

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded room
Date : 2011/03/02

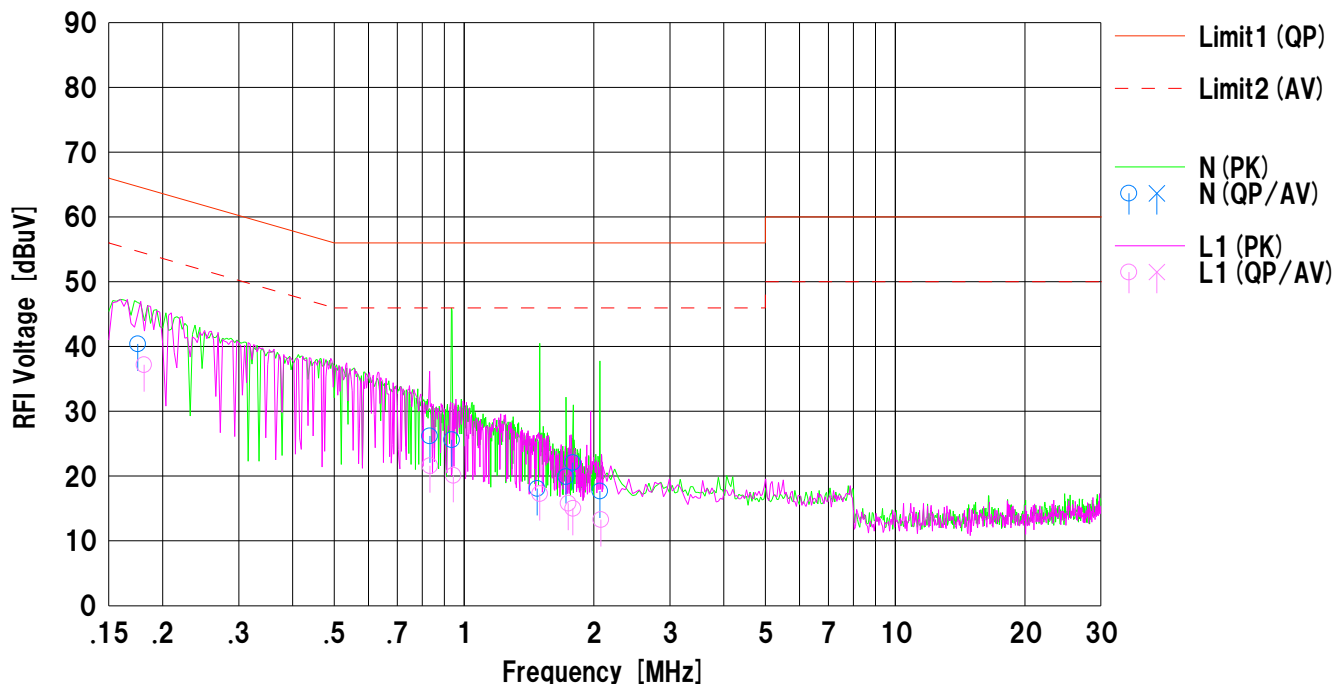
Company : ALPS Electric Co., Ltd.
Kind of E.U.T. : Wireless LAN Module
Model No. : UGFZ1
Serial No. : 13

Mode : Transmitting (802.11b_2412MHz)
Report No. : 31GE0143-SH-02-A
Power : DC3.6V
Temp./Humi. : 23°C / 33%

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.17492	26.6	---	13.8	40.4	---	64.7	54.7	24.3	---	N	
2	0.83269	13.5	---	12.7	26.2	---	56.0	46.0	29.8	---	N	
3	0.93558	12.9	---	12.7	25.6	---	56.0	46.0	30.4	---	N	
4	1.47733	5.3	---	12.8	18.1	---	56.0	46.0	37.9	---	N	
5	1.72500	7.1	---	12.8	19.9	---	56.0	46.0	36.1	---	N	
6	1.78694	9.3	---	12.8	22.1	---	56.0	46.0	33.9	---	N	
7	2.06722	4.9	---	12.8	17.7	---	56.0	46.0	38.3	---	N	
8	0.18085	23.4	---	13.8	37.2	---	64.4	54.4	27.2	---	L1	
9	0.83333	8.9	---	12.7	21.6	---	56.0	46.0	34.4	---	L1	
10	0.94474	7.4	---	12.7	20.1	---	56.0	46.0	35.9	---	L1	
11	1.49686	4.5	---	12.8	17.3	---	56.0	46.0	38.7	---	L1	
12	1.74471	3.0	---	12.8	15.8	---	56.0	46.0	40.2	---	L1	
13	1.78983	2.2	---	12.8	15.0	---	56.0	46.0	41.0	---	L1	
14	2.07684	0.5	---	12.8	13.3	---	56.0	46.0	42.7	---	L1	

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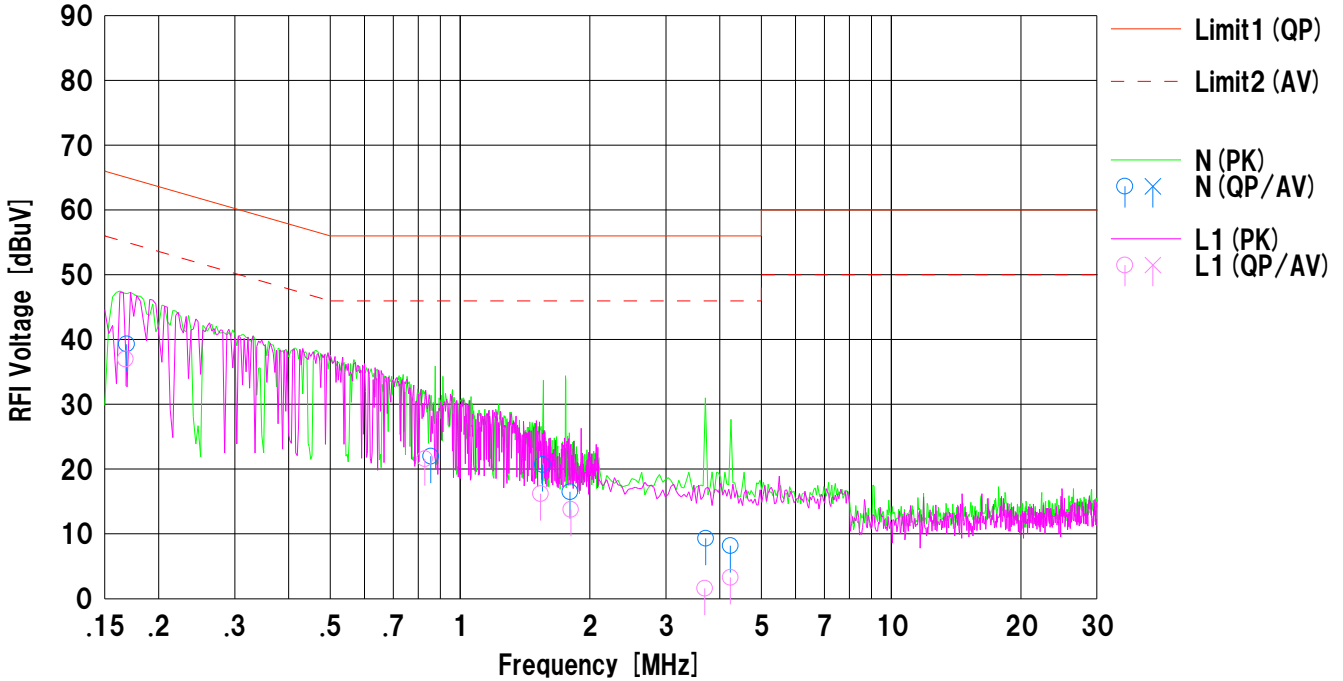
Company : ALPS Electric Co., Ltd.
Kind of E.U.T. : Wireless LAN Module
Model No. : UGFZ1
Serial No. : 13

Mode : Transmitting (802.11b_2437MHz)
Report No. : 31GE0143-SH-02-A
Power : DC3.6V
Temp./Humi. : 23°C / 33%

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.16843	25.7	---	13.6	39.3	---	65.0	55.0	25.7	---	N	
2	0.85545	9.3	---	12.7	22.0	---	56.0	46.0	34.0	---	N	
3	1.55297	7.9	---	12.8	20.7	---	56.0	46.0	35.3	---	N	
4	1.79792	3.7	---	12.8	16.5	---	56.0	46.0	39.5	---	N	
5	3.71506	-3.7	---	13.0	9.3	---	56.0	46.0	46.7	---	N	
6	4.23429	-4.8	---	13.0	8.2	---	56.0	46.0	47.8	---	N	
7	0.16739	23.2	---	13.8	37.0	---	65.0	55.0	28.0	---	L1	
8	0.82853	8.9	---	12.7	21.6	---	56.0	46.0	34.4	---	L1	
9	1.53710	3.4	---	12.8	16.2	---	56.0	46.0	39.8	---	L1	
10	1.80673	1.0	---	12.8	13.8	---	56.0	46.0	42.2	---	L1	
11	3.69439	-11.4	---	13.0	1.6	---	56.0	46.0	54.4	---	L1	
12	4.23718	-9.7	---	13.0	3.3	---	56.0	46.0	52.7	---	L1	

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UL Japan, Inc. Shonan EMC Lab. No.1 Shielded room
Date : 2011/03/02

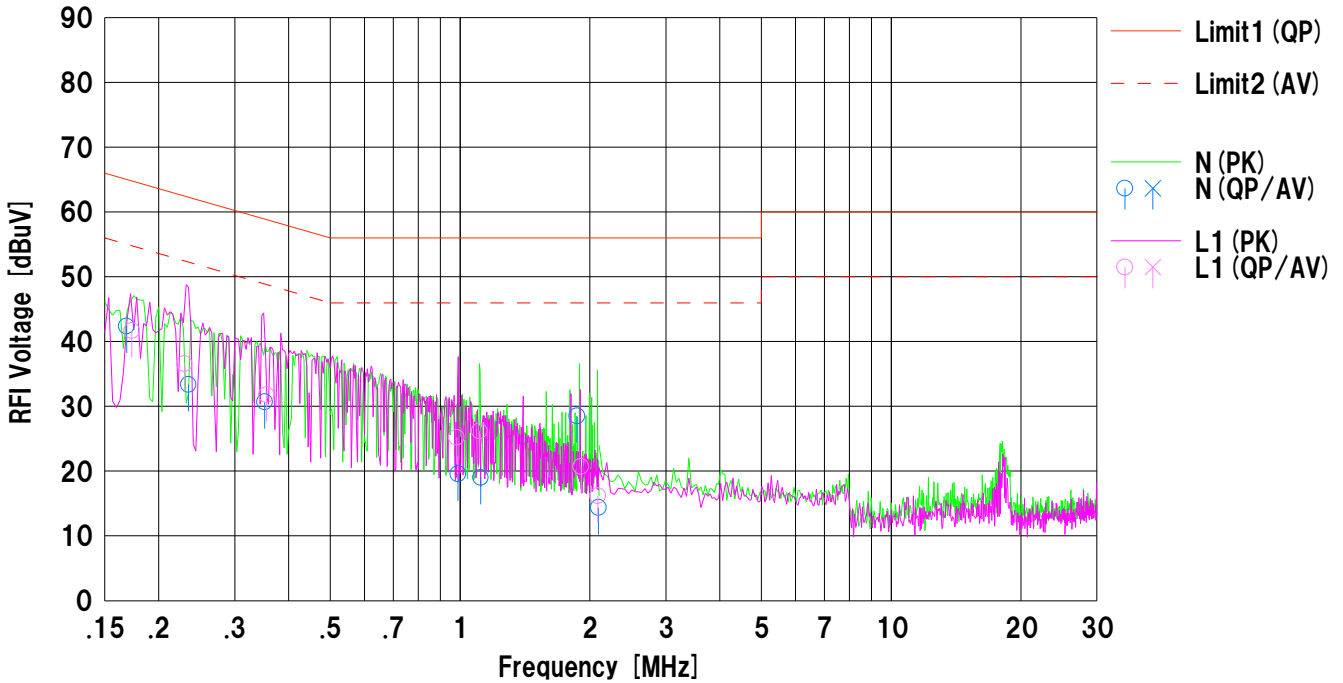
Company : ALPS Electric Co., Ltd.
Kind of E.U.T. : Wireless LAN Module
Model No. : UGFZ1
Serial No. : 13

Mode : Transmitting (802.11b_2462MHz)
Report No. : 31GE0143-SH-02-A
Power : DC3.6V
Temp./Humi. : 23°C / 33%

Remarks : -

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

Engineer : Hikaru Shirasawa

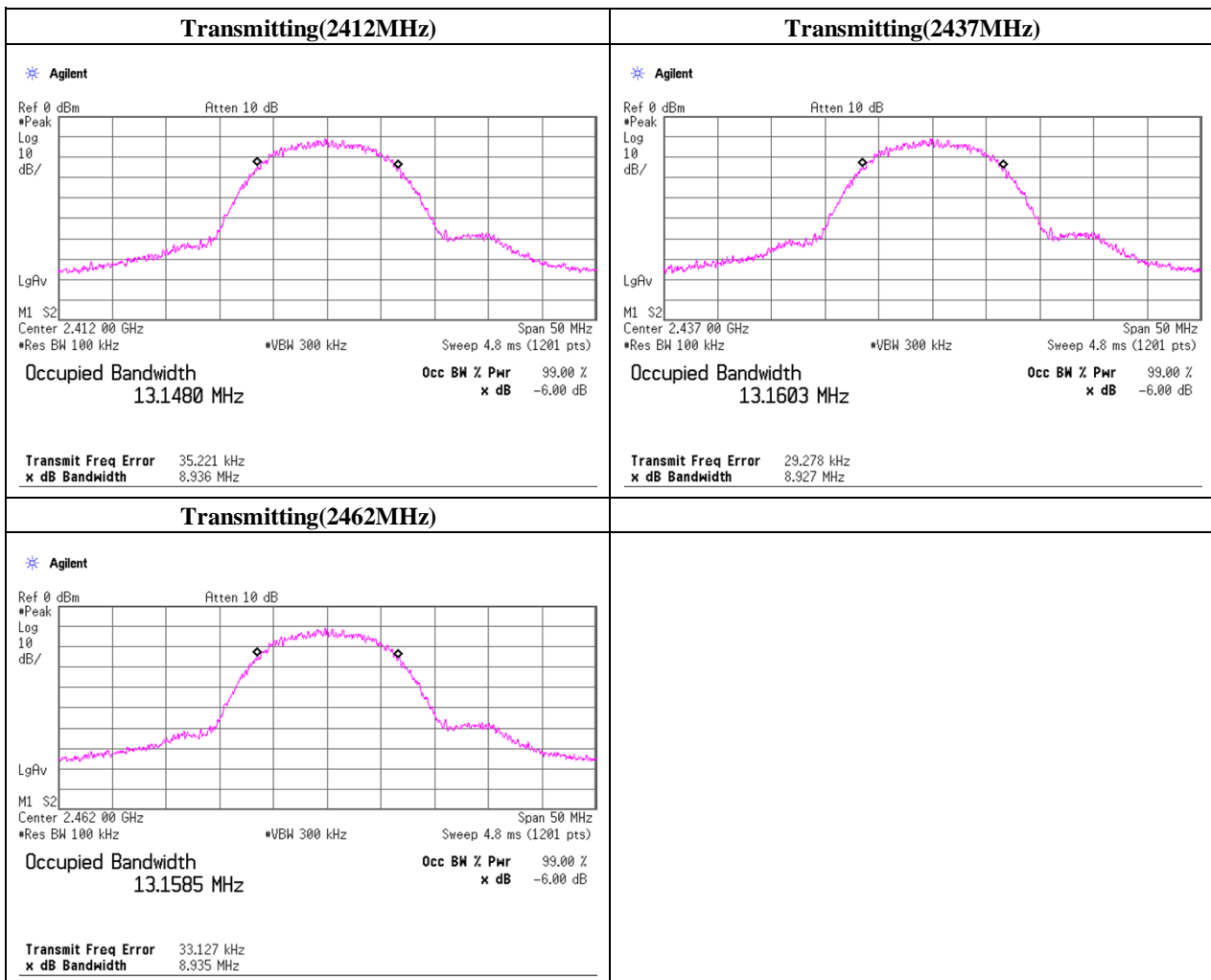


No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.16827	28.9	---	13.5	42.4	---	65.0	55.0	22.6	---	N	
2	0.23413	20.5	---	12.9	33.4	---	62.3	52.3	28.9	---	N	
3	0.35216	17.8	---	12.9	30.7	---	58.9	48.9	28.2	---	N	
4	0.98839	6.9	---	12.7	19.6	---	56.0	46.0	36.4	---	N	
5	1.11499	6.2	---	12.8	19.0	---	56.0	46.0	37.0	---	N	
6	1.86779	15.7	---	12.8	28.5	---	56.0	46.0	27.5	---	N	
7	2.09360	1.6	---	12.8	14.4	---	56.0	46.0	41.6	---	N	
8	0.17300	28.2	---	13.5	41.7	---	64.8	54.8	23.1	---	L1	
9	0.22936	23.7	---	12.9	36.6	---	62.4	52.4	25.8	---	L1	
10	0.35538	18.9	---	12.9	31.8	---	58.8	48.8	27.0	---	L1	
11	0.98087	12.5	---	12.7	25.2	---	56.0	46.0	30.8	---	L1	
12	1.10870	13.4	---	12.8	26.2	---	56.0	46.0	29.8	---	L1	
13	1.90833	7.9	---	12.8	20.7	---	56.0	46.0	35.3	---	L1	
14	2.08622	3.4	---	12.8	16.2	---	56.0	46.0	39.8	---	L1	

-6dB Bandwidth

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date 2011/2/22
 Temperature / Humidity 21deg.C. / 27%RH
 Engineer Hikaru Shirasawa
 Mode Tx, IEEE802.11b, 11Mbps, PN9,

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	13.148	> 0.500
2437.0000	13.160	> 0.500
2462.0000	13.159	> 0.500



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Peak Output Power (Conducted)

Test place : UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date : 2011/2/22
 Temperature / Humidity : 21deg.C. 27%RH
 Engineer : Hikaru Shirasawa
 Mode : Tx, IEEE802.11b, 11Mbps, PN9,

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	0.66	1.28	9.97	11.91	15.52	30.00	1000	18.09
Mid	2437.0	0.77	1.28	9.97	12.02	15.93	30.00	1000	17.98
High	2462.0	0.65	1.28	9.97	11.90	15.50	30.00	1000	18.10

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.

[Pre check]

Antenna 0

Data Rate [Mbps]	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
1	2437.0	0.70	1.28	9.97	11.95	15.67	30.00	1000	18.05
2	2437.0	0.75	1.28	9.97	12.00	15.85	30.00	1000	18.00
5.5	2437.0	0.72	1.28	9.97	11.97	15.74	30.00	1000	18.03
11	2437.0	0.77	1.28	9.97	12.02	15.93	30.00	1000	17.98

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.2 & 3 Semi Anechoic Chamber
Date	2011/2/22	2011/2/27
Temperature / Humidity	21deg.C. 27%RH	22deg.C. 31%RH
Engineer	Hikaru Shirasawa	Akio Hayashi
	(above 1GHz)	(below 1GHz)
Mode	Tx, 2412 MHz	
	IEEE802.11b, 11Mbps, PN9,	

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.	154.623	QP	42.0	14.8	8.5	31.8	33.5	43.5	10.0	211	68	
Hori.	157.710	QP	42.8	15.1	8.5	31.8	34.6	43.5	8.9	180	76	
Hori.	423.733	QP	46.6	16.9	7.3	31.6	39.2	46.0	6.8	100	268	
Hori.	430.051	QP	46.9	17.0	7.3	31.6	39.6	46.0	6.4	100	267	
Hori.	652.790	QP	31.5	19.8	8.4	31.6	28.1	46.0	17.9	130	109	
Hori.	2279.321	PK	44.9	27.4	13.2	40.2	45.3	73.9	28.6	100	215	
Hori.	2323.267	PK	42.2	27.5	13.3	40.2	42.8	73.9	31.1	100	215	
Hori.	2390.000	PK	47.2	27.5	13.3	40.2	47.8	73.9	26.1	100	215	
Hori.	2456.078	PK	45.3	27.6	13.3	40.2	46.0	73.9	27.9	100	215	
Hori.	2500.352	PK	42.9	27.6	13.4	40.1	43.8	73.9	30.1	100	215	
Hori.	2543.873	PK	43.5	27.7	13.4	40.2	44.4	73.9	29.5	100	215	
Hori.	2587.476	PK	45.4	27.9	13.4	40.3	46.4	73.9	27.5	100	215	
Hori.	4824.650	PK	57.2	31.6	5.7	40.1	54.4	73.9	19.5	100	34	
Hori.	7236.986	PK	48.0	36.5	6.8	38.3	53.0	73.9	20.9	100	36	
Hori.	9648.231	PK	48.2	37.9	8.0	37.4	56.7	73.9	17.2	100	75	
Hori.	12060.760	PK	45.1	39.3	9.2	38.3	55.3	73.9	18.6	100	299	
Hori.	14472.310	PK	48.0	41.3	0.6	38.4	51.5	73.9	22.4	100	54	
Hori.	2279.321	AV	33.0	27.4	13.2	40.2	33.4	53.9	20.5	100	215	VBW=10Hz
Hori.	2323.267	AV	33.1	27.5	13.3	40.2	33.7	53.9	20.2	100	215	VBW=10Hz
Hori.	2390.000	AV	37.5	27.5	13.3	40.2	38.1	53.9	15.8	100	215	VBW=10Hz
Hori.	2456.078	AV	34.8	27.6	13.3	40.2	35.5	53.9	18.4	100	215	VBW=10Hz
Hori.	2500.352	AV	33.6	27.6	13.4	40.1	34.5	53.9	19.4	100	215	VBW=10Hz
Hori.	2543.873	AV	33.7	27.7	13.4	40.2	34.6	53.9	19.3	100	215	VBW=10Hz
Hori.	2587.476	AV	33.1	27.9	13.4	40.3	34.1	53.9	19.8	100	215	VBW=10Hz
Hori.	4824.650	AV	48.8	31.6	5.7	40.1	46.0	53.9	7.9	100	34	VBW=10Hz
Hori.	7236.986	AV	39.5	36.5	6.8	38.3	44.5	53.9	9.4	100	36	VBW=10Hz
Hori.	9648.231	AV	40.0	37.9	8.0	37.4	48.5	53.9	5.4	100	75	VBW=10Hz
Hori.	12060.760	AV	32.2	39.3	9.2	38.3	42.4	53.9	11.5	100	299	VBW=10Hz
Hori.	14472.310	AV	42.2	41.3	0.6	38.4	45.7	53.9	8.2	100	54	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

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.	2412.000	PK	95.5	27.6	13.3	40.2	96.2	-	-	Carrier
Hori.	2400.000	PK	54.0	27.5	13.3	40.2	54.6	76.2	21.6	

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.2 & 3 Semi Anechoic Chamber
Date	2011/2/22	2011/2/27
Temperature / Humidity	21deg.C. 27%RH	22deg.C. 31%RH
Engineer	Hikaru Shirasawa	Akio Hayashi
	(above 1GHz)	(below 1GHz)
Mode	Tx, 2412 MHz	
	IEEE802.11b, 11Mbps, PN9,	

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
Vert.	86.598	QP	40.9	7.6	7.7	31.9	24.3	40.0	15.7	132	130	
Vert.	89.693	QP	46.2	8.2	7.8	31.9	30.3	43.5	13.2	104	129	
Vert.	126.793	QP	42.4	13.0	8.2	31.8	31.8	43.5	11.7	100	201	
Vert.	423.733	QP	43.0	16.9	7.3	31.6	35.6	46.0	10.4	145	128	
Vert.	430.051	QP	43.2	17.0	7.3	31.6	35.9	46.0	10.1	155	135	
Vert.	652.790	QP	31.7	19.8	8.4	31.6	28.3	46.0	17.7	100	23	
Vert.	2279.290	PK	44.6	27.4	13.2	40.2	45.0	73.9	28.9	100	92	
Vert.	2323.743	PK	43.9	27.5	13.3	40.2	44.5	73.9	29.4	100	92	
Vert.	2390.000	PK	50.0	27.5	13.3	40.2	50.6	73.9	23.3	100	92	
Vert.	2456.028	PK	47.1	27.6	13.3	40.2	47.8	73.9	26.1	100	92	
Vert.	2500.126	PK	46.1	27.6	13.4	40.1	47.0	73.9	26.9	100	92	
Vert.	2543.864	PK	46.2	27.7	13.4	40.2	47.1	73.9	26.8	100	92	
Vert.	2587.230	PK	45.3	27.9	13.4	40.3	46.3	73.9	27.6	100	92	
Vert.	4824.085	PK	55.9	31.6	5.7	40.1	53.1	73.9	20.8	100	286	
Vert.	7236.332	PK	46.0	36.5	6.8	38.3	51.0	73.9	22.9	100	102	
Vert.	9648.763	PK	45.6	37.9	8.0	37.4	54.1	73.9	19.8	100	84	
Vert.	12060.380	PK	43.3	39.3	9.2	38.3	53.5	73.9	20.4	100	321	
Vert.	14472.310	PK	47.3	41.3	0.6	38.4	50.8	73.9	23.1	100	66	
Vert.	2279.290	AV	32.3	27.4	13.2	40.2	32.7	53.9	21.2	100	92	VBW=10Hz
Vert.	2323.743	AV	33.0	27.5	13.3	40.2	33.6	53.9	20.3	100	92	VBW=10Hz
Vert.	2390.000	AV	39.3	27.5	13.3	40.2	39.9	53.9	14.0	100	92	VBW=10Hz
Vert.	2456.028	AV	36.5	27.6	13.3	40.2	37.2	53.9	16.7	100	92	VBW=10Hz
Vert.	2500.126	AV	34.5	27.6	13.4	40.1	35.4	53.9	18.5	100	92	VBW=10Hz
Vert.	2543.864	AV	33.2	27.7	13.4	40.2	34.1	53.9	19.8	100	92	VBW=10Hz
Vert.	2587.230	AV	33.3	27.9	13.4	40.3	34.3	53.9	19.6	100	92	VBW=10Hz
Vert.	4824.085	AV	46.9	31.6	5.7	40.1	44.1	53.9	9.8	100	286	VBW=10Hz
Vert.	7236.332	AV	35.3	36.5	6.8	38.3	40.3	53.9	13.6	100	102	VBW=10Hz
Vert.	9648.763	AV	38.2	37.9	8.0	37.4	46.7	53.9	7.2	100	84	VBW=10Hz
Vert.	12060.380	AV	32.1	39.3	9.2	38.3	42.3	53.9	11.6	100	321	VBW=10Hz
Vert.	14472.310	AV	35.1	41.3	0.6	38.4	38.6	53.9	15.3	100	66	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

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
Vert.	2412.000	PK	98.3	27.6	13.3	40.2	99.0	-	-	Carrier
Vert.	2400.000	PK	55.8	27.5	13.3	40.2	56.4	79.0	22.6	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 & 3 Semi Anechoic Chamber
 Date 2011/2/22 2011/2/27
 Temperature / Humidity 21deg.C. 27%RH 22deg.C. 31%RH
 Engineer Hikaru Shirasawa Akio Hayashi
 (above 1GHz) (below 1GHz)
 Mode Tx, 2437 MHz
 IEEE802.11b, 11Mbps, PN9,

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.	89.707	QP	42.2	8.2	7.8	31.9	26.3	43.5	17.2	206	54	
Hori.	154.589	QP	42.2	14.8	8.5	31.8	33.7	43.5	9.8	202	71	
Hori.	157.684	QP	42.1	15.1	8.5	31.8	33.9	43.5	9.6	205	77	
Hori.	402.032	QP	43.3	16.5	7.1	31.6	35.3	46.0	10.7	100	266	
Hori.	429.881	QP	46.3	16.9	7.3	31.6	38.9	46.0	7.1	100	271	
Hori.	2303.237	PK	47.1	27.4	13.3	40.2	47.6	73.9	26.3	118	106	
Hori.	2350.863	PK	48.6	27.5	13.3	40.2	49.2	73.9	24.7	118	106	
Hori.	2377.643	PK	48.2	27.5	13.3	40.2	48.8	73.9	25.1	118	106	
Hori.	2481.112	PK	47.9	27.6	13.3	40.1	48.7	73.9	25.2	118	106	
Hori.	2527.511	PK	47.9	27.7	13.4	40.2	48.8	73.9	25.1	118	106	
Hori.	2610.320	PK	47.1	27.9	13.5	40.3	48.2	73.9	25.7	118	106	
Hori.	4874.230	PK	58.3	31.7	5.7	40.0	55.7	73.9	18.2	100	63	
Hori.	7311.468	PK	48.1	36.7	6.9	38.5	53.2	73.9	20.7	129	61	
Hori.	9748.831	PK	48.5	38.1	8.0	37.4	57.2	73.9	16.7	100	196	
Hori.	12185.490	PK	44.3	39.2	9.2	38.2	54.5	73.9	19.4	100	296	
Hori.	14622.320	PK	49.0	41.5	0.6	38.3	52.8	73.9	21.1	100	36	
Hori.	2303.237	AV	33.5	27.4	13.3	40.2	34.0	53.9	19.9	118	106	VBW=10Hz
Hori.	2350.863	AV	33.3	27.5	13.3	40.2	33.9	53.9	20.0	118	106	VBW=10Hz
Hori.	2377.643	AV	33.6	27.5	13.3	40.2	34.2	53.9	19.7	118	106	VBW=10Hz
Hori.	2481.112	AV	33.7	27.6	13.3	40.1	34.5	53.9	19.4	118	106	VBW=10Hz
Hori.	2527.511	AV	33.2	27.7	13.4	40.2	34.1	53.9	19.8	118	106	VBW=10Hz
Hori.	2610.320	AV	33.2	27.9	13.5	40.3	34.3	53.9	19.6	118	106	VBW=10Hz
Hori.	4874.230	AV	50.5	31.7	5.7	40.0	47.9	53.9	6.0	100	63	VBW=10Hz
Hori.	7311.468	AV	36.3	36.7	6.9	38.5	41.4	53.9	12.5	129	61	VBW=10Hz
Hori.	9748.831	AV	37.3	38.1	8.0	37.4	46.0	53.9	7.9	100	196	VBW=10Hz
Hori.	12185.490	AV	32.5	39.2	9.2	38.2	42.7	53.9	11.2	100	296	VBW=10Hz
Hori.	14622.320	AV	41.2	41.5	0.6	38.3	45.0	53.9	8.9	100	36	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 & 3 Semi Anechoic Chamber
 Date 2011/2/22 2011/2/27
 Temperature / Humidity 21deg.C. 27%RH 22deg.C. 31%RH
 Engineer Hikaru Shirasawa Akio Hayashi
 (above 1GHz) (below 1GHz)
 Mode Tx, 2437 MHz
 IEEE802.11b, 11Mbps, PN9,

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
Vert.	49.532	QP	35.9	11.4	7.2	31.9	22.6	40.0	17.4	100	152	
Vert.	89.707	QP	45.7	8.2	7.8	31.9	29.8	43.5	13.7	116	143	
Vert.	126.780	QP	42.9	13.0	8.2	31.8	32.3	43.5	11.2	113	194	
Vert.	402.032	QP	38.4	16.5	7.1	31.6	30.4	46.0	15.6	100	233	
Vert.	429.881	QP	42.3	16.9	7.3	31.6	34.9	46.0	11.1	153	313	
Vert.	652.559	QP	32.8	19.8	8.4	31.6	29.4	46.0	16.6	100	174	
Vert.	2303.932	PK	45.4	27.4	13.3	40.2	45.9	73.9	28.0	100	21	
Vert.	2350.710	PK	45.3	27.5	13.3	40.2	45.9	73.9	28.0	100	21	
Vert.	2377.000	PK	45.6	27.5	13.3	40.2	46.2	73.9	27.7	100	21	
Vert.	2480.230	PK	45.9	27.6	13.3	40.1	46.7	73.9	27.2	100	21	
Vert.	2527.076	PK	46.2	27.7	13.4	40.2	47.1	73.9	26.8	100	21	
Vert.	2610.642	PK	45.2	27.9	13.5	40.3	46.3	73.9	27.6	100	21	
Vert.	4874.876	PK	57.6	31.7	5.7	40.0	55.0	73.9	18.9	100	97	
Vert.	7311.532	PK	47.2	36.7	6.9	38.5	52.3	73.9	21.6	100	193	
Vert.	9748.432	PK	45.9	38.1	8.0	37.4	54.6	73.9	19.3	105	37	
Vert.	12185.170	PK	44.9	39.2	9.2	38.2	55.1	73.9	18.8	100	337	
Vert.	14622.320	PK	45.3	41.5	0.6	38.3	49.1	73.9	24.8	100	147	
Vert.	2303.932	AV	33.8	27.4	13.3	40.2	34.3	53.9	19.6	100	21	VBW=10Hz
Vert.	2350.710	AV	32.8	27.5	13.3	40.2	33.4	53.9	20.5	100	21	VBW=10Hz
Vert.	2377.000	AV	33.2	27.5	13.3	40.2	33.8	53.9	20.1	100	21	VBW=10Hz
Vert.	2480.230	AV	33.9	27.6	13.3	40.1	34.7	53.9	19.2	100	21	VBW=10Hz
Vert.	2527.076	AV	33.9	27.7	13.4	40.2	34.8	53.9	19.1	100	21	VBW=10Hz
Vert.	2610.642	AV	33.7	27.9	13.5	40.3	34.8	53.9	19.1	100	21	VBW=10Hz
Vert.	4874.876	AV	49.5	31.7	5.7	40.0	46.9	53.9	7.0	100	97	VBW=10Hz
Vert.	7311.532	AV	36.6	36.7	6.9	38.5	41.7	53.9	12.2	100	193	VBW=10Hz
Vert.	9748.432	AV	37.5	38.1	8.0	37.4	46.2	53.9	7.7	105	37	VBW=10Hz
Vert.	12185.170	AV	32.8	39.2	9.2	38.2	43.0	53.9	10.9	100	337	VBW=10Hz
Vert.	14622.320	AV	34.6	41.5	0.6	38.3	38.4	53.9	15.5	100	147	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 & 3 Semi Anechoic Chamber
 Date 2011/2/22 2011/2/27
 Temperature / Humidity 21deg.C. 27%RH 22deg.C. 31%RH
 Engineer Hikaru Shirasawa Akio Hayashi
 (above 1GHz) (below 1GHz)
 Mode Tx, 2462 MHz
 IEEE802.11b, 11Mbps, PN9,

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.	154.644	QP	41.5	14.8	8.5	31.8	33.0	43.5	10.5	207	74	
Hori.	157.722	QP	41.7	15.1	8.5	31.8	33.5	43.5	10.0	198	80	
Hori.	417.512	QP	45.9	16.8	7.2	31.6	38.3	46.0	7.7	100	268	
Hori.	429.822	QP	46.7	16.9	7.3	31.6	39.3	46.0	6.7	100	255	
Hori.	2329.231	PK	44.7	27.5	13.3	40.2	45.3	73.9	28.6	100	218	
Hori.	2373.221	PK	45.6	27.5	13.3	40.2	46.2	73.9	27.7	100	218	
Hori.	2483.500	PK	46.0	27.6	13.3	40.1	46.8	73.9	27.1	100	218	
Hori.	2507.212	PK	45.0	27.7	13.4	40.1	46.0	73.9	27.9	100	218	
Hori.	2550.011	PK	45.1	27.8	13.4	40.2	46.1	73.9	27.8	100	218	
Hori.	2593.012	PK	45.2	27.9	13.4	40.3	46.2	73.9	27.7	100	218	
Hori.	2637.226	PK	45.1	28.0	13.5	40.3	46.3	73.9	27.6	100	218	
Hori.	4924.540	PK	56.3	31.8	5.7	40.0	53.8	73.9	20.1	100	23	
Hori.	7386.130	PK	50.3	36.8	6.8	38.6	55.3	73.9	18.6	104	135	
Hori.	9848.976	PK	47.6	38.3	8.1	37.5	56.5	73.9	17.4	100	43	
Hori.	12310.210	PK	44.3	39.2	9.3	38.0	54.8	73.9	19.1	100	2	
Hori.	14772.420	PK	47.6	41.8	0.6	38.1	51.9	73.9	22.0	100	121	
Hori.	2329.231	AV	33.4	27.5	13.3	40.2	34.0	53.9	19.9	100	218	VBW=10Hz
Hori.	2373.221	AV	33.2	27.5	13.3	40.2	33.8	53.9	20.1	100	218	VBW=10Hz
Hori.	2483.500	AV	34.0	27.6	13.3	40.1	34.8	53.9	19.1	100	218	VBW=10Hz
Hori.	2507.212	AV	33.6	27.7	13.4	40.1	34.6	53.9	19.3	100	218	VBW=10Hz
Hori.	2550.011	AV	33.3	27.8	13.4	40.2	34.3	53.9	19.6	100	218	VBW=10Hz
Hori.	2593.012	AV	33.2	27.9	13.4	40.3	34.2	53.9	19.7	100	218	VBW=10Hz
Hori.	2637.226	AV	33.1	28.0	13.5	40.3	34.3	53.9	19.6	100	218	VBW=10Hz
Hori.	4924.540	AV	51.0	31.8	5.7	40.0	48.5	53.9	5.4	100	23	VBW=10Hz
Hori.	7386.130	AV	40.2	36.8	6.8	38.6	45.2	53.9	8.7	104	135	VBW=10Hz
Hori.	9848.976	AV	37.6	38.3	8.1	37.5	46.5	53.9	7.4	100	43	VBW=10Hz
Hori.	12310.210	AV	32.4	39.2	9.3	38.0	42.9	53.9	11.0	100	2	VBW=10Hz
Hori.	14772.420	AV	42.3	41.8	0.6	38.1	46.6	53.9	7.3	100	121	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.2 & 3 Semi Anechoic Chamber
Date	2011/2/22	2011/2/27
Temperature / Humidity	21deg.C. 27%RH	22deg.C. 31%RH
Engineer	Hikaru Shirasawa	Akio Hayashi
	(above 1GHz)	(below 1GHz)
Mode	Tx, 2462 MHz	
	IEEE802.11b, 11Mbps, PN9,	

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
Vert.	86.590	QP	40.8	7.6	7.7	31.9	24.2	40.0	15.8	123	127	
Vert.	89.692	QP	47.2	8.2	7.8	31.9	31.3	43.5	12.2	115	126	
Vert.	126.804	QP	41.6	13.0	8.2	31.8	31.0	43.5	12.5	100	105	
Vert.	417.512	QP	43.8	16.8	7.2	31.6	36.2	46.0	9.8	100	227	
Vert.	429.822	QP	42.2	16.9	7.3	31.6	34.8	46.0	11.2	133	130	
Vert.	649.520	QP	31.3	19.7	8.4	31.6	27.8	46.0	18.2	100	328	
Vert.	2329.431	PK	44.3	27.5	13.3	40.2	44.9	73.9	29.0	100	21	
Vert.	2373.753	PK	45.6	27.5	13.3	40.2	46.2	73.9	27.7	100	21	
Vert.	2483.500	PK	47.1	27.6	13.3	40.1	47.9	73.9	26.0	100	21	
Vert.	2507.642	PK	45.8	27.7	13.4	40.1	46.8	73.9	27.1	100	21	
Vert.	2550.120	PK	45.4	27.8	13.4	40.2	46.4	73.9	27.5	100	21	
Vert.	2593.010	PK	45.6	27.9	13.4	40.3	46.6	73.9	27.3	100	21	
Vert.	2637.240	PK	45.6	28.0	13.5	40.3	46.8	73.9	27.1	100	21	
Vert.	4924.864	PK	54.0	31.8	5.7	40.0	51.5	73.9	22.4	108	23	
Vert.	7386.213	PK	47.3	36.8	6.8	38.6	52.3	73.9	21.6	100	45	
Vert.	9848.640	PK	44.6	38.3	8.1	37.5	53.5	73.9	20.4	112	343	
Vert.	12310.230	PK	44.4	39.2	9.3	38.0	54.9	73.9	19.0	100	212	
Vert.	14772.420	PK	44.3	41.8	0.6	38.1	48.6	73.9	25.3	100	22	
Vert.	2329.431	AV	33.4	27.5	13.3	40.2	34.0	53.9	19.9	100	21	VBW=10Hz
Vert.	2373.753	AV	33.7	27.5	13.3	40.2	34.3	53.9	19.6	100	21	VBW=10Hz
Vert.	2483.500	AV	33.6	27.6	13.3	40.1	34.4	53.9	19.5	100	21	VBW=10Hz
Vert.	2507.642	AV	33.9	27.7	13.4	40.1	34.9	53.9	19.0	100	21	VBW=10Hz
Vert.	2550.120	AV	34.9	27.8	13.4	40.2	35.9	53.9	18.0	100	21	VBW=10Hz
Vert.	2593.010	AV	34.1	27.9	13.4	40.3	35.1	53.9	18.8	100	21	VBW=10Hz
Vert.	2637.240	AV	34.6	28.0	13.5	40.3	35.8	53.9	18.1	100	21	VBW=10Hz
Vert.	4924.864	AV	48.7	31.8	5.7	40.0	46.2	53.9	7.7	108	23	VBW=10Hz
Vert.	7386.213	AV	37.4	36.8	6.8	38.6	42.4	53.9	11.5	100	45	VBW=10Hz
Vert.	9848.640	AV	34.4	38.3	8.1	37.5	43.3	53.9	10.6	112	343	VBW=10Hz
Vert.	12310.230	AV	32.5	39.2	9.3	38.0	43.0	53.9	10.9	100	212	VBW=10Hz
Vert.	14772.420	AV	35.9	41.8	0.6	38.1	40.2	53.9	13.7	100	22	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).

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

Shonan EMC Lab.

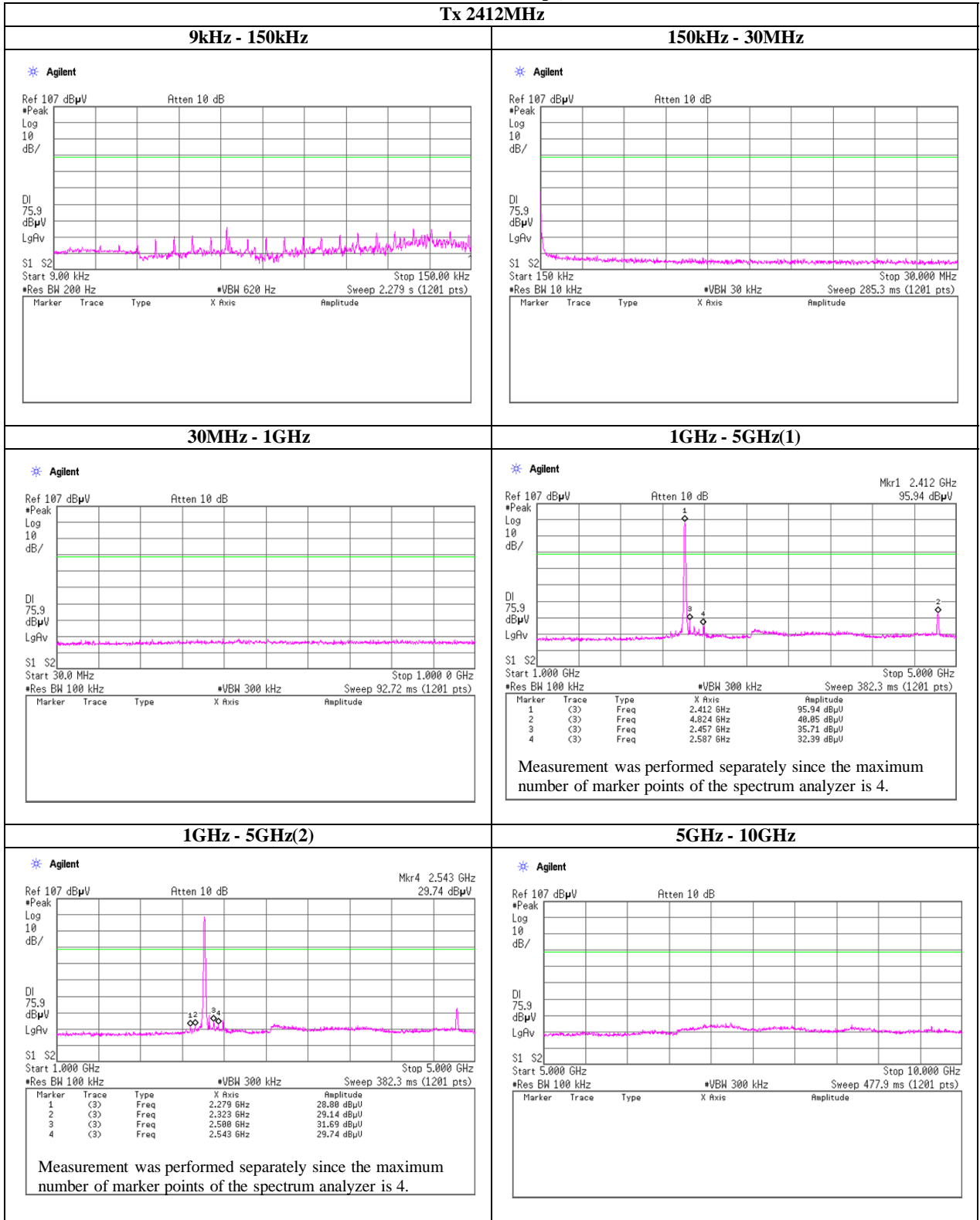
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

IEEE802.11b, 11Mbps, PN9



UL Japan, Inc.

Shonan EMC Lab.

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

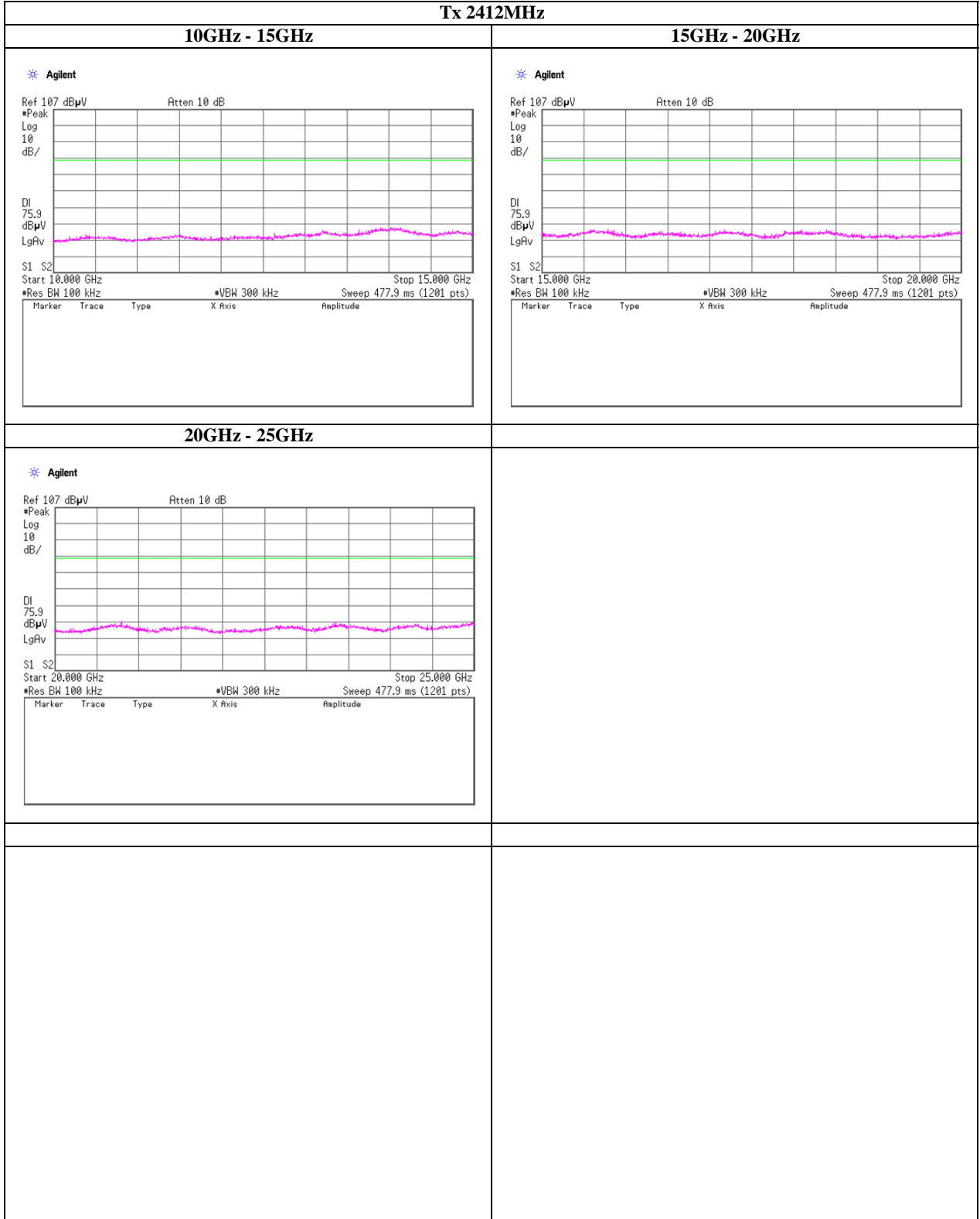
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

IEEE802.11b, 11Mbps, PN9

Tx 2412MHz



UL Japan, Inc.

Shonan EMC Lab.

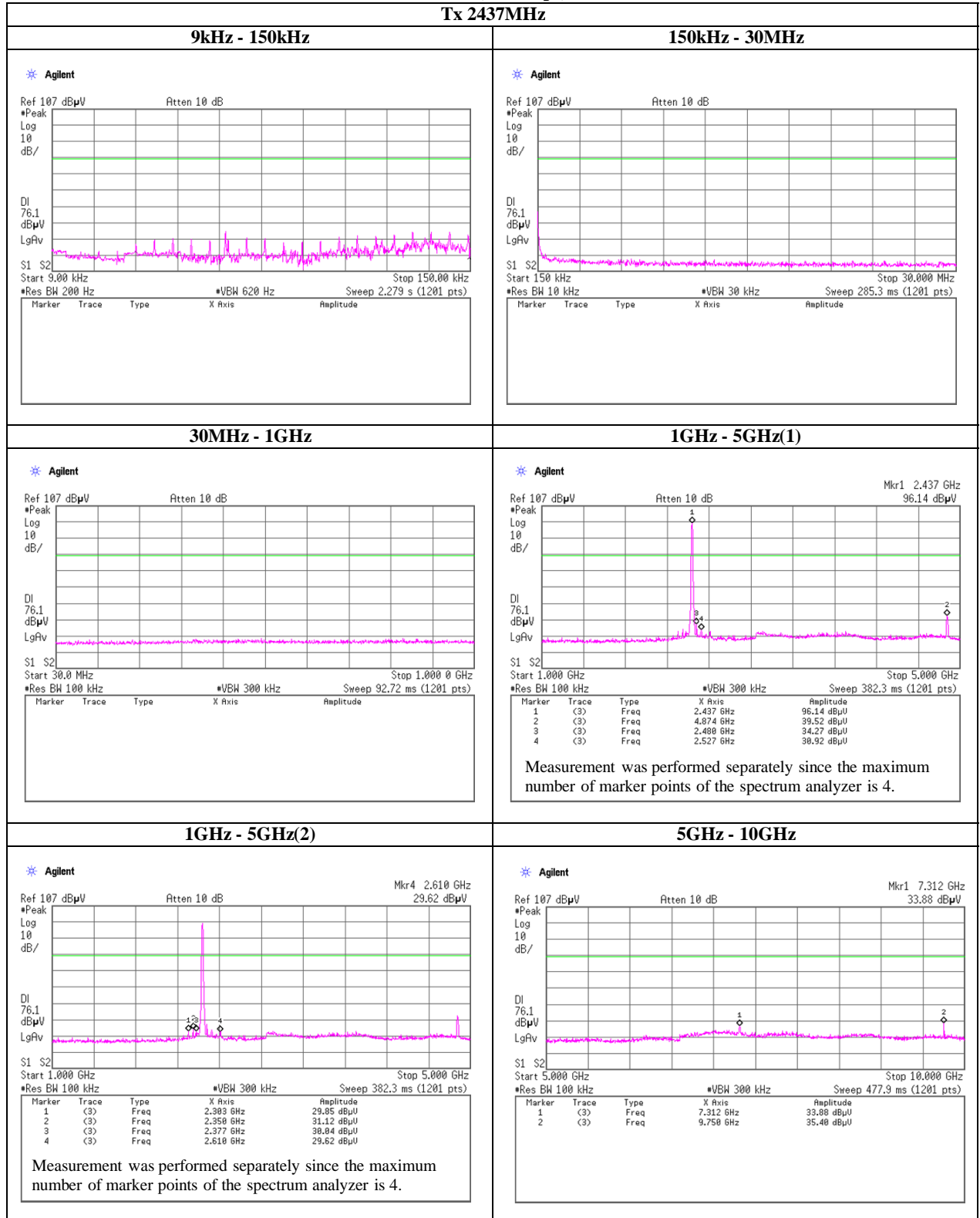
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

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Spurious emission (Conducted)

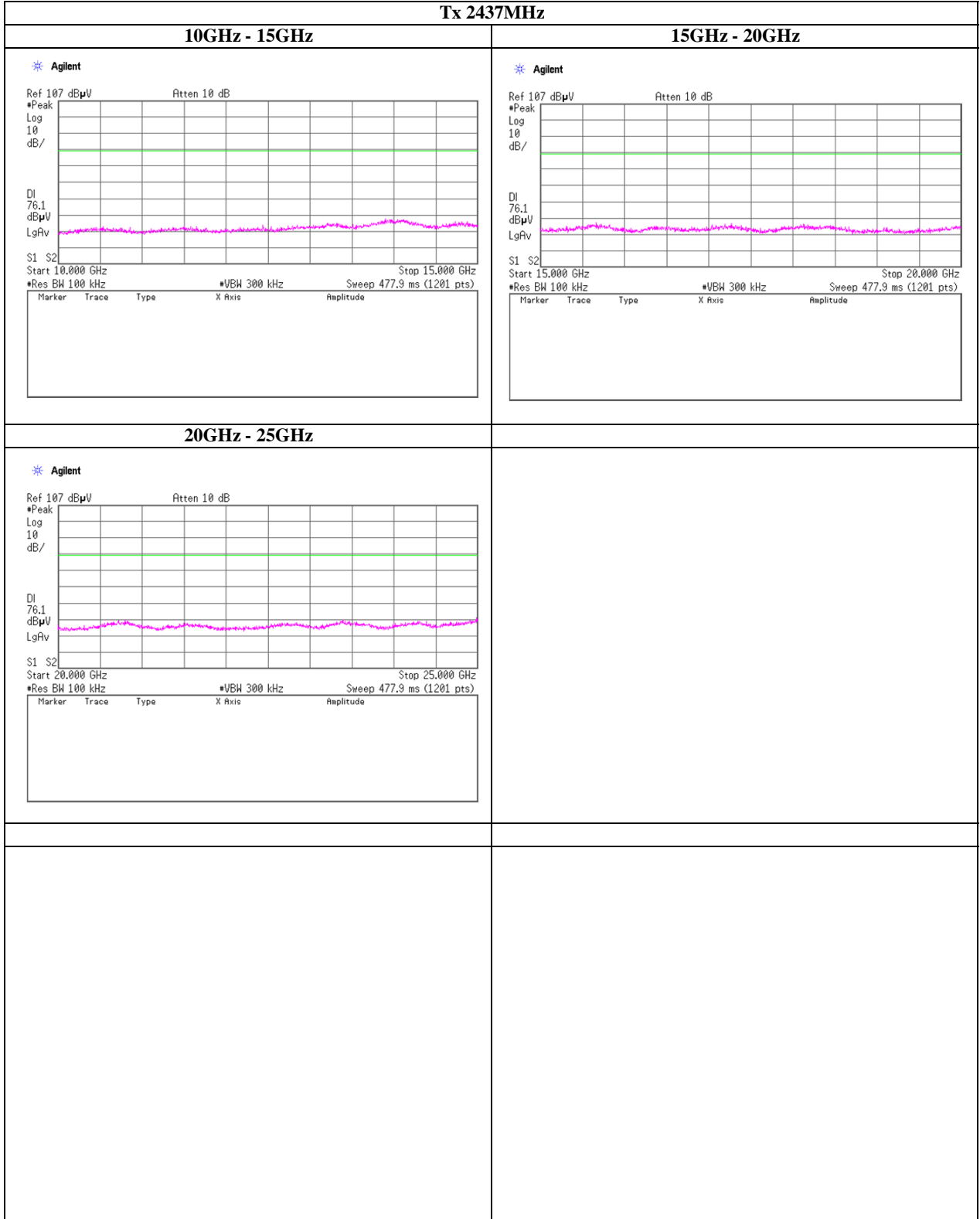
IEEE802.11b, 11Mbps, PN9



Spurious emission (Conducted)

IEEE802.11b, 11Mbps, PN9

Tx 2437MHz



UL Japan, Inc.

Shonan EMC Lab.

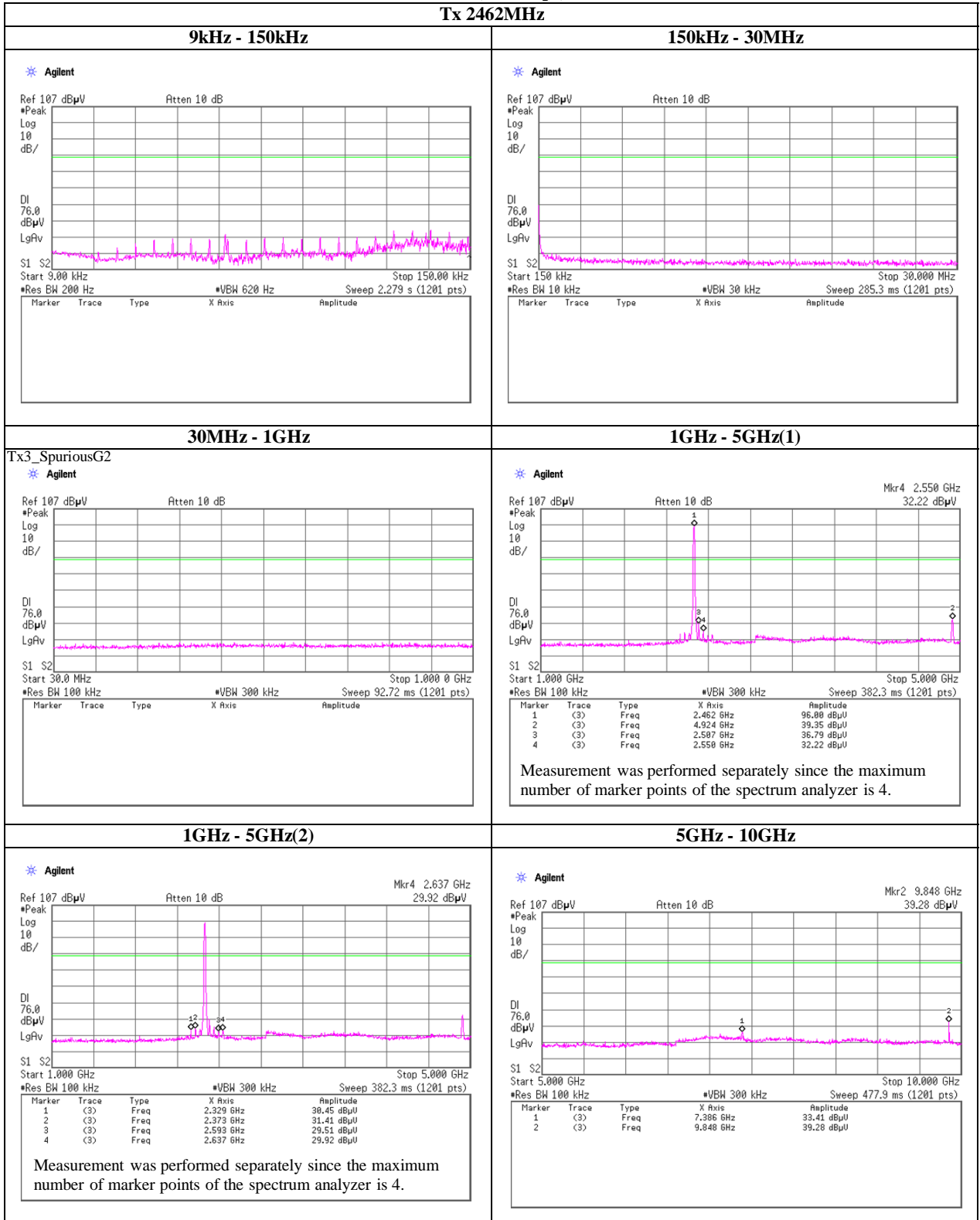
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

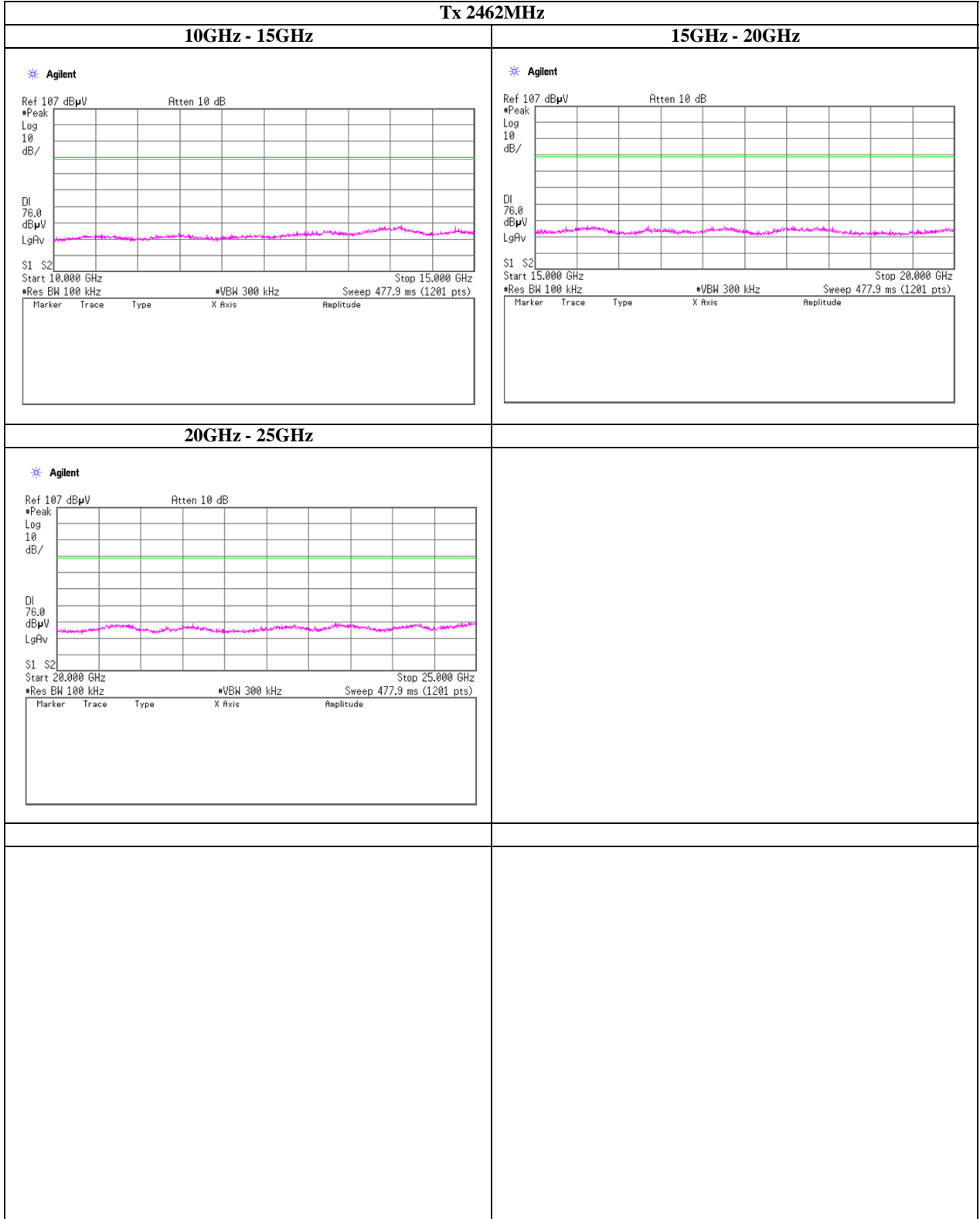
IEEE802.11b, 11Mbps, PN9



Spurious emission (Conducted)

IEEE802.11b, 11Mbps, PN9

Tx 2462MHz



UL Japan, Inc.

Shonan EMC Lab.

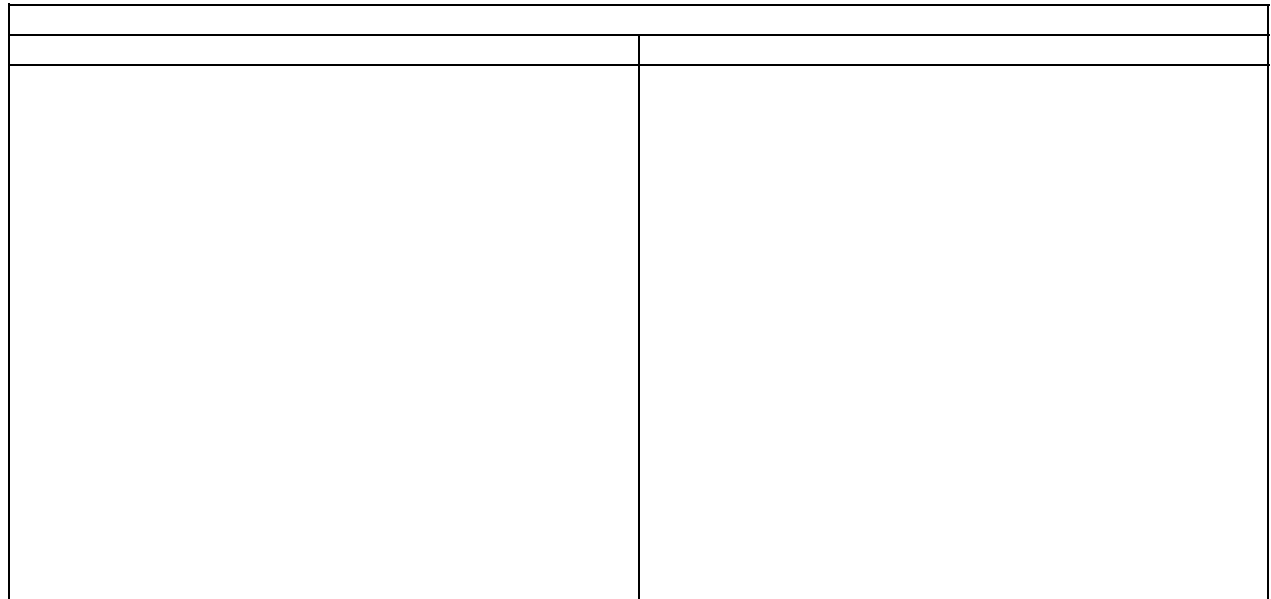
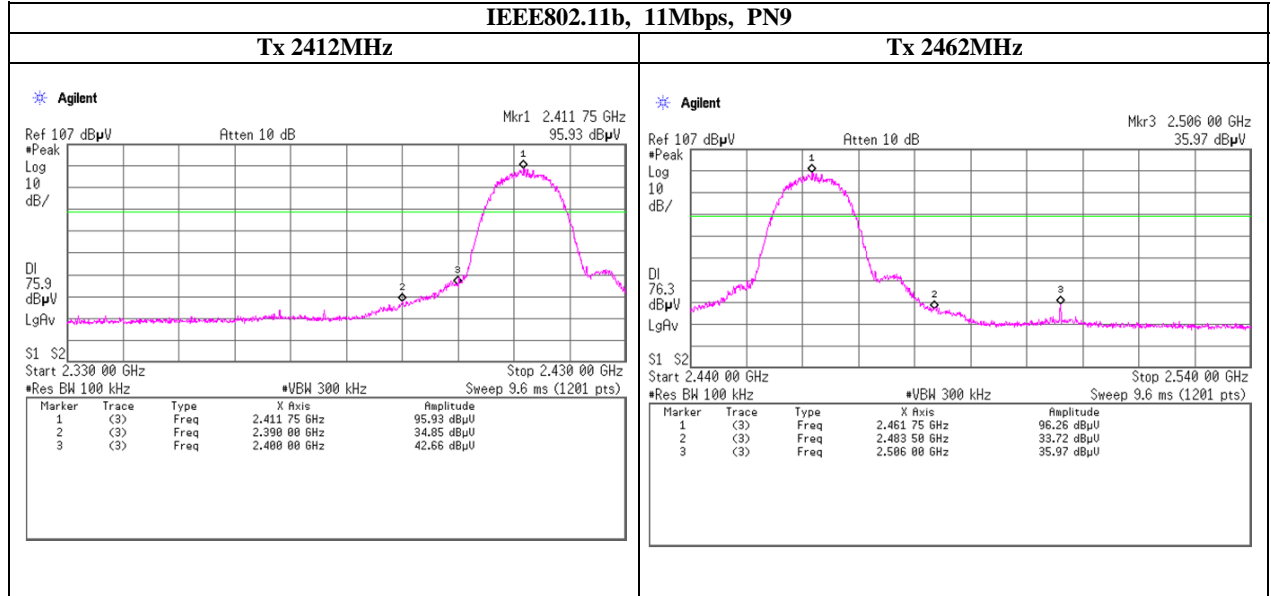
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Band Edge compliance



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

Power Density

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 2011/2/22
Temperature / Humidity 21deg.C. 27%RH
Engineer Hikaru Shirasawa
Mode Tx

[IEEE802.11b, 11Mbps, PN9]

Ch. Freq. [MHz]	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412	2412.02	-14.88	1.28	9.97	-3.63	8.00	11.63
2437	2437.02	-14.69	1.28	9.97	-3.44	8.00	11.44
2462	2462.02	-15.26	1.28	9.97	-4.01	8.00	12.01

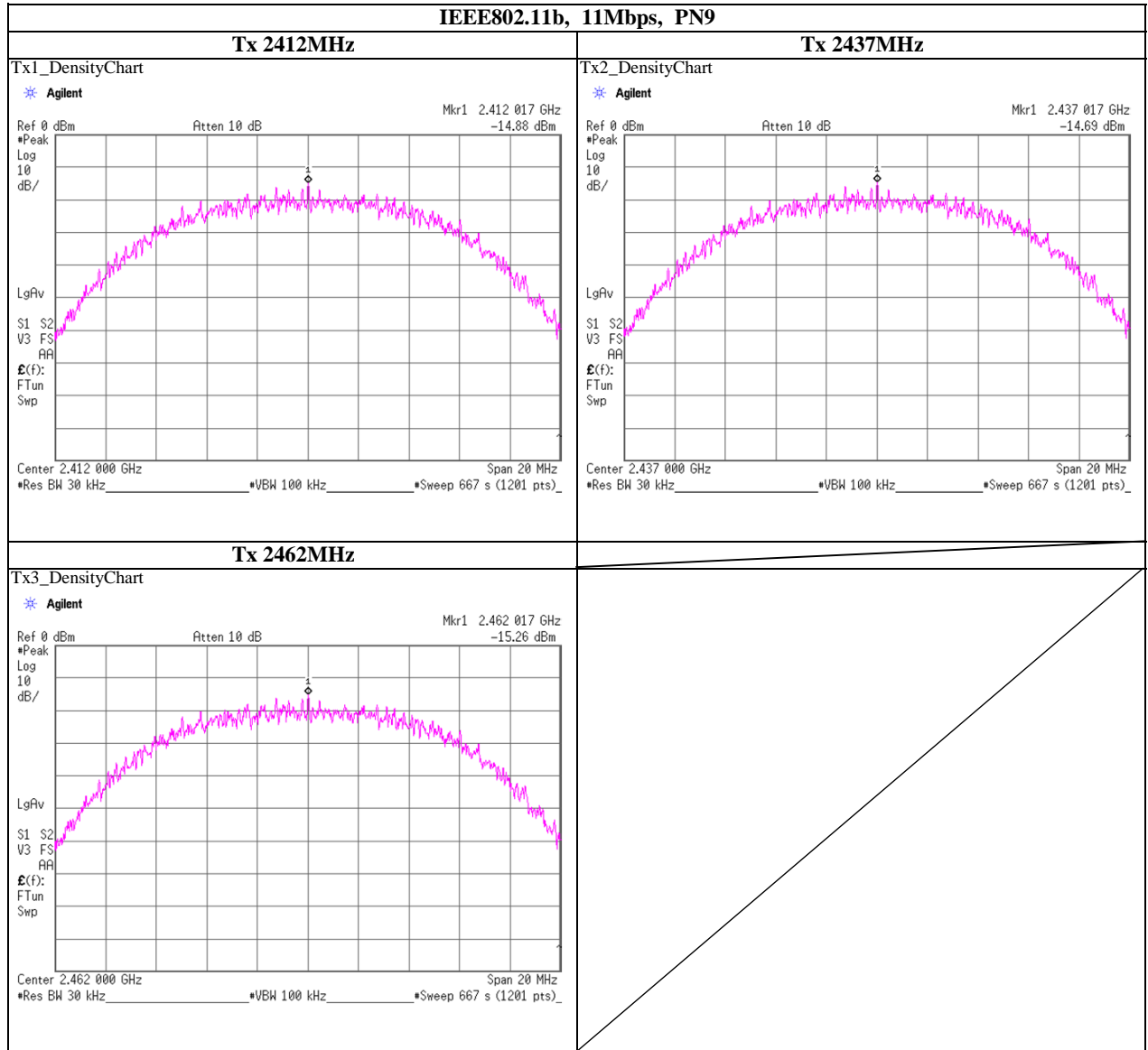
Sample Calculation:

Result = Reading + Cable Loss (supplied by customer) + Atten. Loss

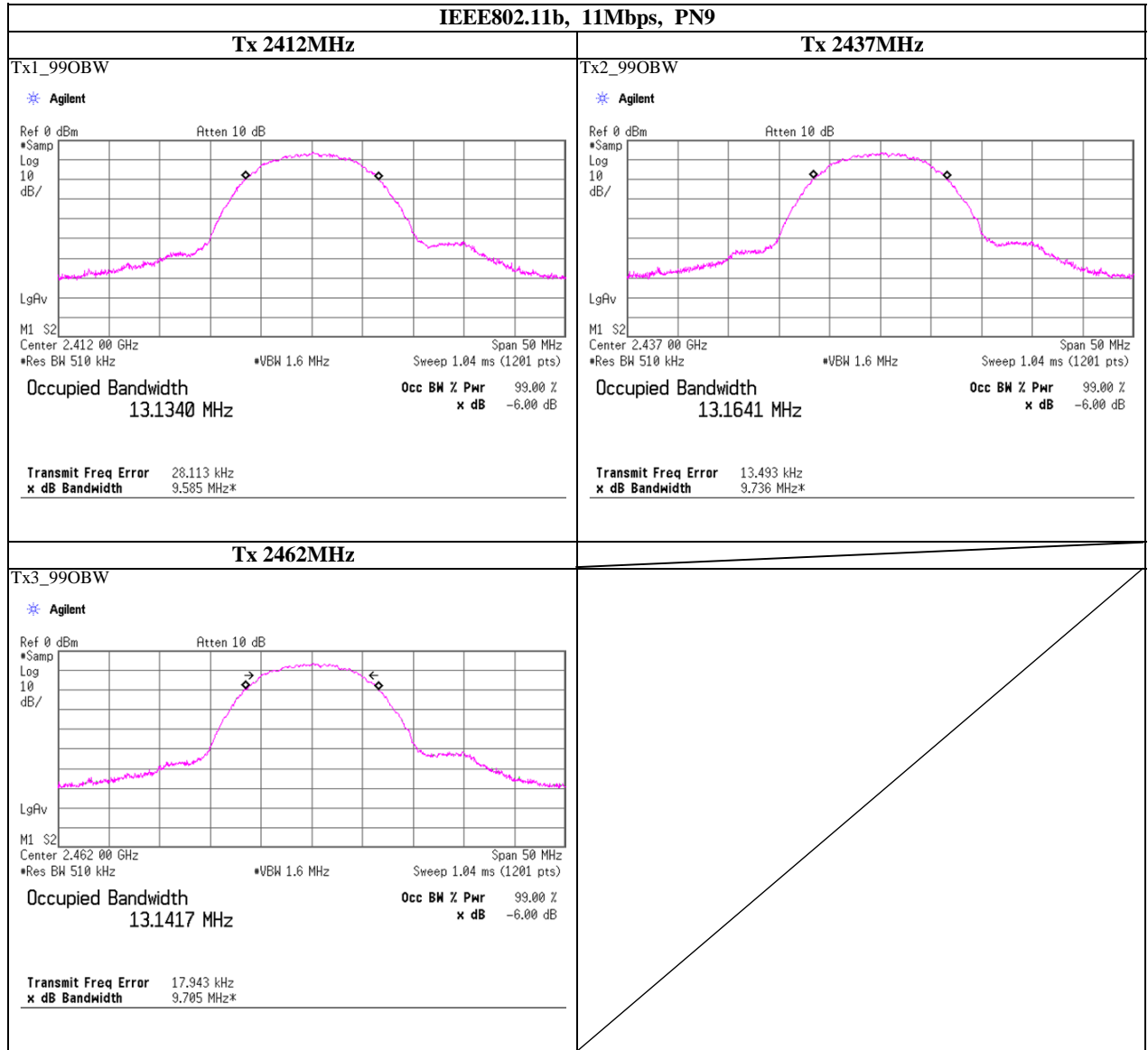
UL Japan, Inc.
Shonan EMC Lab.

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



99% Occupied Bandwidth



UL Japan, Inc.

Shonan EMC Lab.

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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	2010/11/16 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	RE	2010/03/09 * 12
SAT10-06	Attenuator(above1GHz)	Agilent	8493C-010	74865	RE	2010/03/05 * 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
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2011/02/23 * 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	2011/02/23 * 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	-
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2010/06/22 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2010/03/02 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2010/03/29 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2010/03/02 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2011/02/17 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SAT3-02	Attenuator	JFW	50HF-003N	-	RE	2011/02/17 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2010/10/11 * 12
SCC-B1/B3/B5/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2010/04/02 * 12
SCC-B2/B4/B6/B7/B8/B13/SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-270(RF Selector)	RE	2010/04/02 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2010/10/11 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2011/02/23 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	RE	2010/08/18 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2010/09/04 * 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 ,
- AT: Antenna terminal disturbance voltage

APPENDIX 3
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-A12/A13/SRSE-01	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-269(RF Selector)	CE	2010/04/02 * 12
SLS-06	LISN	Schwarzbeck	NSLK8126	8126440	CE	2010/03/29 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	CE	2011/03/02 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	CE	2010/10/29 * 12
SJM-07	Measure	PROMART	SEN1935	-	CE	-
SHF-01	Highpass Filter	Rohde & Schwarz	EZ-25	100021	CE	2010/03/29 * 12
SCC-01	Coaxial Cable	Fujikura	5D2W	-	CE	2011/01/07 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	CE	2011/02/17 * 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 ,