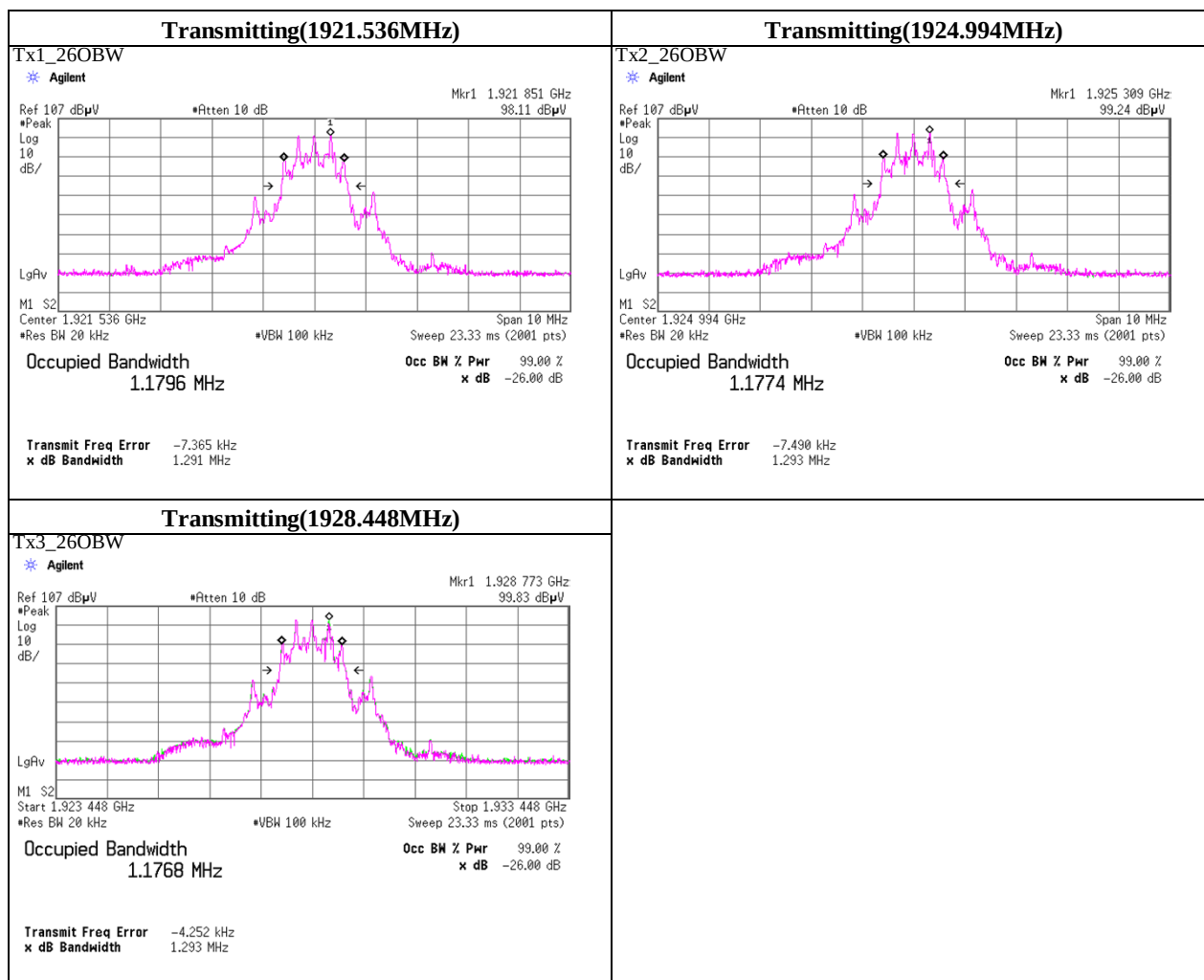


APPENDIX 2: Data of EMI test

26dB Bandwidth

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	April 23, 2011	
Temperature / Humidity	21deg.C , 62%RH	
Engineer	Yasumasa Owaki	
Mode	Tx	
	Antenna 0 (Worst antenna (Antenna 0 or Antenna 1)), Vertical	

Freq. [MHz]	26dB Bandwidth [MHz]	Limit [MHz]
1921.5360	1.291	=< 2.5
1924.9940	1.293	=< 2.5
1928.4480	1.293	=< 2.5



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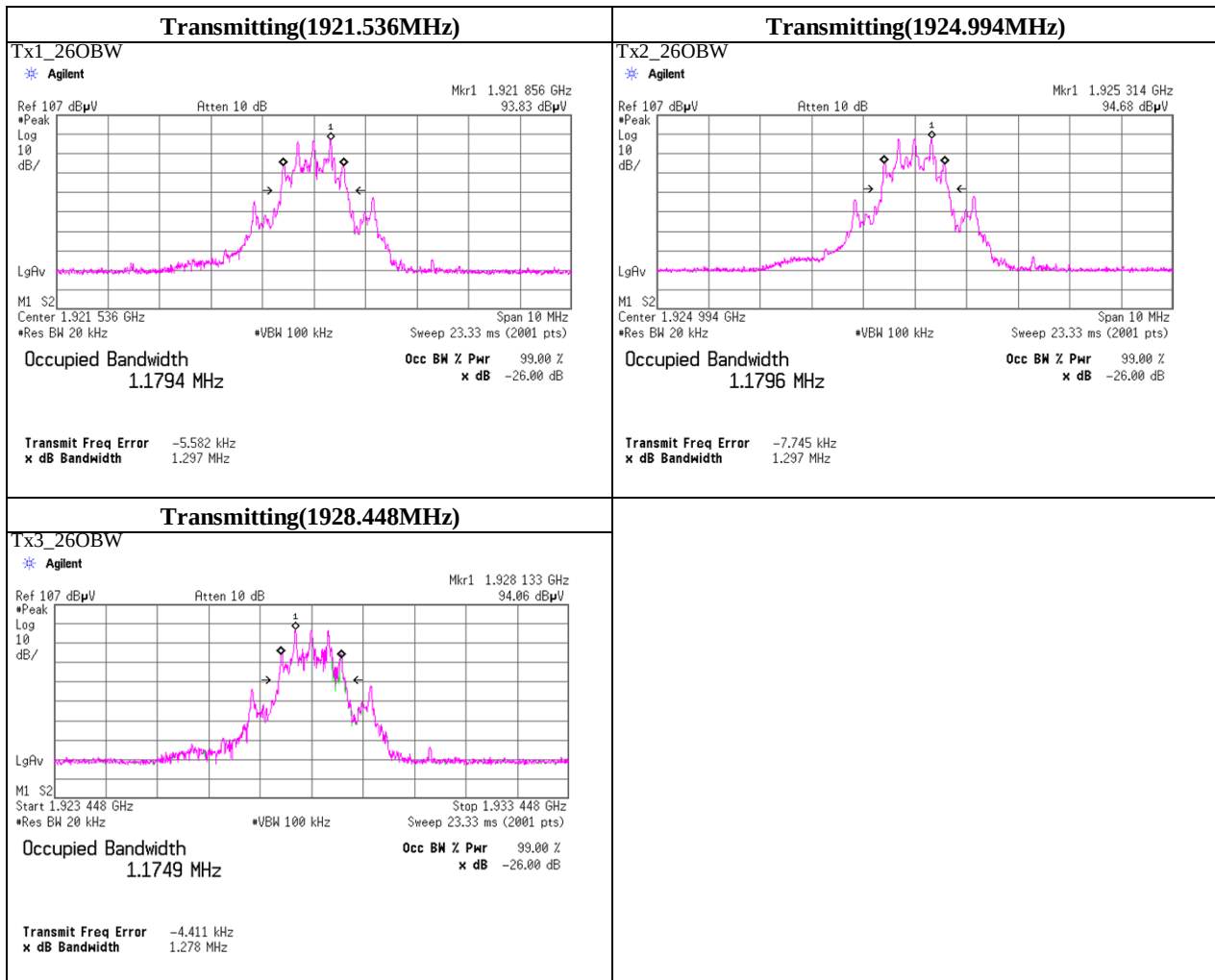
Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

26dB Bandwidth

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	April 25, 2011	
Temperature / Humidity	20deg.C. , 45%RH	
Engineer	Yasumasa Owaki	
Mode	Tx	
	Antenna 2, Vertical	

Freq. [MHz]	26dB Bandwidth [MHz]	Limit [MHz]
1921.5360	1.297	=< 2.5
1924.9940	1.297	=< 2.5
1928.4480	1.278	=< 2.5



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 0, Horizontal	

(Reference) (Reference)

Freq. [MHz]	S/A (PK) Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5360	92.81	19.23	112.04	10.93	10.81	5.83	15.90	23.56	20.14	7.66	90	115
1924.9940	92.45	19.23	111.68	10.73	10.82	5.84	15.71	23.56	20.14	7.85	90	115
1928.4480	92.28	19.33	111.61	10.46	10.84	5.85	15.45	23.56	20.14	8.11	90	115

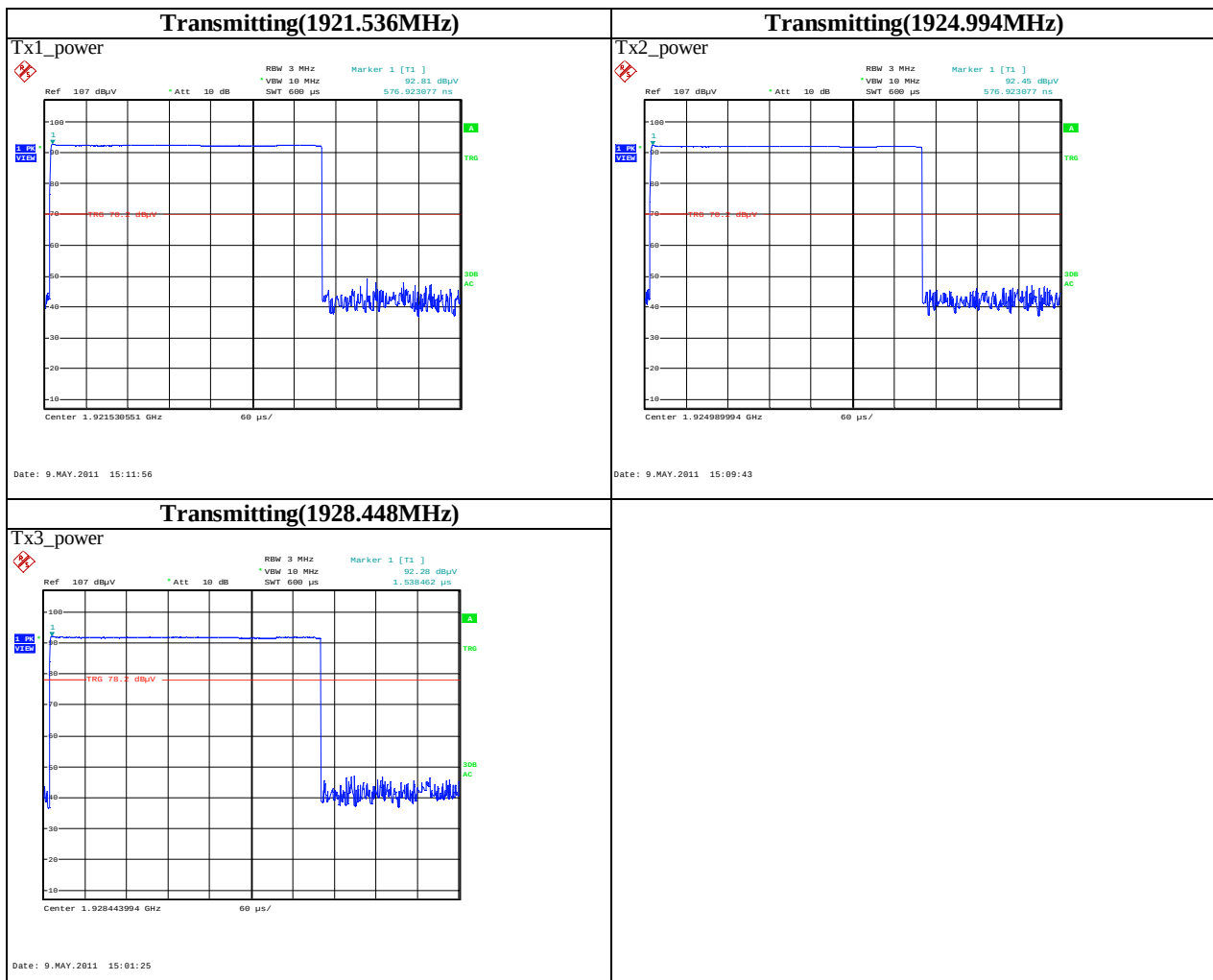
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm] - (3.42[dBi] - 3[dBi])



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 0 (worst), Vertical (worst)	

(Reference) (Reference)

Freq.	S/A (PK) Reading	Ant.,Cable, Amp factor	Result3 @3m	SG Reading	Antenna Gain	Cable Loss	Result1 (EIRP)	Limit2 (EIRP)	Limit (terminal)	Margin	T/T angle	Antenna height
[MHz]	[dBuV]	[dB]	[dBuV/m]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dBm]	[dB]	[deg]	[cm]
1921.5360	100.39	19.23	119.62	16.35	10.81	5.83	21.33	23.56	20.14	2.23	180	140
1924.9940	100.07	19.23	119.30	16.06	10.82	5.84	21.05	23.56	20.14	2.51	180	140
1928.4480	100.21	19.33	119.54	16.19	10.84	5.85	21.18	23.56	20.14	2.38	180	140

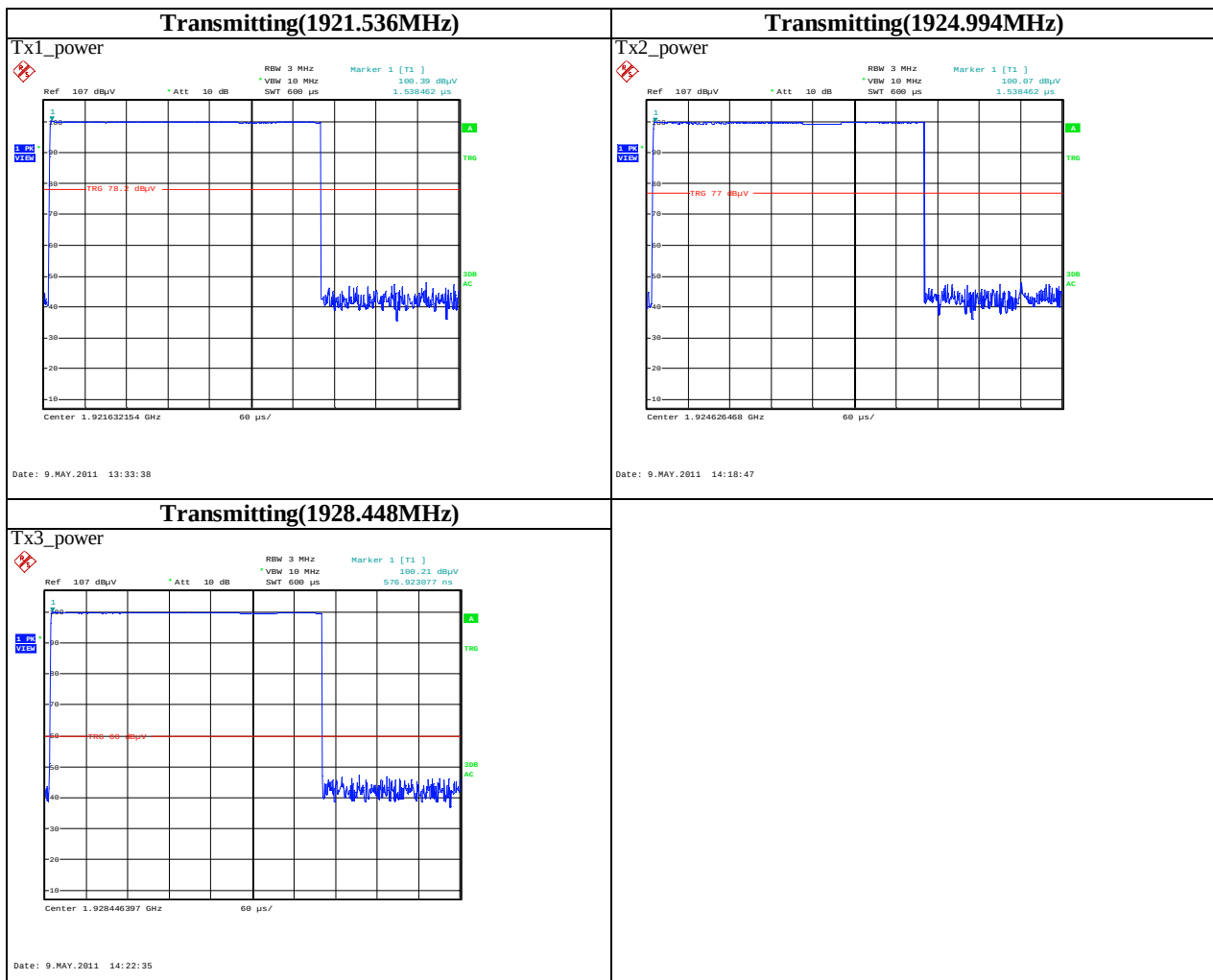
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm] - (3.42[dBi] - 3[dBi])



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 1, Horizontal	

(Reference) (Reference)

Freq. [MHz]	S/A (PK) Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5360	89.29	19.23	108.52	7.41	10.81	5.83	12.38	23.56	20.14	11.18	90	115
1924.9940	89.13	19.23	108.36	7.41	10.82	5.84	12.39	23.56	20.14	11.17	90	115
1928.4480	86.56	19.33	105.89	4.74	10.84	5.85	9.73	23.56	20.14	13.83	90	115

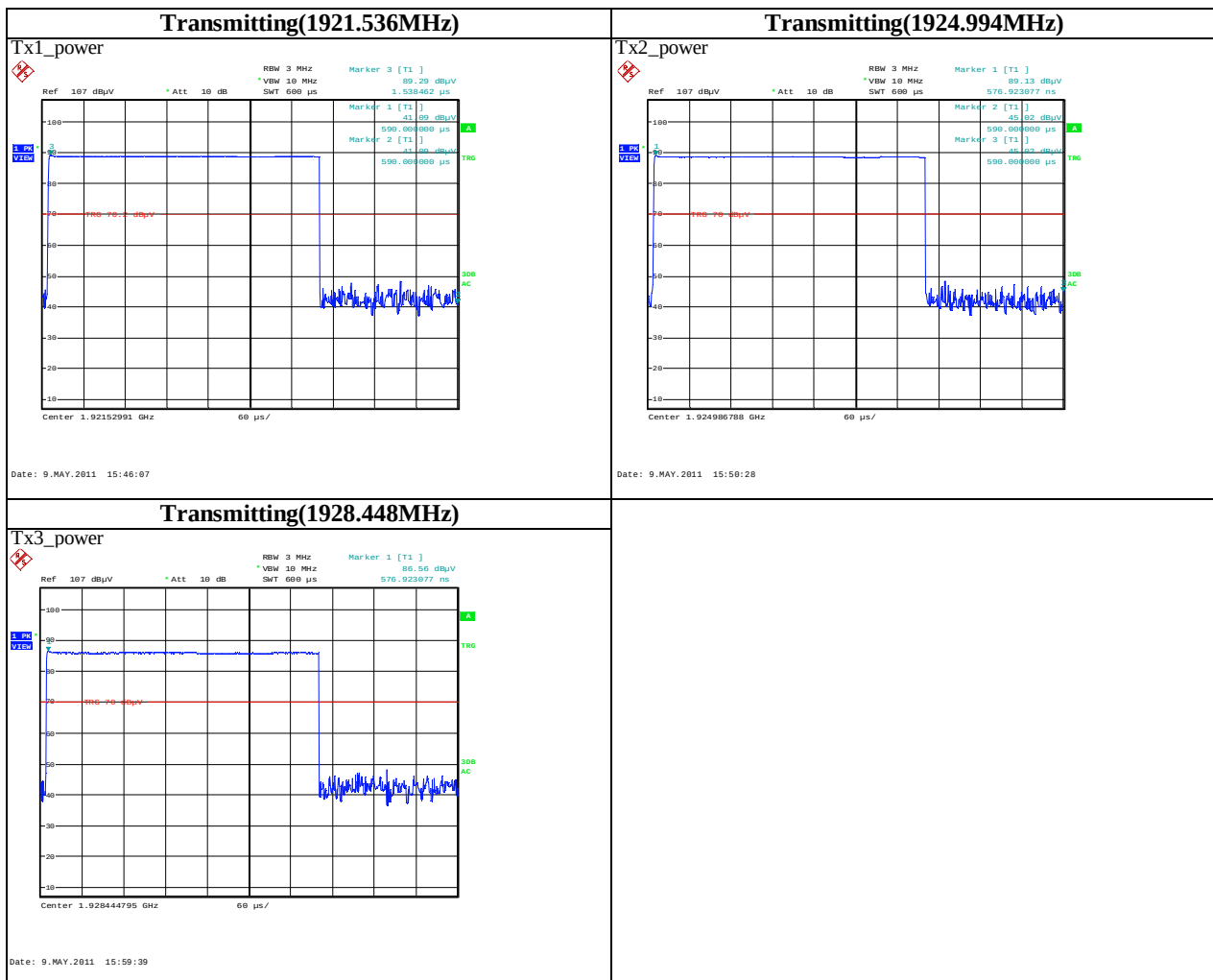
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm] - (3.42[dBi] - 3[dBi])



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 1, Vertical (worst)	

(Reference) (Reference)

Freq. [MHz]	S/A (PK) Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5360	94.35	19.23	113.58	10.31	10.81	5.83	15.29	23.56	20.14	8.27	180	140
1924.9940	94.80	19.23	114.03	10.79	10.82	5.84	15.78	23.56	20.14	7.78	180	140
1928.4480	94.75	19.33	114.08	10.73	10.84	5.85	15.72	23.56	20.14	7.84	180	140

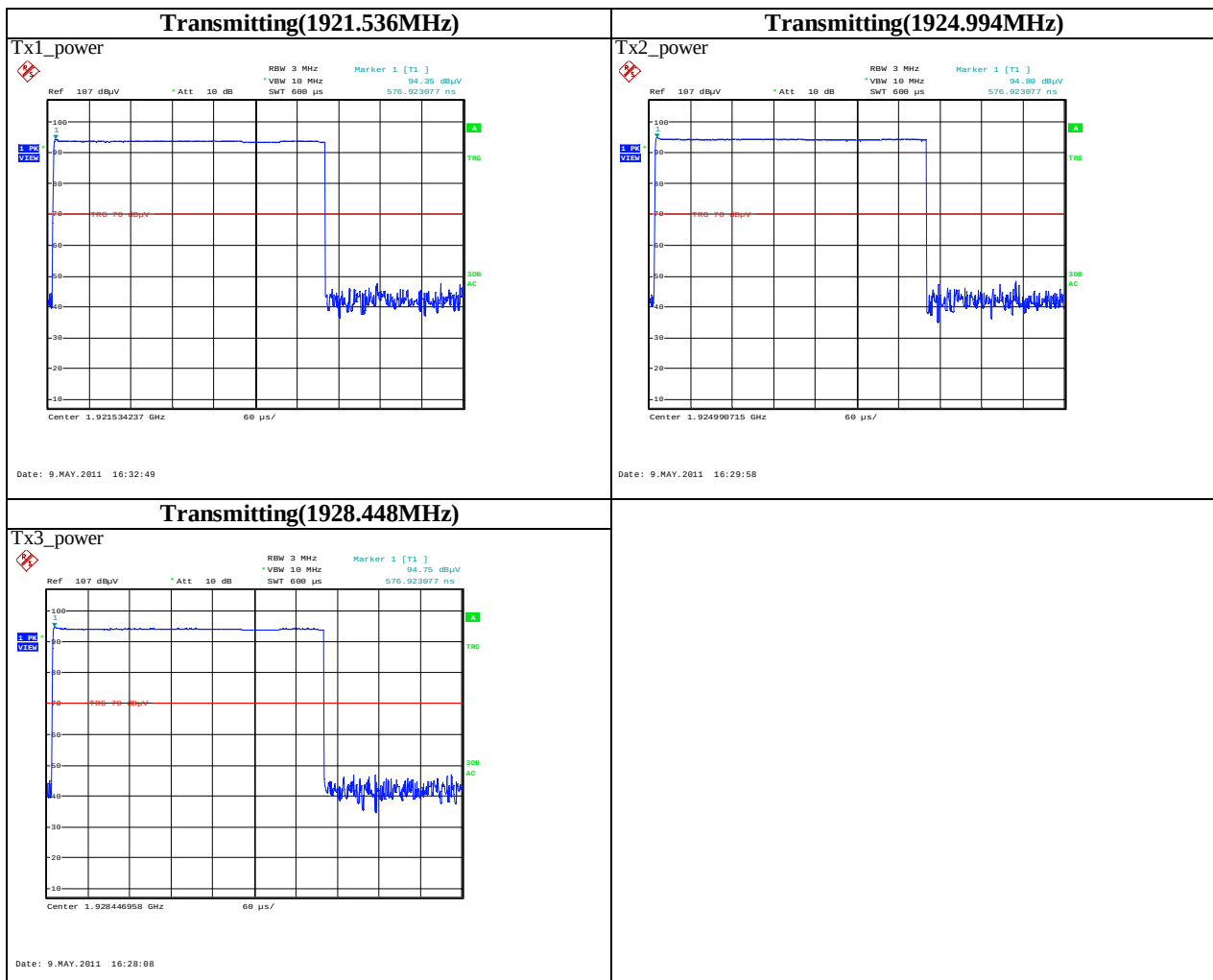
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm] - (3.42[dBi] - 3[dBi])



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 2, Horizontal	

(Reference) (Reference)

Freq.	S/A (PK) Reading	Ant.,Cable, Amp factor	Result3 @3m	SG Reading	Antenna Gain	Cable Loss	Result1 (EIRP)	Limit2 (EIRP)	Limit (terminal)	Margin	T/T angle	Antenna height
[MHz]	[dBuV]	[dB]	[dBuV/m]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dBm]	[dB]	[deg]	[cm]
1921.5360	74.54	19.23	93.77	-7.34	10.81	5.83	-2.37	22.45	20.56	24.82	90	115
1924.9940	73.65	19.23	92.88	-8.07	10.82	5.84	-3.09	22.45	20.56	25.54	90	115
1928.4480	73.70	19.33	93.03	-8.12	10.84	5.85	-3.13	22.45	20.56	25.58	90	115

Sample Calculation:

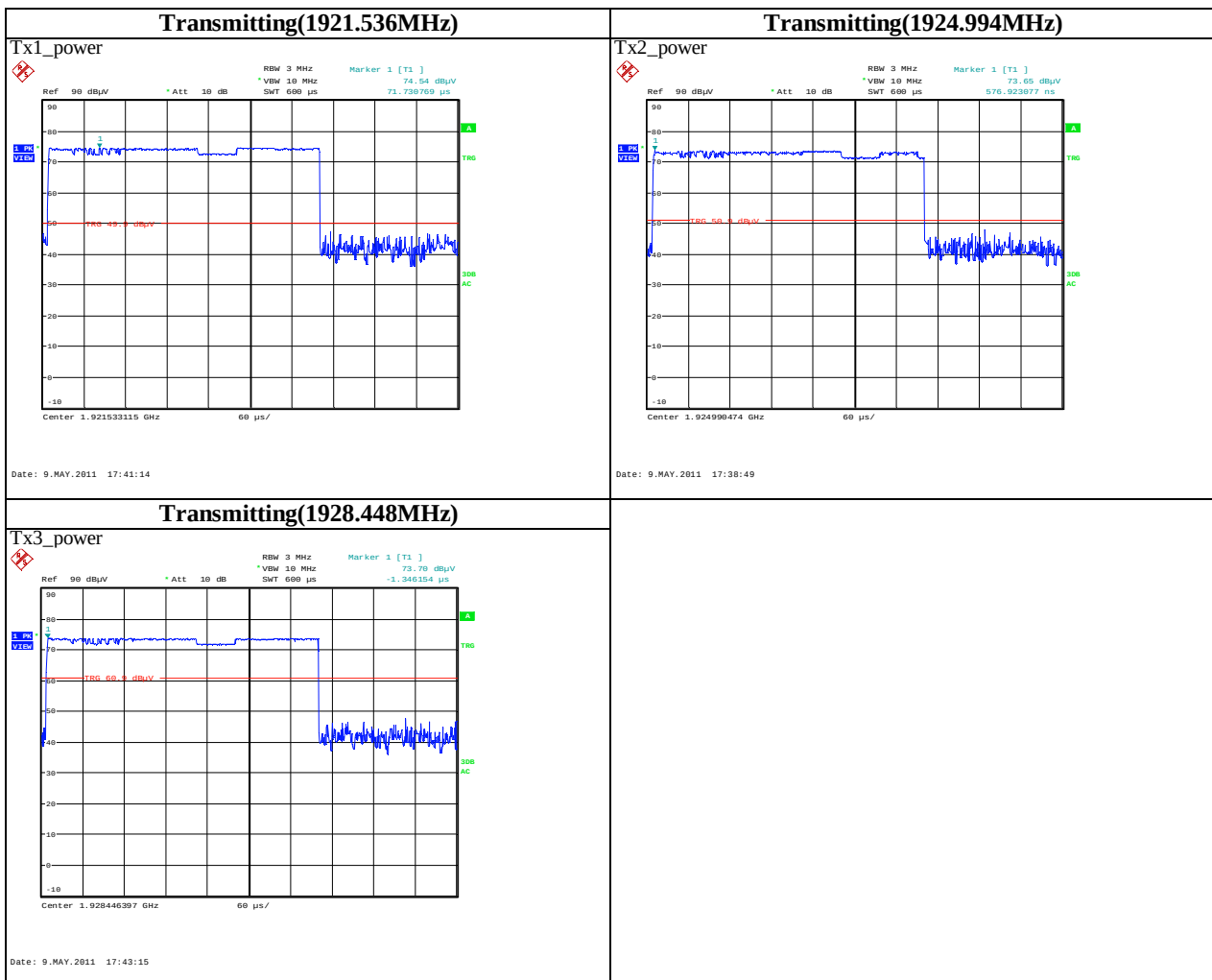
Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

(* antenna cable loss is refer to next page.)

Limit2 [dBm] = Limit (terminal) + (8 [dBi] - (cable loss) 6.11[dB])

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm]



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Peak Transmitter Power

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 2, Vertical (worst)	

(Reference) (Reference)

Freq. [MHz]	S/A (PK) Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5360	80.12	19.23	99.35	-3.92	10.81	5.83	1.06	22.45	20.56	21.39	180	140
1924.9940	80.23	19.23	99.46	-3.78	10.82	5.84	1.21	22.45	20.56	21.24	180	140
1928.4480	78.61	19.33	97.94	-5.41	10.84	5.85	-0.42	22.45	20.56	22.87	180	140

Sample Calculation:

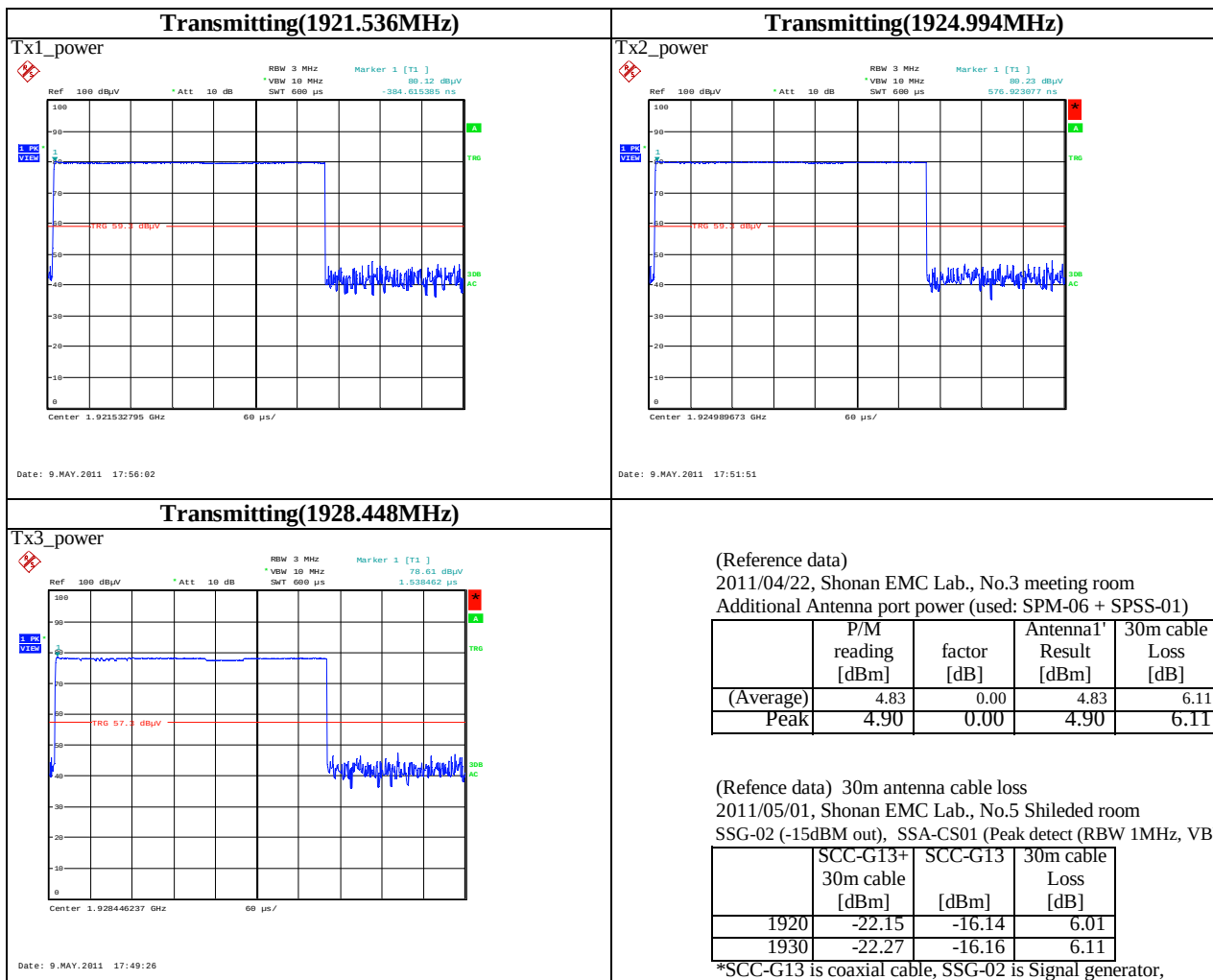
Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

(* antenna cable loss is refer to table of "30m antenna cable loss".)

Limit2 [dBm] = Limit (terminal) + (8 [dBi] - (cable loss) 6.11[dB])

Limit (terminal) [dBm] = 5 x LOG(26dB bandwidth [Hz]) - 10[dBm]



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Peak Power Spectrum Density

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	May 9, 2011	
Temperature / Humidity	27deg.C. , 34%RH	
Engineer	Kenichi Adachi	
Mode	Tx	
	Antenna 0, Vertical (worst)	

(Reference) (Reference)

Freq. [MHz]	S/A Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit1 (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5364	86.73	19.23	105.96	2.69	10.81	5.83	7.67	8.19	4.77	0.52	90	115
1928.4500	86.99	19.33	106.32	2.98	10.84	5.85	7.97	8.19	4.77	0.22	90	115

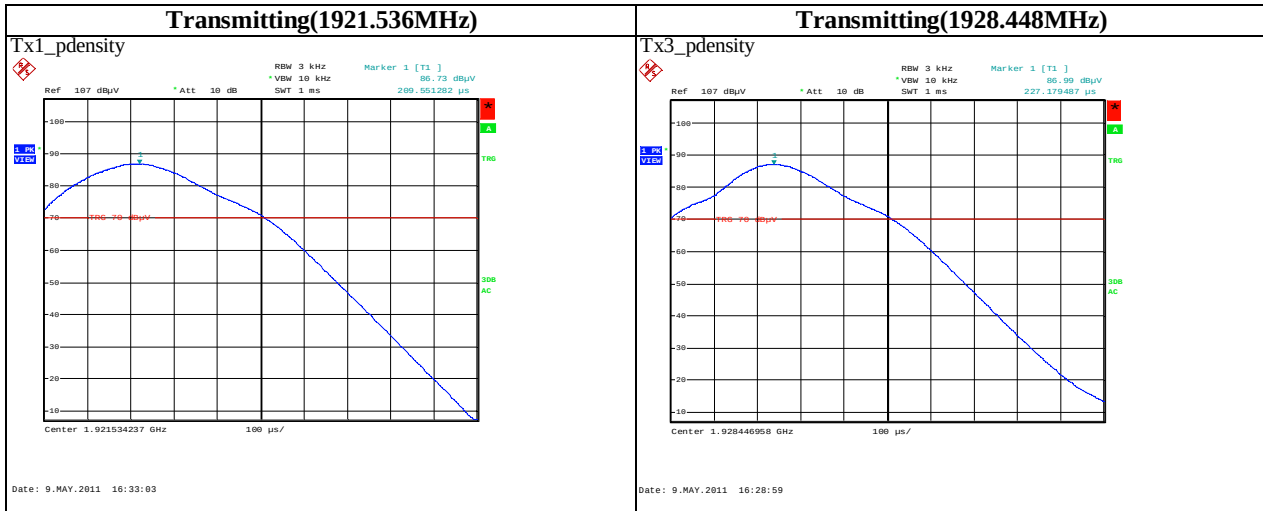
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit1 [dBm] = 10 x log (3[mW])



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Peak Power Spectrum Density

Test placeUL Japan, Inc. Yamakita EMC Lab.No.1 Open area test site

DateMay 9, 2011

Temperature / Humidity27deg.C. , 34%RH

EngineerKenichi Adachi

ModeTx

Antenna 1, Vertical (worst)

(Reference)		(Reference)										
Freq.	S/A	Ant.,Cable,	Result3	SG	Antenna	Cable	Result1	Limit2	Limit1	Margin	T/T	Antenna
[MHz]	Reading	Amp factor	@3m	Reading	Gain	Loss	(EIRP)	(EIRP)	(terminal)	[dB]	angle	height
	[dBuV]	[dB]	[dBuV/m]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dBm]		[deg]	[cm]
1921.5348	86.23	19.23	105.46	2.19	10.81	5.83	7.17	8.19	4.77	1.02	90	115
1928.1363	86.90	19.33	106.23	2.89	10.84	5.85	7.88	8.19	4.77	0.31	90	115

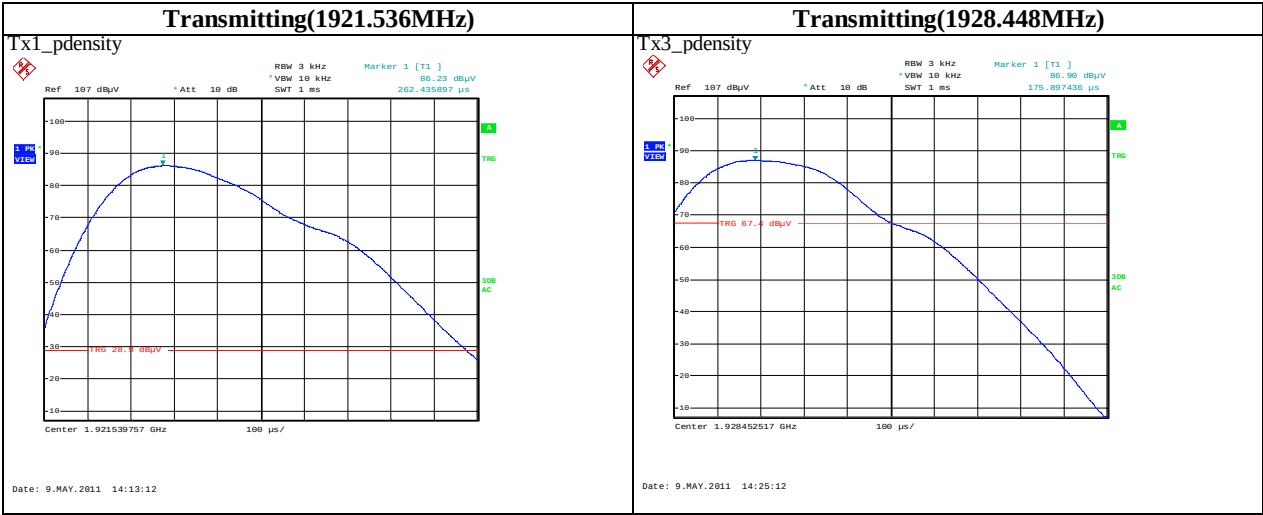
Sample Calculation:

Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB]

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

Limit2 [dBm] = Limit (terminal) + 3.42[dBi]

Limit1 [dBm] = 10 x log (3[mW])



Peak Power Spectrum Density

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date May 9, 2011
 Temperature / Humidity 27deg.C. , 34%RH
 Engineer Kenichi Adachi
 Mode Tx
 Antenna 2, Vertical (worst)

(Reference) (Reference)

Freq. [MHz]	S/A Reading [dBuV]	Ant.,Cable, Amp factor [dB]	Result3 @3m [dBuV/m]	SG Reading [dBm]	Antenna Gain [dB]	Cable Loss [dB]	Result1 (EIRP) [dBm]	Limit2 (EIRP) [dBm]	Limit1 (terminal) [dBm]	Margin [dB]	T/T angle [deg]	Antenna height [cm]
1921.5324	72.75	19.23	91.98	-11.29	10.81	5.83	-6.31	6.66	4.77	12.97	90	115
1928.4466	70.54	19.33	89.87	-13.47	10.84	5.85	-8.48	6.66	4.77	15.14	90	115

Sample Calculation:

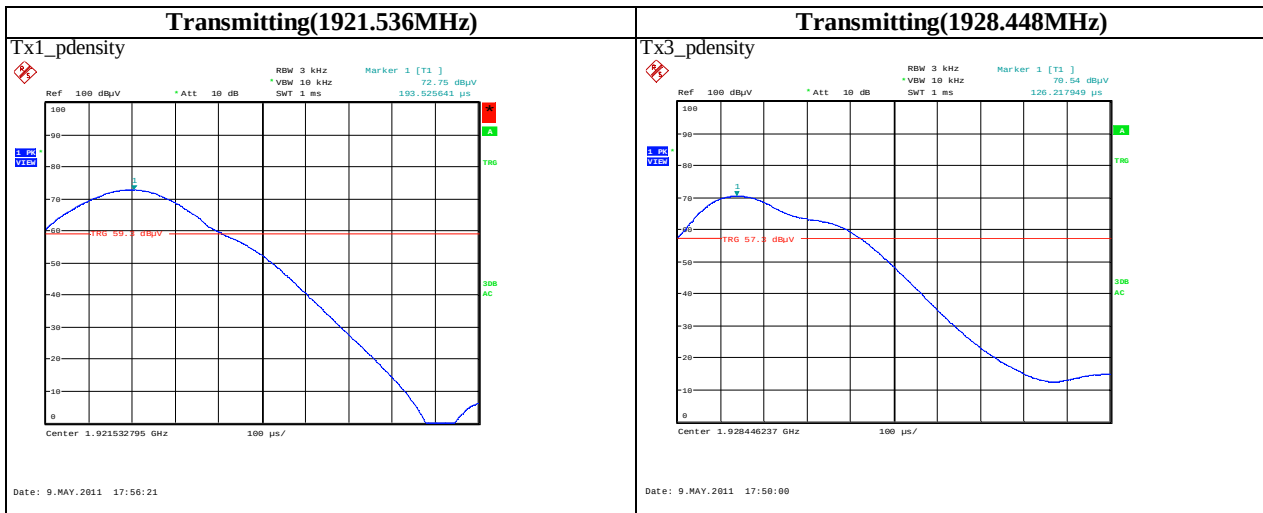
Result3 [dBuV/m] = (S/A (PK) Reading [dBuV] + Ant, Cable, Amp factor[dB])

Result1 [dBm] = SG Reading [dBm] + Antenna Gain [dB] - Cable Loss [dB]

(* antenna cable loss is refer to "Peak Transmit Power".)

Limit2 [dBm] = Limit (terminal) + (8 [dBi] - (cable loss) 6.11 [dB])

Limit1 [dBm] = 10 x log (3[mW])



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In-band Unwanted Emission

Test place

UL Japan, Inc. Yamakita EMC Lab.

No.1 Open area test site

Date

April 26, 2011

Temperature / Humidity

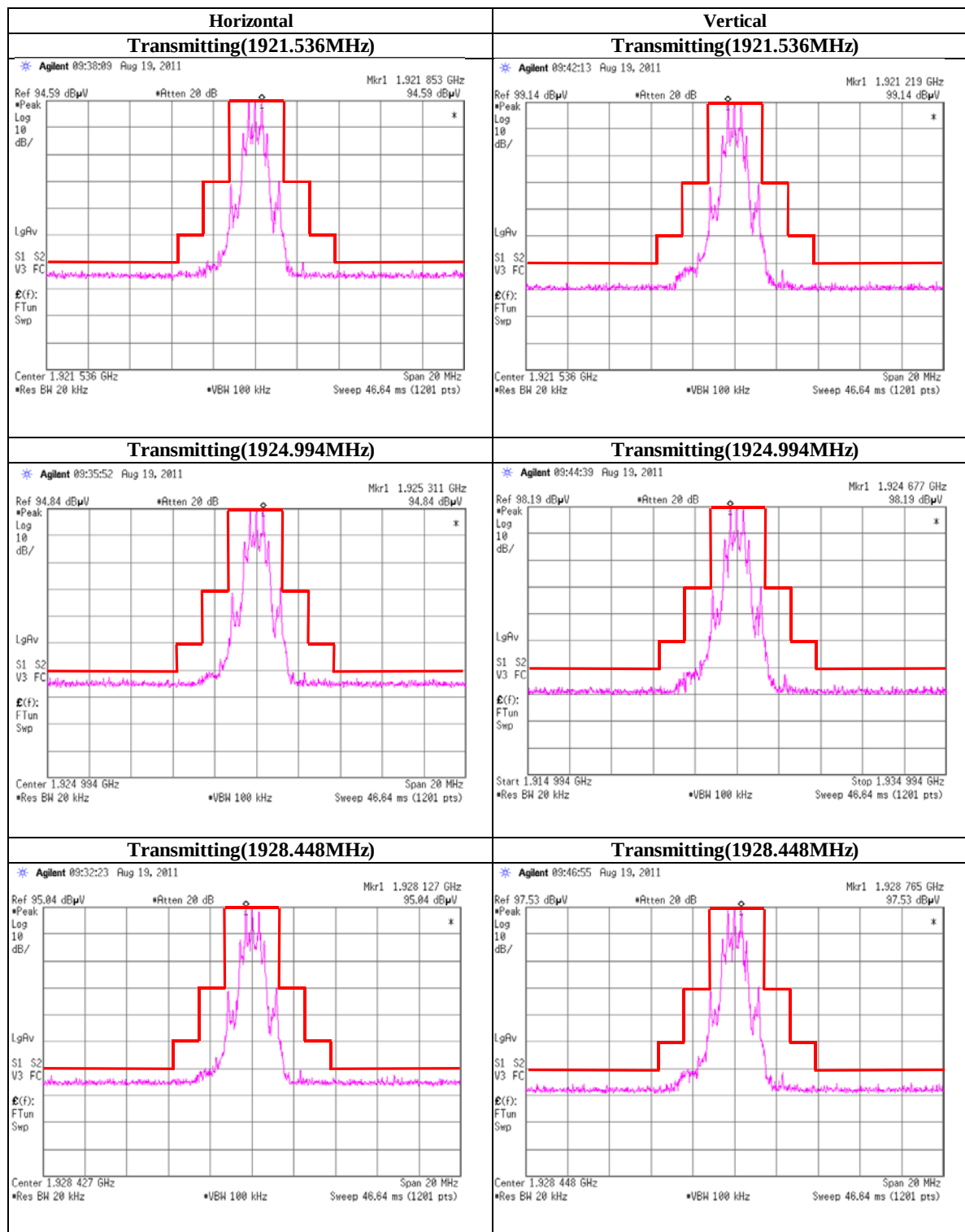
24deg.C. , 69%RH

Engineer

Akira Sato

Mode

Tx Antenna 0

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

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In-band Unwanted Emission

Test place

UL Japan, Inc. Yamakita EMC Lab.

No.1 Open area test site

Date

April 26, 2011

Temperature / Humidity

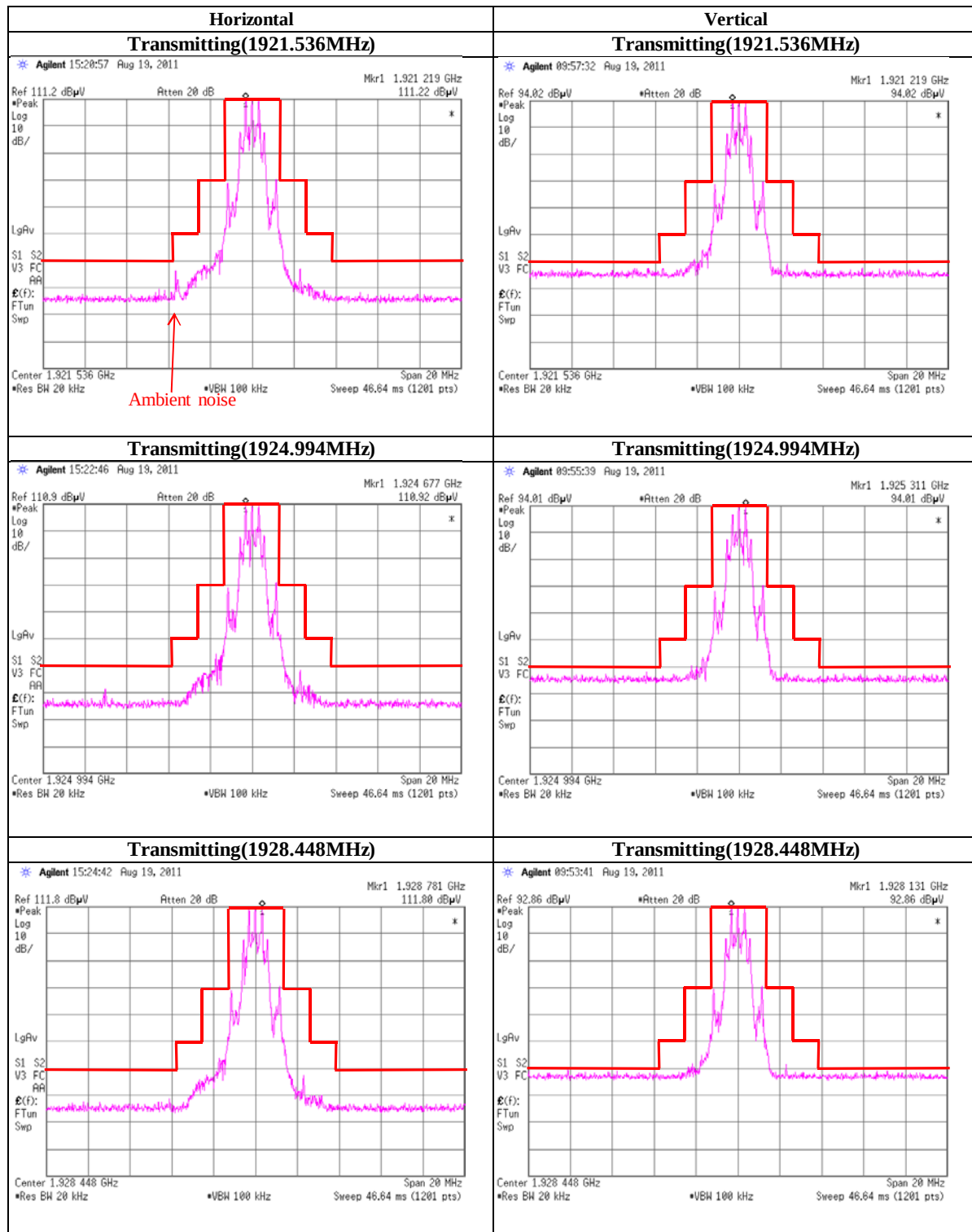
24deg.C , 69%RH

Engineer

Akira Sato

Mode

Tx Antenna 1



UL Japan, Inc.

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In-band Unwanted Emission

Test place

UL Japan, Inc. Yamakita EMC Lab.

No.1 Open area test site

Date

April 26, 2011

Temperature / Humidity

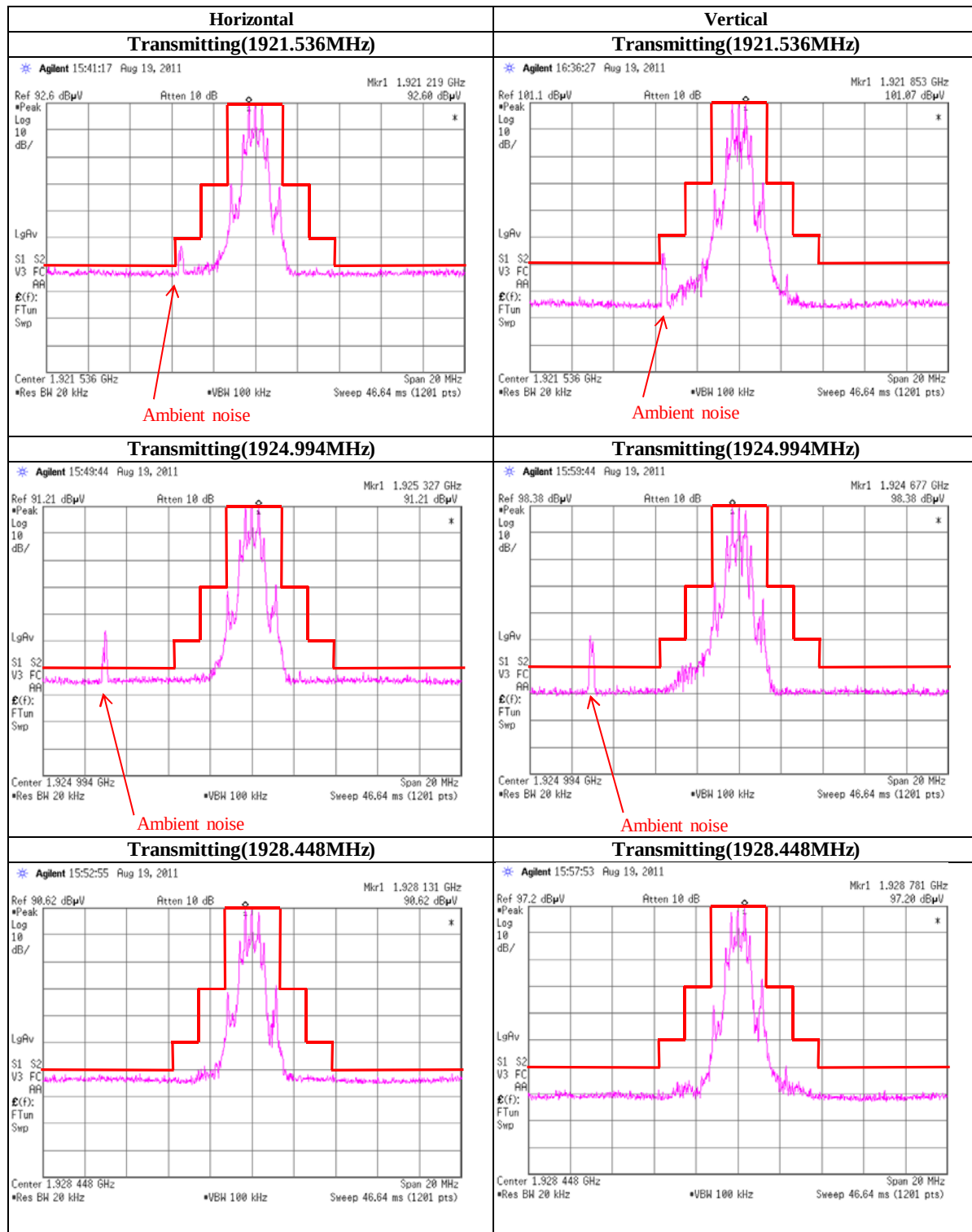
24deg.C. , 69%RH

Engineer

Akira Sato

Mode

Tx Antenna 2



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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1921.536 MHz Antenna 0 (Worst antenna (Antenna 0 or Antenna 1))		

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	435.450	PK	31.2	17.7	8.8	27.6	30.1	-65.13	-36.08	29.05	159	226	
Ver.	425.080	PK	28.2	17.7	8.7	27.5	27.1	-68.13	-36.08	32.05	100	226	
Ver.	435.450	PK	35.1	17.7	8.8	27.6	34.0	-61.23	-36.08	25.15	100	226	
Ver.	456.190	PK	28.6	17.7	9.0	27.7	27.6	-67.63	-36.08	31.55	100	226	
Ver.	476.930	PK	28.1	17.7	9.1	27.7	27.2	-68.03	-36.08	31.95	107	226	
Hor.	1917.500	PK	27.5	29.3	4.6	34.8	26.6	-68.61	-36.08	32.53	113	0	
Hor.	1918.750	PK	29.7	29.3	4.6	34.8	28.8	-66.44	-26.08	40.36	113	0	
Hor.	1920.000	PK	35.3	29.3	4.6	34.8	34.4	-60.82	-6.08	54.74	113	0	
Ver.	1917.500	PK	28.4	29.3	4.6	34.8	27.5	-67.69	-36.08	31.61	140	180	
Ver.	1918.750	PK	33.9	29.3	4.6	34.8	33.0	-62.26	-26.08	36.18	140	180	
Ver.	1920.000	PK	44.0	29.3	4.6	34.8	43.1	-52.12	-6.08	46.04	140	180	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = $10 \times \log((10 \wedge ((\text{Result}[\text{dBuV/m}]) / 20)) \times 10 \wedge (-6)) \times 3[\text{m}] \wedge 2) / (30 \times (\text{gain} = 1) \times 10 \wedge 3)$

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

*The 3rd harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain = 3.42 dBi)

< In-Restrict band >

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
Ver.	114.050	QP	29.0	12.3	8.6	27.3	22.6	43.5	20.9	100	271	
Hor.	3843.072	PK	42.3	31.4	7.1	34.1	46.7	73.9	27.2	100	0	
Hor.	3843.072	AV	27.9	31.4	7.1	34.1	32.3	53.9	21.6	100	0	
Ver.	3843.072	PK	41.7	31.4	7.1	34.1	46.1	73.9	27.8	100	225	
Ver.	3843.072	AV	28.2	31.4	7.1	34.1	32.6	53.9	21.4	100	225	

Result [dBuV/m] = 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).

*The 3rd harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN

Telephone : +81 465 77 1011

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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1928.448 MHz Antenna 0 (Worst antenna (Antenna 0 or Antenna 1))		

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	435.440	PK	29.8	17.7	8.8	27.6	28.7	-66.53	-36.08	30.45	171	226	
Ver.	425.090	PK	28.7	17.7	8.7	27.5	27.6	-67.63	-36.08	31.55	100	226	
Ver.	435.440	PK	35.8	17.7	8.8	27.6	34.7	-60.53	-36.08	24.45	100	226	
Ver.	456.180	PK	30.1	17.7	9.0	27.7	29.1	-66.13	-36.08	30.05	100	226	
Hor.	1930.000	PK	31.4	29.3	4.6	34.8	30.5	-64.77	-6.08	58.69	113	0	
Hor.	1931.250	PK	27.7	29.3	4.6	34.8	26.8	-68.45	-26.08	42.37	113	0	
Hor.	1932.500	PK	26.9	29.3	4.6	34.8	26.0	-69.24	-36.08	33.16	113	0	
Ver.	1930.000	PK	38.2	29.3	4.6	34.8	37.3	-57.96	-6.08	51.88	140	180	
Ver.	1931.250	PK	30.5	29.3	4.6	34.8	29.6	-65.63	-26.08	39.55	140	180	
Ver.	1932.500	PK	27.6	29.3	4.6	34.8	26.7	-68.49	-36.08	32.41	140	180	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = 10 x log(((10 ^ ((Result[dBuV/m]) / 20)) x 10 ^ (-6)) x 3[m]) ^ 2) / (30 x (gain=) 1) x 10 ^ 3)

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

*The 3rd harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain = 3.42 dBi)

< In-Restrict band >

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
Ver.	114.050	QP	26.3	12.3	8.6	27.3	19.9	43.5	23.6	100	271	
Hor.	3856.896	PK	41.3	31.4	7.1	34.1	45.7	73.9	28.2	100	0	
Hor.	3856.896	AV	28.0	31.4	7.1	34.1	32.4	53.9	21.5	100	0	
Ver.	3856.896	PK	41.7	31.4	7.1	34.1	46.1	73.9	27.8	100	225	
Ver.	3856.896	AV	28.1	31.4	7.1	34.1	32.5	53.9	21.4	100	225	

Result [dBuV/m] = 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).

*The 3rd harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN

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Test Report No.: 31HE0252-SH-A-R1

Issued date : May 17, 2011

FCC ID : ACJ9TAWX-C3010

Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	April 26, 2011	April 25, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH
Engineer	Akira Sato	Yasumasa Owaki
Mode	Rx, 1924.994 MHz	Antenna 0 (Worst antenna (Antenna 0 or Antenna 1))

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin	Height [cm]	Angle [deg.]	Remark
Hor.	435.440	QP	31.5	17.7	8.8	27.6	30.4	46.0	15.6	170	225	
Ver.	48.470	QP	24.8	12.0	7.5	27.5	16.8	40.0	23.2	100	271	
Ver.	114.050	QP	24.2	12.3	8.6	27.3	17.8	43.5	25.7	100	271	
Ver.	425.070	QP	28.0	17.7	8.7	27.5	26.9	46.0	19.1	100	226	
Ver.	435.440	QP	34.3	17.7	8.8	27.6	33.2	46.0	12.8	100	226	
Ver.	456.200	QP	31.0	17.7	9.0	27.7	30.0	46.0	16.0	100	226	
Hor.	1924.994	PK	42.7	29.3	4.6	34.8	41.8	73.9	32.1	100	0	
Hor.	1924.994	AV	31.3	29.3	4.6	34.8	30.4	53.9	23.5	100	0	
Ver.	1924.994	PK	43.3	29.3	4.6	34.8	42.4	73.9	31.5	100	180	
Ver.	1924.994	AV	31.4	29.3	4.6	34.8	30.5	53.9	23.4	100	180	

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).

Limit : FCC 15.109 class B Limit

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

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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1921.536 MHz	Antenna 1	

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	435.450	PK	30.2	17.7	8.8	27.6	29.1	-66.13	-36.08	30.05	175	226	
Ver.	425.090	PK	28.6	17.7	8.7	27.5	27.5	-67.73	-36.08	31.65	112	226	
Ver.	435.450	PK	35.9	17.7	8.8	27.6	34.8	-60.43	-36.08	24.35	100	226	
Ver.	456.170	PK	30.3	17.7	9.0	27.7	29.3	-65.93	-36.08	29.85	100	226	
Hor.	1917.500	PK	28.3	29.3	4.6	34.8	27.4	-67.85	-36.08	31.77	113	0	
Hor.	1918.750	PK	28.6	29.3	4.6	34.8	27.7	-67.49	-26.08	41.41	113	0	
Hor.	1920.000	PK	34.4	29.3	4.6	34.8	33.5	-61.70	-6.08	55.62	113	0	
Hor.	5764.608	PK	24.3	34.3	8.3	33.7	33.2	-62.00	-36.08	25.92	100	0	
Ver.	1917.500	PK	28.3	29.3	4.6	34.8	27.4	-67.85	-36.08	31.77	140	180	
Ver.	1918.750	PK	30.1	29.3	4.6	34.8	29.2	-66.04	-26.08	39.96	140	180	
Ver.	1920.000	PK	37.7	29.3	4.6	34.8	36.8	-58.39	-6.08	52.31	140	180	
Ver.	5764.608	PK	24.3	34.3	8.3	33.7	33.2	-62.06	-36.08	25.98	100	225	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = $10 \times \log((10^{\frac{(Result[dBuV/m])}{20}}) \times 10^{(-6)}) \times 3[m]^2 / (30 \times (gain=1) \times 10^3)$

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

*The 4th harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain = 3.42 dBi)

< In-Restrict band >

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
Ver.	114.070	QP	24.7	12.3	8.6	27.3	18.3	43.5	25.2	100	271	
Hor.	3843.072	PK	41.8	31.4	7.1	34.1	46.2	73.9	27.7	100	0	
Hor.	3843.072	AV	28.0	31.4	7.1	34.1	32.4	53.9	21.5	100	0	
Ver.	3843.072	PK	42.5	31.4	7.1	34.1	46.9	73.9	27.0	100	225	
Ver.	3843.072	AV	28.5	31.4	7.1	34.1	32.9	53.9	21.0	100	225	

Result [dBuV/m] = 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).

*The 4th harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1928.448 MHz	Antenna 1	

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	435.450	PK	32.4	17.7	8.8	27.6	31.3	-63.93	-36.08	27.85	167	226	
Ver.	425.080	PK	28.0	17.7	8.7	27.5	26.9	-68.33	-36.08	32.25	105	226	
Ver.	435.450	PK	35.9	17.7	8.8	27.6	34.8	-60.43	-36.08	24.35	100	226	
Ver.	456.200	PK	30.6	17.7	9.0	27.7	29.6	-65.63	-36.08	29.55	100	226	
Hor.	1930.000	PK	28.4	29.3	4.6	34.8	27.5	-67.77	-6.08	61.69	113	0	
Hor.	1931.250	PK	30.0	29.3	4.6	34.8	29.1	-66.14	-26.08	40.06	113	0	
Hor.	1932.500	PK	28.2	29.3	4.6	34.8	27.3	-67.93	-36.08	31.85	113	0	
Hor.	5785.344	PK	24.0	34.3	8.3	33.7	32.9	-62.29	-36.08	26.21	100	0	
Ver.	1930.000	PK	33.7	29.3	4.6	34.8	32.8	-62.44	-6.08	56.36	140	180	
Ver.	1931.250	PK	29.5	29.3	4.6	34.8	28.6	-66.60	-26.08	40.52	140	180	
Ver.	1932.500	PK	28.5	29.3	4.6	34.8	27.6	-67.64	-36.08	31.56	140	180	
Ver.	5785.344	PK	23.4	34.3	8.3	33.7	32.3	-62.89	-36.08	26.81	100	225	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = $10 \times \log \left(\left(10^{\left(\frac{\text{Result[dBuV/m]}}{20} \right)} \times 10^{-6} \right) \times 3 \right) / \left(30 \times (\text{gain}) \right) \times 10^3$

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

*The 4th harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain = 3.42 dBi)

< In-Restrict band >

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
Ver.	114.070	QP	24.6	12.3	8.6	27.3	18.2	43.5	25.3	100	271	
Hor.	3856.896	PK	41.8	31.4	7.1	34.1	46.2	73.9	27.7	100	0	
Hor.	3856.896	AV	28.0	31.4	7.1	34.1	32.4	53.9	21.5	100	0	
Ver.	3856.896	PK	41.7	31.4	7.1	34.1	46.1	73.9	27.8	100	225	
Ver.	3856.896	AV	28.4	31.4	7.1	34.1	32.8	53.9	21.1	100	225	

Result [dBuV/m] = 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).

*The 4th harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

Yamakita EMC Lab.

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Test Report No.: 31HE0252-SH-A-R1

Issued date : May 17, 2011

FCC ID : ACJ9TAWX-C3010

Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	April 26, 2011	April 25, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH
Engineer	Akira Sato	Yasumasa Owaki
Mode	Rx, 1924.994 MHz	Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin	Height [cm]	Angle [deg.]	Remark
Hor.	435.440	QP	31.5	17.7	8.8	27.6	30.4	46.0	15.6	170	225	
Ver.	48.470	QP	24.8	12.0	7.5	27.5	16.8	40.0	23.2	100	271	
Ver.	114.050	QP	24.2	12.3	8.6	27.3	17.8	43.5	25.7	100	271	
Ver.	425.070	QP	28.0	17.7	8.7	27.5	26.9	46.0	19.1	100	226	
Ver.	435.440	QP	34.3	17.7	8.8	27.6	33.2	46.0	12.8	100	226	
Ver.	456.200	QP	31.0	17.7	9.0	27.7	30.0	46.0	16.0	100	226	
Hor.	1924.994	PK	42.6	29.3	4.6	34.8	41.7	73.9	32.2	100	0	
Hor.	1924.994	AV	31.3	29.3	4.6	34.8	30.4	53.9	23.6	100	0	
Ver.	1924.994	PK	43.3	29.3	4.6	34.8	42.4	73.9	31.5	100	180	
Ver.	1924.994	AV	31.5	29.3	4.6	34.8	30.6	53.9	23.3	100	180	

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).

Limit : FCC 15.109 class B Limit

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

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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1921.536 MHz	Antenna 2	

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	953.650	PK	19.2	22.9	12.6	26.9	27.8	-67.43	-37.61	29.82	100	90	
Ver.	93.300	PK	22.5	8.9	8.3	27.4	12.3	-82.93	-37.61	45.32	100	180	
Ver.	601.140	PK	20.5	17.7	8.7	27.5	19.4	-75.83	-37.61	38.22	100	180	
Ver.	891.440	PK	19.6	17.7	8.8	27.6	18.5	-76.73	-37.61	39.12	100	180	
Ver.	953.650	PK	19.2	17.7	9.0	27.7	18.2	-77.03	-37.61	39.42	100	180	
Hor.	1917.500	PK	26.0	29.3	4.6	34.8	25.1	-70.16	-37.61	32.55	100	90	
Hor.	1918.750	PK	25.4	29.3	4.6	34.8	24.5	-70.70	-27.61	43.09	100	90	
Hor.	1920.000	PK	26.8	29.3	4.6	34.8	25.9	-69.31	-7.61	61.70	100	90	
Ver.	1917.500	PK	26.2	29.3	4.6	34.8	25.3	-69.92	-37.61	32.31	100	180	
Ver.	1918.750	PK	25.8	29.3	4.6	34.8	24.9	-70.37	-27.61	42.76	100	180	
Ver.	1920.000	PK	27.9	29.3	4.6	34.8	27.0	-68.21	-7.61	60.60	100	180	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = $10 \times \log((10^{\frac{(\text{Result}[\text{dBuV/m}])}{20}}) \times 10^{(-6)}) \times 3[\text{m}]^2 / (30 \times (\text{gain} - 1) \times 10^3)$

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

*The 3rd harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain 8 dBi - antenna cable loss 6.11 dB)

< In-Restrict band >

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
Hor.	3843.072	PK	41.8	31.4	7.1	34.1	46.2	73.9	27.7	100	90	
Hor.	3843.072	AV	27.9	31.4	7.1	34.1	32.3	53.9	21.7	100	90	
Ver.	3843.072	PK	41.6	31.4	7.1	34.1	46.0	73.9	27.9	100	180	
Ver.	3843.072	AV	27.9	31.4	7.1	34.1	32.3	53.9	21.6	100	180	

Result [dBuV/m] = 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).

*The 3rd harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

Yamakita EMC Lab.

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Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site	
Date	April 26, 2011	April 25, 2011	May 9, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH	27deg.C. , 34%RH
Engineer	Akira Sato	Yasumasa Owaki	Kenichi Adachi
Mode	Tx, 1928.448 MHz	Antenna 2	

< Out of Restrict band >

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit (EIRP) [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hor.	953.650	PK	19.2	22.9	12.6	27.4	27.3	-67.93	-37.61	30.32	100	90	
Ver.	93.300	PK	22.6	8.9	8.3	27.4	12.4	-82.83	-37.61	45.22	100	180	
Ver.	601.140	PK	20.3	19.4	10.1	28.0	21.8	-73.43	-37.61	35.82	100	180	
Ver.	891.440	PK	19.5	22.2	12.2	27.1	26.8	-68.43	-37.61	30.82	100	180	
Ver.	953.650	PK	19.2	22.9	12.6	27.4	27.3	-67.93	-37.61	30.32	100	180	
Hor.	1930.000	PK	28.2	29.3	4.6	34.8	27.3	-67.90	-7.61	60.29	100	90	
Hor.	1931.250	PK	26.6	29.3	4.6	34.8	25.7	-69.57	-27.61	41.96	100	90	
Hor.	1932.500	PK	26.4	29.3	4.6	34.8	25.5	-69.75	-37.61	32.14	100	90	
Ver.	1930.000	PK	29.1	29.3	4.6	34.8	28.2	-67.03	-7.61	59.42	100	180	
Ver.	1931.250	PK	27.3	29.3	4.6	34.8	26.4	-68.82	-27.61	41.21	100	180	
Ver.	1932.500	PK	26.2	29.3	4.6	34.8	25.3	-69.94	-37.61	32.33	100	180	

Result [dBuV/m] = Reading + Ant Factor + Loss (Cable+Attenuator+Filter - Gain(Amplifier))

Result [dBm] = $10 \times \log((10^{\frac{1}{10} \times (\text{Result}[\text{dBuV/m}] - 20)}) \times 10^{(-6)} \times 3[m])^2 / (30 \times (\text{gain} - 1) \times 10^3)$

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

*The 3rd harmonic was not seen so the result was its base noise level.

Limit (EIRP) : (ANSI C63.17 clause 6.1.6.2 Limit) + (EUT antenna gain 8 dBi - antenna cable loss 6.11 dB)

< In-Restrict band >

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
Hor.	3856.896	PK	41.2	31.4	7.1	34.1	45.6	73.9	28.3	100	90	
Hor.	3856.896	AV	27.9	31.4	7.1	34.1	32.3	53.9	21.6	100	90	
Ver.	3856.896	PK	41.1	31.4	7.1	34.1	45.5	73.9	28.4	100	180	
Ver.	3856.896	AV	27.9	31.4	7.1	34.1	32.3	53.9	21.6	100	180	

Result [dBuV/m] = 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).

*The 3rd harmonic was not seen so the result was its base noise level.

Limit : FCC 15.209 Limit

UL Japan, Inc.

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Test Report No.: 31HE0252-SH-A-R1

Issued date : May 17, 2011

FCC ID : ACJ9TAWX-C3010

Unwanted Radiated Emission

Test place	UL Japan, Inc. Yamakita EMC Lab.	No.1 Open area test site
Date	April 26, 2011	April 25, 2011
Temperature / Humidity	29deg.C. , 34%RH	20deg.C. , 60%RH
Engineer	Akira Sato	Yasumasa Owaki
Mode	Rx, 1924.994 MHz	Antenna 2

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin	Height [cm]	Angle [deg.]	Remark
Hor.	953.650	PK	19.2	22.9	12.6	27.4	27.3	46.0	18.7	100	90	
Ver.	93.310	PK	22.3	8.9	8.3	27.4	12.1	40.0	27.9	100	180	
Ver.	601.140	PK	20.5	19.4	10.1	28.0	22.0	43.5	21.5	100	180	
Ver.	891.440	PK	19.6	22.2	12.2	27.1	26.9	46.0	19.1	100	180	
Ver.	953.650	PK	19.2	22.9	12.6	27.4	27.3	46.0	18.7	100	180	
Hor.	1924.994	PK	42.6	29.3	4.6	34.8	41.7	73.9	32.2	100	0	
Hor.	1924.994	AV	31.3	29.3	4.6	34.8	30.4	53.9	23.6	100	0	
Ver.	1924.994	PK	43.3	29.3	4.6	34.8	42.4	73.9	31.5	100	180	
Ver.	1924.994	AV	31.5	29.3	4.6	34.8	30.6	53.9	23.3	100	180	

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).

Limit : FCC 15.109 class B Limit

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Unwanted Radiated Emission

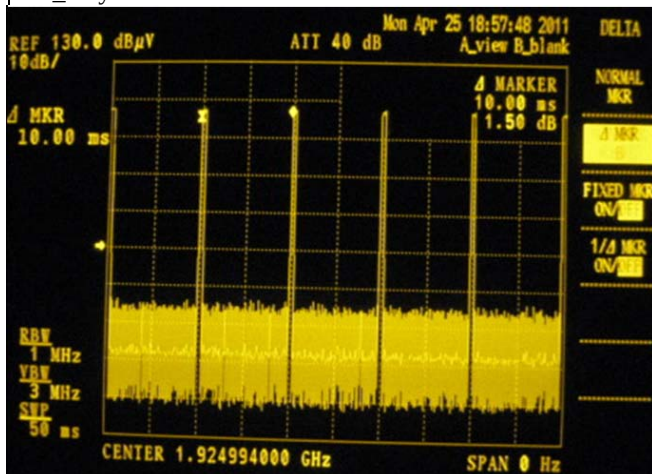
Tx,

VBW (AV) Calculation

VBW: $1/x = 100\text{Hz}$

x: (Tx on+Tx off) = 10ms

Tx2_duty1



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Monitoring Threshold, Least Interfered Channel

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011 May 11, 2011
 Temperature / Humidity 21deg.C. , 63%RH 20deg.C. , 69%RH
 Engineer Kenichi Adachi Kenichi Adachi
 Mode Communication , (antenna position 1, 2)

(bandwidth: 1.297 MHz)

[antenna position 1]

Value Calculated (threshold limit at antenna terminal)

$= -174 + 10 \times \text{LOG}(\text{BW} [\text{Hz}]) + (\text{M(L)} =) 30 + \text{P}(\text{max})[\text{dBm}] - \text{P}(\text{EUT})[\text{dBm}] = -174 + 10 \times \log(1.297 \times 10^6) + 30 + 20.56 - 20.14$	
[a] Lower Threshold T(L, pos1)	-82.45 dBm
$= -174 + 10 \times \text{LOG}(\text{BW} [\text{Hz}]) + (\text{M(U)} =) 50 + \text{P}(\text{max})[\text{dBm}] - \text{P}(\text{EUT})[\text{dBm}] = -174 + 10 \times \log(1.297 \times 10^6) + 50 + 20.56 - 20.14$	
[b] Upper Threshold T(U, pos1)	-62.45 dBm
[c] U(M) =	6 dB

* The peak transmit power limit was used for P(EUT) in the calculation of the threshold limit, to consider the worst case applicable limit.

[d] masking channel Level: T(U, pos1) + U(M) + 10 =	-46.45 dBm	(reference)
[e] Interference signal: T(U, pos1) + U(M) =	-56.45 dBm	

Interfered cable loss = 15.3 dB
 Distance = 0.8 m, EUT ant.Gain = 3.42 dBi
 Freq. = 1928.448 MHz G(REF) = 10.8 dBi (Interfered antenna gain)
 Interfered level limit = -56.45[dBm] - 3.42 [dBi] - 20 x log (Lamda / (4 x pi() x 0.8 [m])) - G(REF) + Interfered loss
 = -56.45 - 3.42 - 20 x log ((300 / 1928.448) / (4 x 3.14... x 0.8)) - 10.8 [dBi] + 15.3[dB] = -19.16 dBm

Monitoring Threshold		Verdict
Least Interfered Channel Procedure Not used:		N/A
Lower Threshold (SG reading)	N/A	
Lower Threshold (point result)	N/A	
Least Interfered Channel Procedure:		Pass
Upper Threshold (SG setting)	-40.60 dBm	
Upper Threshold (interfered point result)	-77.89 dBm	

F1: 1928.448MHz (other channel was masked.)

Least Interfered Channel (LIC) Procedure Test

	Observation	Verdict
b) F1: T(U)+U(M)+7dB, F2: T(U)+U(M)	Transmitting F2	Pass
c) F1: T(U)+U(M), F2: T(U)+U(M)+7dB	Transmitting F1	Pass
d) F1: T(U)+U(M)+1dB, F2: T(U)+U(M)-6dB	Transmitting F2	Pass
e) F1: T(U)+U(M)-6dB, F2: T(U)+U(M)+1dB	Transmitting F1	Pass

F1: 1928.448MHz, F2: 1926.720MHz (other channel was masked.)

[antenna position 2]

Value Calculated (threshold limit at antenna terminal)

$= -174 + 10 \times \text{LOG}(\text{BW} [\text{Hz}]) + (\text{M(L)} =) 30 + \text{P}(\text{max})[\text{dBm}] - \text{P}(\text{EUT})[\text{dBm}] = -174 + 10 \times \log(1.297 \times 10^6) + 30 + 20.56 - (1.21 - 1.89)$	
[a] Lower Threshold T(L, pos2)	-61.63 dBm
$= -174 + 10 \times \text{LOG}(\text{BW} [\text{Hz}]) + (\text{M(U)} =) 50 + \text{P}(\text{max})[\text{dBm}] - \text{P}(\text{EUT})[\text{dBm}] = -174 + 10 \times \log(1.297 \times 10^6) + 50 + 20.56 - (1.21 - 1.89)$	
[b] Upper Threshold T(U, pos2)	-41.63 dBm
[c] U(M) =	6 dB

[d] masking channel Level: T(U, pos2) + U(M) + 10 =	-25.63 dBm	(reference)
[e] Interference signal: T(U, pos2) + U(M) =	-35.63 dBm	

Interfered cable loss = 9.2 dB
 Distance = 3 m, EUT ant.Gain = 1.89 dBi = 8dBi - (cable loss) 6.11dB
 Freq. = 1928.448 MHz G(REF) = 10.8 dBi (Interfered antenna gain)
 P(EUT, pos2, EIRP) max= 1.21dBm, P(EUT,pos2) at antenna terminal = P(EUT, pos2, EIRP) - EUT ant.Gain = -0.68dBm
 Interfered level limit = -35.63[dBm] - 1.89 [dBi] - 20 x log (Lamda / (4 x pi() x 3 [m])) - G(REF) + Interfered loss
 = -35.63 - 1.89 - 20 x log ((300 / 1928.448) / (4 x 3.14... x 3)) - 10.8 [dBi] + 9.2[dB] = 8.57 dBm

Monitoring Threshold		Verdict
Least Interfered Channel Procedure Not used:		N/A
Lower Threshold (SG reading)	N/A	
Lower Threshold (point result)	N/A	
Least Interfered Channel Procedure:		Pass
Upper Threshold (SG setting)	-12.60 dBm	
Upper Threshold (interfered point result)	-56.80 dBm	

F1: 1928.448MHz (other channel was masked.)

* The calculations in the above tables show that T(U,pos1) < T(U,pos2), i.e. T(U,pos1) represents a more severe limit.

Therefore the value of T(U,pos1) was used as the value of T(U) in this test report for all test items where T(U) is involved: T(U) = T(U,pos1).

Least Interfered Channel (LIC) Procedure Test

	Observation	Verdict
b) F1: T(U)+U(M)+7dB, F2: T(U)+U(M)	Transmitting F2	Pass
c) F1: T(U)+U(M), F2: T(U)+U(M)+7dB	Transmitting F1	Pass
d) F1: T(U)+U(M)+1dB, F2: T(U)+U(M)-6dB	Transmitting F2	Pass
e) F1: T(U)+U(M)-6dB, F2: T(U)+U(M)+1dB	Transmitting F1	Pass

F1: 1928.448MHz, F2: 1926.720MHz (other channel was masked.)

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Automatic Discontinuation of Transmission

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 29, 2011
 Temperature / Humidity 20deg.C. , 66%RH
 Engineer Kenichi Adachi
 Mode Communication , (antenna position 1)

Test	EUT Reaction	Verdict
1, Power removed from the EUT	A	Pass
2, EUT Switch Off	N/A	Pass
3, Hook-On by companion device	B	Pass
4, Hook-On by EUT	N/A	Pass
5, Power Removed from Companion Device	B	Pass
6, Companion Device Switch Off	B	Pass

A: Connection breakdown, Cease of all transmissions

B: Connection breakdown, EUT transmits control and signaling information

C: Connection breakdown, Companion Device transmits control and signaling information

N/A: Not Applicable (the EUT does not have an radio on/off switch and can not perform Hook-On.)

System Acknowledgement

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011 May 10, 2011
 Temperature / Humidity 21deg.C. , 63%RH 24deg.C. , 59%RH
 Engineer Kenichi Adachi Kenichi Adachi
 Mode Communication , (antenna position 1, 2)

[Antenna position 1]

	Observation	Verdict
Initial transmission without acknowledgements	Only for Initiating device	N/A
Transmission time after loss of acknowledgements	3.474 s	Pass

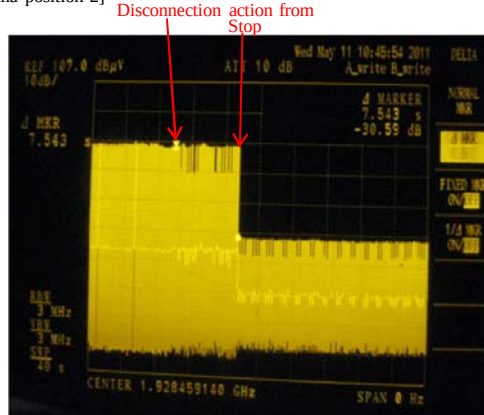
[Antenna position 2]

	Observation	Verdict
Initial transmission without acknowledgements	Only for Initiating device	N/A
Transmission time after loss of acknowledgements	7.543 s	Pass

[Antenna position 1]



[Antenna position 2]



Selected Channel Confirmation

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011 May 11, 2011
 Temperature / Humidity 21deg.C. , 63%RH 20deg.C. , 69%RH
 Engineer Kenichi Adachi Kenichi Adachi
 Mode Communication , (antenna position 1, 2)

[Antenna position 1]

	Observation	Verdict
F1: T(U)+U(M), F2: none	Transmission, F2	Pass
F1: none, F2: T(U)+U(M)	Transmission, F1	Pass

[Antenna position 2]

	Observation	Verdict
F1: T(U)+U(M), F2: none	Transmission, F2	Pass
F1: none, F2: T(U)+U(M)	Transmission, F1	Pass

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Monitor Bandwidth

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011 May 11, 2011
 Temperature / Humidity 21deg.C. , 63%RH 20deg.C. , 69%RH
 Engineer Kenichi Adachi Kenichi Adachi
 Mode Communication , (antenna position 1, 2)

[Antenna position 1]

	Observation	Verdict
Simple Compliance test	No transmission	Pass
More Detailed Test, at -6dB points	N/A	N/A
More Detailed Test, at -12dB points	N/A	N/A

[Antenna position 2]

	Observation	Verdict
Simple Compliance test	No transmission	Pass
More Detailed Test, at -6dB points	N/A	N/A
More Detailed Test, at -12dB points	N/A	N/A

Monitoring Reaction time

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date May 1, 2011 May 11, 2011
 Temperature / Humidity 21deg.C. , 68%RH 20deg.C. , 69%RH
 Engineer Kenichi Adachi Kenichi Adachi
 Mode Communication , (antenna position 1, 2)

[Antenna position 1]

	Observation	Verdict
largest of 50us or $50 \times \sqrt{1.25 / B[\text{MHz}]}$	No Transmission	Pass
largest of 35us or $35 \times \sqrt{1.25 / B[\text{MHz}]}$ and with interference level raised 6dB	No transmission	Pass

[Antenna position 2]

	Observation	Verdict
largest of 50us or $50 \times \sqrt{1.25 / B[\text{MHz}]}$	No Transmission	Pass
largest of 35us or $35 \times \sqrt{1.25 / B[\text{MHz}]}$ and with interference level raised 6dB	No transmission	Pass

Frame-Repetition Stability

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011
 Temperature / Humidity 21deg.C. , 63%RH
 Engineer Kenichi Adachi
 Mode Communication , (antenna position 1)

Maximum Frame Repeation Stability	Limit	Verdict
max 2.04 ppm	10ppm	Pass

Frame period and Jitter

Test place UL Japan, Inc. Yamakita EMC Lab. No.1 Open area test site
 Date April 30, 2011
 Temperature / Humidity 21deg.C. , 63%RH
 Engineer Kenichi Adachi
 Mode Communication , (antenna position 1)

Frame Period [ms]	Maximum Jitter [us]	Limit Maximum Jitter[us]	Verdict
10.00	0.03	25.00	Pass

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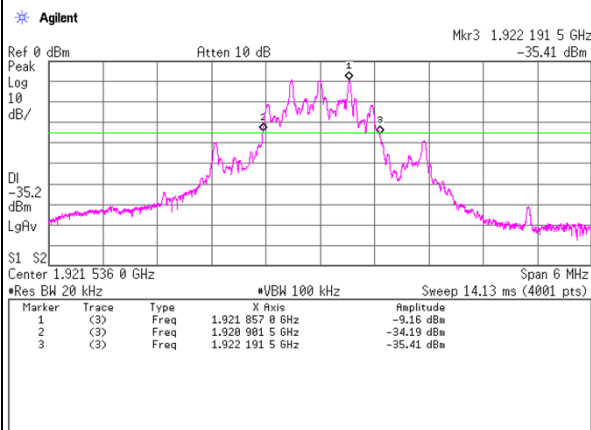
Facsimile : +81 465 77 2112

Frequency Stability

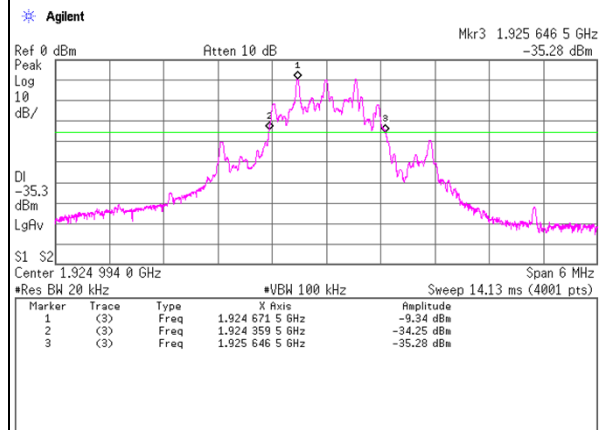
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Normal Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90150	1922.19150	1921.54650	5.46	10.00	4.54
1924.9940	1924.35950	1925.64650	1925.00300	4.68	10.00	5.32
1928.4480	1927.81200	1929.10650	1928.45925	5.83	10.00	4.17

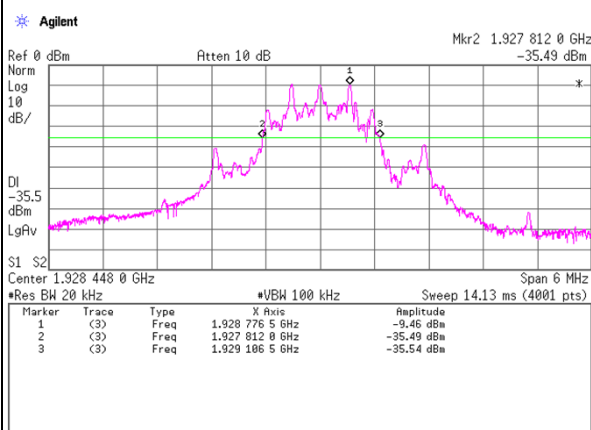
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



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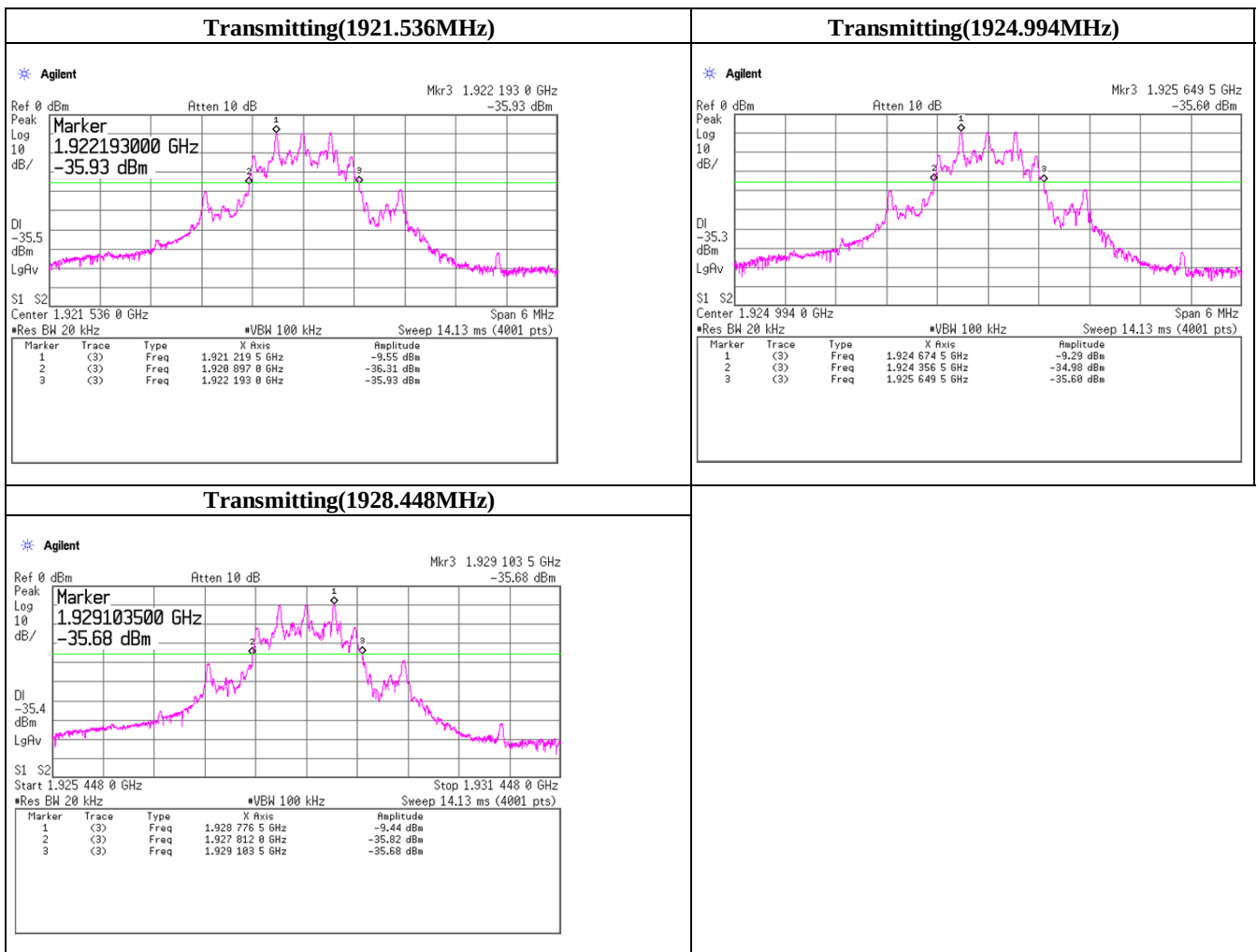
Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Normal Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89700	1922.19300	1921.54500	4.68	10.00	5.32
1924.9940	1924.35650	1925.64950	1925.00300	4.68	10.00	5.32
1928.4480	1927.81200	1929.10350	1928.45775	5.06	10.00	4.94



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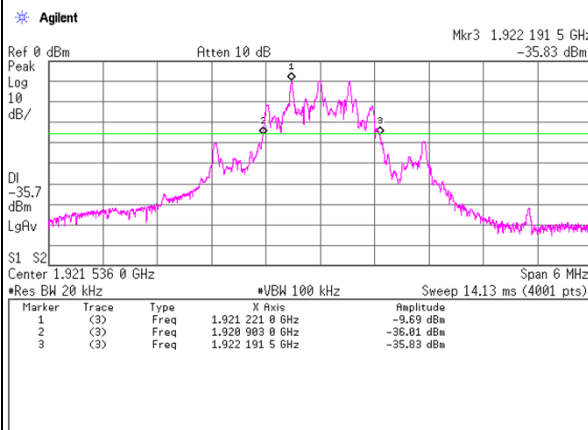
Facsimile : +81 465 77 2112

Frequency Stability

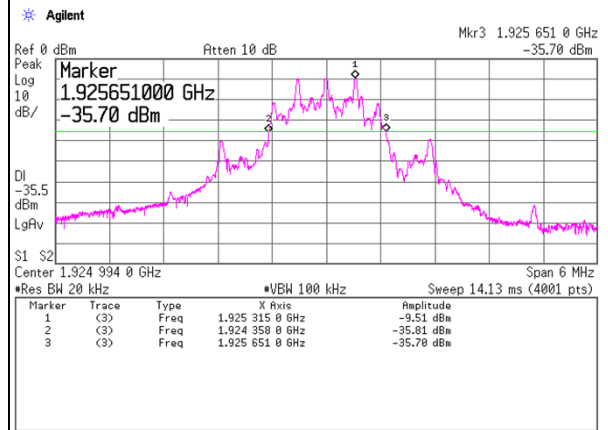
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Normal Temperature, Highest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90300	1922.19150	1921.54725	5.85	10.00	4.15
1924.9940	1924.35800	1925.65100	1925.00450	5.45	10.00	4.55
1928.4480	1927.81500	1929.11100	1928.46300	7.78	10.00	2.22

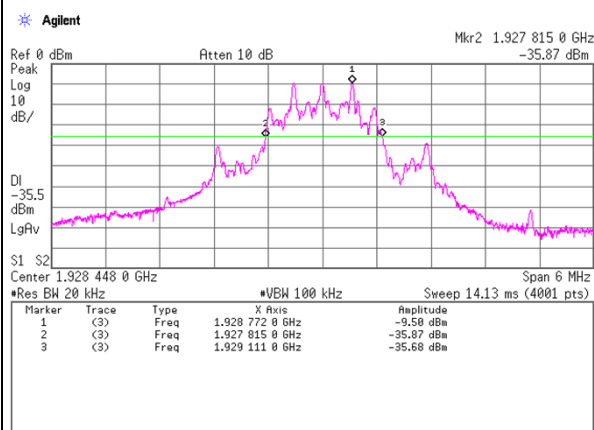
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



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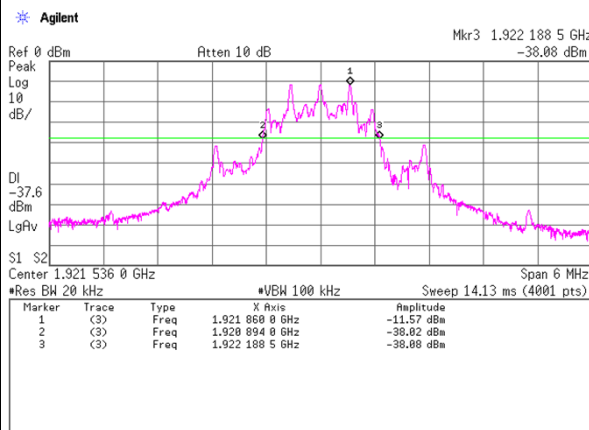
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Frequency Stability

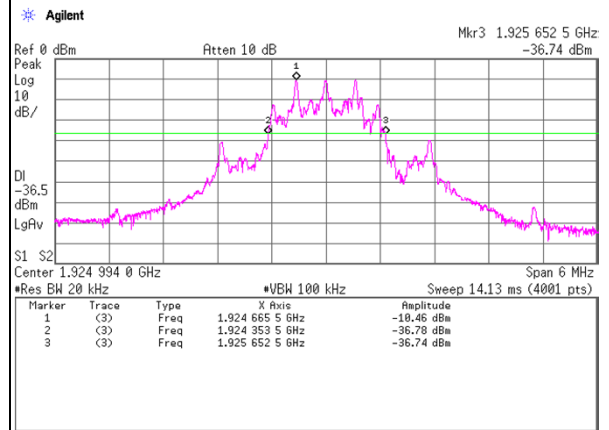
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Lowest Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89400	1922.18850	1921.54125	2.73	10.00	7.27
1924.9940	1924.35350	1925.65250	1925.00300	4.68	10.00	5.32
1928.4480	1927.81200	1929.10650	1928.45925	5.83	10.00	4.17

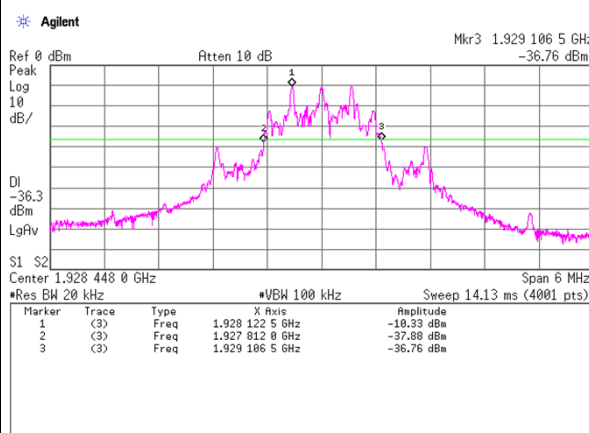
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



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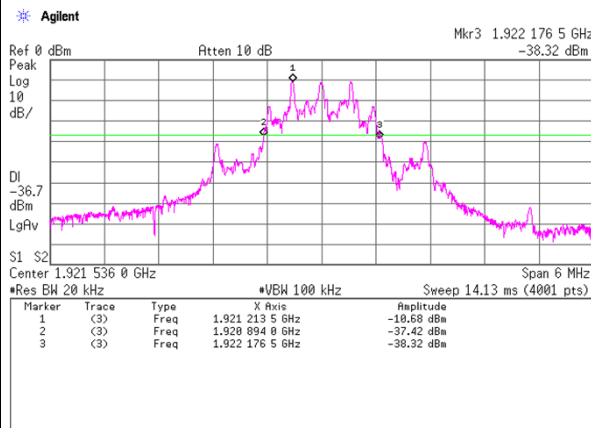
Facsimile : +81 465 77 2112

Frequency Stability

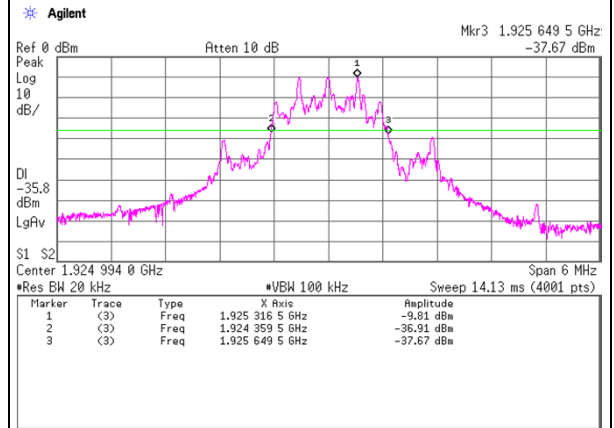
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Lowest Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89400	1922.17650	1921.53525	-0.39	10.00	9.61
1924.9940	1924.35950	1925.64950	1925.00450	5.45	10.00	4.55
1928.4480	1927.81800	1929.10050	1928.45925	5.83	10.00	4.17

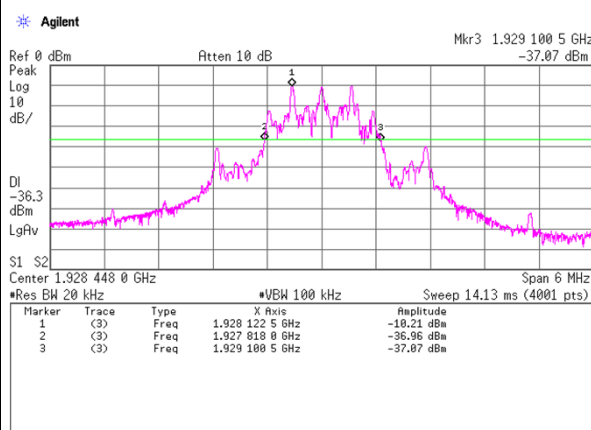
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN

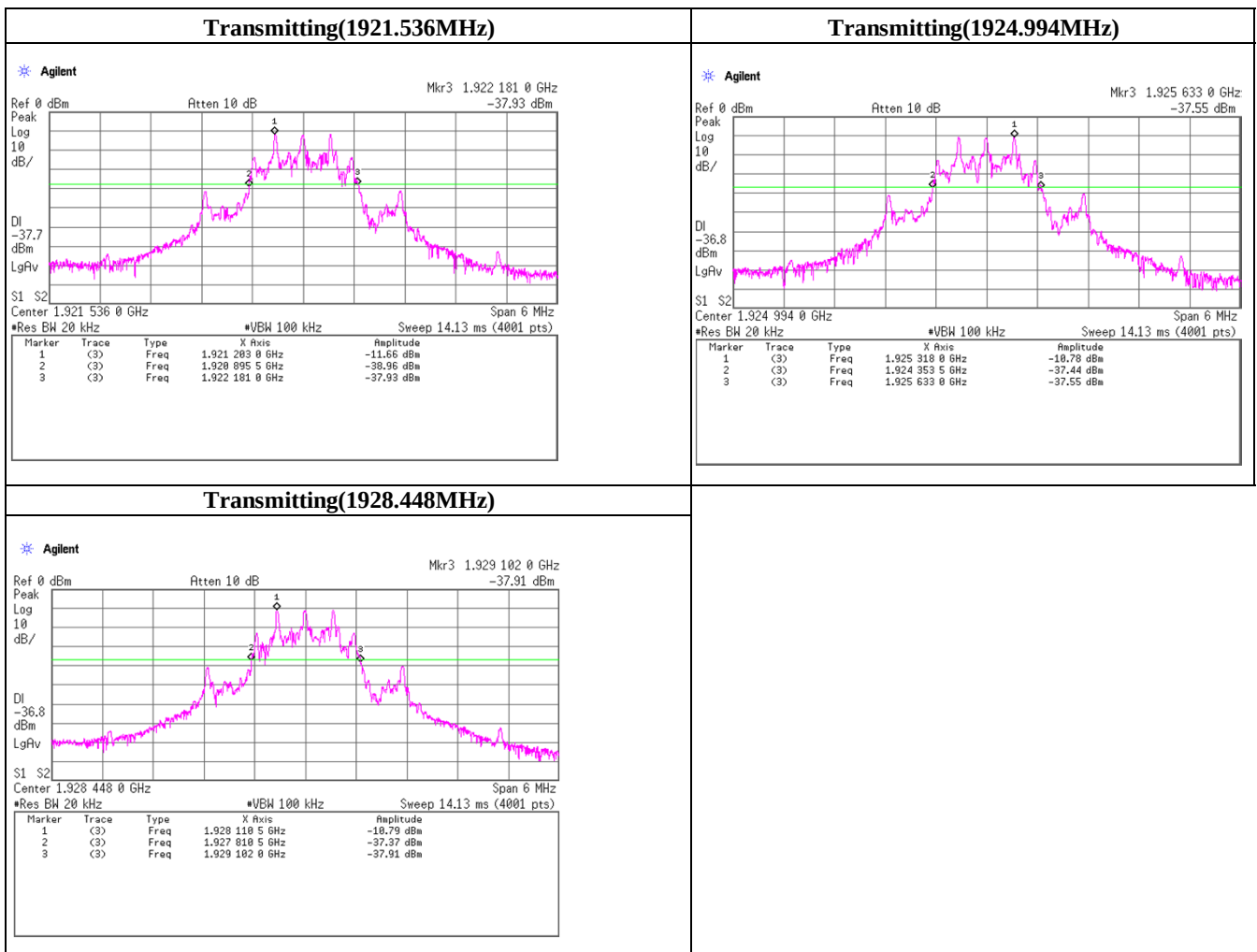
Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Lowest Temperature, Highest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89550	1922.18100	1921.53825	1.17	10.00	8.83
1924.9940	1924.35350	1925.63300	1924.99325	-0.39	10.00	9.61
1928.4480	1927.81050	1929.10200	1928.45625	4.28	10.00	5.72



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Telephone : +81 465 77 1011

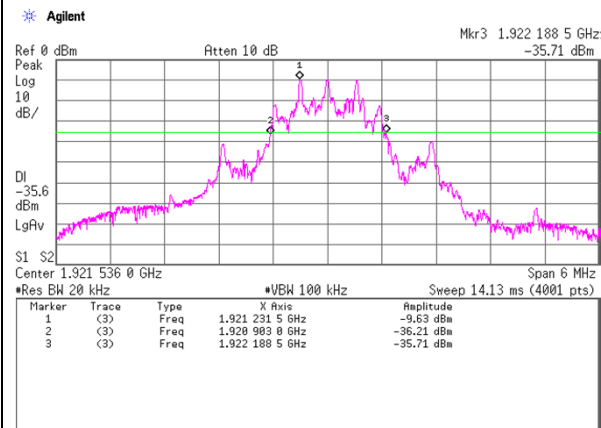
Facsimile : +81 465 77 2112

Frequency Stability

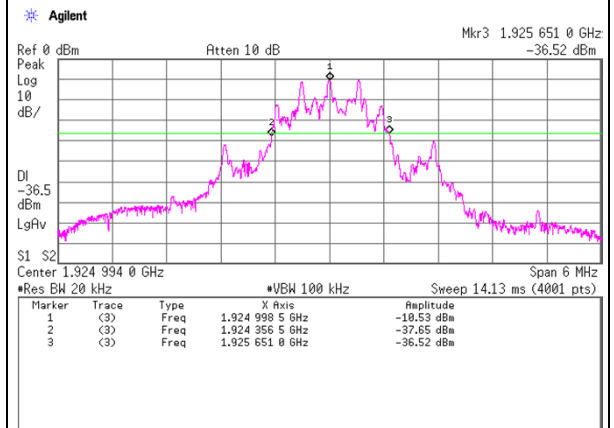
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Highest Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90300	1922.18850	1921.54575	5.07	10.00	4.93
1924.9940	1924.35650	1925.65100	1925.00375	5.06	10.00	4.94
1928.4480	1927.81500	1929.11100	1928.46300	7.78	10.00	2.22

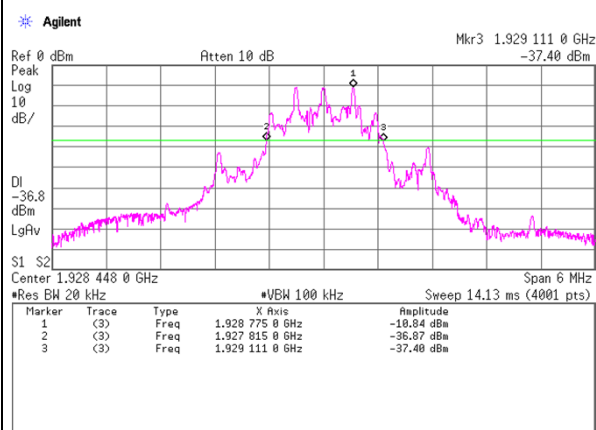
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

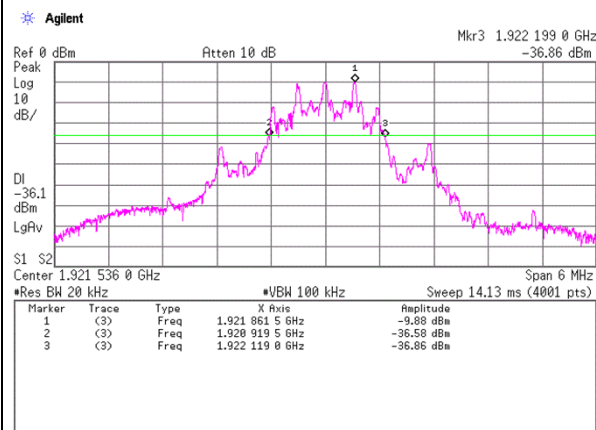
Facsimile : +81 465 77 2112

Frequency Stability

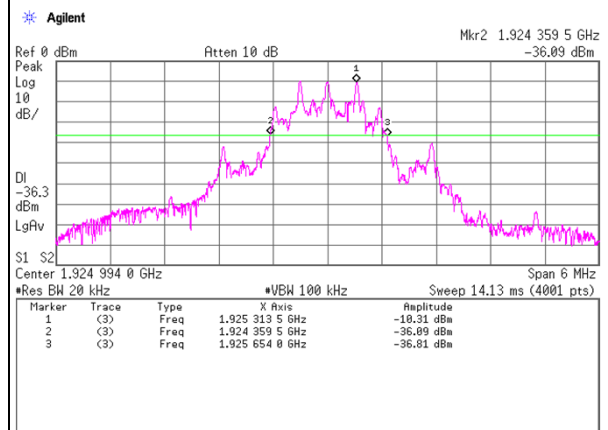
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 0, Highest Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.91950	1922.11900	1921.51925	-8.72	10.00	1.28
1924.9940	1924.35950	1925.65400	1925.00675	6.62	10.00	3.38
1928.4480	1927.81350	1929.10950	1928.46150	7.00	10.00	3.00

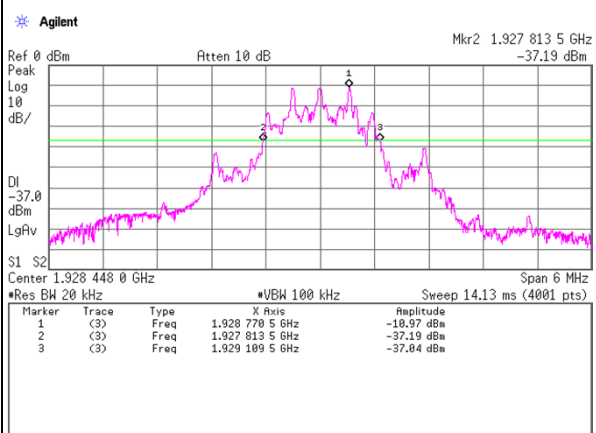
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

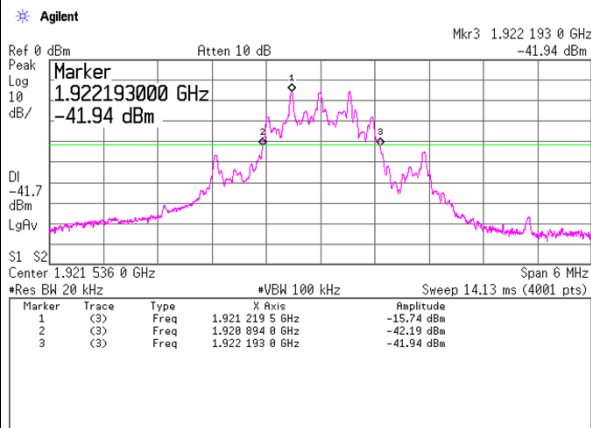
Facsimile : +81 465 77 2112

Frequency Stability

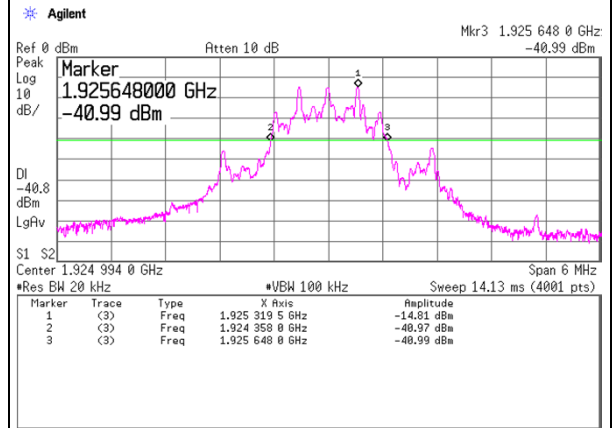
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Normal Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89400	1922.19300	1921.54350	3.90	10.00	6.10
1924.9940	1924.35800	1925.64800	1925.00300	4.68	10.00	5.32
1928.4480	1927.81350	1929.10650	1928.46000	6.22	10.00	3.78

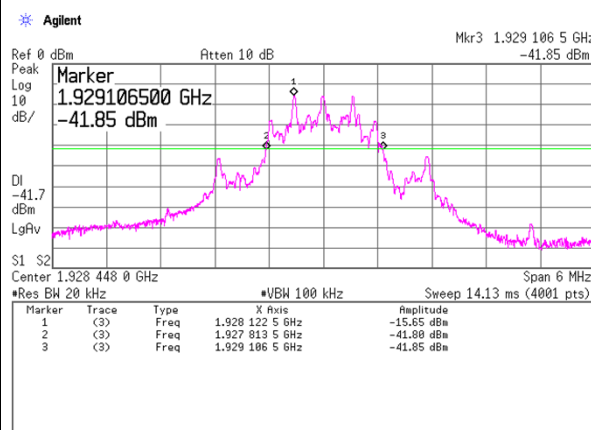
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN

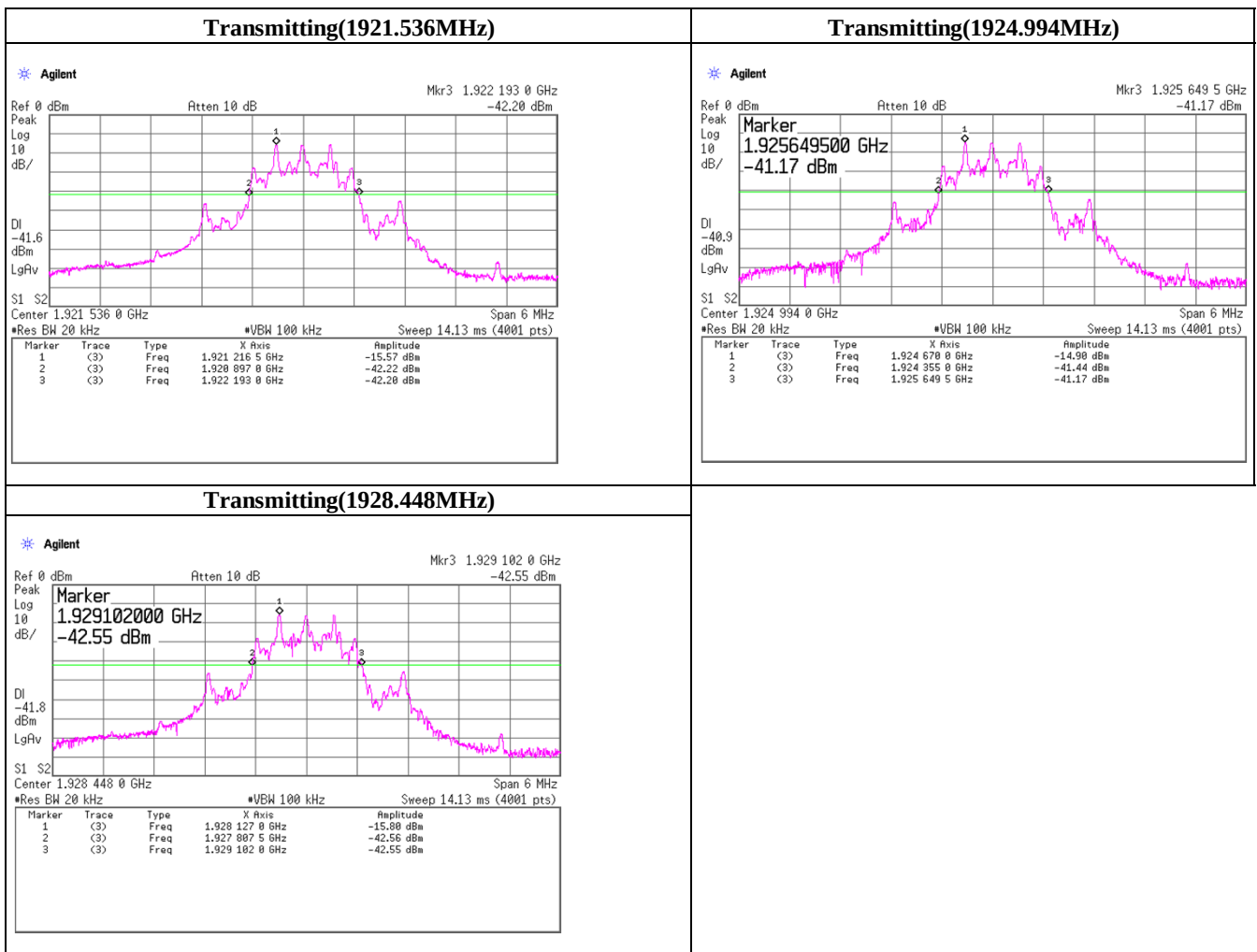
Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Normal Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89700	1922.19300	1921.54500	4.68	10.00	5.32
1924.9940	1924.35500	1925.64950	1925.00225	4.29	10.00	5.71
1928.4480	1927.80750	1929.10200	1928.45475	3.50	10.00	6.50



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Telephone : +81 465 77 1011

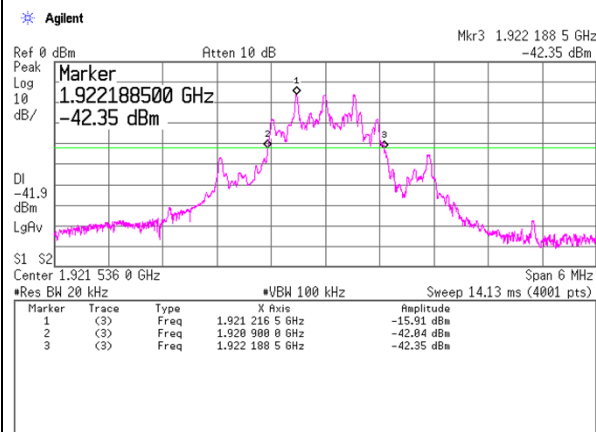
Facsimile : +81 465 77 2112

Frequency Stability

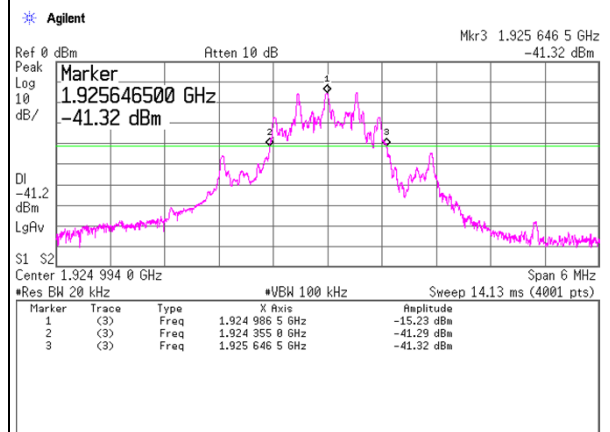
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Normal Temperature, Highest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90000	1922.18850	1921.54425	4.29	10.00	5.71
1924.9940	1924.35500	1925.64650	1925.00075	3.51	10.00	6.49
1928.4480	1927.81050	1929.10050	1928.45550	3.89	10.00	6.11

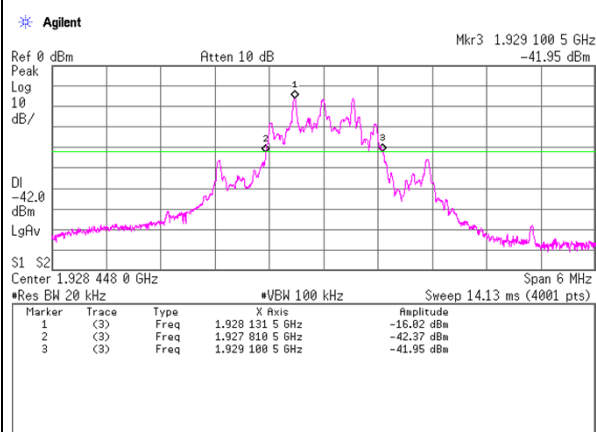
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

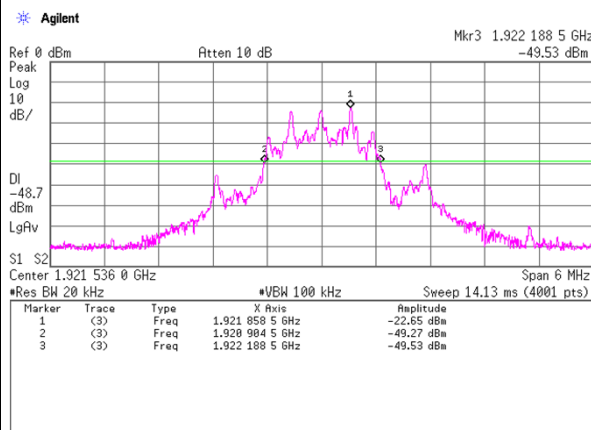
Facsimile : +81 465 77 2112

Frequency Stability

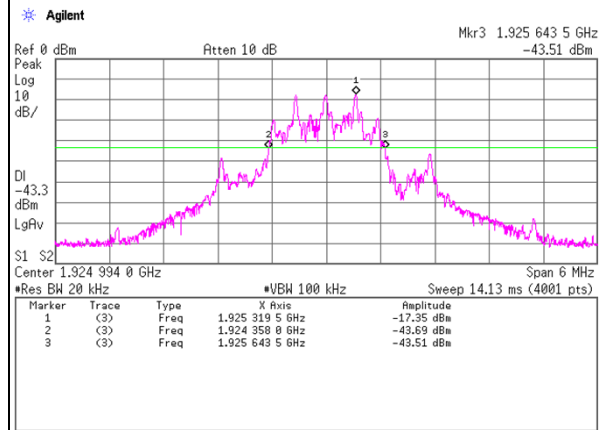
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Lowest Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90450	1922.18850	1921.54650	5.46	10.00	4.54
1924.9940	1924.35800	1925.64350	1925.00075	3.51	10.00	6.49
1928.4480	1927.80600	1929.10500	1928.45550	3.89	10.00	6.11

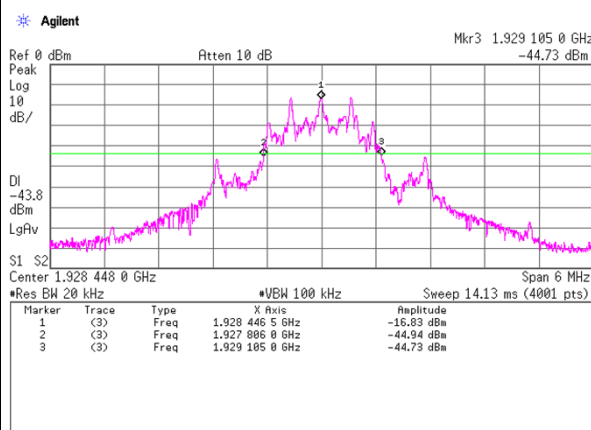
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

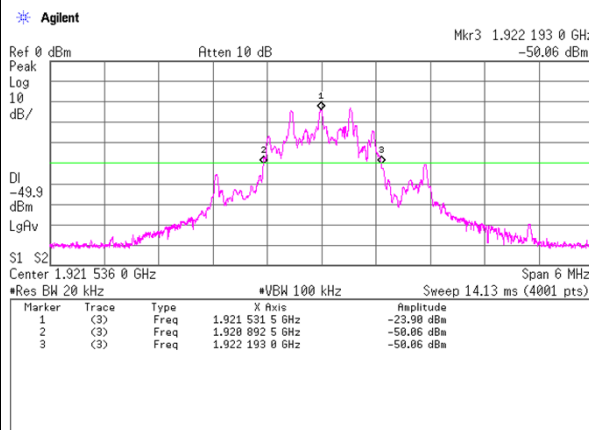
Facsimile : +81 465 77 2112

Frequency Stability

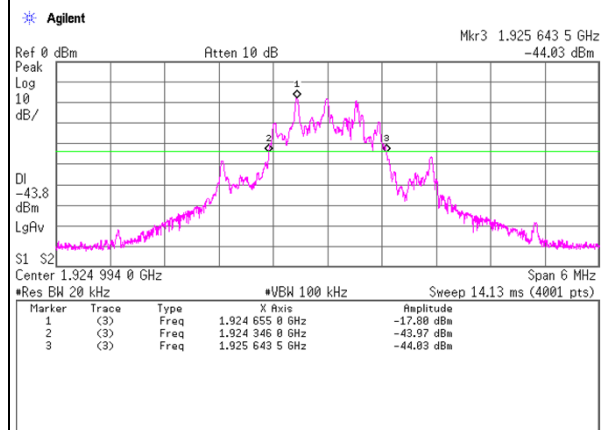
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Lowest Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89250	1922.19300	1921.54275	3.51	10.00	6.49
1924.9940	1924.34600	1925.64350	1924.99475	0.39	10.00	9.61
1928.4480	1927.81050	1929.10500	1928.45775	5.06	10.00	4.94

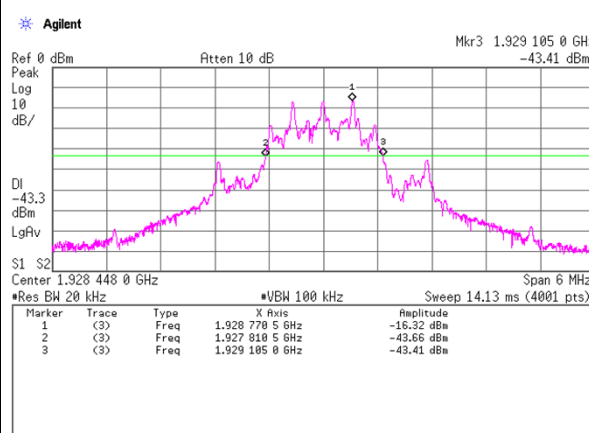
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

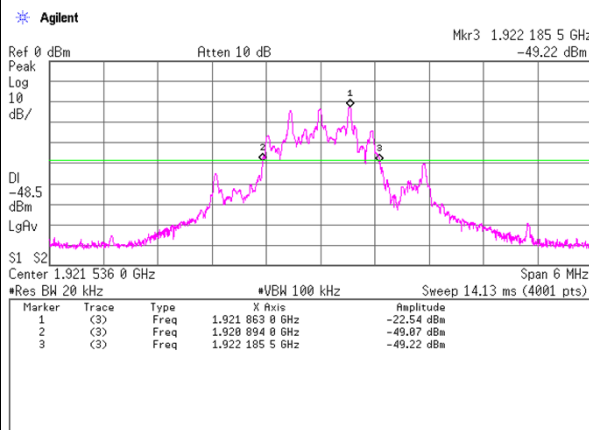
Facsimile : +81 465 77 2112

Frequency Stability

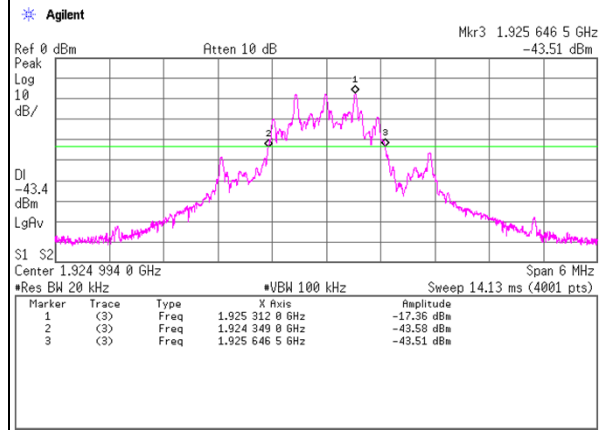
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Lowest Temperature, Highest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89400	1922.18550	1921.53975	1.95	10.00	8.05
1924.9940	1924.34900	1925.64650	1924.99775	1.95	10.00	8.05
1928.4480	1927.80750	1929.10350	1928.45550	3.89	10.00	6.11

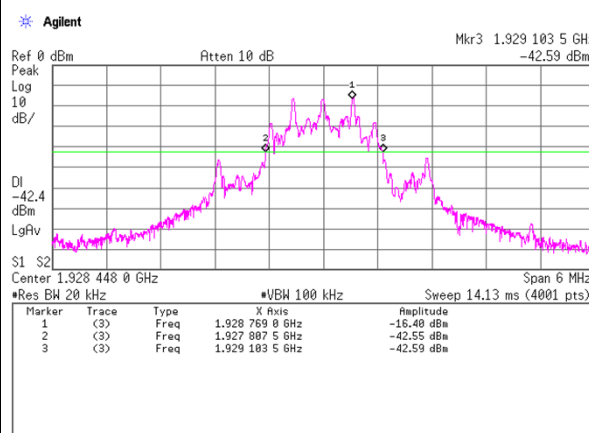
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



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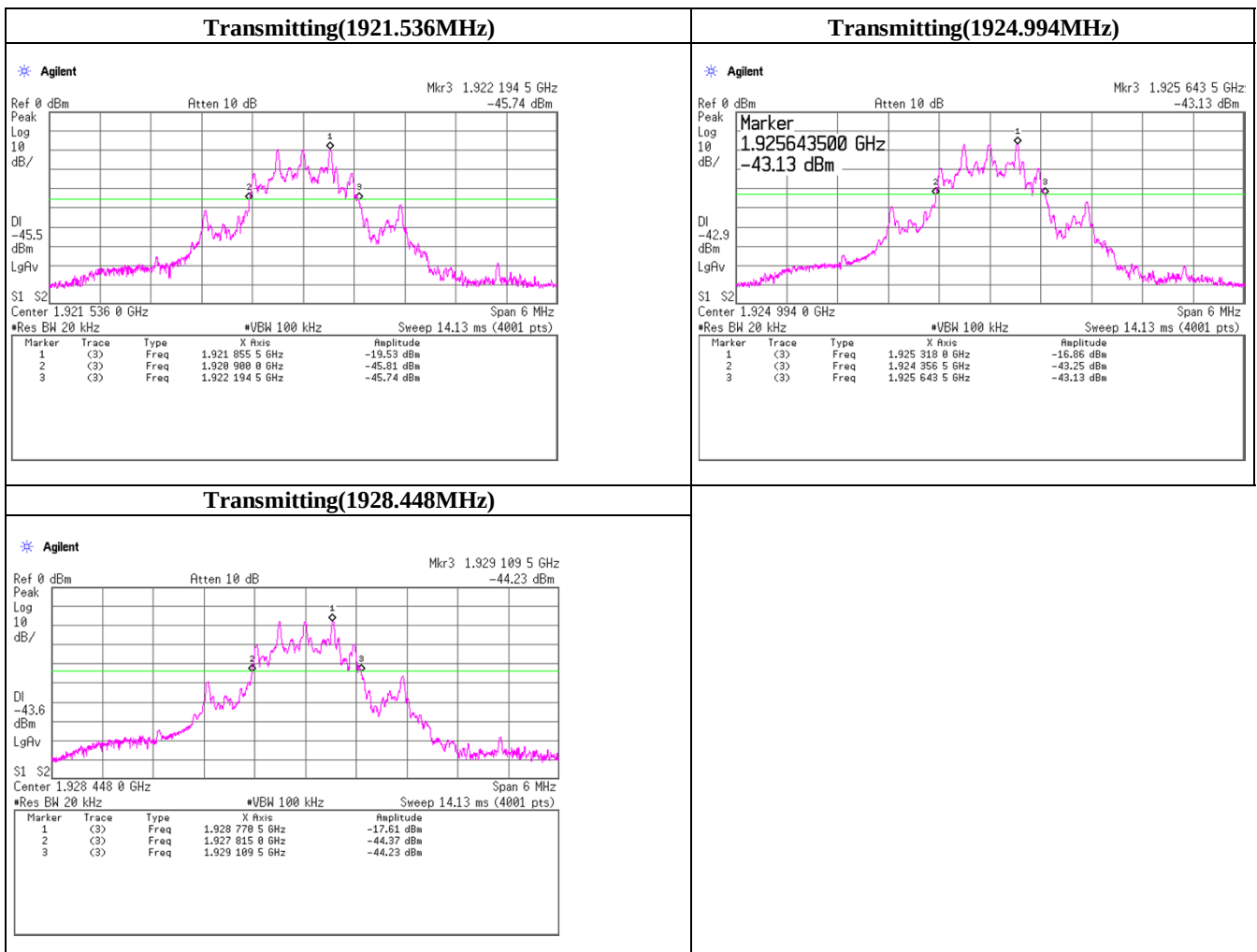
Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Frequency Stability

Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Highest Temperature, Normal Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90000	1922.19450	1921.54725	5.85	10.00	4.15
1924.9940	1924.35650	1925.64350	1925.00000	3.12	10.00	6.88
1928.4480	1927.81500	1929.10950	1928.46225	7.39	10.00	2.61



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Telephone : +81 465 77 1011

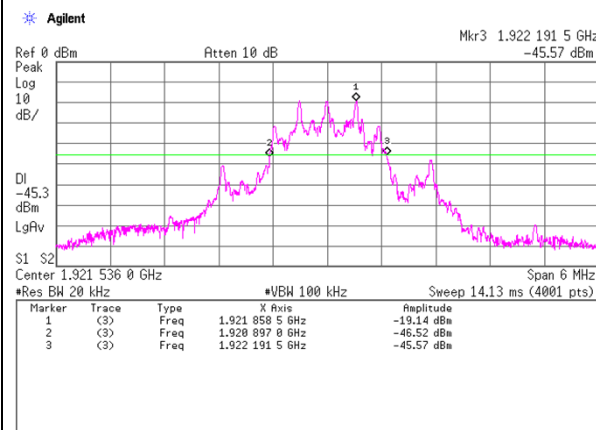
Facsimile : +81 465 77 2112

Frequency Stability

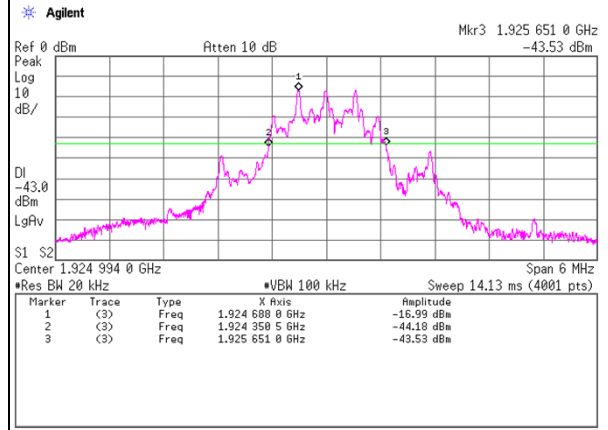
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Highest Temperature, Lowest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.89700	1922.19150	1921.54425	4.29	10.00	5.71
1924.9940	1924.35050	1925.65100	1925.00075	3.51	10.00	6.49
1928.4480	1927.81500	1929.10350	1928.45925	5.83	10.00	4.17

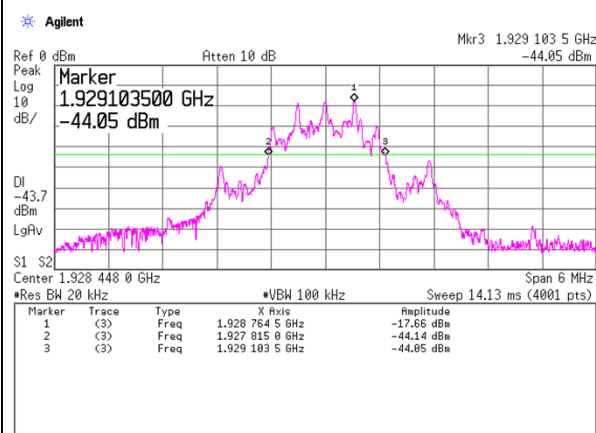
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

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Telephone : +81 465 77 1011

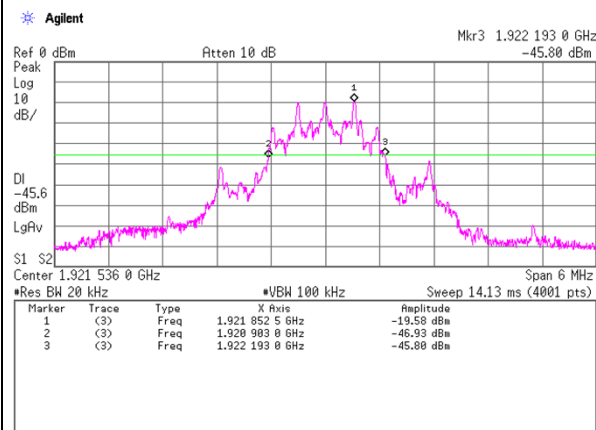
Facsimile : +81 465 77 2112

Frequency Stability

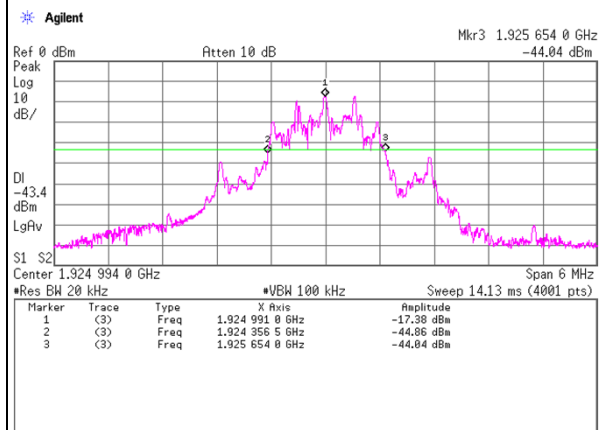
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded room
Date	May 1, 2011
Temperature / Humidity	24deg.C. , 47%RH
Engineer	Kenichi Adachi
Mode	Tx, ,
	Antenna 1 and 2, Highest Temperature, Highest Voltage

Freq. [MHz]	Lower Freq. [MHz]	Upper Freq. [MHz]	Result [MHz]	Result [ppm]	Limit [ppm]	Margin [ppm]
1921.5360	1920.90300	1922.19300	1921.54800	6.25	10.00	3.75
1924.9940	1924.35650	1925.65400	1925.00525	5.84	10.00	4.16
1928.4480	1927.81350	1929.11100	1928.46225	7.39	10.00	2.61

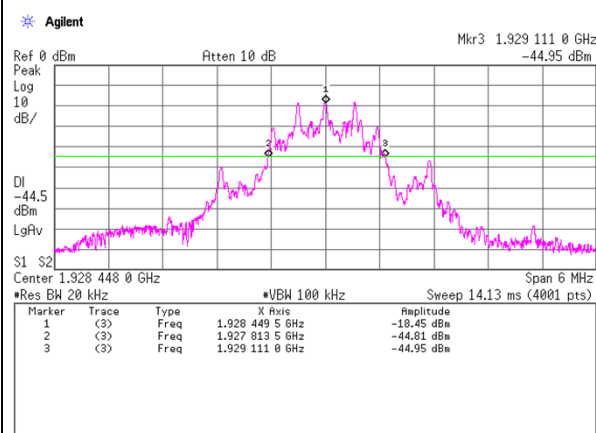
Transmitting(1921.536MHz)



Transmitting(1924.994MHz)



Transmitting(1928.448MHz)



UL Japan, Inc.

Yamakita EMC Lab.

907 Kawanishi, Yamakita-machi, Ashigarakami-gun, Kanagawa 258-0124 JAPAN

Telephone : +81 465 77 1011

Facsimile : +81 465 77 2112

Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A - R1

Applicant : Panasonic System Networks Co., Ltd.
Type of Equipment : Center Module
Model No. : WX-C3010
Serial No. : HH0155
Power : AC120V/60Hz
Mode : A: Tx-L (1921.536MHz)
Remarks : Antenna:0
Date : 4/27/2011
Phase : Single Phase
Temperature : 25 °C
Humidity : 48 %
Limit : FCC Part15C s 15.207. / RSS - Gen 7.2.4
Engineer : Akira Sato

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1500	18.8	-	18.1	-	0.2	0.1	13.0	32.1	-	66.0	56.0	33.9	-
2.	0.2686	25.7	25.5	30.9	30.8	0.1	0.2	13.0	44.2	44.1	61.2	51.2	17.0	7.1
3.	0.4036	13.0	-	22.2	-	0.1	0.2	13.0	35.5	-	57.8	47.8	22.3	-
4.	0.9407	23.0	22.6	23.8	23.0	0.1	0.2	13.0	37.1	36.3	56.0	46.0	18.9	9.7
5.	1.0744	25.3	25.2	25.5	25.4	0.1	0.3	13.0	38.9	38.8	56.0	46.0	17.1	7.2
6.	1.2101	23.5	21.2	23.0	21.7	0.1	0.3	13.0	36.9	35.1	56.0	46.0	19.1	10.9
7.	15.5842	26.0	22.9	24.8	21.7	0.3	1.5	13.0	40.8	37.7	60.0	50.0	19.2	12.3

CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

■ LISN: KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-14/15/16/18
■ PULSE LIMITTER: KPL-01 ■ EMI RECEIVER: KTR-02

Data of Conducted Disturbance Test

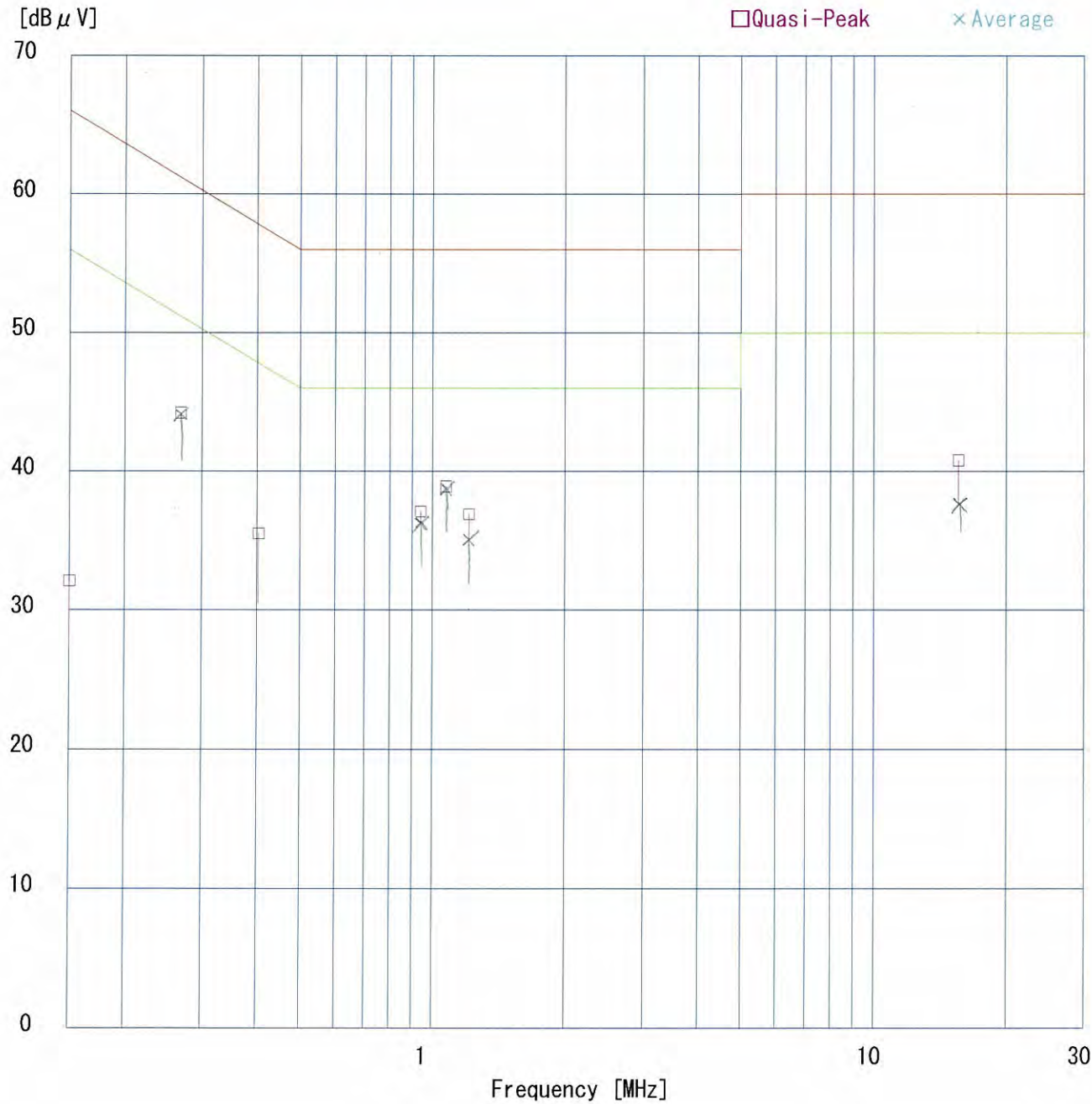
UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A-R1

Applicant
Type of Equipment
Model No.
Serial No.
Power
Mode
Remarks
Date
Phase
Temperature
Humidity
Limit

: Panasonic System Networks Co., Ltd.
: Center Module
: WX-C3010
: HH0155
: AC120V/60Hz
: A: Tx-L (1921.536MHz)
: Antenna:0
: 4/27/2011
: Single Phase
: 25 °C
: 48 %
: FCC Part15C § 15.207.

Engineer : Akira Sato

/ RSS-Gen 7.2.4



Data of Conducted Disturbance Test

UL Japan, Inc.

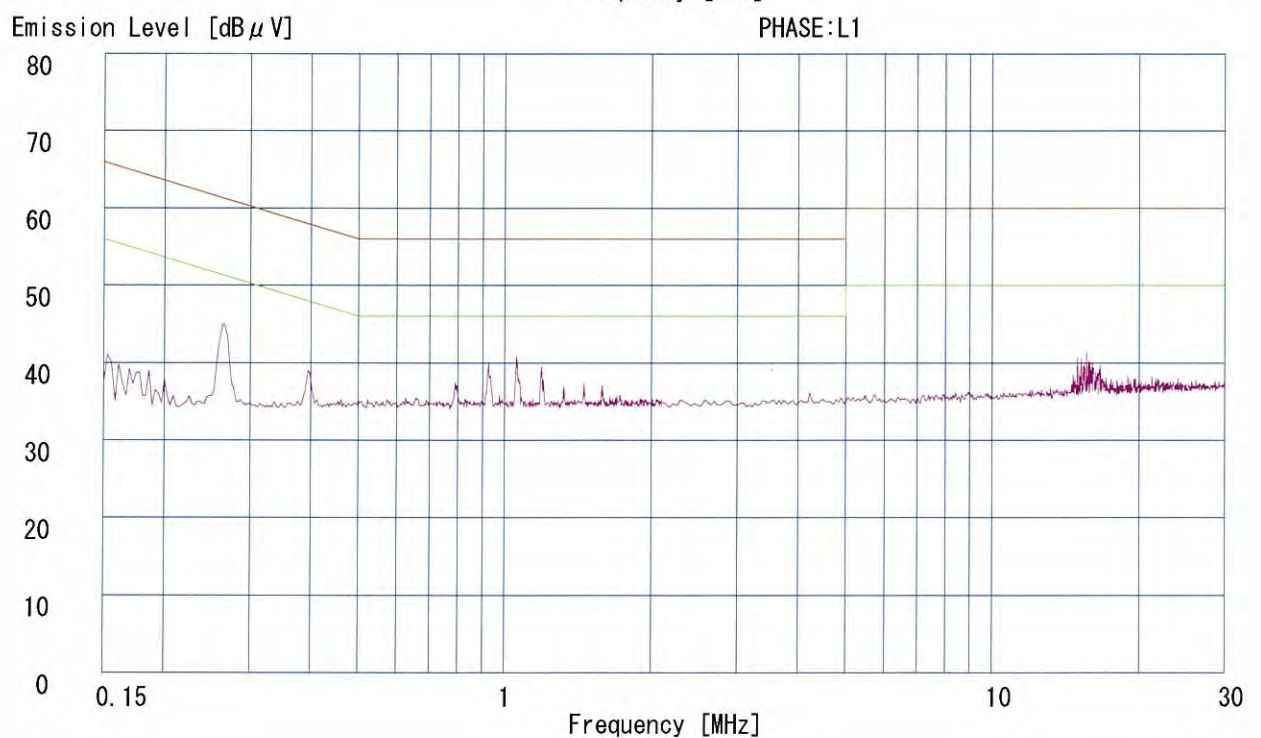
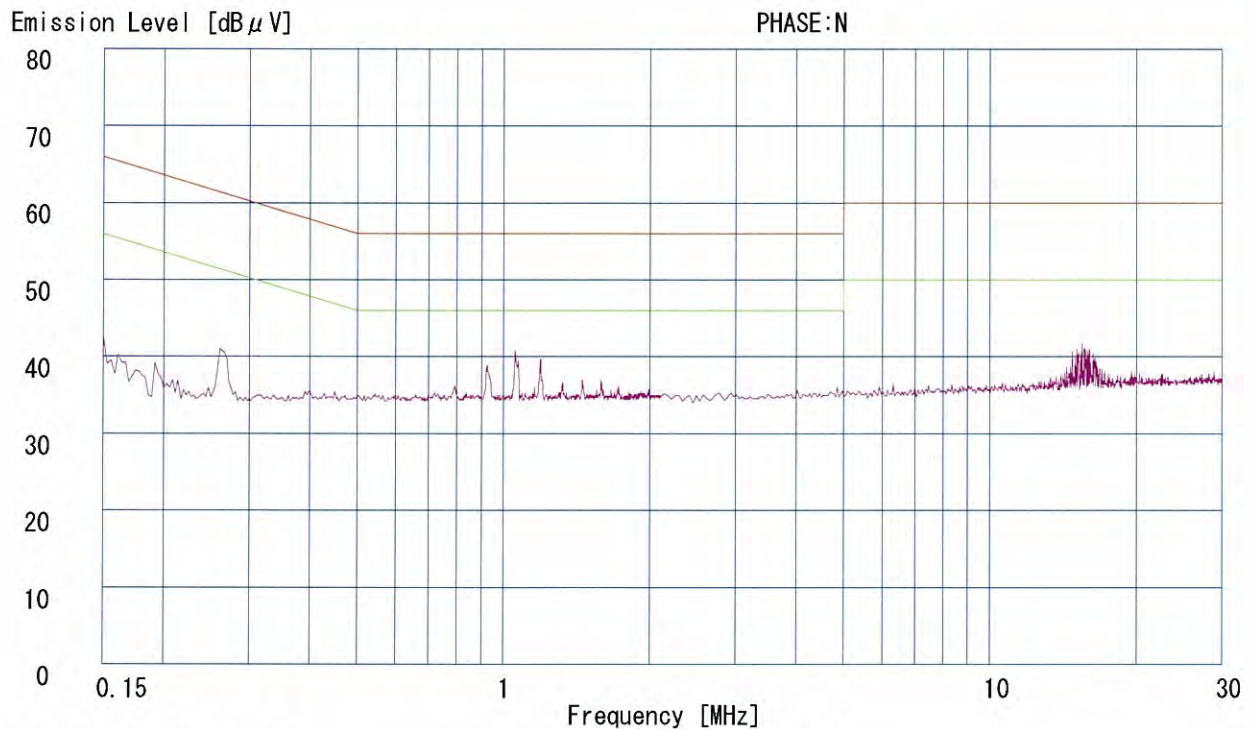
YAMAKITA No.1 Shielded room

Report No. : 31HE0252-SH - A-R1

Applicant : Panasonic System Networks Co., Ltd.
 Type of Equipment : Center Module
 Model No. : WX-C3010
 Serial No. : HH0155
 Power : AC120V/60Hz
 Mode : A: Tx-L (1921.536MHz)
 Remarks : Antenna:0
 Date : 4/27/2011
 Phase : Single Phase
 Temperature : 25 °C
 Humidity : 48 %
 Limit 1 : FCC Part15C § 15.207.
 Limit 2 : None

Engineer : Akira Sato

/ RSS-Gen 7.2.4



Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A - R1

Applicant : Panasonic System Networks Co., Ltd.
Type of Equipment : Center Module
Model No. : WX-C3010
Serial No. : HH0155
Power : AC120V/60Hz
Mode : C: Tx-H(1928.448MHz)
Remarks : Antenna:0
Date : 4/27/2011
Phase : Single Phase
Temperature : 25 °C
Humidity : 48 %
Limit : FCC Part15C § 15.207. / RSS - Gen 7.2.4

Engineer : Akira Sato

No.	FREQ. [MHz]	READING(N)		READING(L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP	AV	QP	AV				QP	AV	QP	AV	QP	AV
		[dB μV]		[dB μV]					[dB]		[dB μV]		[dB]	
1.	0.1500	18.7	—	18.4	—	0.2	0.1	13.0	32.0	—	66.0	56.0	34.0	—
2.	0.2690	25.7	25.5	31.0	30.8	0.1	0.2	13.0	44.3	44.1	61.1	51.1	16.8	7.0
3.	0.4023	12.9	—	22.1	—	0.1	0.2	13.0	35.4	—	57.8	47.8	22.4	—
4.	0.9398	23.1	22.8	23.7	23.5	0.1	0.2	13.0	37.0	36.8	56.0	46.0	19.0	9.2
5.	1.0753	25.5	25.2	25.5	25.2	0.1	0.3	13.0	38.9	38.6	56.0	46.0	17.1	7.4
6.	1.2094	23.4	22.1	23.3	21.9	0.1	0.3	13.0	36.8	35.5	56.0	46.0	19.2	10.5
7.	15.5832	26.0	23.1	24.5	21.8	0.3	1.5	13.0	40.8	37.9	60.0	50.0	19.2	12.1

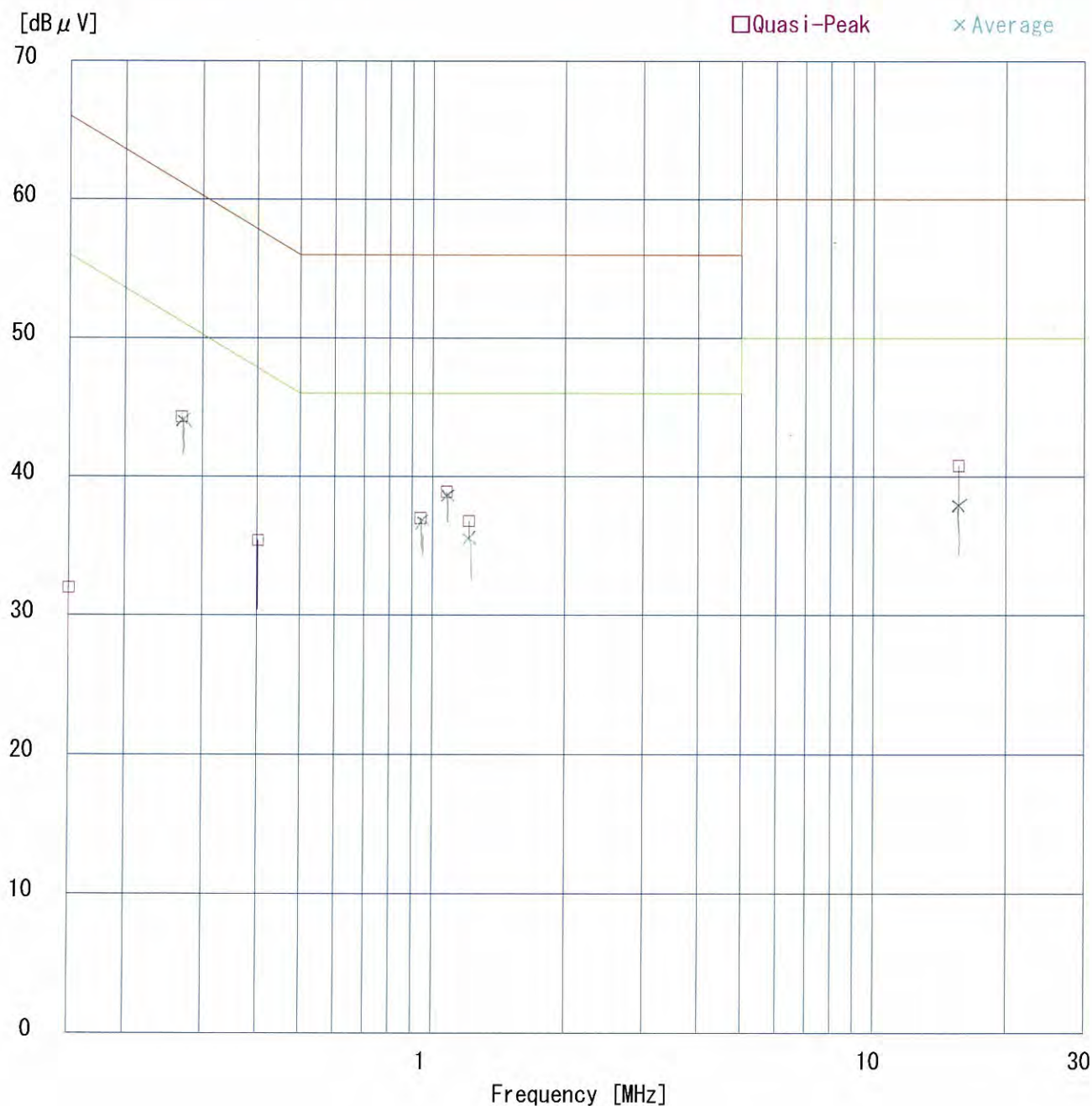
CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

■ LISN: KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-14/15/16/18
 ■ PULSE LIMITTER: KPL-01 ■ EMI RECEIVER: KTR-02

Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A - R 1

Applicant	: Panasonic System Networks Co., Ltd.	
Type of Equipment	: Center Module	
Model No.	: WX-C3010	
Serial No.	: HH0155	
Power	: AC120V/60Hz	
Mode	: C: Tx-H(1928.448MHz)	
Remarks	: Antenna:0	
Date	: 4/27/2011	
Phase	: Single Phase	
Temperature	: 25 °C	Engineer : Akira Sato
Humidity	: 48 %	
Limit	: FCC Part15C § 15.207. / RSS-Gen 7.2.4	



Data of Conducted Disturbance Test

UL Japan, Inc.

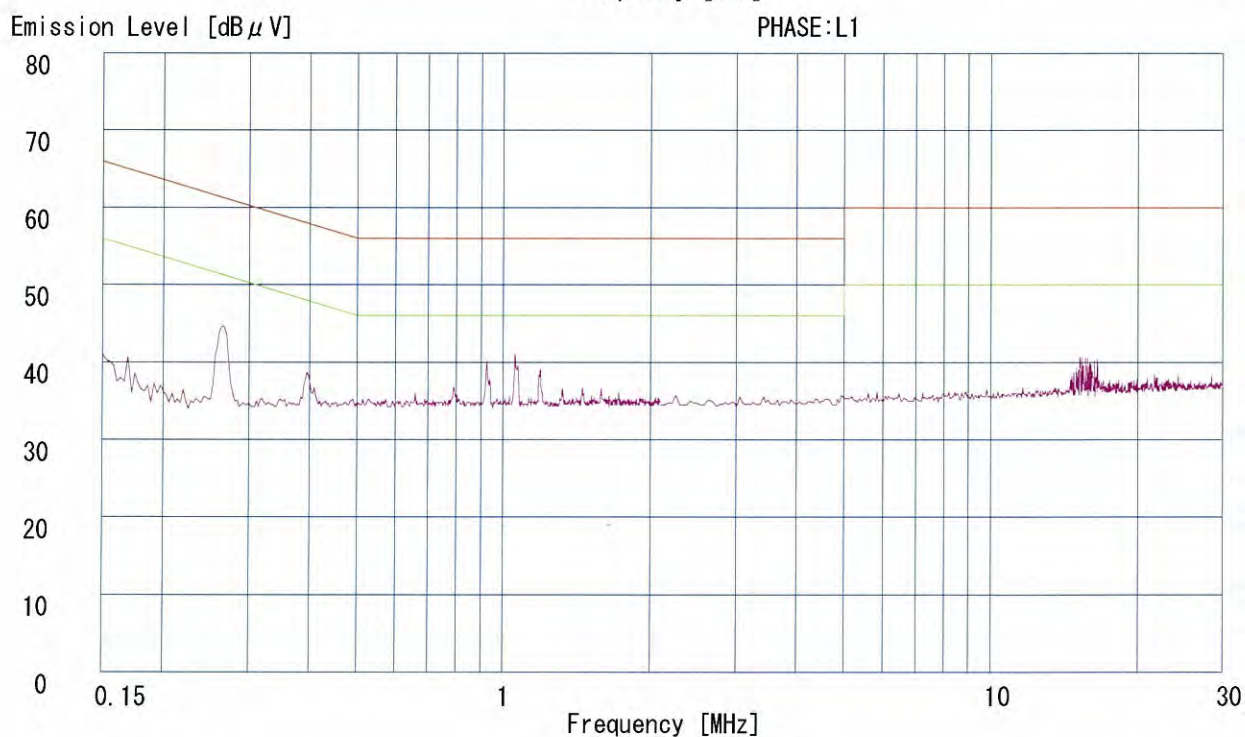
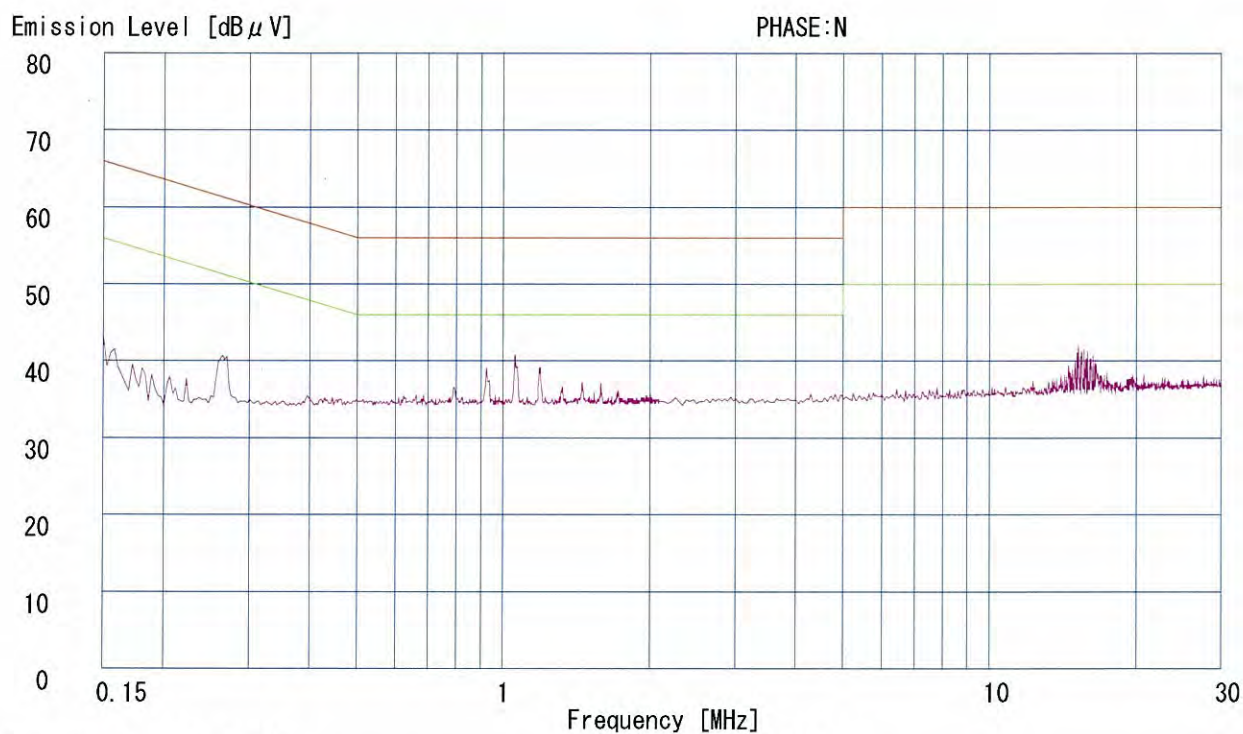
YAMAKITA No.1 Shielded room

Report No. : 31HE0252-SH - A-R1

Applicant : Panasonic System Networks Co., Ltd.
 Type of Equipment : Center Module
 Model No. : WX-C3010
 Serial No. : HH0155
 Power : AC120V/60Hz
 Mode : C: Tx-H(1928.448MHz)
 Remarks : Antenna:0
 Date : 4/27/2011
 Phase : Single Phase
 Temperature : 25 °C
 Humidity : 48 %
 Limit 1 : FCC Part15C § 15.207.
 Limit 2 : None

Engineer : Akira Sato

/ RSS-Gen 7.2.4



Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A - R1

Applicant : Panasonic System Networks Co., Ltd.
Type of Equipment : Center Module
Model No. : WX-G3010
Serial No. : HH0155
Power : AC120V/60Hz
Mode : D: Rx-M(1924.994MHz)
Remarks : Antenna:1
Date : 4/27/2011
Phase : Single Phase
Temperature : 25 °C
Humidity : 48 %
Limit : FCC Part15B CLASS B (15.107) / RSS-Gen 7.2.4

Engineer : Akira Sato

No.	FREQ. [MHz]	READING (N)		READING (L1)		LISN FACTOR [dB]	CABLE LOSS [dB]	ATTEN. [dB]	RESULT		LIMITS		MARGIN	
		QP [dB μV]	AV [dB μV]	QP [dB μV]	AV [dB μV]				QP [dB]	AV [dB μV]	QP [dB μV]	AV [dB μV]	QP [dB]	AV [dB]
1.	0.1500	19.2	-	19.1	-	0.2	0.1	13.0	32.5	-	66.0	56.0	33.5	-
2.	0.2686	25.6	25.3	30.4	30.3	0.1	0.2	13.0	43.7	43.6	61.2	51.2	17.5	7.6
3.	0.4041	13.4	-	22.2	-	0.1	0.2	13.0	35.5	-	57.8	47.8	22.3	-
4.	0.9418	23.4	23.2	23.9	23.7	0.1	0.2	13.0	37.2	37.0	56.0	46.0	18.8	9.0
5.	1.0755	24.6	-	24.8	24.7	0.1	0.3	13.0	38.2	38.1	56.0	46.0	17.8	7.9
6.	1.3448	20.1	-	19.6	-	0.1	0.3	13.0	33.5	-	56.0	46.0	22.5	-
7.	15.5907	25.5	22.4	24.3	21.0	0.3	1.5	13.0	40.3	37.2	60.0	50.0	19.7	12.8

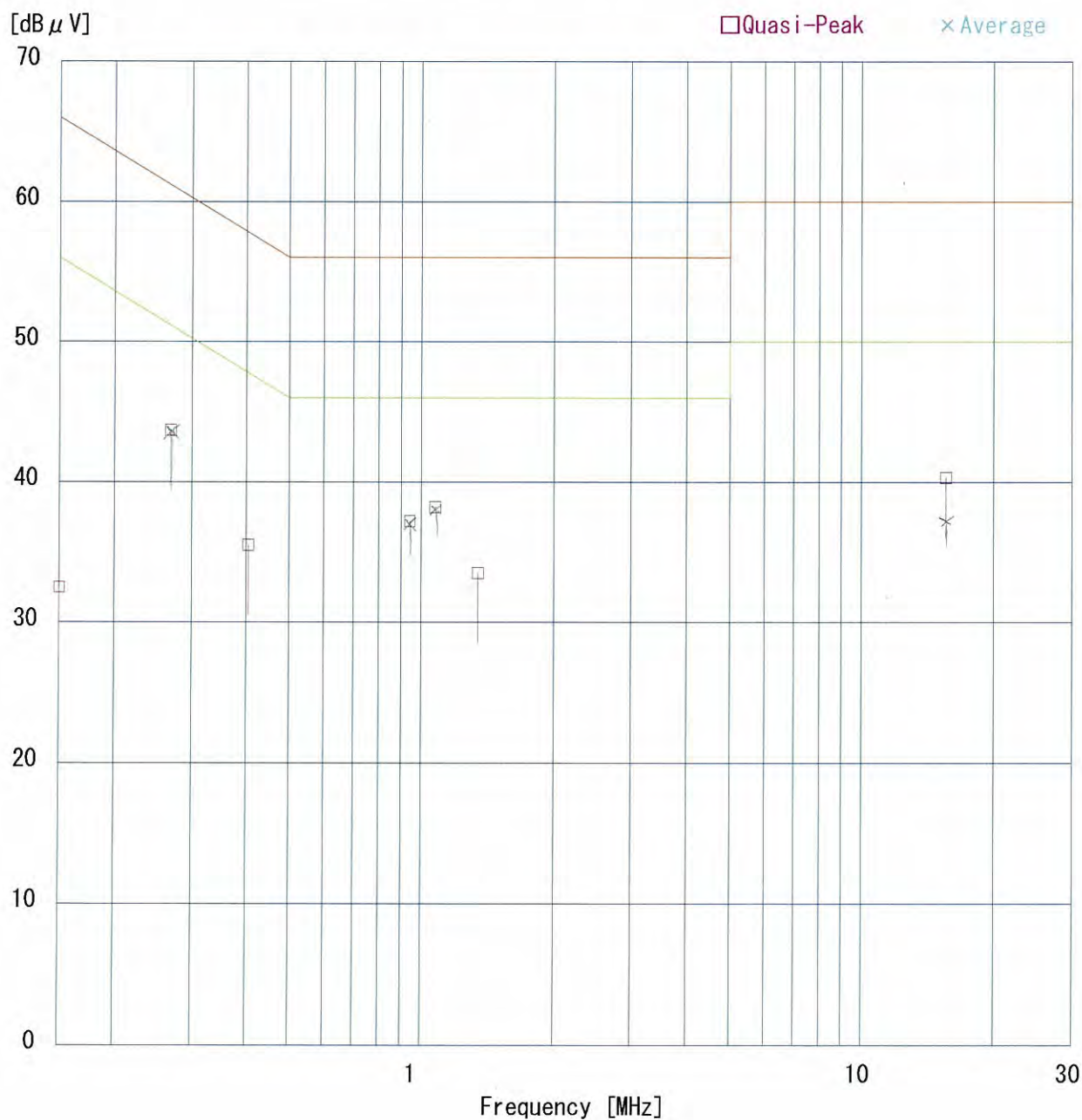
CALCULATION: READING + LISN FACTOR + CABLE LOSS + ATTEN.

■ LISN: KLS-02 (NSLK8127) ■ COAXIAL CABLE: KCC-14/15/16/18
■ PULSE LIMITTER: KPL-01 ■ EMI RECEIVER: KTR-02

Data of Conducted Disturbance Test

UL Japan, Inc.
YAMAKITA No.1 Shielded room
Report No. : 31HE0252-SH - A - R1

Applicant	: Panasonic System Networks Co., Ltd.	
Type of Equipment	: Center Module	
Model No.	: WX-C3010	
Serial No.	: HH0155	
Power	: AC120V/60Hz	
Mode	: D: Rx-M(1924.994MHz)	
Remarks	: Antenna:1	
Date	: 4/27/2011	
Phase	: Single Phase	
Temperature	: 25 °C	Engineer : Akira Sato
Humidity	: 48 %	
Limit	: FCC Part15B CLASS B (15.107) / RSS-Gen 7.2.4	



Data of Conducted Disturbance Test

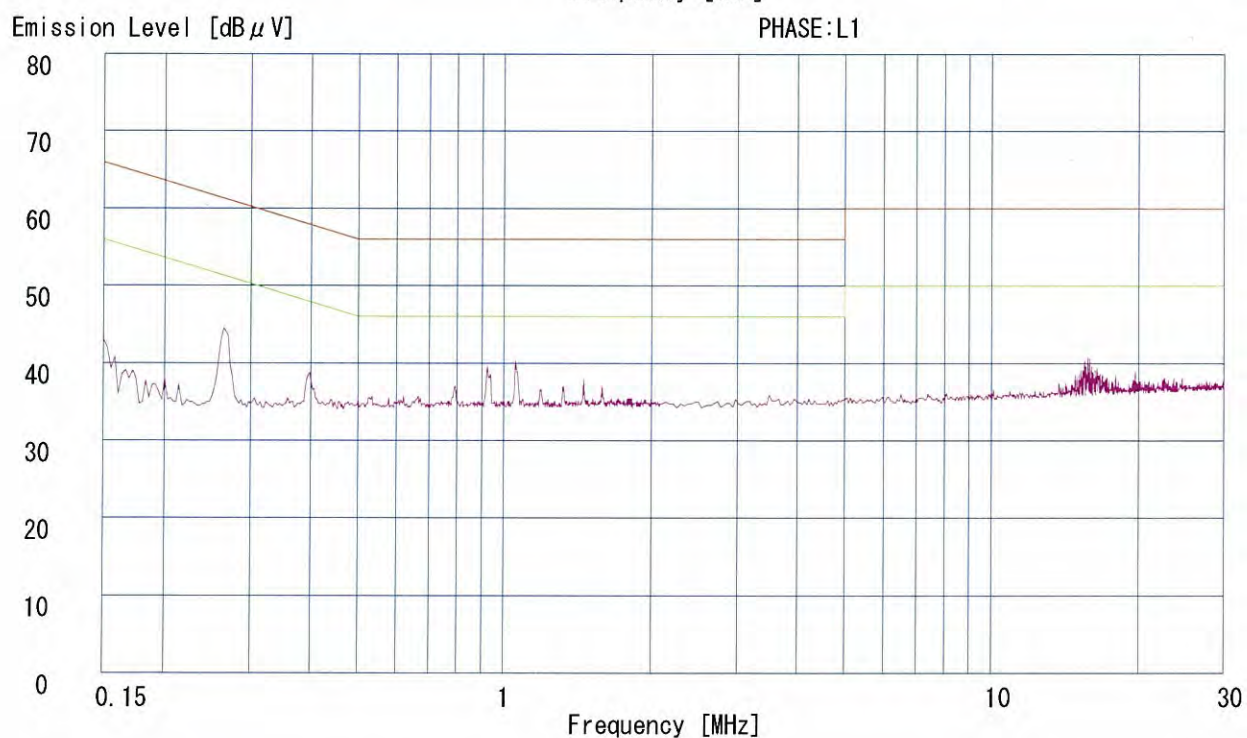
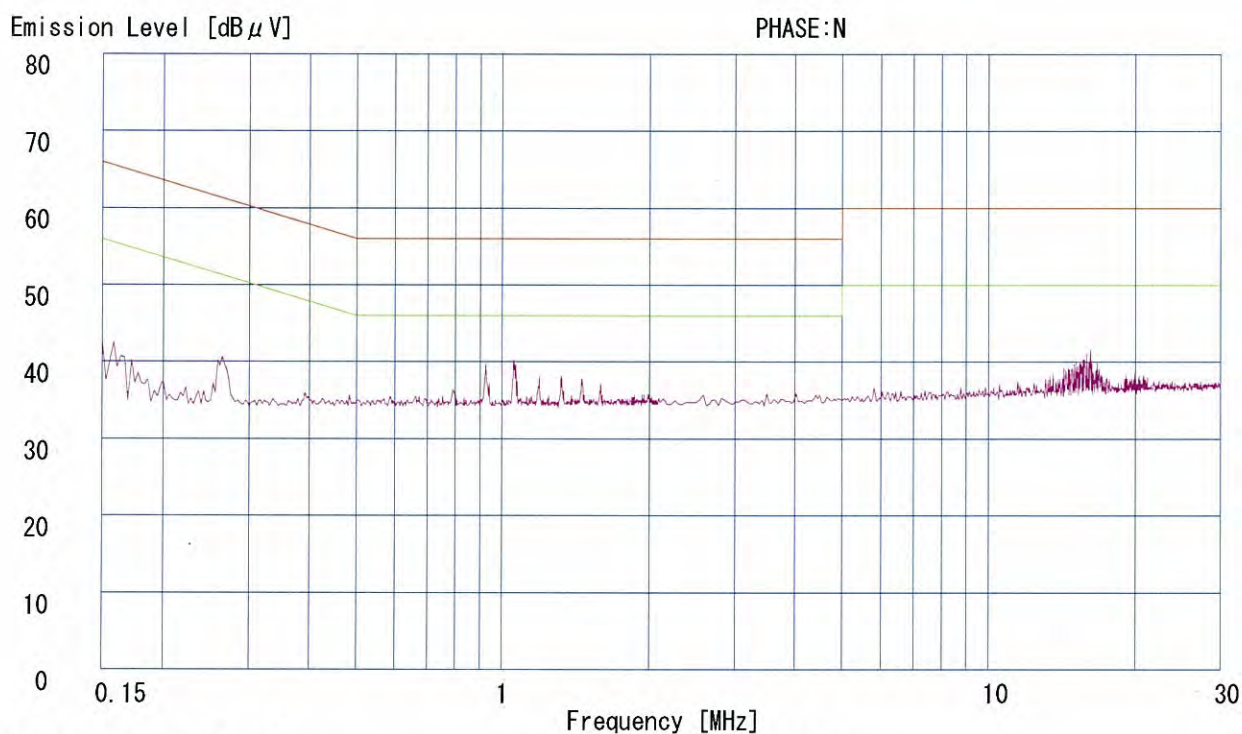
UL Japan, Inc.

YAMAKITA No.1 Shielded room

Report No. : 31HE0252-SH - A - R1

Applicant : Panasonic System Networks Co., Ltd.
 Type of Equipment : Center Module
 Model No. : WX-C3010
 Serial No. : HH0155
 Power : AC120V/60Hz
 Mode : D: Rx-M(1924.994MHz)
 Remarks : Antenna:1
 Date : 4/27/2011
 Phase : Single Phase
 Temperature : 25 °C
 Humidity : 48 %
 Limit 1 : FCC Part15B CLASS B (15.107) / RSS-Gen 7.2.4
 Limit 2 : None

Engineer : Akira Sato



Test Report No : 31HE0252-SH-A-R1

APPENDIX 3 Test Instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
KHA-01	Horn Antenna	A.H.Systems	SAS-200/571	354	RE, AP	2010/08/17 * 12
KCC-D18/D19	Coaxial cable	Suhner	SCOFLEX104	268148/4 / 268304/4	RE, AP	2010/07/21 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE, AP	2011/04/21 * 12
KSA-04	Spectrum Analyzer	Advantest	R3271A	95060087	RE	2010/11/22 * 12
KOS-11	Humidity Indicator	Custom	CTH-202	Q.C.13	RE, AP	2010/04/21 * 24
KJM-10	Measure	KOMELON	KMC-36	-	CE, RE	-
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	004	RE	2011/04/21 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE, AP, FREQ	2011/02/02 * 12
SAT20-03	Attenuator	Agilent	8493C-020	74891	RE, AP	2011/03/23 * 12
KAT10-S2	Attenuator	Agilent	8490D 010	06036	RE	2010/12/22 * 12
KOTS-01	Open Test Site	JSE	30m	1	RE, AP	2010/08/22 * 12
CUST-YA-CE	Conducted emission(software)	UL Japan	CE(Ver.2.0)	-	CE	-
KLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127344	CE	2010/08/05 * 12
KAT13-01	Attenuator	JFW	50FP-013-H2N	-	CE	2011/04/01 * 12
KCC-14/15/16 /18/KPL-01/KRM-01	Coaxial Cable/Pulse Limiter/RF Relay Matrix	Fujikura/Suhner/PMM/TSJ	5D-2W(10m)/8D-2W(10m)/S04272B(2m)/S04272B(2m)/P L01/-	-/9909017	CE	2011/03/17 * 12
CUST-YA-RE	Radiated emission(software)	UL Japan	RE(Ver.2.0)	-	RE	-
KAF-01	Pre Amplifier	Hewlett Packard	8447D	2944A09587	RE	2010/08/18 * 12
KAT6-03	Attenuator	INMET	18N-6dB	-	RE	2011/01/20 * 12
KAT3-12	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2010/08/23 * 12
KBA-01	Biconical Antenna	Schwarzbeck	BBA9106	1748	RE	2010/10/11 * 12
KLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	170	RE	2010/10/11 * 12
KCC-40/11/12 /41/18/KRM-01	Coaxial Cable/RF Relay Matrix	Fujikura/Suhner/TSJ	8D-2W/12D-SFA/S04272B/S04272B /S04272B	-/9909017	RE	2010/06/19 * 12
KSA-02	Spectrum Analyzer	Advantest	R3265A	55060826	CE, RE	2011/02/28 * 12
KTR-02	Test Receiver	Rohde & Schwarz	ESCS30	830986/017	CE, RE	2010/09/28 * 12
KOS-04	Humidity Indicator	SATO	PC-5000TRH	B-08	CE	2010/07/26 * 12
KHA-06	Horn Antenna	ETS LINDGREN	3116	00046543	RE	2011/03/15 * 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 ,
RE: Radiated emission ,
AP: Access Protocol tests ,
FREQ: Frequency stability

Test Report No : 31HE0252-SH-A-R1

APPENDIX 3 Test Instruments

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
KCC-D24/D25	Coaxial Cable	Suhner	SUCOFLEX 102	32718/2 / 32709/2	RE, AP	2011/04/20 * 12
KSG-04	Signal Generator	Rohde & Schwarz	SML03	100263	RE, AP	2010/09/22 * 12
KCC-D26/D27	Coaxial Cable	Suhner	SUCOFLEX 102	34492/2, 34460/2	RE, AP	2010/05/11 * 12
SHA-RS01	Horn Antenna	Schwarzbeck	BBHA9120D	770	RE, AP	2010/08/08 * 12
SPSC-01	Power Splitters/Combiners	Mini-Circuit	ZFSC-2-2500	U201700832	AP	2011/05/06 * 12
SPD-01	Power Divider	Agilent	11636B	56998	AP	2011/04/27 * 12
SPSC-04	Power Splitters/Combiners	Mini-Circuit	ZN4PD1-63-S+	-	AP	2010/07/27 * 12
KSG-08	Signal Generator	Rohde & Schwarz	SMT06	100763	AP	2010/06/11 * 12
SCC-G24	Coaxial Cable	Suhner	141PE	-	AP	2010/07/27 * 12
SCC-G25	Coaxial Cable	Suhner	141PE	-	AP	2010/07/27 * 12
SCC-G26	Coaxial Cable	Suhner	141PE	-	AP	2010/07/27 * 12
SSG-01	Signal Generator	Agilent	E4438C	MY47271584	AP	2011/02/21 * 12
SCH-01	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	FREQ	2011/04/06 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	FREQ	2011/03/02 * 12
STS-05	Digital Hitester	Hioki	3805-50	080997828	FREQ	2011/03/15 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	FREQ	2011/03/23 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2010/10/29 * 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 ,
RE: Radiated emission ,
AP: Access Protocol tests ,
FREQ: Frequency stability