.1	-24.7	11.7	53.9	42.2	VBW:270Hz
Hori.	2493.000	AV	36.0	27.6	13.7	41.1	-24.7	11.5	53.9	42.4	VBW:270Hz
Hori.	4882.000	AV	53.6	31.7	6.0	40.9	-24.7	25.7	53.9	28.2	VBW:270Hz
Hori.	7323.000	AV	38.1	36.7	7.4	41.4	-24.7	16.1	53.9	37.8	VBW:270Hz
Hori.	9764.000	AV	34.4	38.2	8.7	38.8	-24.7	17.8	53.9	36.1	VBW:270Hz
Hori.	12205.000	AV	35.4	39.2	10.3	39.2	-24.7	21.0	53.9	32.9	VBW:270Hz
Vert.	2390.000	AV	36.1	27.5	13.8	41.1	-24.7	11.6	53.9	42.3	VBW:270Hz
Vert.	2417.000	AV	39.6	27.6	13.7	41.1	-24.7	15.1	53.9	38.8	VBW:270Hz
Vert.	2465.000	AV	40.5	27.6	13.7	41.1	-24.7	16.0	53.9	37.9	VBW:270Hz
Vert.	2493.000	AV	37.0	27.6	13.7	41.1	-24.7	12.5	53.9	41.4	VBW:270Hz
Vert.	4882.000	AV	53.1	31.7	6.0	40.9	-24.7	25.2	53.9	28.7	VBW:270Hz
Vert.	7323.000	AV	37.2	36.7	7.4	41.4	-24.7	15.2	53.9	38.7	VBW:270Hz
Vert.	9764.000	AV	34.0	38.2	8.7	38.8	-24.7	17.4	53.9	36.5	VBW:270Hz
Vert.	12205.000	AV	35.6	39.2	10.3	39.2	-24.7	21.2	53.9	32.7	VBW:270Hz

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

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

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	August 11, 2011	August 12, 2011
Temperature / Humidity	25deg.C , 59%RH	22deg.C , 71%RH
Engineer	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2480 MHz Tx, Bluetooth, BDR, PRBS9	

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.	360.012	QP	44.7	15.1	9	31.9	36.9	46	9.1	100	214	
Hori.	480.016	QP	47.1	16.9	9.5	31.9	41.6	46	4.4	100	147	
Hori.	1652.643	PK	52.3	25.7	13.1	40.9	50.2	73.9	23.7	100	185	
Hori.	2400.111	PK	54.7	27.5	13.8	41.1	54.9	73.9	19.0	100	68	
Hori.	2427.000	PK	47.1	27.6	13.7	41.1	47.3	73.9	26.6	100	0	
Hori.	2456.000	PK	47.3	27.6	13.7	41.1	47.5	73.9	26.4	100	155	
Hori.	2483.500	PK	48.9	27.6	13.7	41.1	49.1	73.9	24.8	100	155	
Hori.	2504.000	PK	46.5	27.6	13.9	41.1	46.9	73.9	27.0	100	155	
Hori.	2533.000	PK	46	27.7	13.9	41.1	46.5	73.9	27.4	100	0	
Hori.	3307.000	PK	47.4	29.3	5.4	41.6	40.5	73.9	33.4	100	0	
Hori.	4133.000	PK	46.5	30.2	5.8	41.7	40.8	73.9	33.1	100	0	
Hori.	4960.000	PK	52.9	31.9	6	40.8	50	73.9	23.9	100	149	
Hori.	7440.000	PK	48.1	36.9	7.3	41.5	50.8	73.9	23.1	100	0	
Hori.	9920.000	PK	44	38.4	8.8	38.8	52.4	73.9	21.5	100	0	
Hori.	12400.000	PK	45.5	39.1	10.3	39.2	55.7	73.9	18.2	100	0	
Hori.	1652.643	AV	48.6	25.7	13.1	40.9	46.5	53.9	7.4	100	185	VBW:10Hz
Hori.	2400.111	AV	50.1	27.5	13.8	41.1	50.3	53.9	3.6	100	68	VBW:10Hz
Hori.	3307.000	AV	36.3	29.3	5.4	41.6	29.4	53.9	24.5	100	0	VBW:10Hz
Hori.	4133.000	AV	36.4	30.2	5.8	41.7	30.7	53.9	23.2	100	0	VBW:10Hz
Vert.	360.012	QP	41.2	15.1	9	31.9	33.4	46	12.6	132	192	
Vert.	480.016	QP	43.9	16.9	9.5	31.9	38.4	46	7.6	230	142	
Vert.	1652.643	PK	52.2	25.7	13.1	40.9	50.1	73.9	23.8	152	322	
Vert.	2400.111	PK	51	27.5	13.8	41.1	51.2	73.9	22.7	100	158	
Vert.	2427.000	PK	46.4	27.6	13.7	41.1	46.6	73.9	27.3	100	0	
Vert.	2456.000	PK	48.6	27.6	13.7	41.1	48.8	73.9	25.1	100	21	
Vert.	2483.500	PK	52.5	27.6	13.7	41.1	52.7	73.9	21.2	100	20	
Vert.	2504.000	PK	39.7	27.6	13.9	41.1	40.1	73.9	33.8	100	21	
Vert.	2533.000	PK	46.8	27.7	13.9	41.1	47.3	73.9	26.6	100	0	
Vert.	3307.000	PK	48	29.3	5.4	41.6	41.1	73.9	32.8	100	0	
Vert.	4133.000	PK	47.3	30.2	5.8	41.7	41.6	73.9	32.3	100	0	
Vert.	4960.000	PK	55.4	31.9	6	40.8	52.5	73.9	21.4	102	29	
Vert.	7440.000	PK	47.2	36.9	7.3	41.5	49.9	73.9	24.0	100	0	
Vert.	9920.000	PK	44	38.4	8.8	38.8	52.4	73.9	21.5	100	0	
Vert.	12400.000	PK	45.2	39.1	10.3	39.2	55.4	73.9	18.5	100	0	
Vert.	1652.643	AV	48.3	25.7	13.1	40.9	46.2	53.9	7.7	152	322	VBW:10Hz
Vert.	2400.111	AV	46.3	27.5	13.8	41.1	46.5	53.9	7.4	100	158	VBW:10Hz
Vert.	3307.000	AV	36.4	29.3	5.4	41.6	29.5	53.9	24.4	100	0	VBW:10Hz
Vert.	4133.000	AV	36.6	30.2	5.8	41.7	30.9	53.9	23.0	100	0	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).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

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Shonan EMC Lab.

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Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2480 MHz
 Tx, Bluetooth, BDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2427.000	AV	36.4	27.6	13.7	41.1	-24.7	11.9	53.9	42.0	VBW:270Hz
Hori.	2456.000	AV	37.5	27.6	13.7	41.1	-24.7	13.0	53.9	40.9	VBW:270Hz
Hori.	2483.500	AV	37.2	27.6	13.7	41.1	-24.7	12.7	53.9	41.2	VBW:270Hz
Hori.	2504.000	AV	37.1	27.6	13.9	41.1	-24.7	12.8	53.9	41.1	VBW:270Hz
Hori.	2533.000	AV	36.3	27.7	13.9	41.1	-24.7	12.1	53.9	41.8	VBW:270Hz
Hori.	4960.000	AV	48.2	31.9	6.0	40.8	-24.7	20.6	53.9	33.3	VBW:270Hz
Hori.	7440.000	AV	37.1	36.9	7.3	41.5	-24.7	15.1	53.9	38.8	VBW:270Hz
Hori.	9920.000	AV	34.4	38.4	8.8	38.8	-24.7	18.1	53.9	35.8	VBW:270Hz
Hori.	12400.000	AV	35.2	39.1	10.3	39.2	-24.7	20.7	53.9	33.2	VBW:270Hz
Vert.	2427.000	AV	36.4	27.6	13.7	41.1	-24.7	11.9	53.9	42.0	VBW:270Hz
Vert.	2456.000	AV	40.8	27.6	13.7	41.1	-24.7	16.3	53.9	37.6	VBW:270Hz
Vert.	2483.500	AV	41.5	27.6	13.7	41.1	-24.7	17.0	53.9	36.9	VBW:270Hz
Vert.	2504.000	AV	47.8	27.6	13.9	41.1	-24.7	23.5	53.9	30.4	VBW:270Hz
Vert.	2533.000	AV	37.0	27.7	13.9	41.1	-24.7	12.8	53.9	41.1	VBW:270Hz
Vert.	4960.000	AV	51.4	31.9	6.0	40.8	-24.7	23.8	53.9	30.1	VBW:270Hz
Vert.	7440.000	AV	37.0	36.9	7.3	41.5	-24.7	15.0	53.9	38.9	VBW:270Hz
Vert.	9920.000	AV	34.4	38.4	8.8	38.8	-24.7	18.1	53.9	35.8	VBW:270Hz
Vert.	12400.000	AV	35.2	39.1	10.3	39.2	-24.7	20.7	53.9	33.2	VBW:270Hz

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

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

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2402 MHz
 Tx, Bluetooth, EDR, PRBS9

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.	360.014	QP	44.5	15.1	9.0	31.9	36.7	46.0	9.3	100	210	
Hori.	480.016	QP	47.3	16.9	9.5	31.9	41.8	46.0	4.2	100	149	
Hori.	1602.025	PK	52.3	25.5	13.1	40.9	50.0	73.9	23.9	100	178	
Hori.	2350.000	PK	46.7	27.5	13.7	41.1	46.8	73.9	27.1	100	0	
Hori.	2378.000	PK	47.2	27.5	13.8	41.1	47.4	73.9	26.5	100	160	
Hori.	2390.000	PK	46.1	27.5	13.8	41.1	46.3	73.9	27.6	100	160	
Hori.	2400.000	PK	59.4	27.5	13.8	41.1	59.6	73.9	14.3	100	160	
Hori.	2426.000	PK	46.3	27.6	13.7	41.1	46.5	73.9	27.4	100	160	
Hori.	2453.000	PK	46.3	27.6	13.7	41.1	46.5	73.9	27.4	100	0	
Hori.	3203.000	PK	47.8	29.2	5.5	41.5	41.0	73.9	32.9	100	0	
Hori.	4804.000	PK	49.9	31.5	6.0	41.1	46.3	73.9	27.6	100	138	
Hori.	7206.000	PK	48.2	36.4	7.4	41.3	50.7	73.9	23.2	100	0	
Hori.	9608.000	PK	44.0	37.9	8.7	38.8	51.8	73.9	22.1	100	0	
Hori.	12010.000	PK	45.4	39.4	10.2	39.2	55.8	73.9	18.1	100	0	
Hori.	1602.025	AV	48.6	25.5	13.1	40.9	46.3	53.9	7.6	100	178	VBW:10Hz
Hori.	3203.000	AV	37.1	29.2	5.5	41.5	30.3	53.9	23.6	100	0	VBW:10Hz
Vert.	360.014	QP	41.5	15.1	9.0	31.9	33.7	46.0	12.3	126	197	
Vert.	480.016	QP	43.0	16.9	9.5	31.9	37.5	46.0	8.5	229	137	
Vert.	1602.025	PK	52.3	25.5	13.1	40.9	50.0	73.9	23.9	111	30	
Vert.	2350.000	PK	47.7	27.5	13.7	41.1	47.8	73.9	26.1	100	0	
Vert.	2378.000	PK	47.3	27.5	13.8	41.1	47.5	73.9	26.4	100	341	
Vert.	2390.000	PK	46.8	27.5	13.8	41.1	47.0	73.9	26.9	100	341	
Vert.	2400.000	PK	65.3	27.5	13.8	41.1	65.5	73.9	8.4	100	341	
Vert.	2426.000	PK	47.6	27.6	13.7	41.1	47.8	73.9	26.1	100	341	
Vert.	2453.000	PK	46.9	27.6	13.7	41.1	47.1	73.9	26.8	100	0	
Vert.	3203.000	PK	46.7	29.2	5.5	41.5	39.9	73.9	34.0	100	0	
Vert.	4804.000	PK	50.4	31.5	6.0	41.1	46.8	73.9	27.1	109	345	
Vert.	7206.000	PK	47.5	36.4	7.4	41.3	50.0	73.9	23.9	100	0	
Vert.	9608.000	PK	44.4	37.9	8.7	38.8	52.2	73.9	21.7	100	0	
Vert.	12010.000	PK	46.2	39.4	10.2	39.2	56.6	73.9	17.3	100	0	
Vert.	1602.025	AV	48.6	25.5	13.1	40.9	46.3	53.9	7.6	111	30	VBW:10Hz
Vert.	3203.000	AV	37.0	29.2	5.5	41.5	30.2	53.9	23.7	100	0	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).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2402 MHz
 Tx, Bluetooth, EDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2350.000	AV	36.2	27.5	13.7	41.1	-24.7	11.6	53.9	42.3	VBW:270Hz
Hori.	2378.000	AV	36.9	27.5	13.8	41.1	-24.7	12.4	53.9	41.5	VBW:270Hz
Hori.	2390.000	AV	35.7	27.5	13.8	41.1	-24.7	11.2	53.9	42.7	VBW:270Hz
Hori.	2400.000	AV	47.7	27.5	13.8	41.1	-24.7	23.2	53.9	30.7	VBW:270Hz
Hori.	2426.000	AV	36.8	27.6	13.7	41.1	-24.7	12.3	53.9	41.6	VBW:270Hz
Hori.	2453.000	AV	36.2	27.6	13.7	41.1	-24.7	11.7	53.9	42.2	VBW:270Hz
Hori.	4804.000	AV	40.2	31.5	6.0	41.1	-24.7	11.9	53.9	42.0	VBW:270Hz
Hori.	7206.000	AV	37.5	36.4	7.4	41.3	-24.7	15.3	53.9	38.6	VBW:270Hz
Hori.	9608.000	AV	34.2	37.9	8.7	38.8	-24.7	17.3	53.9	36.6	VBW:270Hz
Hori.	12010.000	AV	35.7	39.4	10.2	39.2	-24.7	21.4	53.9	32.5	VBW:270Hz
Vert.	2350.000	AV	36.4	27.5	13.7	41.1	-24.7	11.8	53.9	42.1	VBW:270Hz
Vert.	2378.000	AV	38.0	27.5	13.8	41.1	-24.7	13.5	53.9	40.4	VBW:270Hz
Vert.	2390.000	AV	35.9	27.5	13.8	41.1	-24.7	11.4	53.9	42.5	VBW:270Hz
Vert.	2400.000	AV	53.0	27.5	13.8	41.1	-24.7	28.5	53.9	25.4	VBW:270Hz
Vert.	2426.000	AV	38.4	27.6	13.7	41.1	-24.7	13.9	53.9	40.0	VBW:270Hz
Vert.	2453.000	AV	36.6	27.6	13.7	41.1	-24.7	12.1	53.9	41.8	VBW:270Hz
Vert.	4804.000	AV	41.6	31.5	6.0	41.1	-24.7	13.3	53.9	40.6	VBW:270Hz
Vert.	7206.000	AV	37.5	36.4	7.4	41.3	-24.7	15.3	53.9	38.6	VBW:270Hz
Vert.	9608.000	AV	34.1	37.9	8.7	38.8	-24.7	17.2	53.9	36.7	VBW:270Hz
Vert.	12010.000	AV	35.6	39.4	10.2	39.2	-24.7	21.3	53.9	32.6	VBW:270Hz

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

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

Distance factor: 13GHz-40GHz $20\log(3.0m/1.0m) = 9.5dB$

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2441 MHz
 Tx, Bluetooth, EDR, PRBS9

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.	360.010	QP	44.2	15.1	9.0	31.9	36.4	46.0	9.6	100	128	
Hori.	480.016	QP	47.4	16.9	9.5	31.9	41.9	46.0	4.1	100	152	
Hori.	1626.674	PK	52.0	25.6	13.1	40.9	49.8	73.9	24.1	100	185	
Hori.	2390.000	PK	46.1	27.5	13.8	41.1	46.3	73.9	27.6	100	0	
Hori.	2400.071	PK	54.9	27.5	13.8	41.1	55.1	73.9	18.8	100	69	
Hori.	2417.000	PK	47.3	27.6	13.7	41.1	47.5	73.9	26.4	129	157	
Hori.	2465.000	PK	46.6	27.6	13.7	41.1	46.8	73.9	27.1	129	157	
Hori.	2493.000	PK	46.2	27.6	13.7	41.1	46.4	73.9	27.5	100	0	
Hori.	3257.000	PK	47.0	29.3	5.4	41.6	40.1	73.9	33.8	100	0	
Hori.	4882.000	PK	50.6	31.7	6.0	40.9	47.4	73.9	26.5	209	106	
Hori.	7323.000	PK	47.8	36.7	7.4	41.4	50.5	73.9	23.4	100	0	
Hori.	9764.000	PK	44.3	38.2	8.7	38.8	52.4	73.9	21.5	100	0	
Hori.	12205.000	PK	45.1	39.2	10.3	39.2	55.4	73.9	18.5	100	0	
Hori.	1626.674	AV	47.7	25.6	13.1	40.9	45.5	53.9	8.4	100	185	VBW:10Hz
Hori.	2400.071	AV	50.1	27.5	13.8	41.1	50.3	53.9	3.6	100	69	VBW:10Hz
Hori.	3257.000	AV	36.5	29.3	5.4	41.6	29.6	53.9	24.3	100	0	VBW:10Hz
Vert.	360.010	QP	41.5	15.1	9.0	31.9	33.7	46.0	12.3	133	189	
Vert.	480.016	QP	44.5	16.9	9.5	31.9	39.0	46.0	7.0	236	145	
Vert.	1626.674	PK	52.3	25.6	13.1	40.9	50.1	73.9	23.8	112	37	
Vert.	2390.000	PK	47.1	27.5	13.8	41.1	47.3	73.9	26.6	100	0	
Vert.	2400.071	PK	51.1	27.5	13.8	41.1	51.3	73.9	22.6	100	159	
Vert.	2417.000	PK	47.6	27.6	13.7	41.1	47.8	73.9	26.1	100	320	
Vert.	2465.000	PK	47.0	27.6	13.7	41.1	47.2	73.9	26.7	100	320	
Vert.	2493.000	PK	46.3	27.6	13.7	41.1	46.5	73.9	27.4	100	320	
Vert.	3257.000	PK	46.9	29.3	5.4	41.6	40.0	73.9	33.9	100	0	
Vert.	4882.000	PK	51.3	31.7	6.0	40.9	48.1	73.9	25.8	103	136	
Vert.	7323.000	PK	47.4	36.7	7.4	41.4	50.1	73.9	23.8	100	0	
Vert.	9764.000	PK	44.5	38.2	8.7	38.8	52.6	73.9	21.3	100	0	
Vert.	12205.000	PK	45.6	39.2	10.3	39.2	55.9	73.9	18.0	100	0	
Vert.	1626.674	AV	48.6	25.6	13.1	40.9	46.4	53.9	7.5	112	37	VBW:10Hz
Vert.	2400.071	AV	45.9	27.5	13.8	41.1	46.1	53.9	7.8	100	159	VBW:10Hz
Vert.	3257.000	AV	36.9	29.3	5.4	41.6	30.0	53.9	23.9	100	0	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).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2441 MHz
 Tx, Bluetooth, EDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	36.1	27.5	13.8	41.1	-24.7	11.6	53.9	42.3	VBW:270Hz
Hori.	2417.000	AV	37.0	27.6	13.7	41.1	-24.7	12.5	53.9	41.4	VBW:270Hz
Hori.	2465.000	AV	37.0	27.6	13.7	41.1	-24.7	12.5	53.9	41.4	VBW:270Hz
Hori.	2493.000	AV	36.2	27.6	13.7	41.1	-24.7	11.7	53.9	42.2	VBW:270Hz
Hori.	4882.000	AV	41.8	31.7	6.0	40.9	-24.7	13.9	53.9	40.0	VBW:270Hz
Hori.	7323.000	AV	37.6	36.7	7.4	41.4	-24.7	15.6	53.9	38.3	VBW:270Hz
Hori.	9764.000	AV	34.3	38.2	8.7	38.8	-24.7	17.7	53.9	36.2	VBW:270Hz
Hori.	12205.000	AV	35.5	39.2	10.3	39.2	-24.7	21.1	53.9	32.8	VBW:270Hz
Vert.	2390.000	AV	36.6	27.5	13.8	41.1	-24.7	12.1	53.9	41.8	VBW:270Hz
Vert.	2417.000	AV	38.9	27.6	13.7	41.1	-24.7	14.4	53.9	39.5	VBW:270Hz
Vert.	2465.000	AV	38.8	27.6	13.7	41.1	-24.7	14.3	53.9	39.6	VBW:270Hz
Vert.	2493.000	AV	36.5	27.6	13.7	41.1	-24.7	12.0	53.9	41.9	VBW:270Hz
Vert.	4882.000	AV	42.6	31.7	6.0	40.9	-24.7	14.7	53.9	39.2	VBW:270Hz
Vert.	7323.000	AV	37.7	36.7	7.4	41.4	-24.7	15.7	53.9	38.2	VBW:270Hz
Vert.	9764.000	AV	34.3	38.2	8.7	38.8	-24.7	17.7	53.9	36.2	VBW:270Hz
Vert.	12205.000	AV	35.7	39.2	10.3	39.2	-24.7	21.3	53.9	32.6	VBW:270Hz

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

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

Distance factor: 13GHz-40GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2480 MHz
 Tx, Bluetooth, EDR, PRBS9

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.	360.016	QP	44.3	15.1	9.0	31.9	36.5	46.0	9.5	100	208	
Hori.	480.020	QP	47.2	16.9	9.5	31.9	41.7	46.0	4.3	100	147	
Hori.	1652.675	PK	52.0	25.7	13.1	40.9	49.9	73.9	24.0	100	186	
Hori.	2400.093	PK	54.8	27.5	13.8	41.1	55.0	73.9	18.9	100	69	
Hori.	2456.000	PK	47.2	27.6	13.7	41.1	47.4	73.9	26.5	100	153	
Hori.	2483.500	PK	48.6	27.6	13.7	41.1	48.8	73.9	25.1	100	153	
Hori.	2504.000	PK	46.9	27.6	13.9	41.1	47.3	73.9	26.6	100	153	
Hori.	3307.000	PK	46.5	29.3	5.4	41.6	39.6	73.9	34.3	100	0	
Hori.	4960.000	PK	47.3	31.9	6.0	40.8	44.4	73.9	29.5	100	151	
Hori.	7440.000	PK	46.6	36.9	7.3	41.5	49.3	73.9	24.6	100	0	
Hori.	9920.000	PK	44.0	38.4	8.8	38.8	52.4	73.9	21.5	100	0	
Hori.	12400.000	PK	45.3	39.1	10.3	39.2	55.5	73.9	18.4	100	0	
Hori.	1652.675	AV	48.3	25.7	13.1	40.9	46.2	53.9	7.7	100	186	VBW:10Hz
Hori.	2400.093	AV	50.2	27.5	13.8	41.1	50.4	53.9	3.5	100	69	VBW:10Hz
Hori.	3307.000	AV	36.4	29.3	5.4	41.6	29.5	53.9	24.4	100	0	VBW:10Hz
Vert.	360.016	QP	41.3	15.1	9.0	31.9	33.5	46.0	12.5	128	193	
Vert.	480.020	QP	44.2	16.9	9.5	31.9	38.7	46.0	7.3	232	144	
Vert.	1652.675	PK	52.5	25.7	13.1	40.9	50.4	73.9	23.5	148	323	
Vert.	2400.093	PK	50.5	27.5	13.8	41.1	50.7	73.9	23.2	100	159	
Vert.	2456.000	PK	48.5	27.6	13.7	41.1	48.7	73.9	25.2	100	19	
Vert.	2483.500	PK	52.8	27.6	13.7	41.1	53.0	73.9	20.9	100	19	
Vert.	2504.000	PK	47.0	27.6	13.9	41.1	47.4	73.9	26.5	100	19	
Vert.	3307.000	PK	47.2	29.3	5.4	41.6	40.3	73.9	33.6	100	0	
Vert.	4960.000	PK	50.0	31.9	6.0	40.8	47.1	73.9	26.8	103	30	
Vert.	7440.000	PK	46.9	36.9	7.3	41.5	49.6	73.9	24.3	100	0	
Vert.	9920.000	PK	44.9	38.4	8.8	38.8	53.3	73.9	20.6	100	0	
Vert.	12400.000	PK	45.4	39.1	10.3	39.2	55.6	73.9	18.3	100	0	
Vert.	1652.675	AV	48.8	25.7	13.1	40.9	46.7	53.9	7.2	148	323	VBW:10Hz
Vert.	2400.093	AV	45.8	27.5	13.8	41.1	46.0	53.9	7.9	100	159	VBW:10Hz
Vert.	3307.000	AV	36.8	29.3	5.4	41.6	29.9	53.9	24.0	100	0	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).

Distance factor: 13GHz-40GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date August 11, 2011 August 12, 2011
Temperature / Humidity 25deg.C , 59%RH 22deg.C , 71%RH
Engineer Tatsuya Arai Tatsuya Arai
Mode Tx, 2480 MHz
 Tx, Bluetooth, EDR, PRBS9

Dwell time factor relaxation

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Dwell time factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2456.000	AV	36.8	27.6	13.7	41.1	-24.7	12.3	53.9	41.6	VBW:270Hz
Hori.	2483.500	AV	37.4	27.6	13.7	41.1	-24.7	12.9	53.9	41.0	VBW:270Hz
Hori.	2504.000	AV	36.6	27.6	13.9	41.1	-24.7	12.3	53.9	41.6	VBW:270Hz
Hori.	4960.000	AV	37.8	31.9	6.0	40.8	-24.7	10.2	53.9	43.7	VBW:270Hz
Hori.	7440.000	AV	37.0	36.9	7.3	41.5	-24.7	15.0	53.9	38.9	VBW:270Hz
Hori.	9920.000	AV	34.1	38.4	8.8	38.8	-24.7	17.8	53.9	36.1	VBW:270Hz
Hori.	12400.000	AV	35.3	39.1	10.3	39.2	-24.7	20.8	53.9	33.1	VBW:270Hz
Vert.	2456.000	AV	39.2	27.6	13.7	41.1	-24.7	14.7	53.9	39.2	VBW:270Hz
Vert.	2483.500	AV	41.2	27.6	13.7	41.1	-24.7	16.7	53.9	37.2	VBW:270Hz
Vert.	2504.000	AV	38.3	27.6	13.9	41.1	-24.7	14.0	53.9	39.9	VBW:270Hz
Vert.	4960.000	AV	40.0	31.9	6.0	40.8	-24.7	12.4	53.9	41.5	VBW:270Hz
Vert.	7440.000	AV	37.0	36.9	7.3	41.5	-24.7	15.0	53.9	38.9	VBW:270Hz
Vert.	9920.000	AV	34.2	38.4	8.8	38.8	-24.7	17.9	53.9	36.0	VBW:270Hz
Vert.	12400.000	AV	35.1	39.1	10.3	39.2	-24.7	20.6	53.9	33.3	VBW:270Hz

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

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

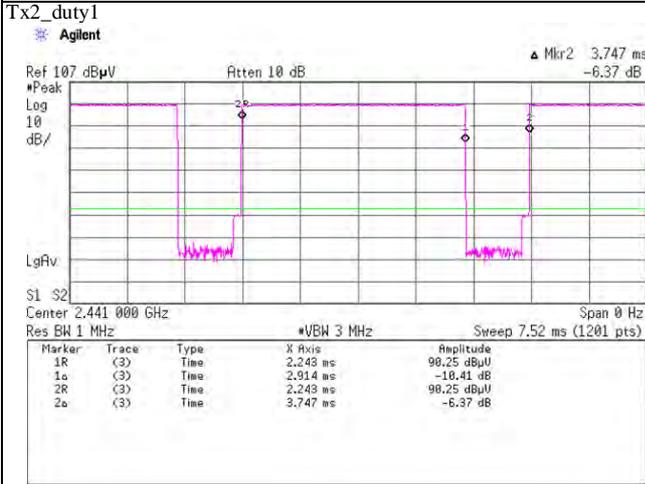
Distance factor: 13GHz-40GHz $20\log(3.0\text{m}/1.0\text{m})= 9.5\text{dB}$

Spurious emission (Radiated)

Tx, Bluetooth, BDR, PRBS9

VBW (AV) Calculation

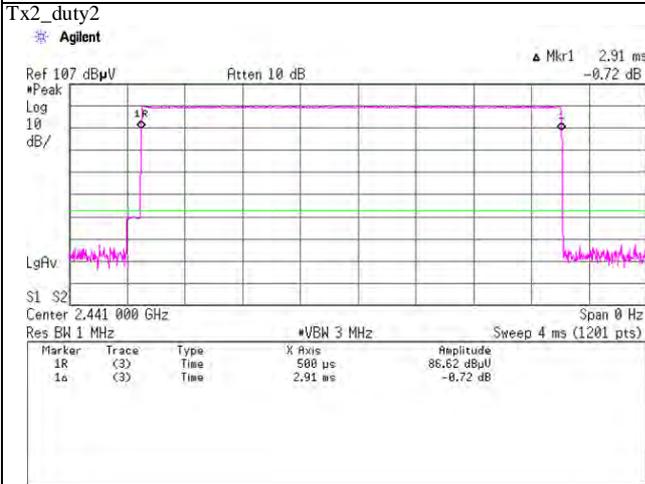
VBW: $1/x = 266\text{Hz} < 270\text{Hz}$
x: (Tx on+Tx off) = 3.75ms



Tx, Bluetooth, BDR, PRBS9

Worst 100ms

***1) Dwell time factor = $20\log(2.91*2/100) = -24.70\text{dB}$**



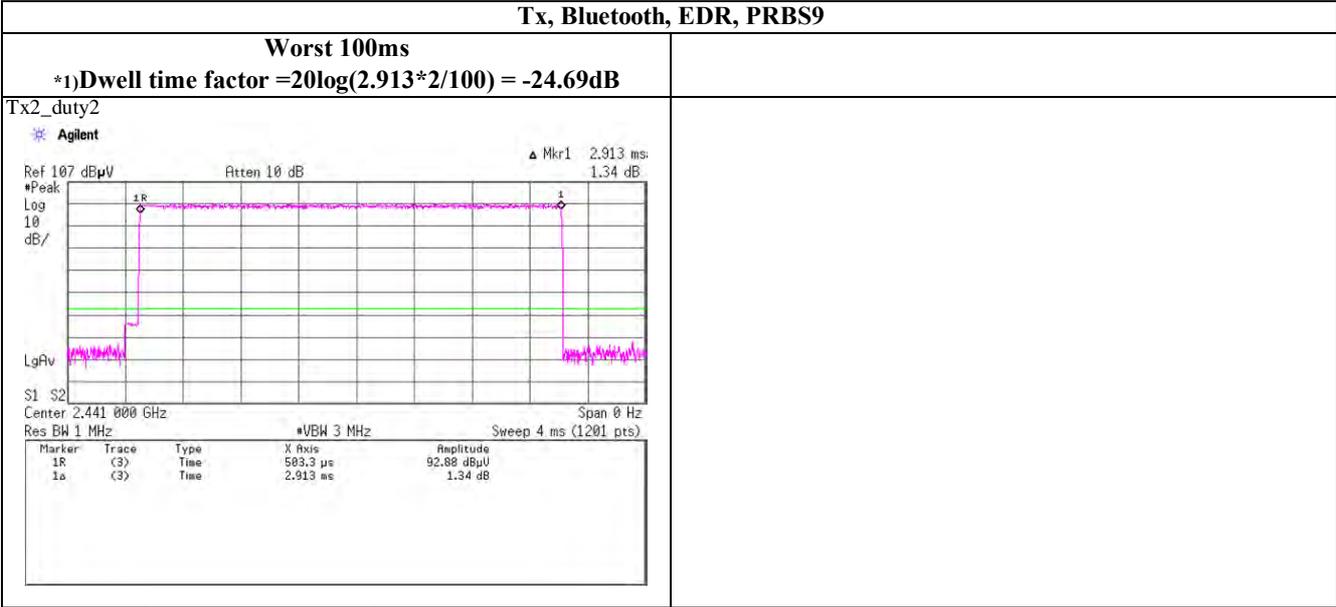
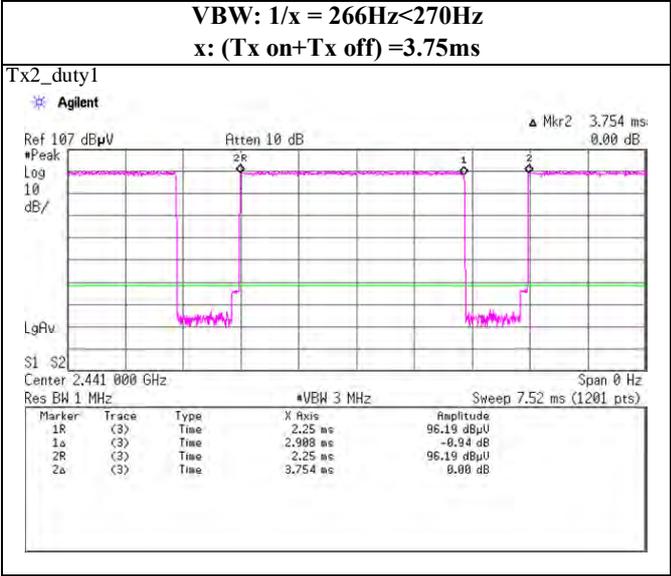
*1) ON time of some channel during 100ms: Twice
 This is the worst case in hopping sequence of Bluetooth.

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Spurious emission (Radiated)

Tx, Bluetooth, EDR, PRBS9

VBW (AV) Calculation



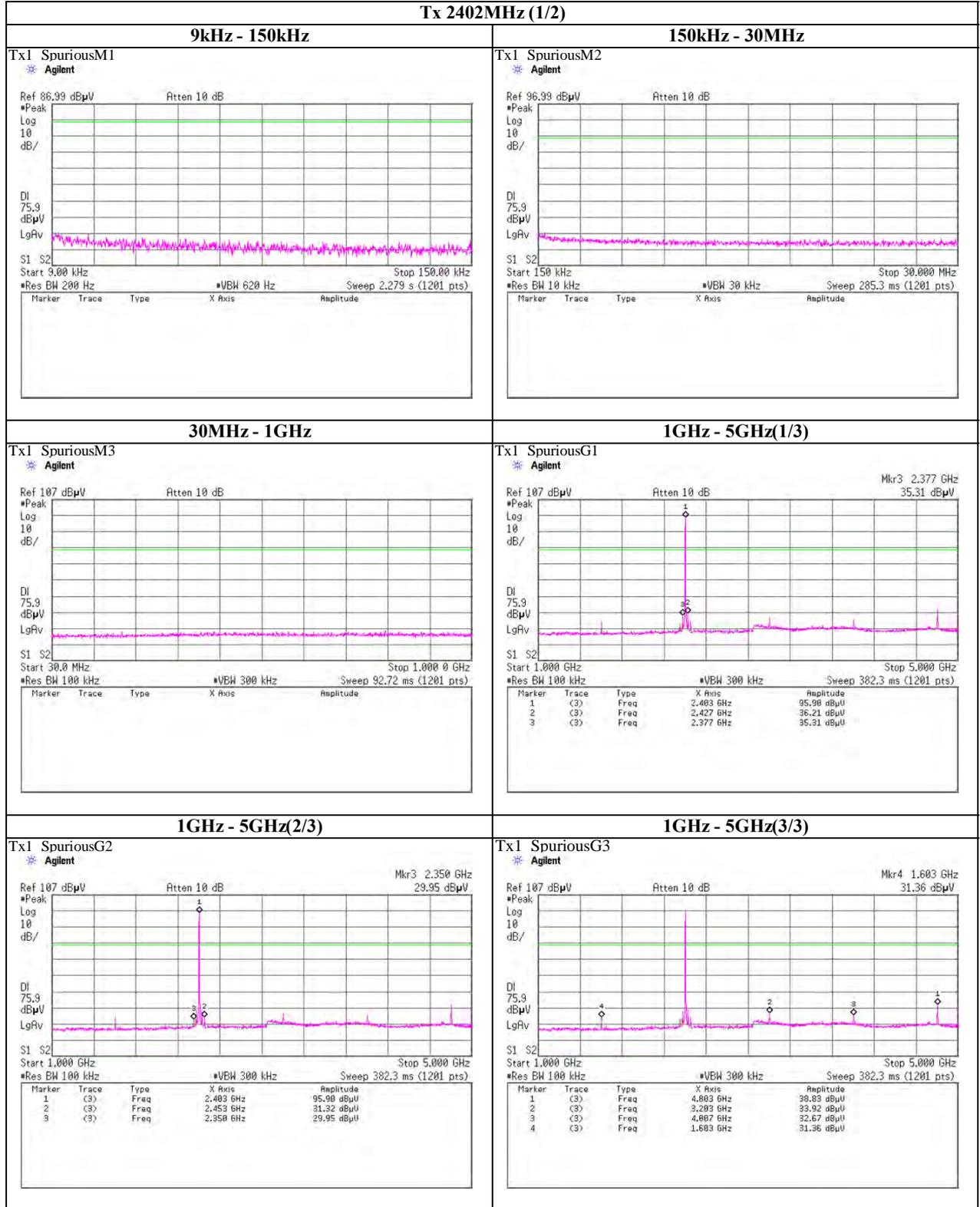
*1) ON time of some channel during 100ms: Twice
 This is the worst case in hopping sequence of Bluetooth.

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Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (1/2)



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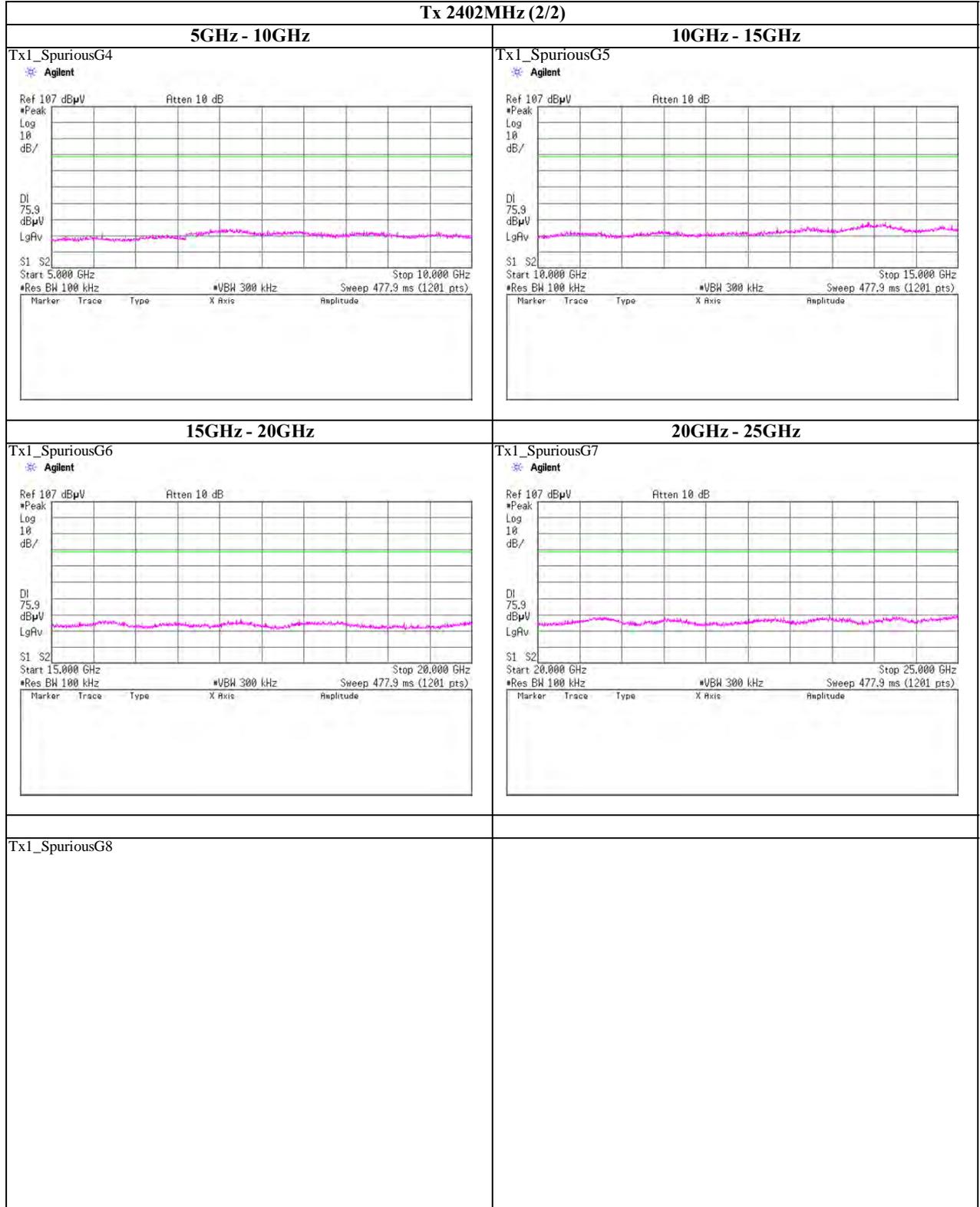
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Spurious emission (Conducted)

Tx, Bluetooth, BDR, PRBS9

Tx 2402MHz (2/2)



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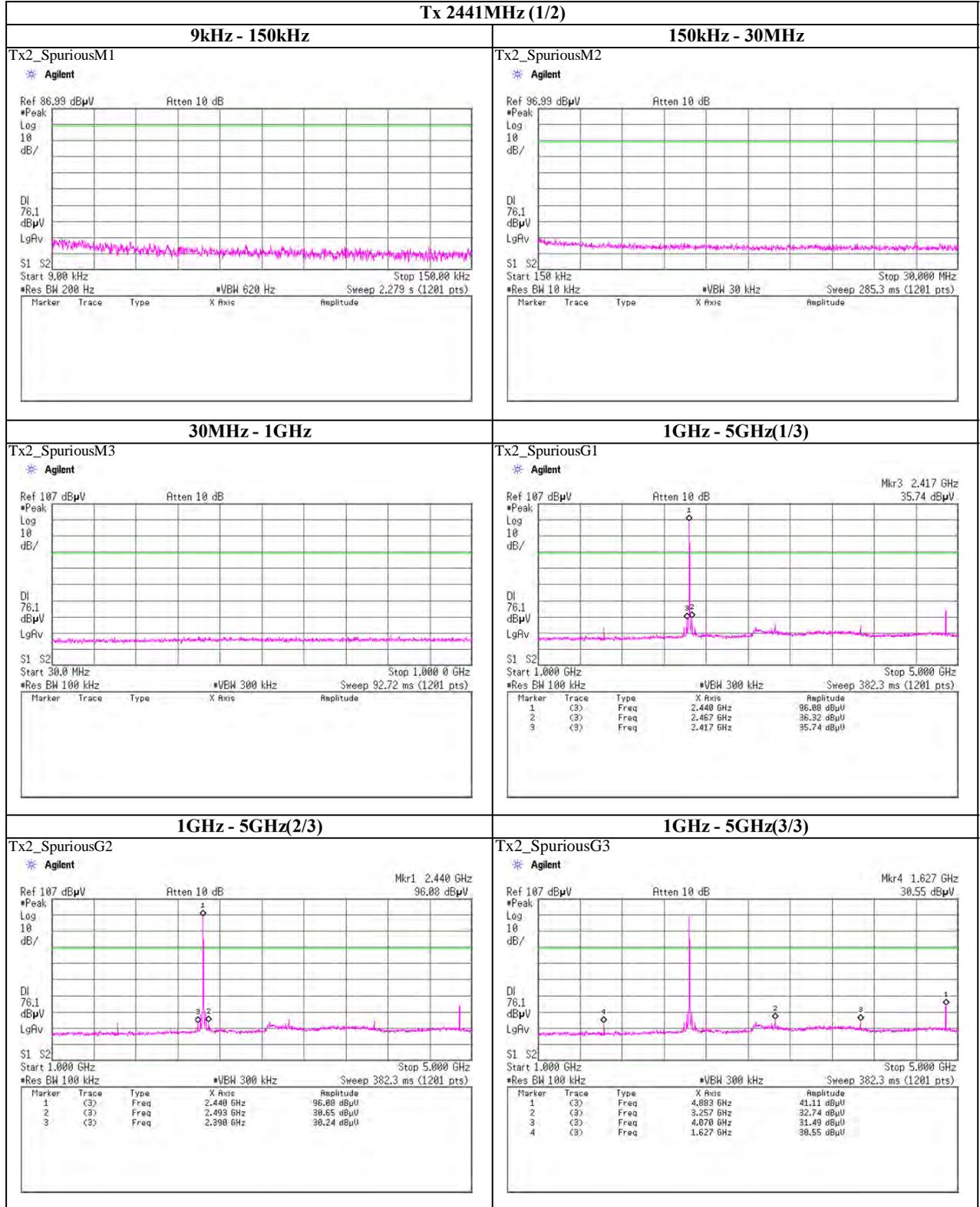
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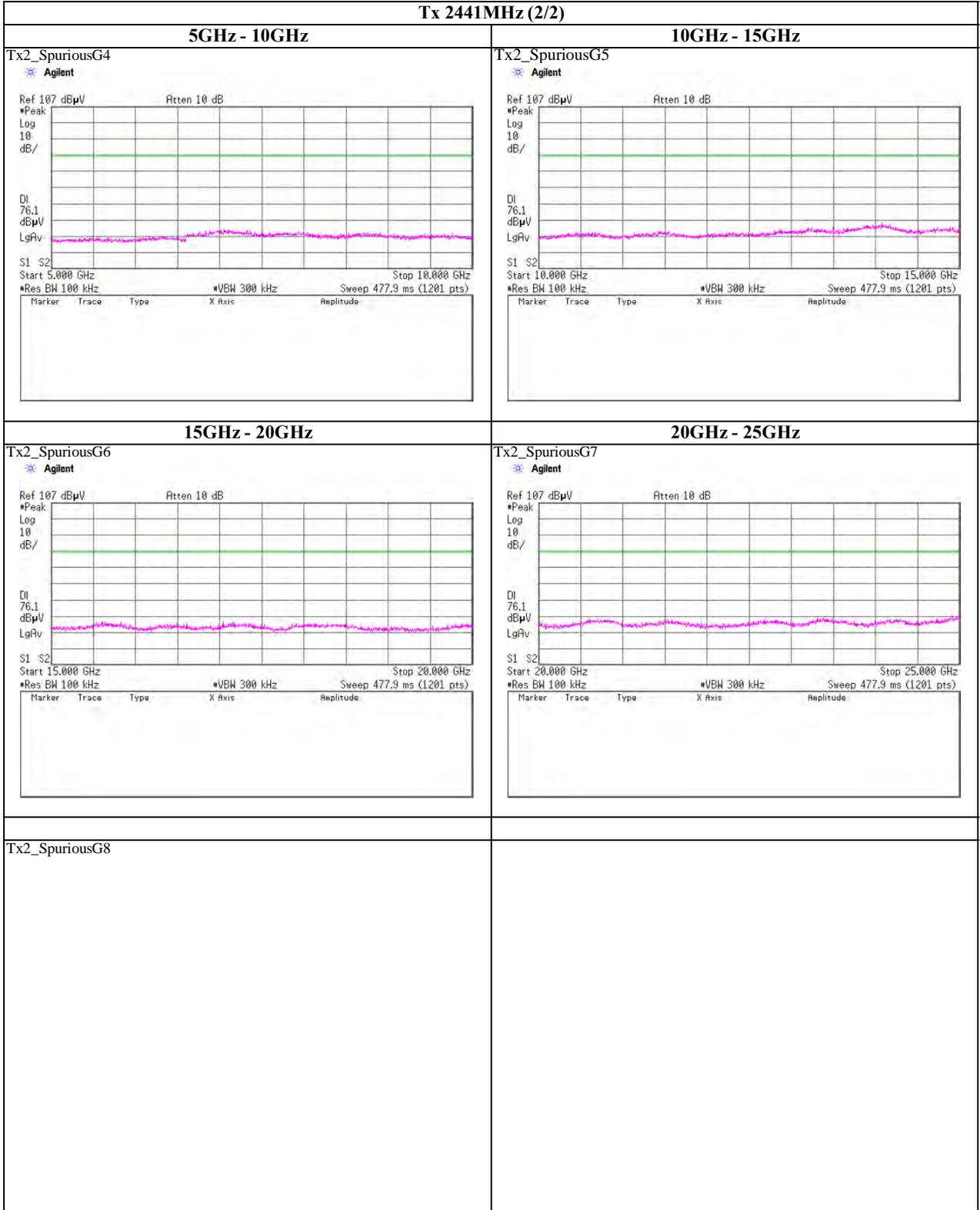
Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9,



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Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9,

Tx 2441MHz (2/2)



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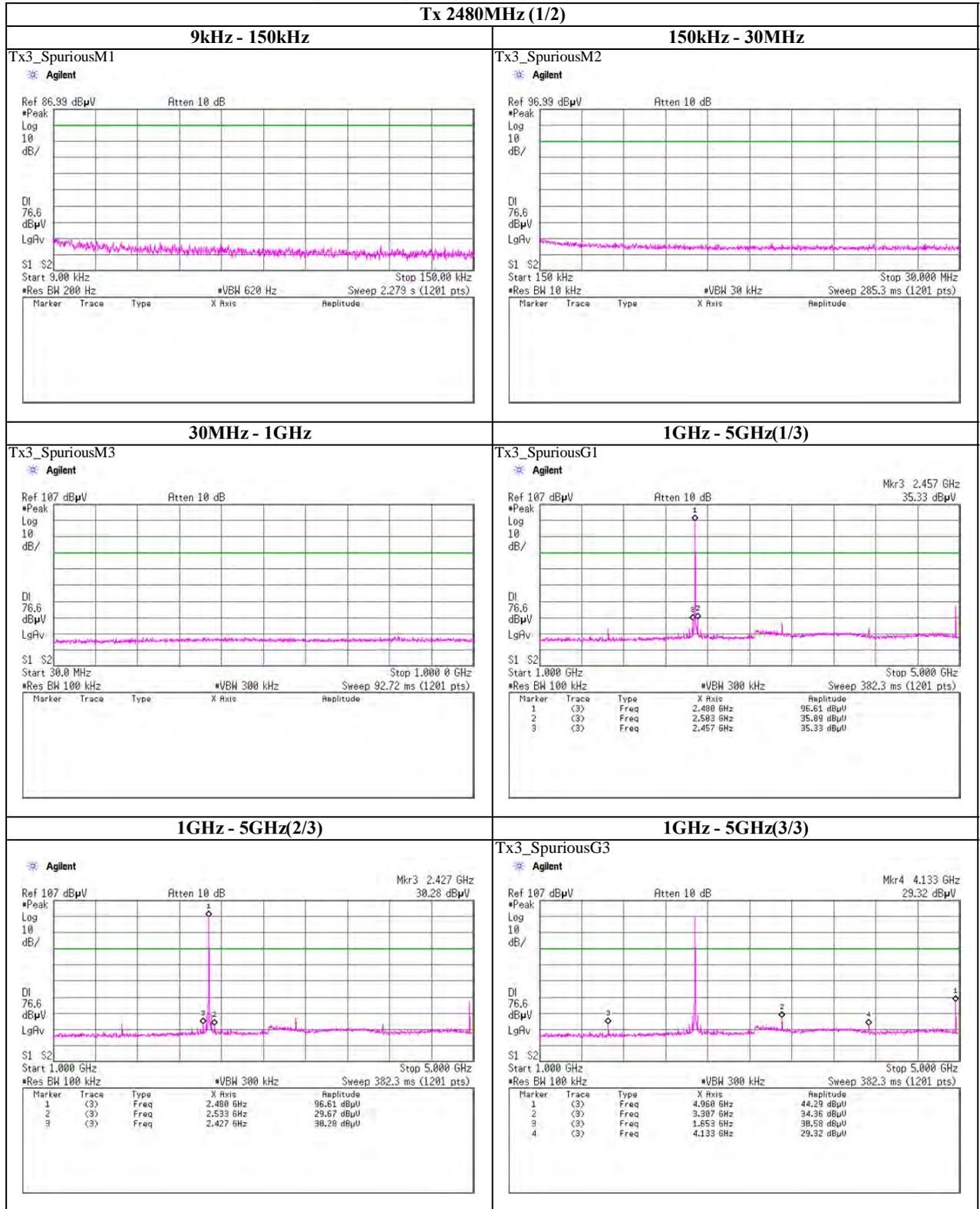
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9,



UL Japan, Inc.

Shonan EMC Lab.

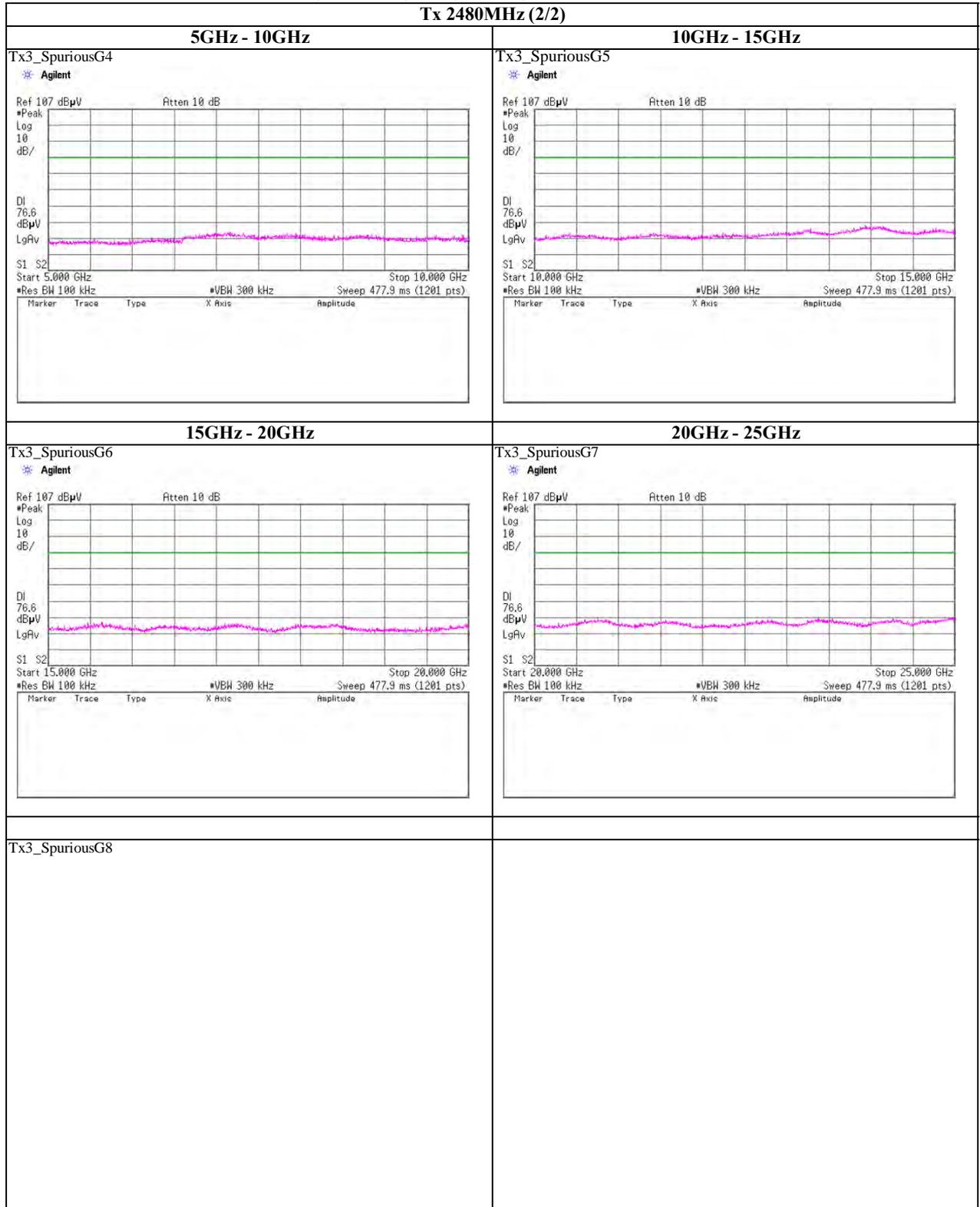
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)
Tx, Bluetooth, BDR, PRBS9,

Tx 2480MHz (2/2)



UL Japan, Inc.

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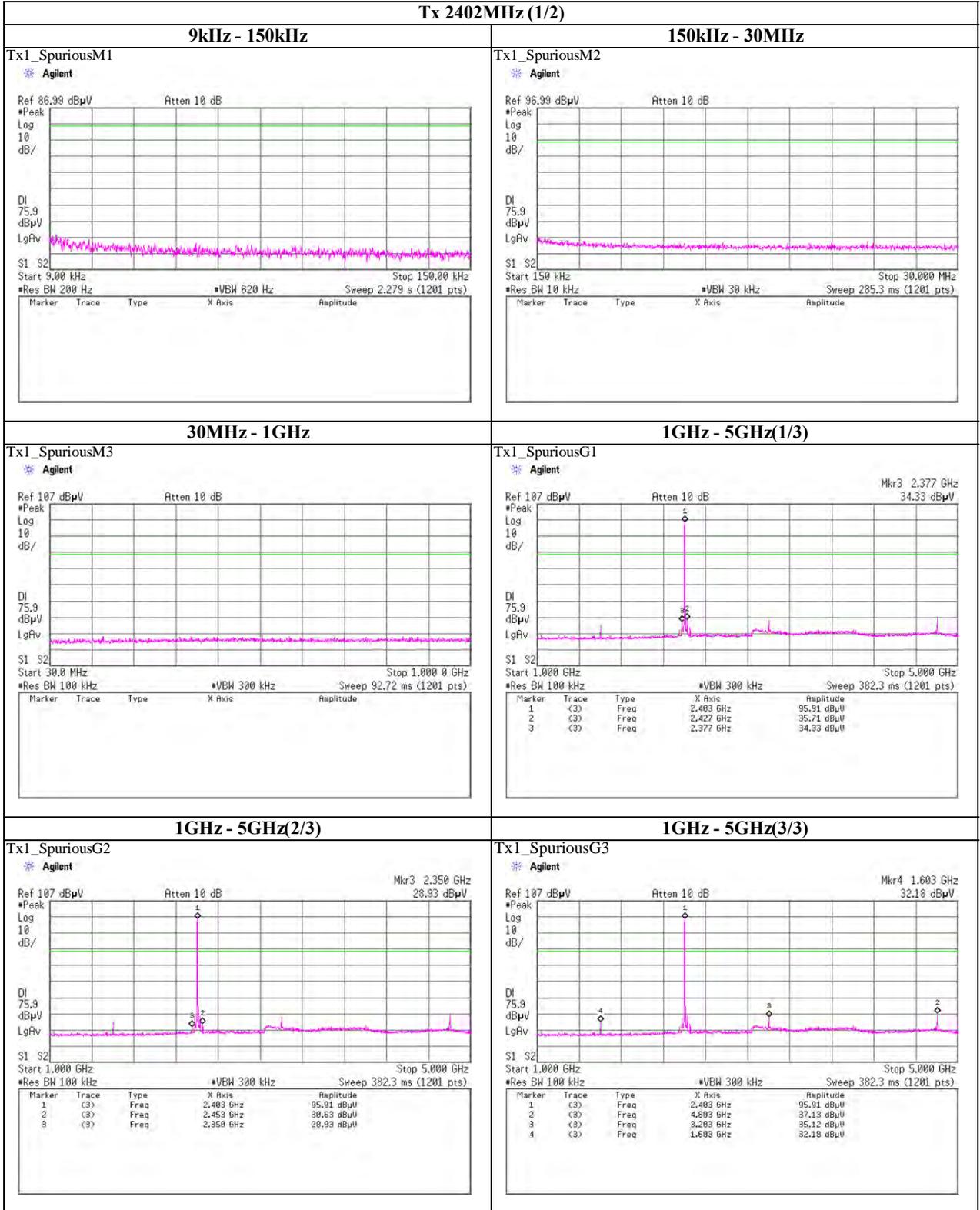
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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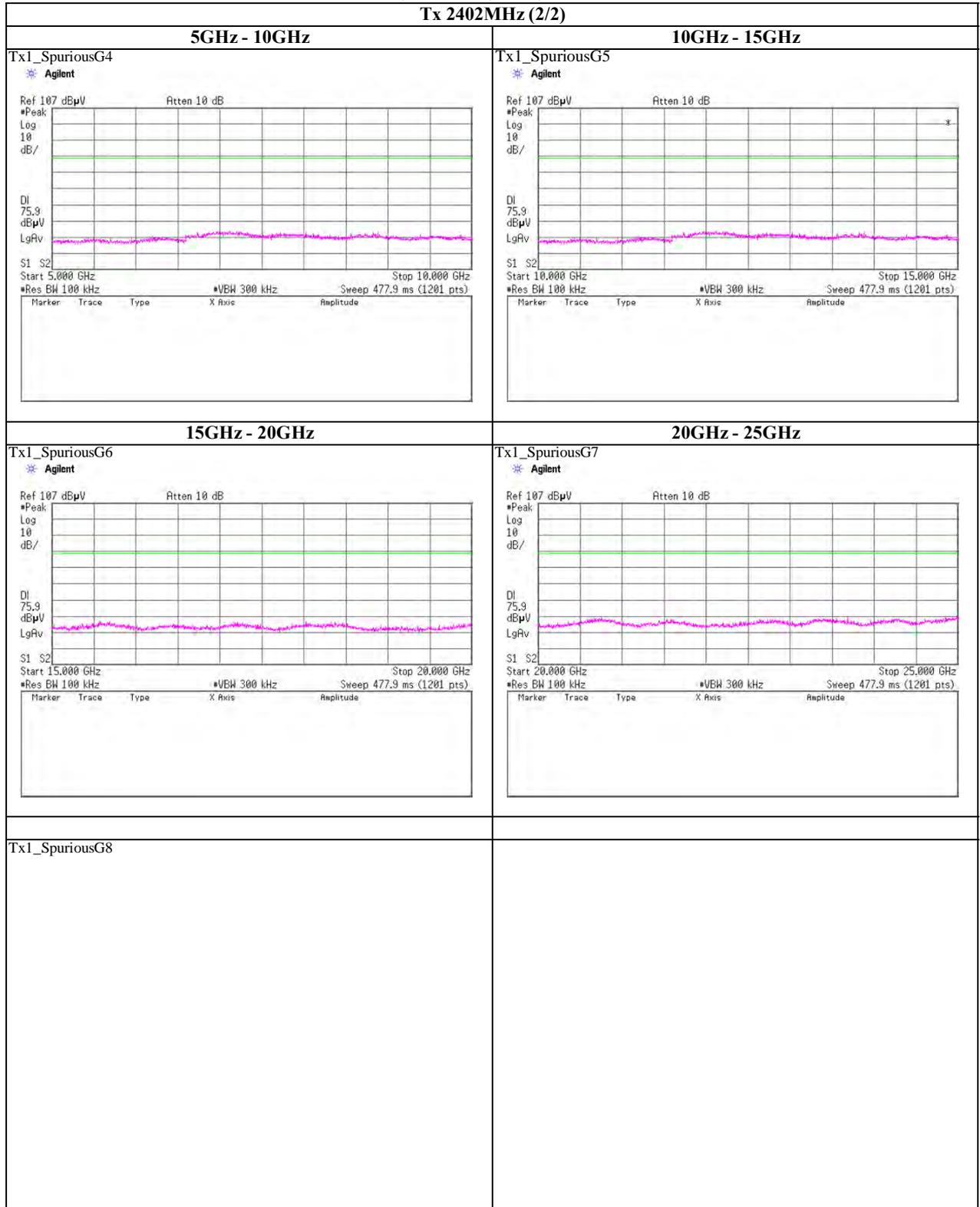
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2402MHz (2/2)



UL Japan, Inc.

Shonan EMC Lab.

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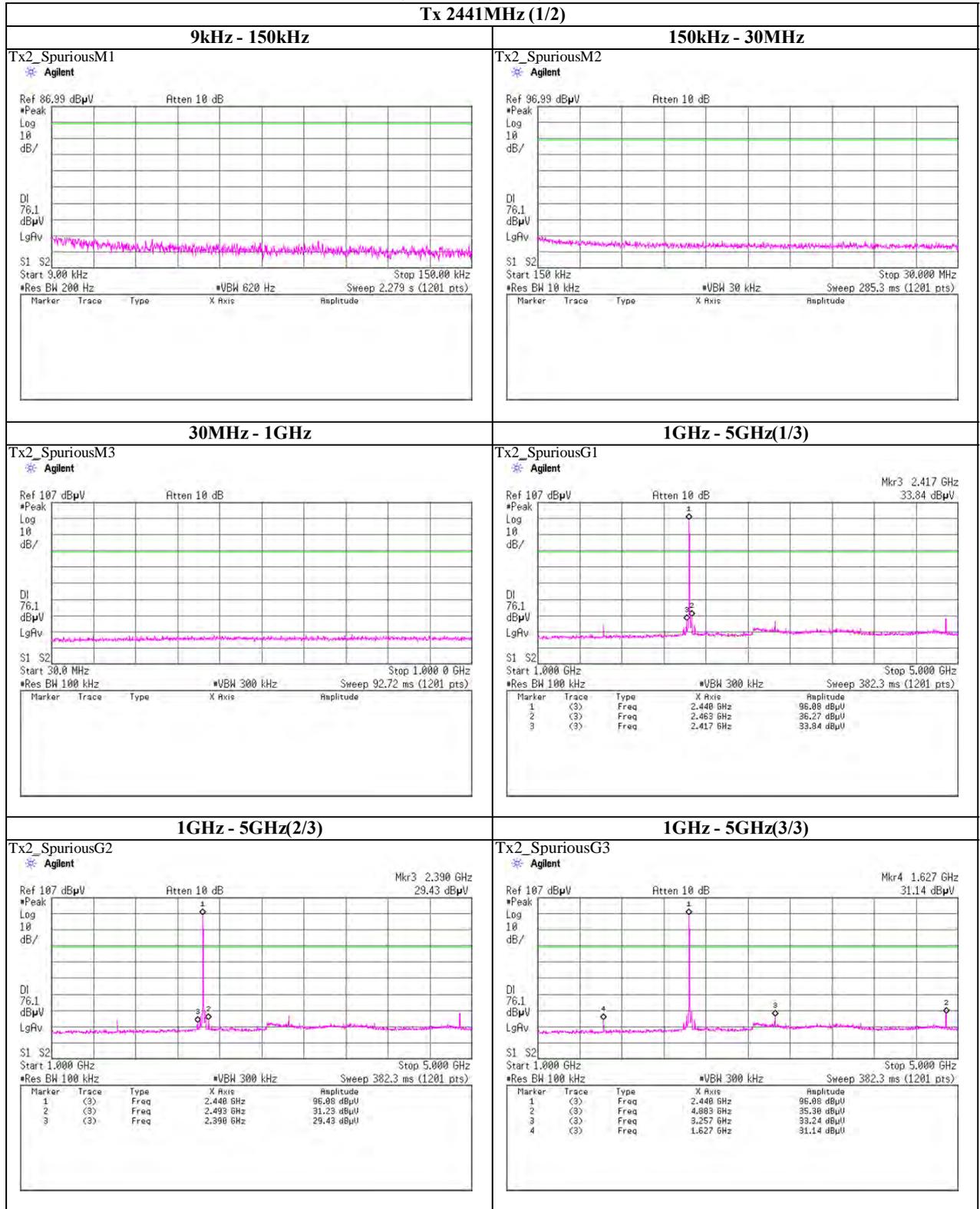
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (1/2)



UL Japan, Inc.

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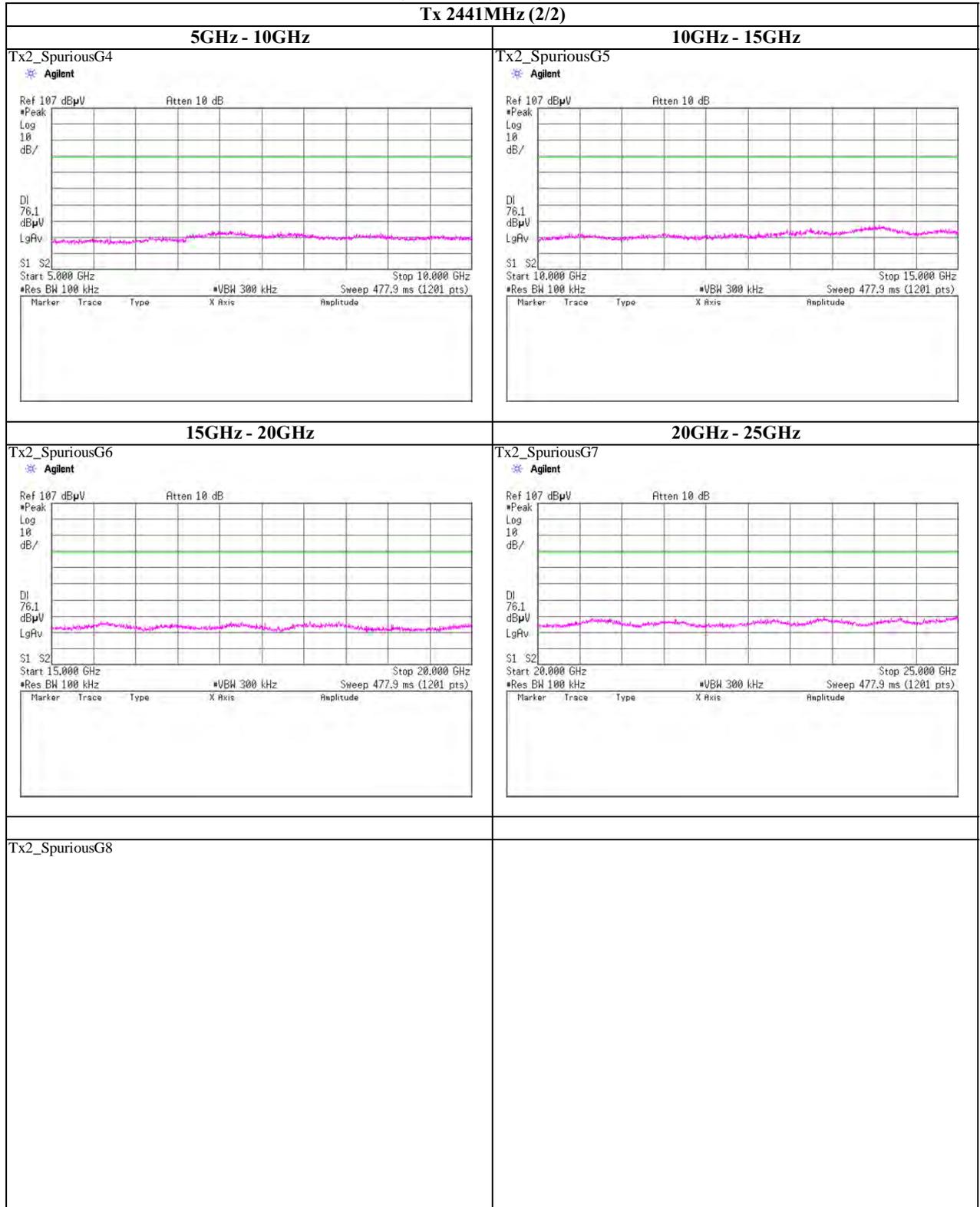
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2441MHz (2/2)



UL Japan, Inc.

Shonan EMC Lab.

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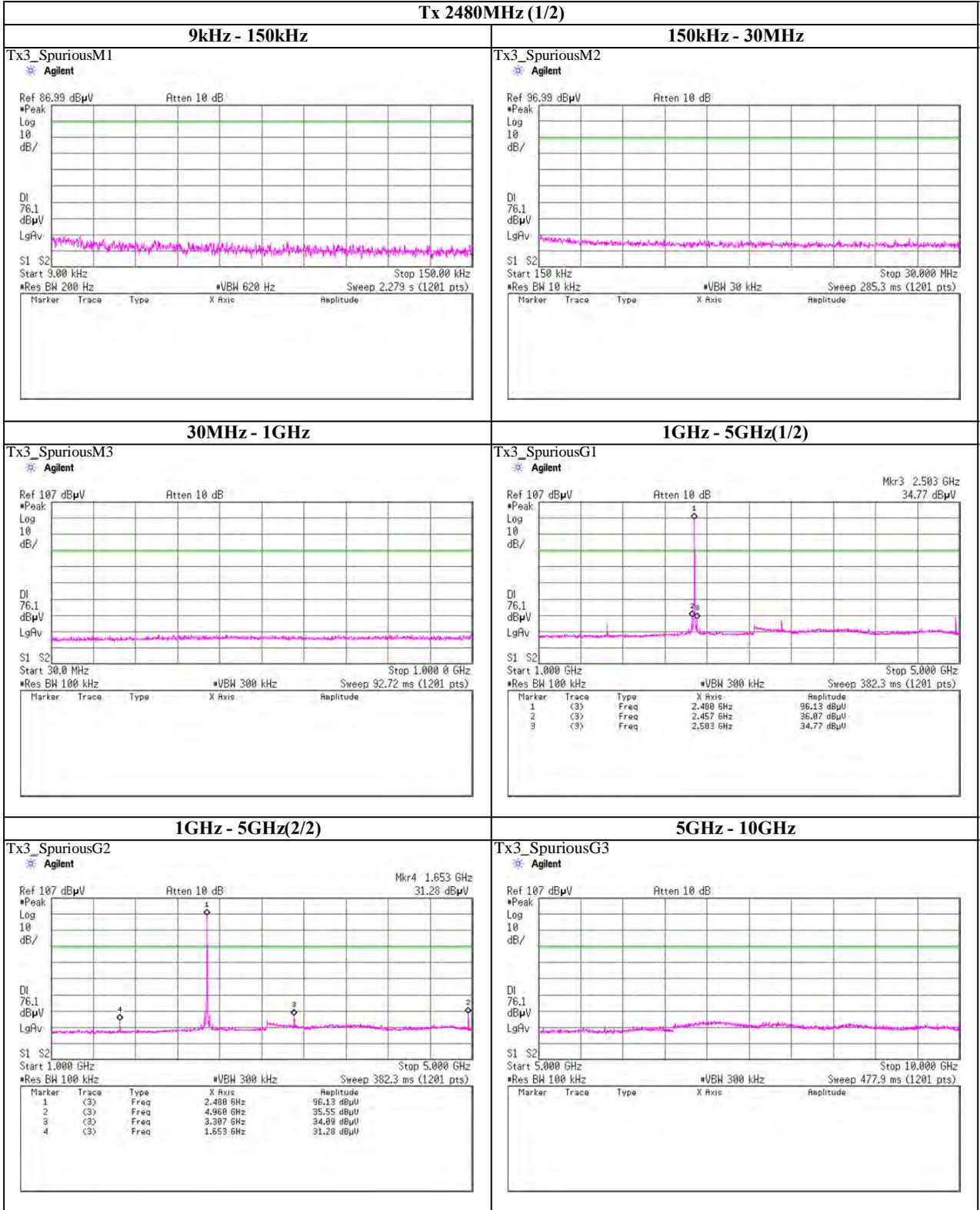
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2480MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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

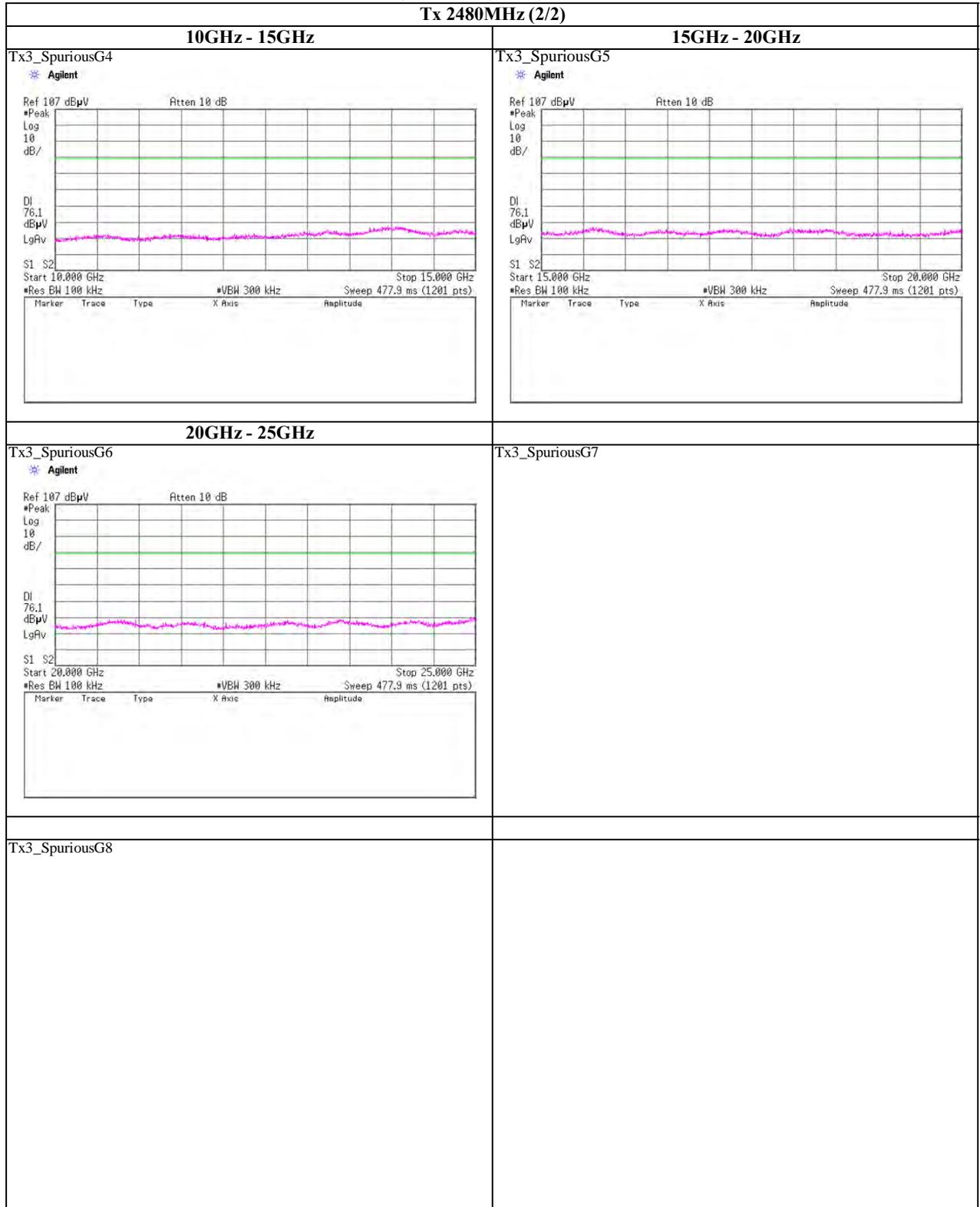
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, Bluetooth, EDR, PRBS9

Tx 2480MHz (2/2)



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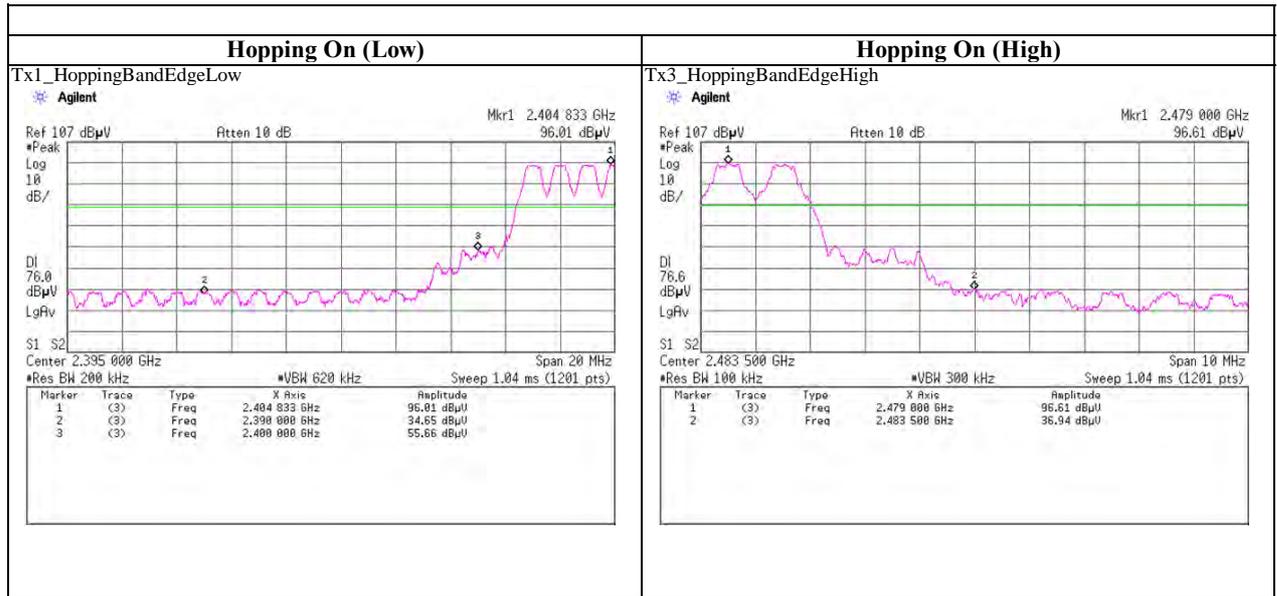
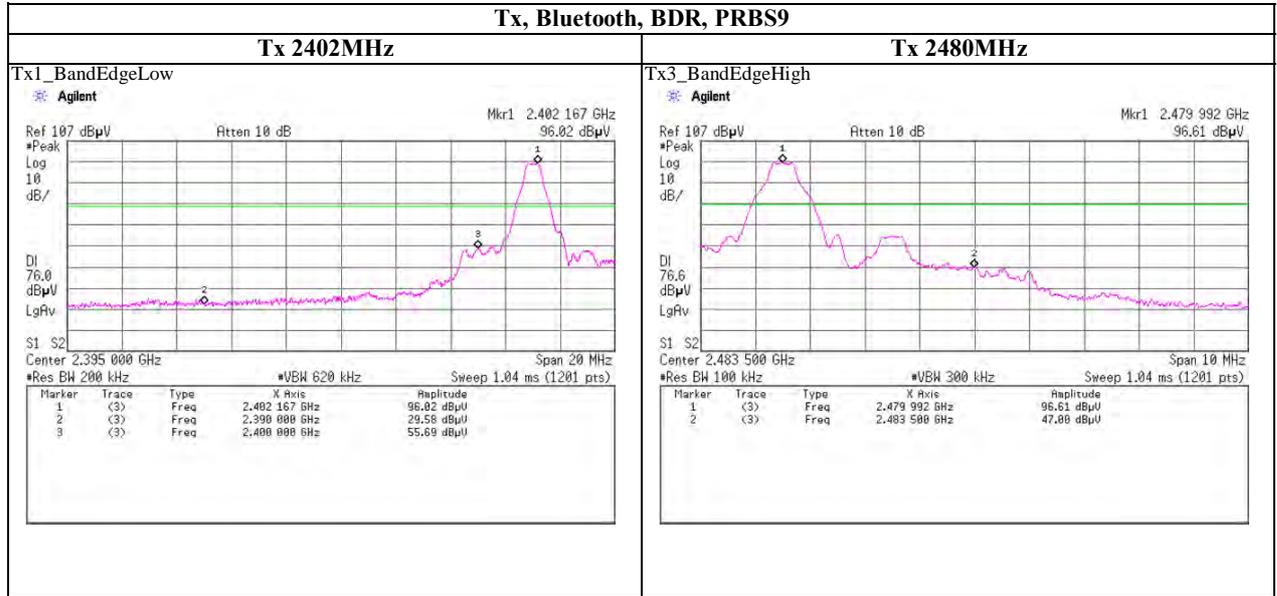
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Spurious emission (Conducted)

Band Edge compliance



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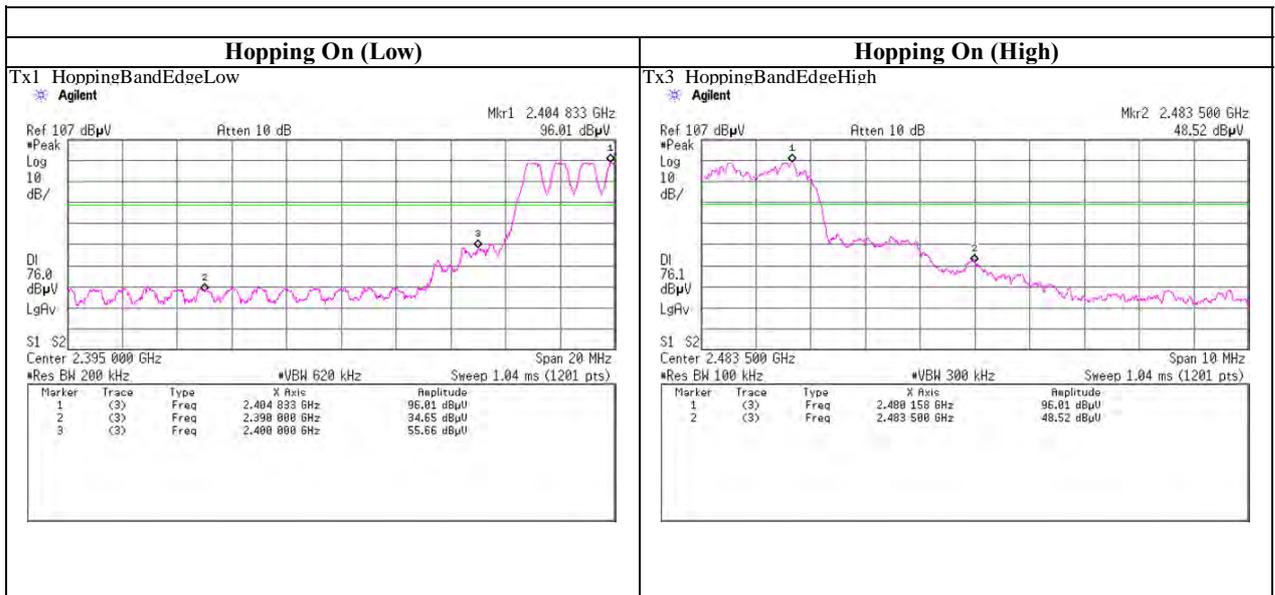
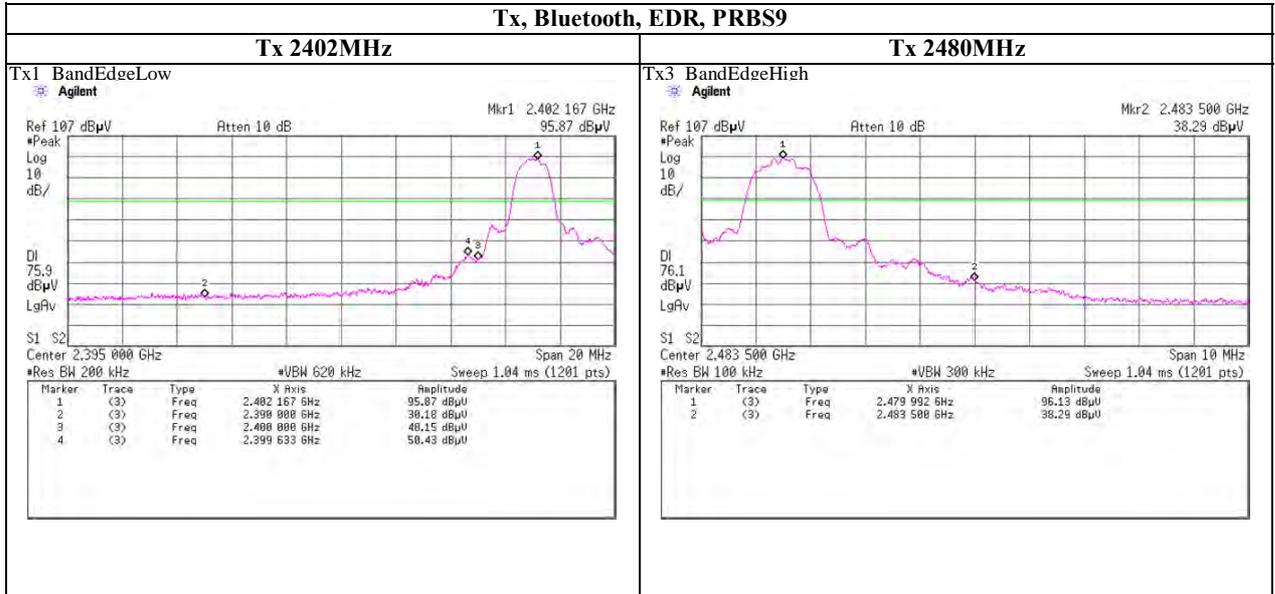
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99% Occupied Bandwidth

Tx, Bluetooth, BDR, PRBS9	
Transmitting(2402MHz)	Transmitting(2441MHz)
<p>Tx1_99OBW * Agilent</p> <p>Center 2.402 000 0 GHz *Res BW 30 kHz *VBW 100 kHz Sweep 10.08 ms (1201 pts) Span 3 MHz</p> <p>Occupied Bandwidth 856.7317 kHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -9.012 kHz x dB Bandwidth 925.332 kHz*</p>	<p>Tx2_99OBW * Agilent</p> <p>Center 2.441 000 0 GHz *Res BW 30 kHz *VBW 100 kHz Sweep 10.08 ms (1201 pts) Span 3 MHz</p> <p>Occupied Bandwidth 857.5794 kHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -10.310 kHz x dB Bandwidth 926.391 kHz*</p>
<p>Tx3_99OBW * Agilent</p> <p>Center 2.480 000 0 GHz *Res BW 30 kHz *VBW 100 kHz Sweep 10.08 ms (1201 pts) Span 3 MHz</p> <p>Occupied Bandwidth 856.1087 kHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -9.963 kHz x dB Bandwidth 929.201 kHz*</p>	<p>Tx1_Hopping99OBW * Agilent</p> <p>Center 2.441 000 GHz *Res BW 1 MHz *VBW 3 MHz Sweep 1.04 ms (1201 pts) Span 100 MHz</p> <p>Occupied Bandwidth 78.5935 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error 19.278 kHz x dB Bandwidth 80.804 MHz*</p>
(Reference) Transmitting(Inquiry)	(Reference) Transmitting(Inquiry, Hopping)
<p>Tx4_99OBW * Agilent</p> <p>Center 2.441 000 0 GHz *Res BW 30 kHz *VBW 100 kHz Sweep 8.4 ms (1201 pts) Span 2.5 MHz</p> <p>Occupied Bandwidth 855.0199 kHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error 7.786 kHz x dB Bandwidth 758.122 kHz*</p>	<p>Tx4_Hopping99OBW * Agilent</p> <p>Center 2.441 000 GHz *Res BW 1 MHz *VBW 3 MHz Sweep 1.04 ms (1201 pts) Span 100 MHz</p> <p>Occupied Bandwidth 77.9589 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -487.495 kHz x dB Bandwidth 79.711 MHz*</p>

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99% Occupied Bandwidth

Tx, Bluetooth, EDR, PRBS9	
Transmitting(2402MHz)	Transmitting(2441MHz)
<p>Tx1_99OBW Agilent</p> <p>Occupied Bandwidth 1.1693 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -1.526 kHz x dB Bandwidth 1.258 MHz*</p>	<p>Tx2_99OBW Agilent</p> <p>Occupied Bandwidth 1.1650 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -2.074 kHz x dB Bandwidth 1.258 MHz*</p>
Transmitting(2480MHz)	Transmitting (Hopping On)
<p>Tx3_99OBW Agilent</p> <p>Occupied Bandwidth 1.1615 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error -3.117 kHz x dB Bandwidth 1.263 MHz*</p>	<p>Tx1_Hopping99OBW Agilent</p> <p>Occupied Bandwidth 78.7216 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -20.00 dB</p> <p>Transmit Freq Error 11.922 kHz x dB Bandwidth 81.234 MHz*</p>

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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	AT/RE	2010/11/16 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2011/03/23 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	AT	2011/03/23 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2011/04/12 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2011/04/12 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2011/03/02 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2011/02/17 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 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	2011/04/28 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2010/10/15 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2011/02/23 * 12
STR-03	Test Receiver	Rohde & Schwarz	ES140	100054/040	RE	2011/07/28 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2010/09/13 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFLMF)	-	RE	-
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2011/04/28 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2010/08/17 * 12
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-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2011/03/15 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2011/03/16 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2011/03/16 * 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 valid calibrations . Each measurement data is traceable to the national or international standards .

Test Item :

RE: Radiated emission,

AT: Antenna terminal conducted test