APPENDIX 2: Data of EMI test

Conducted Emission

Tx, 11b, Ch: Low

DATA OF CONDUCTED EMISSION TEST

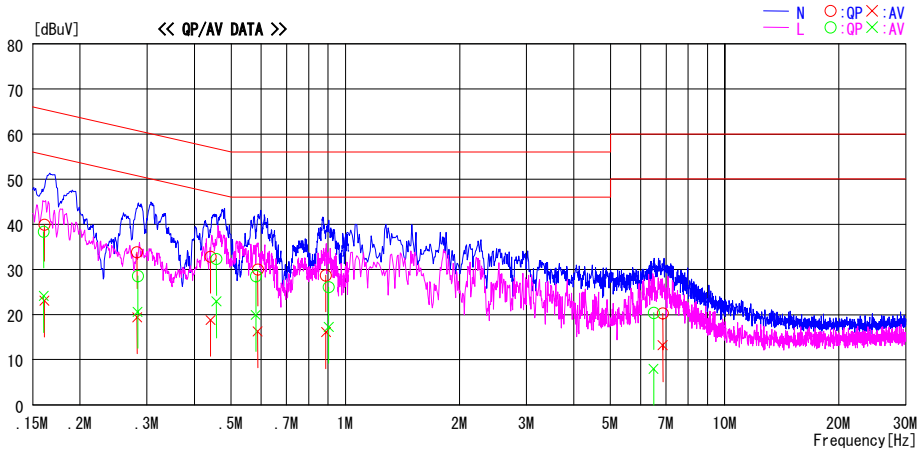
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2412MHz, 11Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.16102	39.6	22.8	0.3	39.9	23.1	65.4	55.4	25.5	32.3	N	
0.28264	33.5	19.1	0.3	33.8	19.4	60.7	50.7	26.9	31.3	N	
0.44148	32.5	18.5	0.3	32.8	18.8	57.0	47.0	24.2	28.2	N	
0.58756	29.7	16.0	0.3	30.0	16.3	56.0	46.0	26.0	29.7	N	
0.88870	28.4	15.8	0.3	28.7	16.1	56.0	46.0	27.3	29.9	N	
6.86600	19.5	12.4	0.8	20.3	13.2	60.0	50.0	39.7	36.8	N	
0.16030	38.1	23.8	0.3	38.4	24.1	65.4	55.4	27.0	31.3	L	
0.28370	28.2	20.3	0.3	28.5	20.6	60.7	50.7	32.2	30.1	L	
0.45736	32.0	22.6	0.3	32.3	22.9	56.7	46.7	24.4	23.8	L	
0.58076	28.2	19.6	0.3	28.5	19.9	56.0	46.0	27.5	26.1	L	
0.90390	25.8	17.0	0.3	26.1	17.3	56.0	46.0	29.9	28.7	L	
6.49430	19.6	7.2	0.8	20.4	8.0	60.0	50.0	39.6	42.0	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission
Tx, 11b, Ch: Mid

DATA OF CONDUCTED EMISSION TEST

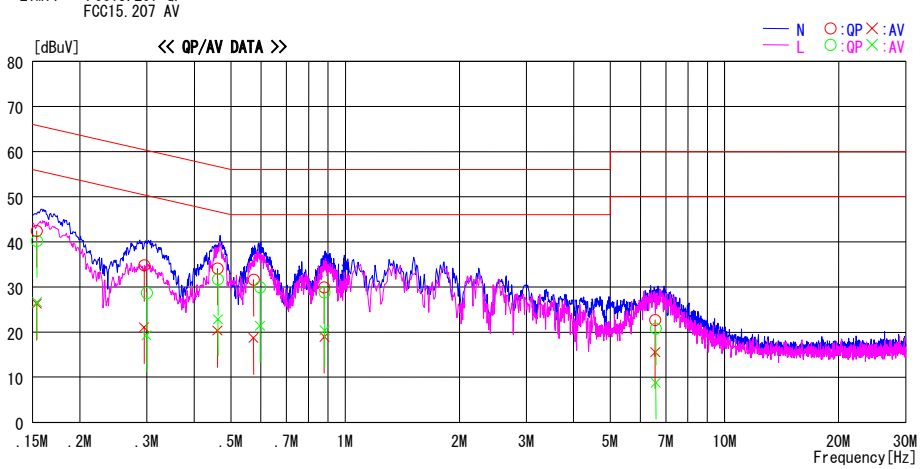
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2437MHz, 11Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15375	42.1	26.0	0.3	42.4	26.3	65.8	55.8	23.4	29.5	N	
0.29502	34.5	20.8	0.3	34.8	21.1	60.4	50.4	25.6	29.3	N	
0.46072	33.8	20.0	0.3	34.1	20.3	56.7	46.7	22.6	26.4	N	
0.57362	31.3	18.4	0.3	31.6	18.7	56.0	46.0	24.4	27.3	N	
0.88020	29.6	18.7	0.3	29.9	19.0	56.0	46.0	26.1	27.0	N	
6.56260	21.9	14.8	0.8	22.7	15.6	60.0	50.0	37.3	34.4	N	
0.15410	39.9	26.3	0.3	40.2	26.6	65.8	55.8	25.6	29.2	L	
0.29960	28.4	19.0	0.3	28.7	19.3	60.3	50.3	31.6	31.0	L	
0.46160	31.4	22.5	0.3	31.7	22.8	56.7	46.7	25.0	23.9	L	
0.59640	29.6	21.1	0.3	29.9	21.4	56.0	46.0	26.1	24.6	L	
0.88280	28.5	20.1	0.3	28.8	20.4	56.0	46.0	27.2	25.6	L	
6.58480	20.0	8.0	0.8	20.8	8.8	60.0	50.0	39.2	41.2	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission
Tx, 11b, Ch: High

DATA OF CONDUCTED EMISSION TEST

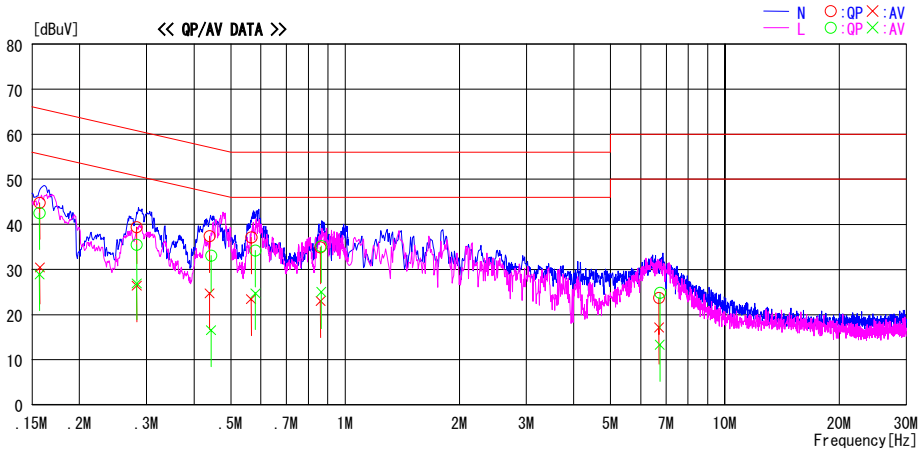
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2462MHz, 11Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15686	42.2	28.6	0.3	42.5	28.9	65.6	55.6	23.1	26.7	L	
0.28280	35.2	26.6	0.3	35.5	26.9	60.7	50.7	25.2	23.8	L	
0.44398	32.8	16.2	0.3	33.1	16.5	57.0	47.0	23.9	30.5	L	
0.58050	33.9	24.4	0.3	34.2	24.7	56.0	46.0	21.8	21.3	L	
0.86523	34.9	24.7	0.3	35.2	25.0	56.0	46.0	20.8	21.0	L	
6.74520	24.0	12.5	0.8	24.8	13.3	60.0	50.0	35.2	36.7	L	
0.15710	44.5	30.1	0.3	44.8	30.4	65.6	55.6	20.8	25.2	N	
0.28272	39.1	26.1	0.3	39.4	26.4	60.7	50.7	21.3	24.3	N	
0.43926	37.1	24.4	0.3	37.4	24.7	57.1	47.1	19.7	22.4	N	
0.56560	36.8	23.1	0.3	37.1	23.4	56.0	46.0	18.9	22.6	N	
0.86156	34.6	22.7	0.3	34.9	23.0	56.0	46.0	21.1	23.0	N	
6.70378	22.9	16.3	0.8	23.7	17.1	60.0	50.0	36.3	32.9	N	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

Conducted Emission
Tx, 11g, Ch: Low

DATA OF CONDUCTED EMISSION TEST

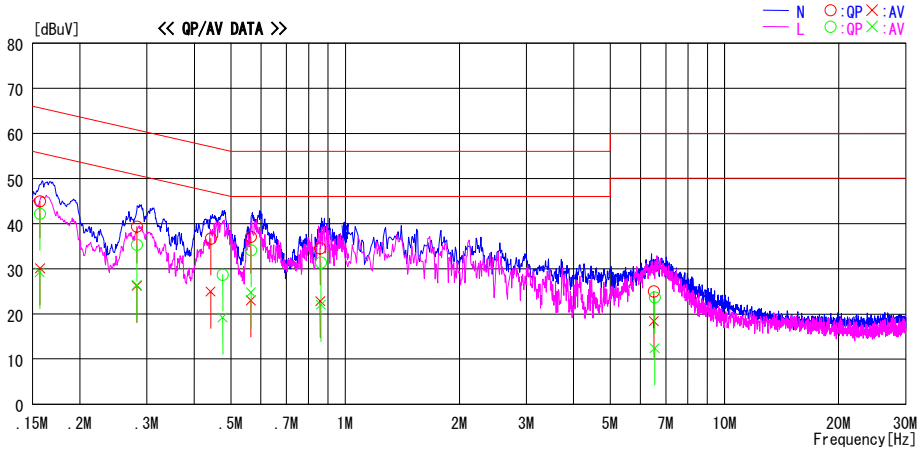
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2412MHz, 54Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15689	44.6	29.8	0.3	44.9	30.1	65.6	55.6	20.7	25.5	N	
0.28248	39.1	25.9	0.3	39.4	26.2	60.7	50.7	21.3	24.5	N	
0.44209	36.4	24.6	0.3	36.7	24.9	57.0	47.0	20.3	22.1	N	
0.56378	36.8	22.7	0.3	37.1	23.0	56.0	46.0	18.9	23.0	N	
0.85988	34.2	22.5	0.3	34.5	22.8	56.0	46.0	21.5	23.2	N	
6.50640	24.2	17.6	0.8	25.0	18.4	60.0	50.0	35.0	31.6	N	
0.15669	41.9	28.9	0.3	42.2	29.2	65.6	55.6	23.4	26.4	L	
0.28232	35.0	26.1	0.3	35.3	26.4	60.7	50.7	25.4	24.3	L	
0.47536	28.4	18.9	0.3	28.7	19.2	56.4	46.4	27.7	27.2	L	
0.56444	33.8	24.5	0.3	34.1	24.8	56.0	46.0	21.9	21.2	L	
0.86327	31.1	21.7	0.3	31.4	22.0	56.0	46.0	24.6	24.0	L	
6.53680	22.9	11.6	0.8	23.7	12.4	60.0	50.0	36.3	37.6	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission
Tx, 11g, Ch: Mid

DATA OF CONDUCTED EMISSION TEST

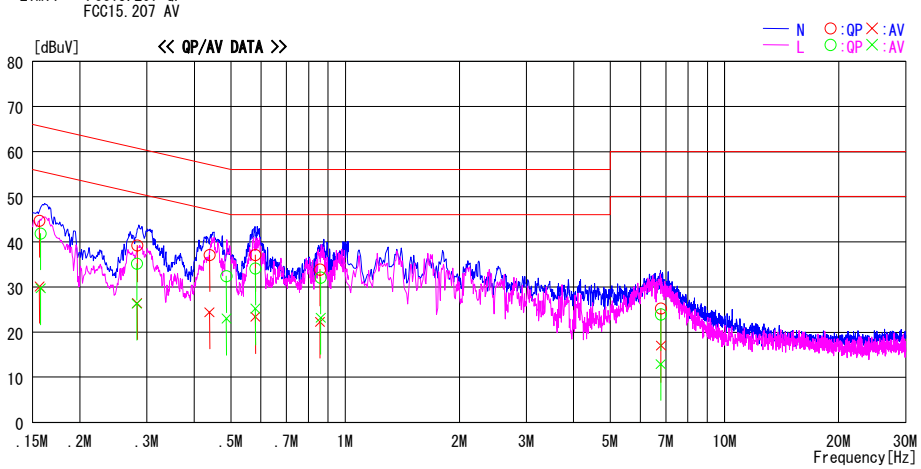
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2437MHz, 54Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15654	44.4	29.8	0.3	44.7	30.1	65.6	55.6	20.9	25.5	N	
0.28288	38.9	26.1	0.3	39.2	26.4	60.7	50.7	21.5	24.3	N	
0.43896	36.8	24.1	0.3	37.1	24.4	57.1	47.1	20.0	22.7	N	
0.57948	36.8	23.1	0.3	37.1	23.4	56.0	46.0	18.9	22.6	N	
0.85760	33.6	22.0	0.3	33.9	22.3	56.0	46.0	22.1	23.7	N	
6.79600	24.4	16.2	0.8	25.2	17.0	60.0	50.0	34.8	33.0	N	
0.15757	41.6	29.4	0.3	41.9	29.7	65.6	55.6	23.7	25.9	L	
0.28234	34.9	26.0	0.3	35.2	26.3	60.7	50.7	25.5	24.4	L	
0.48663	32.1	22.7	0.3	32.4	23.0	56.2	46.2	23.8	23.2	L	
0.57980	33.8	24.9	0.3	34.1	25.2	56.0	46.0	21.9	20.8	L	
0.86125	31.8	22.9	0.3	32.1	23.2	56.0	46.0	23.9	22.8	L	
6.79060	23.1	12.1	0.8	23.9	12.9	60.0	50.0	36.1	37.1	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Conducted Emission
Tx, 11g, Ch: High

DATA OF CONDUCTED EMISSION TEST

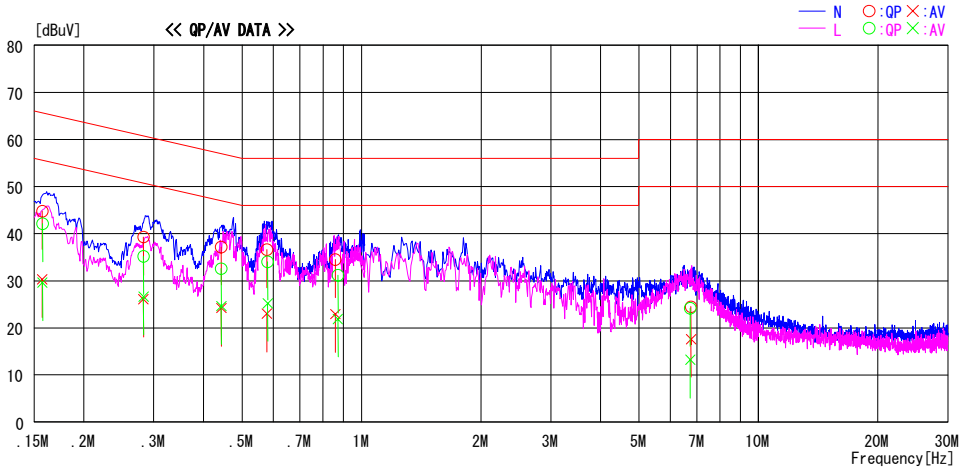
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2462MHz, 54Mbps

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15705	44.5	30.0	0.3	44.8	30.3	65.6	55.6	20.8	25.3	N	
0.28245	39.0	25.8	0.3	39.3	26.1	60.7	50.7	21.4	24.6	N	
0.44356	36.9	23.9	0.3	37.2	24.2	57.0	47.0	19.8	22.8	N	
0.57810	36.3	22.7	0.3	36.6	23.0	56.0	46.0	19.4	23.0	N	
0.86001	34.2	22.6	0.3	34.5	22.9	56.0	46.0	21.5	23.1	N	
6.76430	23.7	16.8	0.8	24.5	17.6	60.0	50.0	35.5	32.4	N	
0.15725	41.8	29.3	0.3	42.1	29.6	65.6	55.6	23.5	26.0	L	
0.28280	34.9	26.3	0.3	35.2	26.6	60.7	50.7	25.5	24.1	L	
0.44317	32.3	24.3	0.3	32.6	24.6	57.0	47.0	24.4	22.4	L	
0.58038	33.7	24.9	0.3	34.0	25.2	56.0	46.0	22.0	20.8	L	
0.87195	30.9	21.6	0.3	31.2	21.9	56.0	46.0	24.8	24.1	L	
6.73603	23.4	12.4	0.8	24.2	13.2	60.0	50.0	35.8	36.8	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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Facsimile : +81 596 24 8124

Conducted Emission
Rx, 11b/g, Ch: Mid

DATA OF CONDUCTED EMISSION TEST

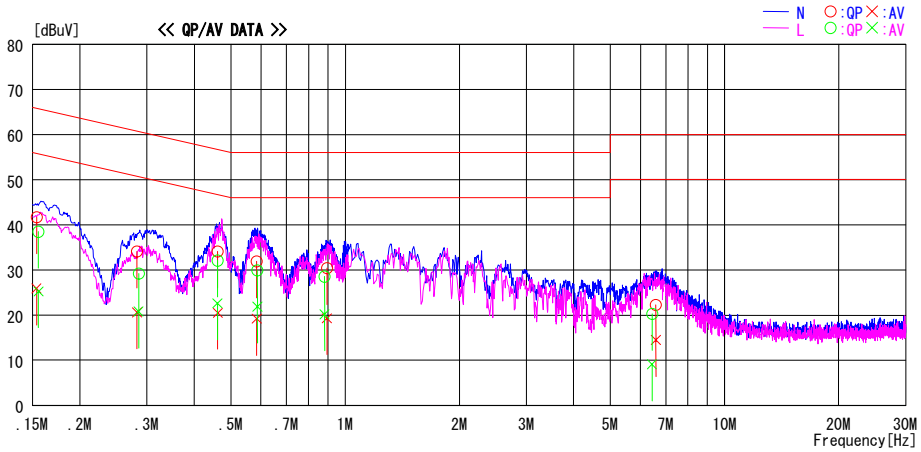
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 45%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Rx, 11b/g, 2437MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15362	41.4	25.6	0.3	41.7	25.9	65.8	55.8	24.1	29.9	N	
0.28277	33.8	20.3	0.3	34.1	20.6	60.7	50.7	26.6	30.1	N	
0.46142	33.8	20.2	0.3	34.1	20.5	56.7	46.7	22.6	26.2	N	
0.58442	31.6	18.9	0.3	31.9	19.2	56.0	46.0	24.1	26.8	N	
0.89541	30.1	19.0	0.3	30.4	19.3	56.0	46.0	25.6	26.7	N	
6.58729	21.4	13.7	0.8	22.2	14.5	60.0	50.0	37.8	35.5	N	
0.15545	38.2	25.0	0.3	38.5	25.3	65.7	55.7	27.2	30.4	L	
0.28540	28.9	20.5	0.3	29.2	20.8	60.7	50.7	31.5	29.9	L	
0.46084	31.8	22.3	0.3	32.1	22.6	56.7	46.7	24.6	24.1	L	
0.58684	29.6	21.6	0.3	29.9	21.9	56.0	46.0	26.1	24.1	L	
0.88121	28.2	19.9	0.3	28.5	20.2	56.0	46.0	27.5	25.8	L	
6.44120	19.5	8.3	0.8	20.3	9.1	60.0	50.0	39.7	40.9	L	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

6dB Bandwidth

UL Japan, Inc.
Head Office EMC Lab. No.6 Shielded Room

Company	: YAMAHA CORPORATION	Test Report No.	: 29CE0117-HO-01
Equipment	: YAMAHA Wi-Fi PCB	Regulation	: FCC15.247(a)(2)/RSS-210A8.2(a)
Model No.	: WR11780	Test distance	: -
Serial No.	: 1	Date	: November 5, 2008
Power	: DC 5V	Temperature	: 21deg. C.
Mode	: Tx 11b, 11Mbps (2412MHz, 2437MHz, 2462MHz)	Humidity	: 47%
	: Tx 11g, 54Mbps (2412MHz, 2437MHz, 2462MHz)	Engineer	: Takeshi Choda

[IEEE802.11b]

Ch	Freq. [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
Low	2412.0	12.051	>500
Mid	2437.0	12.387	>500
High	2462.0	12.238	>500

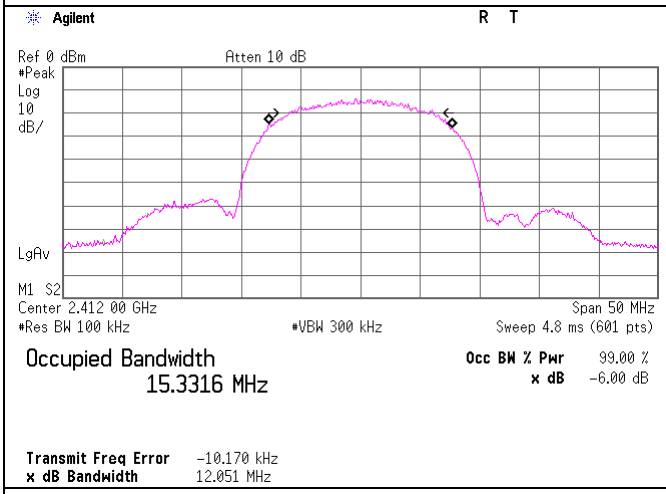
[IEEE802.11g]

Ch	Freq. [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
Low	2412.0	16.266	>500
Mid	2437.0	16.455	>500
High	2462.0	16.546	>500

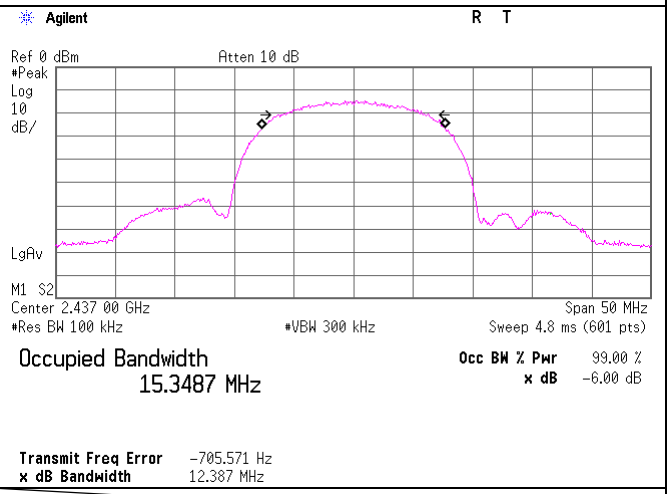
6dB Bandwidth

11b

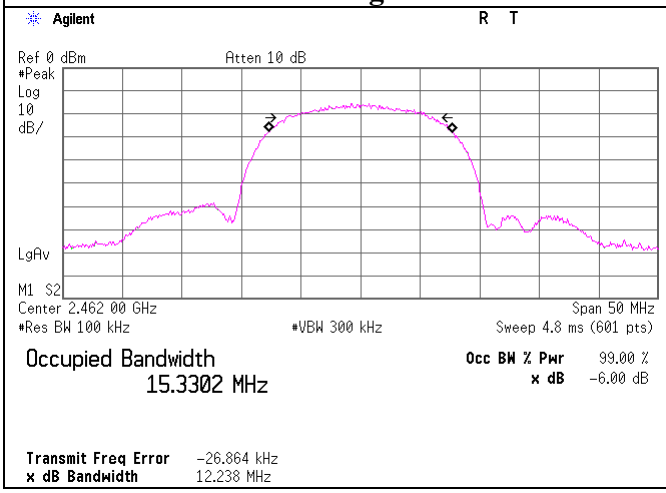
Ch: Low



Ch: Mid



Ch: High



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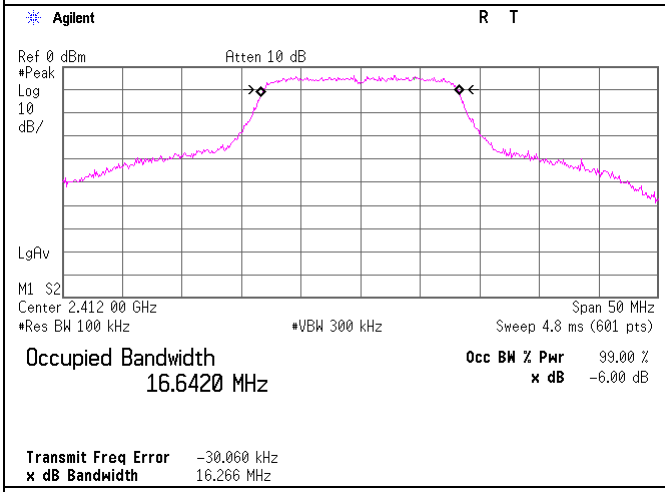
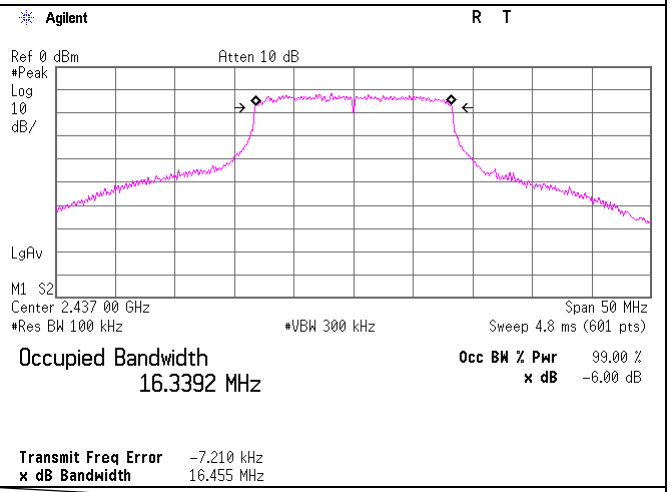
6dB Bandwidth

11g

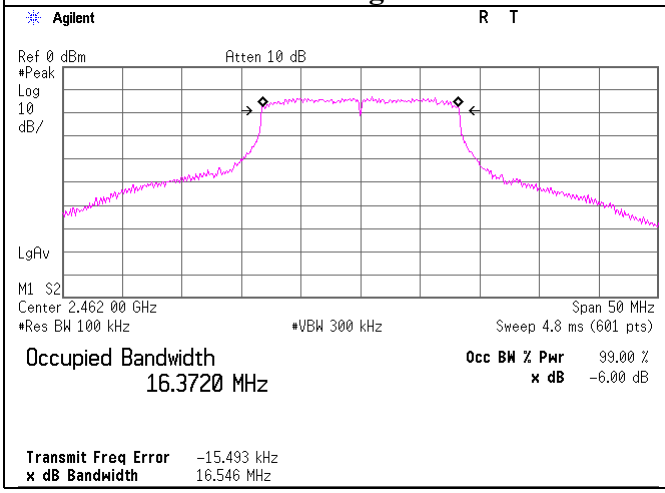
Ch: Low



Ch: Mid



Ch: High



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Maximum Peak Output Power

UL Japan, Inc.
Head Office EMC Lab. No.2 Semi anechoic chamber

Company : YAMAHA CORPORATION
Equipment : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 1
Power : DC5V
Mode : Tx 11b, 11Mbps (2412MHz, 2437MHz, 2462MHz)
: Tx 11g, 54Mbps (2412MHz, 2437MHz, 2462MHz)

Test Report No. : 29CE0117-HO-01
Regulation : FCC15.247(b)(3)/RSS-210A8.4(4)
Test distance : -
Date : November 4, 2008
Temperature : 20deg.C.
Humidity : 50%
Engineer : Akio Hayashi

[IEEE802.11b]

Ch	Freq.	P/M Reading	Cable Loss	Atten.	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	2.33	0.78	10.22	13.33	21.53	30.00	1000	16.67
Mid	2437.0	2.39	0.78	10.22	13.39	21.83	30.00	1000	16.61
High	2462.0	2.42	0.78	10.22	13.42	21.98	30.00	1000	16.58

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11g]

Ch	Freq.	P/M Reading	Cable Loss	Atten.	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	8.29	0.78	10.22	19.29	84.92	30.00	1000	10.71
Mid	2437.0	8.20	0.78	10.22	19.20	83.18	30.00	1000	10.80
High	2462.0	8.11	0.78	10.22	19.11	81.47	30.00	1000	10.89

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

11b Rate Check
[IEEE 802.11b] ANT:MAIN PK

Rate	Freq.	P/M Reading	Cable Loss	Atten.	Result		Limit		Margin
[MBPS]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
1	2437	2.23	0.78	10.22	13.23	21.04	30	1000	16.77
2	2437	2.31	0.78	10.22	13.31	21.43	30	1000	16.69
5.5	2437	2.23	0.78	10.22	13.23	21.04	30	1000	16.77
11	2437	2.39	0.78	10.22	13.39	21.83	30	1000	16.61

11g Rate Check
[IEEE 802.11g] ANT:MAIN PK

Rate	Freq.	P/M Reading	Cable Loss	Atten.	Result		Limit		Margin
[MBPS]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
6	2437	7.85	0.78	10.22	18.85	76.74	30	1000	11.15
9	2437	7.91	0.78	10.22	18.91	77.80	30	1000	11.09
12	2437	8.09	0.78	10.22	19.09	81.10	30	1000	10.91
18	2437	8.11	0.78	10.22	19.11	81.47	30	1000	10.89
24	2437	8.18	0.78	10.22	19.18	82.79	30	1000	10.82
36	2437	8.30	0.78	10.22	19.3	85.11	30	1000	10.7
48	2437	8.10	0.78	10.22	19.1	81.28	30	1000	10.9
54	2437	8.20	0.78	10.22	19.2	83.18	30	1000	10.8

Radiated Spurious Emission (below 1GHz)

Tx, 11b, Ch: Low

DATA OF RADIATED EMISSION TEST

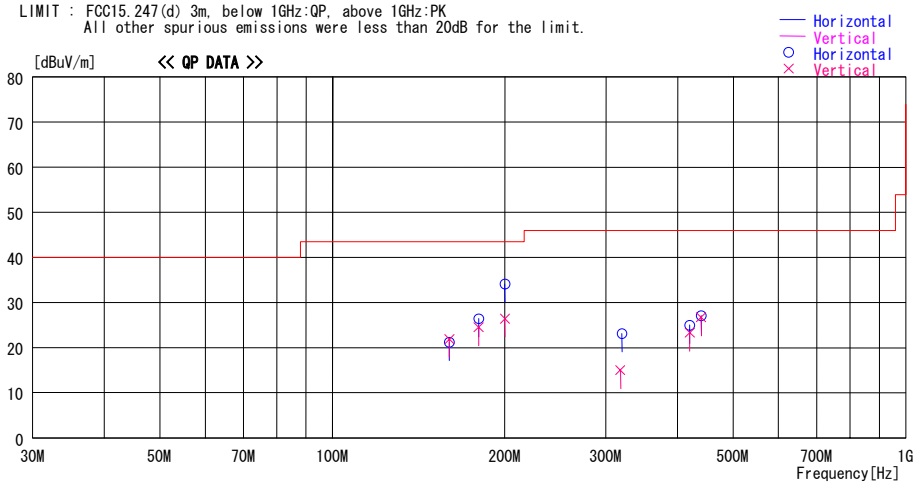
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2412MHz, 11Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-X)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
160.000	29.0	QP	15.4	-23.2	21.2	2	100	Hori.	43.5	22.3	
159.999	29.7	QP	15.4	-23.2	21.9	342	100	Vert.	43.5	21.6	
179.998	33.2	QP	16.4	-23.2	26.4	0	194	Hori.	43.5	17.1	
179.998	31.3	QP	16.4	-23.2	24.5	272	105	Vert.	43.5	19.0	
199.999	40.9	QP	16.2	-23.0	34.1	10	181	Hori.	43.5	9.4	
199.999	33.2	QP	16.2	-23.0	26.4	248	100	Vert.	43.5	17.1	
317.982	21.8	QP	15.1	-21.9	15.0	0	100	Vert.	46.0	31.0	
319.996	29.8	QP	15.2	-21.9	23.1	0	100	Hori.	46.0	22.9	
419.992	28.7	QP	17.5	-21.2	25.0	206	100	Hori.	46.0	21.0	
419.998	27.0	QP	17.5	-21.2	23.3	0	150	Vert.	46.0	22.7	
440.000	30.5	QP	17.6	-21.0	27.1	198	100	Hori.	46.0	18.9	
439.992	30.1	QP	17.6	-21.0	26.7	59	122	Vert.	46.0	19.3	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

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Radiated Spurious Emission (below 1GHz)

Tx, 11b, Ch: Mid

DATA OF RADIATED EMISSION TEST

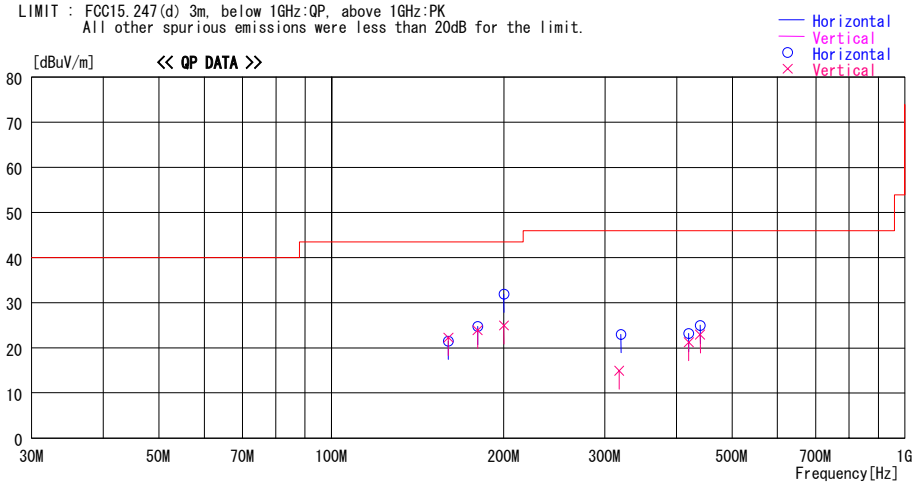
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2437MHz, 11Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
160.000	29.3	QP	15.4	-23.2	21.5	0	206	Hori.	43.5	22.0	
159.999	30.1	QP	15.4	-23.2	22.3	78	100	Vert.	43.5	21.2	
179.999	31.5	QP	16.4	-23.2	24.7	8	198	Hori.	43.5	18.8	
179.998	30.7	QP	16.4	-23.2	23.9	282	105	Vert.	43.5	19.6	
199.998	38.7	QP	16.2	-23.0	31.9	218	181	Hori.	43.5	11.6	
199.999	31.7	QP	16.2	-23.0	24.9	271	100	Vert.	43.5	18.6	
317.934	21.7	QP	15.1	-21.9	14.9	0	100	Vert.	46.0	31.1	
319.998	29.7	QP	15.2	-21.9	23.0	0	100	Hori.	46.0	23.0	
419.996	26.9	QP	17.5	-21.2	23.2	202	100	Hori.	46.0	22.8	
419.998	24.9	QP	17.5	-21.2	21.2	52	129	Vert.	46.0	24.8	
439.996	28.4	QP	17.6	-21.0	25.0	196	100	Hori.	46.0	21.0	
439.997	26.3	QP	17.6	-21.0	22.9	68	129	Vert.	46.0	23.1	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Tx, 11b, Ch: High

DATA OF RADIATED EMISSION TEST

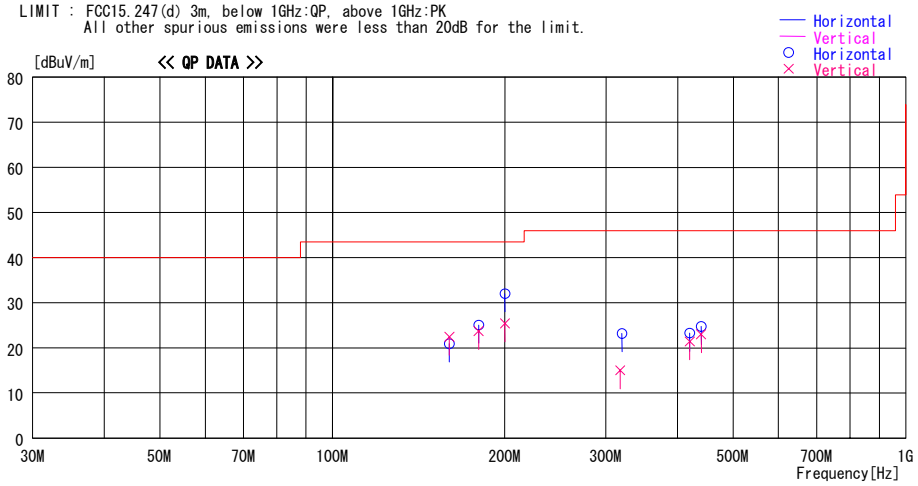
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11b, 2462MHz, 11Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
159.999	28.7	QP	15.4	-23.2	20.9	350	210	Hori.	43.5	22.6	
159.999	30.2	QP	15.4	-23.2	22.4	79	100	Vert.	43.5	21.1	
179.999	31.9	QP	16.4	-23.2	25.1	15	175	Hori.	43.5	18.4	
179.998	30.5	QP	16.4	-23.2	23.7	269	100	Vert.	43.5	19.8	
199.998	38.8	QP	16.2	-23.0	32.0	214	172	Hori.	43.5	11.5	
199.998	32.2	QP	16.2	-23.0	25.4	270	100	Vert.	43.5	18.1	
317.923	21.8	QP	15.1	-21.9	15.0	0	100	Vert.	46.0	31.0	
319.998	29.9	QP	15.2	-21.9	23.2	5	100	Hori.	46.0	22.8	
419.996	27.0	QP	17.5	-21.2	23.3	200	100	Hori.	46.0	22.7	
419.998	25.1	QP	17.5	-21.2	21.4	52	132	Vert.	46.0	24.6	
439.998	28.1	QP	17.6	-21.0	24.7	206	100	Hori.	46.0	21.3	
439.997	26.4	QP	17.6	-21.0	23.0	61	132	Vert.	46.0	23.0	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Tx, 11g, Ch: Low

DATA OF RADIATED EMISSION TEST

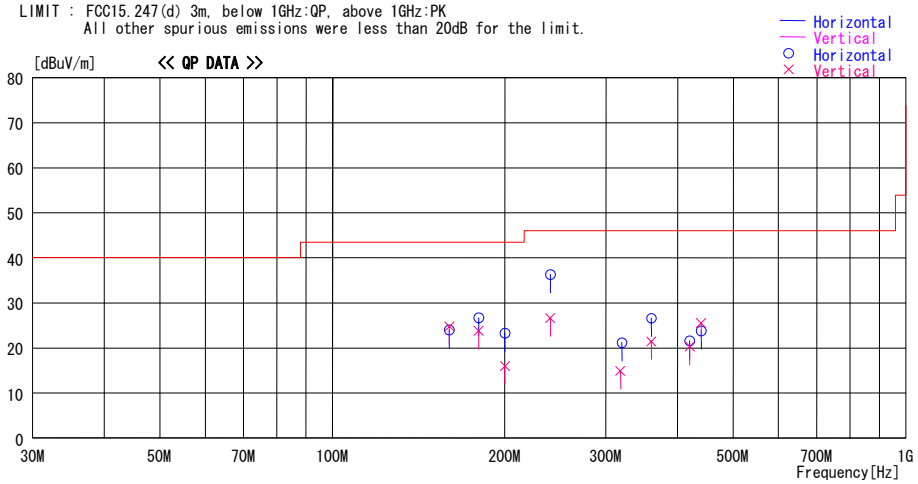
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/07

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2412MHz, 54Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-X)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
159.998	32.6	QP	15.4	-23.2	24.8	76	100	Vert.	43.5	18.7	
159.999	31.8	QP	15.4	-23.2	24.0	0	209	Hori.	43.5	19.5	
179.998	33.5	QP	16.4	-23.2	26.7	38	194	Hori.	43.5	16.8	
179.999	30.6	QP	16.4	-23.2	23.8	267	100	Vert.	43.5	19.7	
199.998	30.1	QP	16.2	-23.0	23.3	269	100	Hori.	43.5	20.2	
200.000	22.8	QP	16.2	-23.0	16.0	0	100	Vert.	43.5	27.5	
239.998	42.5	QP	16.4	-22.6	36.3	30	142	Hori.	46.0	9.7	
240.000	32.8	QP	16.4	-22.6	26.6	53	100	Vert.	46.0	19.4	
317.982	21.7	QP	15.1	-21.9	14.9	0	100	Vert.	46.0	31.1	
359.997	26.8	QP	16.3	-21.6	21.5	350	142	Vert.	46.0	24.5	
319.999	27.9	QP	15.2	-21.9	21.2	0	100	Hori.	46.0	24.8	
360.003	31.9	QP	16.3	-21.6	26.6	29	100	Hori.	46.0	19.4	
419.992	25.3	QP	17.5	-21.2	21.6	198	100	Hori.	46.0	24.4	
419.998	24.0	QP	17.5	-21.2	20.3	58	125	Vert.	46.0	25.7	
439.997	28.9	QP	17.6	-21.0	25.5	283	118	Vert.	46.0	20.5	
439.997	27.2	QP	17.6	-21.0	23.8	198	100	Hori.	46.0	22.2	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Tx, 11g, Ch: Mid

DATA OF RADIATED EMISSION TEST

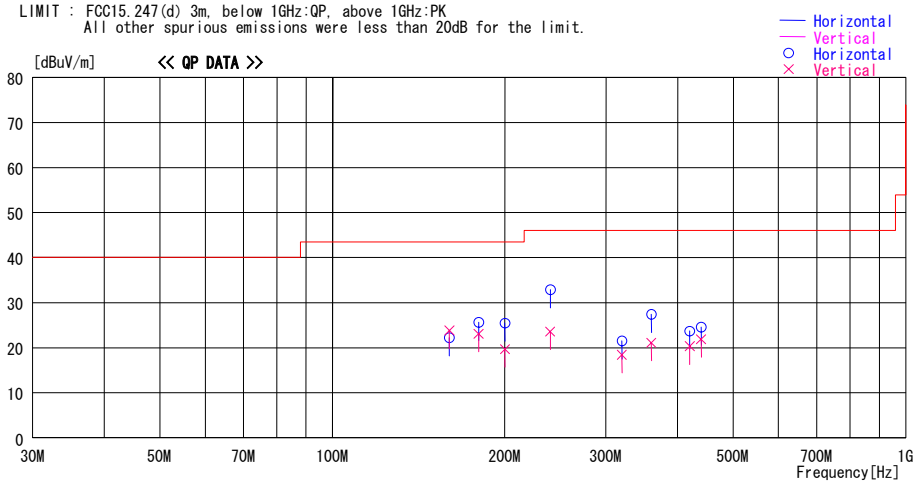
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2437MHz, 54Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-X)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
159.999	31.6	QP	15.4	-23.2	23.8	79	100	Vert.	43.5	19.7	
160.000	30.0	QP	15.4	-23.2	22.2	28	194	Hori.	43.5	21.3	
179.999	32.4	QP	16.4	-23.2	25.6	28	194	Hori.	43.5	17.9	
180.000	29.8	QP	16.5	-23.2	23.1	262	100	Vert.	43.5	20.4	
199.999	32.3	QP	16.2	-23.0	25.5	234	177	Hori.	43.5	18.0	
200.001	26.5	QP	16.2	-23.0	19.7	257	100	Vert.	43.5	23.8	
239.998	39.1	QP	16.4	-22.6	32.9	8	141	Hori.	46.0	13.1	
239.999	29.8	QP	16.4	-22.6	23.6	69	100	Vert.	46.0	22.4	
319.999	25.1	QP	15.2	-21.9	18.4	0	100	Vert.	46.0	27.6	
359.996	26.4	QP	16.3	-21.6	21.1	337	161	Vert.	46.0	24.9	
319.992	28.2	QP	15.2	-21.9	21.5	8	106	Hori.	46.0	24.5	
359.999	32.7	QP	16.3	-21.6	27.4	37	100	Hori.	46.0	18.6	
419.996	27.4	QP	17.5	-21.2	23.7	65	100	Hori.	46.0	22.3	
419.998	24.0	QP	17.5	-21.2	20.3	288	125	Vert.	46.0	25.7	
439.996	28.0	QP	17.6	-21.0	24.6	144	100	Hori.	46.0	21.4	
440.002	25.3	QP	17.6	-21.0	21.9	82	132	Vert.	46.0	24.1	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Tx, 11g, Ch: High

DATA OF RADIATED EMISSION TEST

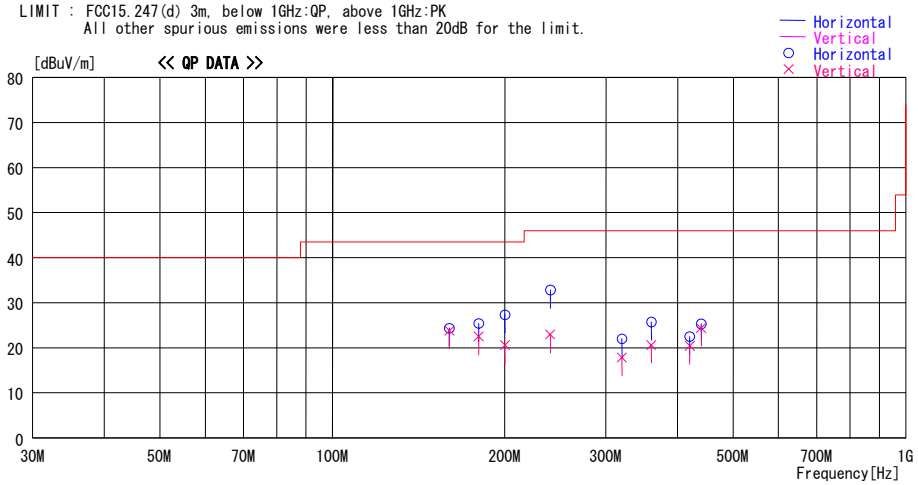
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/06

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Tx, 11g, 2462MHz, 54Mbps, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-X)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
159.999	31.6	QP	15.4	-23.2	23.8	88	100	Vert.	43.5	19.7	
159.998	32.1	QP	15.4	-23.2	24.3	0	209	Hori.	43.5	19.2	
179.999	32.2	QP	16.4	-23.2	25.4	30	192	Hori.	43.5	18.1	
180.000	29.2	QP	16.5	-23.2	22.5	284	100	Vert.	43.5	21.0	
199.999	34.1	QP	16.2	-23.0	27.3	230	175	Hori.	43.5	16.2	
200.002	27.4	QP	16.2	-23.0	20.6	273	100	Vert.	43.5	22.9	
240.004	39.0	QP	16.4	-22.6	32.8	232	149	Hori.	46.0	13.2	
239.998	29.1	QP	16.4	-22.6	22.9	213	100	Vert.	46.0	23.1	
319.998	24.5	QP	15.2	-21.9	17.8	224	309	Vert.	46.0	28.2	
359.996	25.9	QP	16.3	-21.6	20.6	0	162	Vert.	46.0	25.4	
319.999	28.7	QP	15.2	-21.9	22.0	0	100	Hori.	46.0	24.0	
359.999	31.0	QP	16.3	-21.6	25.7	37	100	Hori.	46.0	20.3	
419.998	26.2	QP	17.5	-21.2	22.5	70	100	Hori.	46.0	23.5	
419.996	24.1	QP	17.5	-21.2	20.4	303	100	Vert.	46.0	25.6	
439.998	28.7	QP	17.6	-21.0	25.3	183	100	Hori.	46.0	20.7	
439.998	27.8	QP	17.6	-21.0	24.4	260	129	Vert.	46.0	21.6	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Rx, 11b/g, Ch: Mid

DATA OF RADIATED EMISSION TEST

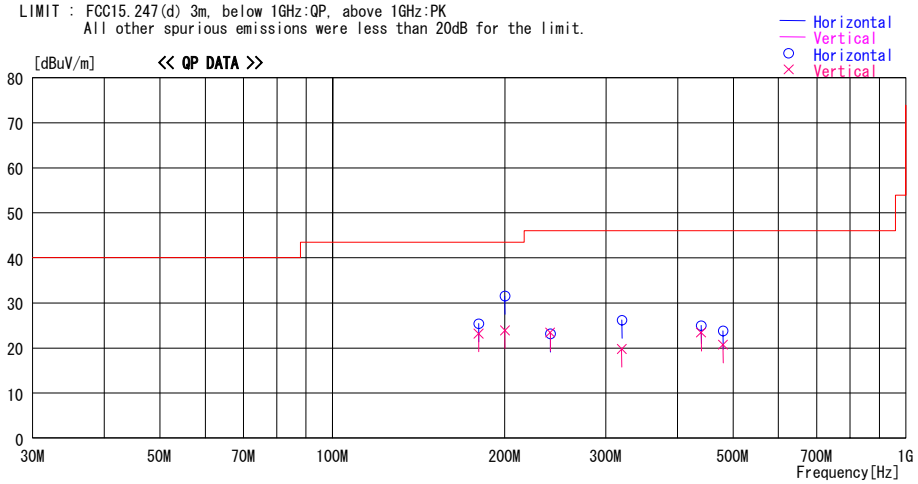
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/11/07

Company : YAMAHA CORPORATION
Kind of EUT : YAMAHA Wi-Fi PCB
Model No. : WR11780
Serial No. : 2

Report No. : 29CE0117-HO-01
Power : DC 5V
Temp./Humi. : 24deg.C / 50%
Engineer : Tomohisa Nakagawa

Mode / Remarks : Rx, 11b/g, 2437MHz, Worst axis(Hor:ANT-X,Module-Z/ Ver:ANT-Y,Module-Z)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
179.999	32.2	QP	16.4	-23.2	25.4	28	193	Hori.	43.5	18.1	
179.995	30.0	QP	16.4	-23.2	23.2	289	100	Vert.	43.5	20.3	
199.998	38.3	QP	16.2	-23.0	31.5	45	174	Hori.	43.5	12.0	
199.999	30.7	QP	16.2	-23.0	23.9	273	100	Vert.	43.5	19.6	
240.000	29.3	QP	16.4	-22.6	23.1	230	135	Hori.	46.0	22.9	
239.998	29.6	QP	16.4	-22.6	23.4	70	100	Vert.	46.0	22.6	
319.600	26.5	QP	15.2	-21.9	19.8	299	268	Vert.	46.0	26.2	
319.994	32.9	QP	15.2	-21.9	26.2	9	100	Hori.	46.0	19.8	
439.991	26.8	QP	17.6	-21.0	23.4	283	100	Vert.	46.0	22.6	
440.000	28.4	QP	17.6	-21.0	25.0	204	100	Hori.	46.0	21.0	
479.997	23.6	QP	17.9	-20.8	20.7	353	138	Vert.	46.0	25.3	
479.998	26.7	QP	17.9	-20.8	23.8	353	100	Hori.	46.0	22.2	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - GAIN(AMP)

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11b, Ch: Low

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11b, 2412MHz, 11Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: Z-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.00	54.5	54.2	26.8	32.4	2.6	0.0	51.5	51.2	73.9	22.4	22.7
2**	2400.00	71.5	70.4	26.8	32.4	2.6	0.0	68.5	67.4	-	-	-
3	4824.00	51.1	50.2	31.2	31.4	4.1	0.7	55.7	54.8	73.9	**18.2**	19.1
4	7236.00	39.7	40.6	35.5	31.2	4.4	0.6	49.0	49.9	73.9	24.9	24.0
5**	9648.00	46.2	42.7	38.6	32.0	5.2	0.9	58.9	55.4	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12060.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	14472.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	16884.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	19296.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	21708.00	NS	NS	-	-	-	-	-	-	73.9	-	-
11	24120.00	45.3	46.7	38.5	29.0	7.7	0.0	53.0	54.4	73.9	20.9	19.5

** Reference data

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.00	45.6	45.9	26.8	32.4	2.6	0.0	42.6	42.9	53.9	11.3	**11.0**
2**	2400.00	63.9	63.1	26.8	32.4	2.6	0.0	60.9	60.1	-	-	-
3	4824.00	36.1	35.2	31.2	31.4	4.1	0.7	40.7	39.8	53.9	13.2	14.1
4	7236.00	27.0	26.8	35.5	31.2	4.4	0.6	36.3	36.1	53.9	17.6	17.8
5**	9648.00	41.8	33.4	38.6	32.0	5.2	0.9	54.5	46.1	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12060.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	14472.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	16884.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	19296.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	21708.00	NS	NS	-	-	-	-	-	-	53.9	-	-
11	24120.00	32.8	33.1	38.5	29.0	7.7	0.0	40.5	40.8	53.9	13.4	13.1

** Reference data

20dBc (Fundamental 2412.0 MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
0	2412.00	103.4	101.2	26.9	32.4	2.6	0.0	100.5	98.3	-	-	-
2	2400.00	66.0	64.3	26.8	32.4	2.6	0.0	63.0	61.3	Funda-20dB	17.5	17.0
5	9648.00	44.4	40.4	38.6	32.0	5.2	0.9	57.1	53.1	Funda-20dB	23.4	25.2

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.

*Hi-Pass Filter was not used for factor 0.0dB of the above table.

*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.

*The limit is rounded down to one decimal place.

*The test result is round off to one or two decimal places, so some differences might be observed.

*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11b, Ch: Mid

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11b, 2437MHz, 11Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: Z-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4874.00	52.9	48.5	31.3	31.3	4.1	0.7	57.7	53.3	73.9	**16.2**	20.6
2	7311.00	40.3	40.2	35.7	31.2	4.5	0.6	49.9	49.8	73.9	24.0	24.1
3**	9748.00	49.4	44.1	38.7	32.0	5.2	0.9	62.2	56.9	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12185.00	NS	NS	-	-	-	-	-	-	73.9	-	-
5	14622.00	NS	NS	-	-	-	-	-	-	73.9	-	-
6	17059.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	19496.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	21933.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	24370.00	44.5	45.6	38.6	29.0	7.7	0.0	52.3	53.4	73.9	21.6	20.5

** Reference data

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4874.00	37.3	34.4	31.3	31.3	4.1	0.7	42.1	39.2	53.9	**11.8**	14.7
2	7311.00	26.6	26.6	35.7	31.2	4.5	0.6	36.2	36.2	53.9	17.7	17.7
3**	9748.00	46.2	36.4	38.7	32.0	5.2	0.9	59.0	49.2	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12185.00	NS	NS	-	-	-	-	-	-	53.9	-	-
5	14622.00	NS	NS	-	-	-	-	-	-	53.9	-	-
6	17059.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	19496.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	21933.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	24370.00	32.1	32.1	38.6	29.0	7.7	0.0	39.9	39.9	53.9	14.0	14.0

** Reference data

20dBc (Fundamental 2437.0 MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
0	2437.00	104.2	102.5	26.9	32.4	2.6	0.0	101.3	99.6	-	-	-
3	9748.00	47.2	41.8	38.7	32.0	5.2	0.9	60.0	54.6	Funda-20dB	21.3	25.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.
*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11b, Ch: High

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11b, 2462MHz, 11Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: Z-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.50	58.9	56.1	27.0	32.4	2.6	0.0	56.1	53.3	73.9	17.8	20.6
2	4924.00	53.6	53.7	31.4	31.3	4.1	0.7	58.5	58.6	73.9	15.4	**15.3**
3	7386.00	41.2	40.2	35.9	31.2	4.5	0.6	51.0	50.0	73.9	22.9	23.9
4**	9848.00	51.8	48.1	38.8	32.0	5.2	0.9	64.7	61.0	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12310.00	NS	NS	-	-	-	-	-	-	73.9	-	-
6	14772.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	17234.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	19696.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	22158.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	24620.00	44.8	44.9	38.8	28.9	7.7	0.0	52.9	53.0	73.9	21.0	20.9

** Reference data

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.50	47.0	44.6	27.0	32.4	2.6	0.0	44.2	41.8	53.9	**9.7**	12.1
2	4924.00	38.4	38.2	31.4	31.3	4.1	0.7	43.3	43.1	53.9	10.6	10.8
3	7386.00	27.7	27.1	35.9	31.2	4.5	0.6	37.5	36.9	53.9	16.4	17.0
4**	9848.00	48.7	44.0	38.8	32.0	5.2	0.9	61.6	56.9	-	-	-
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12310.00	NS	NS	-	-	-	-	-	-	53.9	-	-
6	14772.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	17234.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	19696.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	22158.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	24620.00	31.7	31.8	38.8	28.9	7.7	0.0	39.8	39.9	53.9	14.1	14.0

** Reference data

20dBc (Fundamental 2462.0 MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
0	2462.00	106.3	103.3	27.0	32.4	2.6	0.0	103.5	100.5	-	-	-
4	9848.00	50.1	45.4	38.8	32.0	5.2	0.9	63.0	58.3	Funda-20dB	20.5	22.2

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.
*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11g, Ch: Low

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11g, 2412MHz, 54Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: X-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.00	66.0	63.1	26.8	32.4	2.6	0.0	63.0	60.1	73.9	**10.9**	13.8
2**	2400.00	77.0	74.4	26.8	32.4	2.6	0.0	74.0	71.4	-	-	-
3	4824.00	45.4	48.6	31.2	31.4	4.1	0.7	50.0	53.2	73.9	23.9	20.7
4	7236.00	39.4	39.9	35.5	31.2	4.4	0.6	48.7	49.2	73.9	25.2	24.7
5	9648.00	38.8	39.7	38.6	32.0	5.2	0.9	51.5	52.4	73.9	22.4	21.5
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12060.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	14472.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	16884.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	19296.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	21708.00	NS	NS	-	-	-	-	-	-	73.9	-	-
11	24120.00	44.5	44.6	38.5	29.0	7.7	0.0	52.2	52.3	73.9	21.7	21.6

** Reference data

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2390.00	51.1	49.0	26.8	32.4	2.6	0.0	48.1	46.0	53.9	**5.8**	7.9
2**	2400.00	64.1	62.7	26.8	32.4	2.6	0.0	61.1	59.7	-	-	-
3	4824.00	32.7	37.2	31.2	31.4	4.1	0.7	37.3	41.8	53.9	16.6	12.1
4	7236.00	27.9	27.5	35.5	31.2	4.4	0.6	37.2	36.8	53.9	16.7	17.1
5	9648.00	26.6	27.5	38.6	32.0	5.2	0.9	39.3	40.2	53.9	14.6	13.7
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12060.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	14472.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	16884.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	19296.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	21708.00	NS	NS	-	-	-	-	-	-	53.9	-	-
11	24120.00	32.8	33.2	38.5	29.0	7.7	0.0	40.5	40.9	53.9	13.4	13.0

** Reference data

20dBc (Fundamental 2412.0 MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	20dBc	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	[dB]
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
0	2412.00	100.0	98.8	26.9	32.4	2.6	0.0	97.1	95.9	-	-	-
2	2400.00	66.5	66.3	26.8	32.4	2.6	0.0	63.5	63.3	Funda-20dB	13.6	12.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB

*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.
*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11g, Ch: Mid

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11g, 2437MHz, 54Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: X-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4874.00	43.7	44.4	31.3	31.3	4.1	0.7	48.5	49.2	73.9	25.4	24.7
2	7311.00	35.8	38.9	35.7	31.2	4.5	0.6	45.4	48.5	73.9	28.5	25.4
3	9748.00	39.4	38.2	38.7	32.0	5.2	0.9	52.2	51.0	73.9	21.7	22.9
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12185.00	NS	NS	-	-	-	-	NS	NS	73.9	-	-
5	14622.00	NS	NS	-	-	-	-	NS	NS	73.9	-	-
6	17059.00	NS	NS	-	-	-	-	NS	NS	73.9	-	-
7	19496.00	NS	NS	-	-	-	-	NS	NS	73.9	-	-
8	21933.00	NS	NS	-	-	-	-	NS	NS	73.9	-	-
9	24370.00	45.3	45.8	38.6	29.0	7.7	0.0	53.1	53.6	73.9	20.8	**20.3**

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	4874.00	31.9	32.8	31.3	31.3	4.1	0.7	36.7	37.6	53.9	17.2	16.3
2	7311.00	26.3	26.0	35.7	31.2	4.5	0.6	35.9	35.6	53.9	18.0	18.3
3	9748.00	26.6	26.7	38.7	32.0	5.2	0.9	39.4	39.5	53.9	14.5	14.4
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12185.00	NS	NS	-	-	-	-	NS	NS	53.9	-	-
5	14622.00	NS	NS	-	-	-	-	NS	NS	53.9	-	-
6	17059.00	NS	NS	-	-	-	-	NS	NS	53.9	-	-
7	19496.00	NS	NS	-	-	-	-	NS	NS	53.9	-	-
8	21933.00	NS	NS	-	-	-	-	NS	NS	53.9	-	-
9	24370.00	32.2	32.1	38.6	29.0	7.7	0.0	40.0	39.9	53.9	**13.9**	14.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.
*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, 11g, Ch: High

UL Japan, Inc.
Head Office EMC Lab. No.2 and 3 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.247(d) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m(below10GHz) / 1m(above10GHz)
Model :	WR11780	Date :	October 4, 2008 / October 5, 2008
S/N :	2	Temperature:	20deg.C. / 24deg.C.
Power :	DC 5V	Humidity :	50% / 45%
Mode :	Tx, 11g, 2462MHz, 54Mbps	Engineer :	Akio Hayashi / Tomohisa Nakagawa
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: X-axis)		

PK DETECT (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.50	67.2	64.6	27.0	32.4	2.6	0.0	64.4	61.8	73.9	**9.5**	12.1
2	4924.00	47.1	47.6	31.4	31.3	4.1	0.7	52.0	52.5	73.9	21.9	21.4
3	7386.00	34.1	39.1	35.9	31.2	4.5	0.6	43.9	48.9	73.9	30.0	25.0
4	9848.00	40.3	38.3	38.8	32.0	5.2	0.9	53.2	51.2	73.9	20.7	22.7
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12310.00	NS	NS	-	-	-	-	-	-	73.9	-	-
6	14772.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	17234.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	19696.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	22158.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	24620.00	44.1	44.5	38.8	28.9	7.7	0.0	52.2	52.6	73.9	21.7	21.3

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2483.50	50.6	48.3	27.0	32.4	2.6	0.0	47.8	45.5	53.9	**6.1**	8.4
2	4924.00	35.8	35.4	31.4	31.3	4.1	0.7	40.7	40.3	53.9	13.2	13.6
3	7386.00	26.8	27.8	35.9	31.2	4.5	0.6	36.6	37.6	53.9	17.3	16.3
4	9848.00	28.2	27.3	38.8	32.0	5.2	0.9	41.1	40.2	53.9	12.8	13.7
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12310.00	NS	NS	-	-	-	-	-	-	53.9	-	-
6	14772.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	17234.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	19696.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	22158.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	24620.00	32.1	31.4	38.8	28.9	7.7	0.0	40.2	39.5	53.9	13.7	14.4

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.54 dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*In the frequency over the fifth harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.
*NS: Non-Signal

*The test result is rounded off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Rx, 11b/g, Ch: Mid

UL Japan, Inc.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company:	YAMAHA CORPORATION	Regulation:	FCC15.109(a) / RSS-210 A8.5
Equipment:	YAMAHA Wi-Fi PCB	Test Distance:	3m
Model :	WR11780	Date :	October 4, 2008
S/N :	2	Temperature:	20deg.C.
Power :	DC 5V	Humidity:	50%
Mode :	Rx, 11b/g, 2437MHz	Engineer :	Akio Hayashi
Position :	Antenna (H: X-axis, V: Z-axis), Module (H: Y-axis, V: Z-axis)		

PK DETECT (Reference data) (RBW: 1MHz, VBW: 1MHz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2437.00	41.9	39.6	26.9	32.4	2.6	0.0	39.0	36.7	73.9	34.9	37.2
2	4874.00	43.2	41.2	31.3	31.3	3.6	0.0	46.8	44.8	73.9	**27.1**	29.1

AV DETECT (RBW: 1MHz, VBW: 10Hz)

No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	AV	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2437.00	28.0	27.9	26.9	32.4	2.6	0.0	25.1	25.0	53.9	28.8	28.9
2	4874.00	37.3	33.5	31.3	31.3	3.6	0.0	40.9	37.1	53.9	**13.0**	16.8

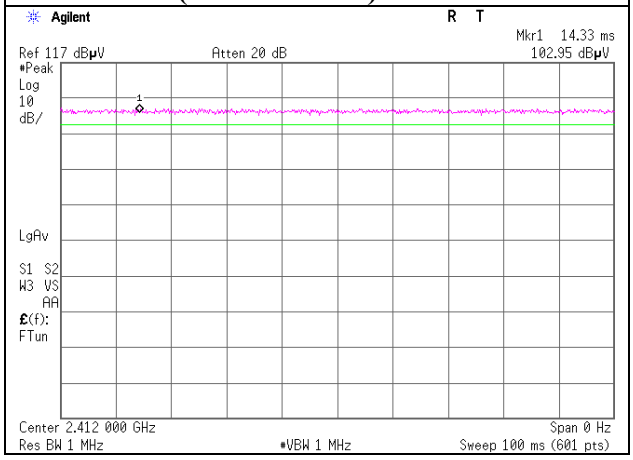
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Filter was not used for factor 0.0dB of the above table.
*The limit is rounded down to one decimal place.
*The test result is round off to one or two decimal places, so some differences might be observed.

*The test result is rounded off to one or two decimal places, so some differences might be observed.

VBW (AV) Calculation

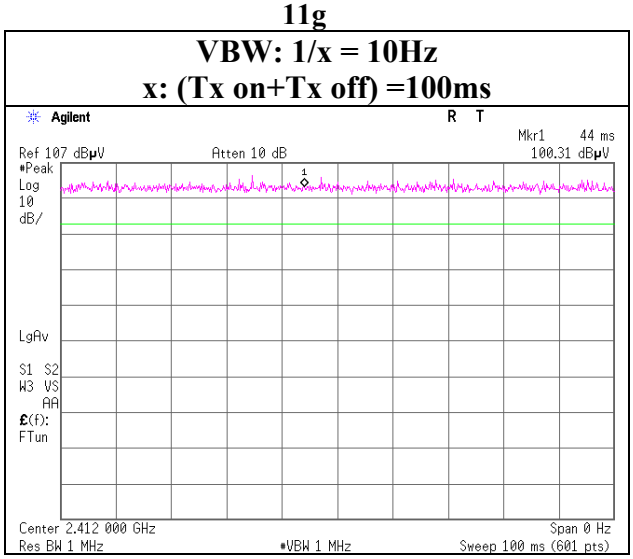
11b

VBW: 1/x = 10Hz
x: (Tx on+Tx off) =100ms



11g

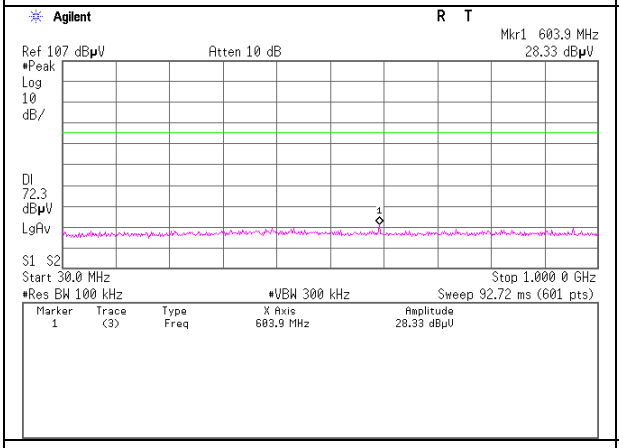
VBW: 1/x = 10Hz
x: (Tx on+Tx off) =100ms



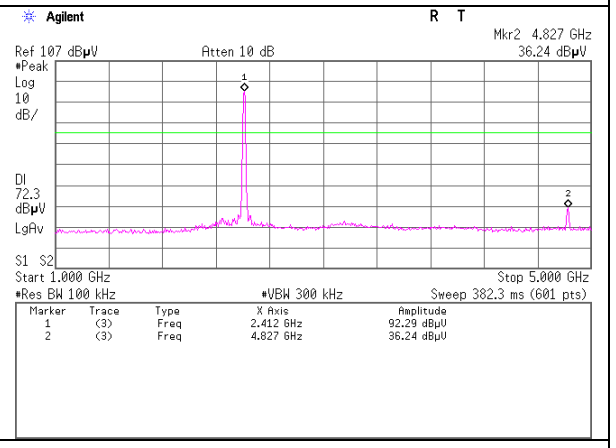
Conducted Spurious Emission

Tx, 11b, Ch: Low

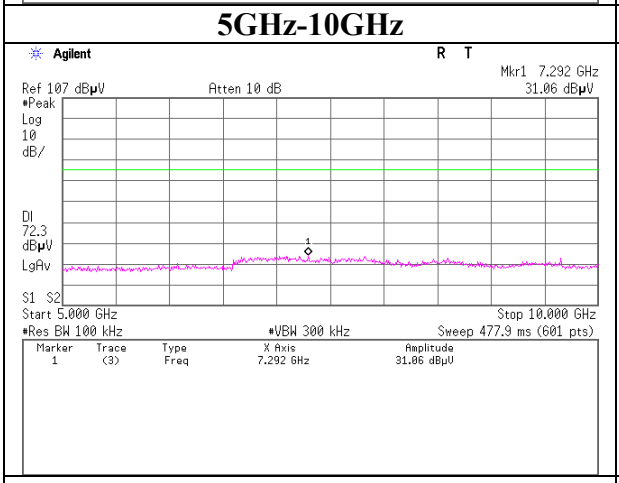
30MHz-1GHz



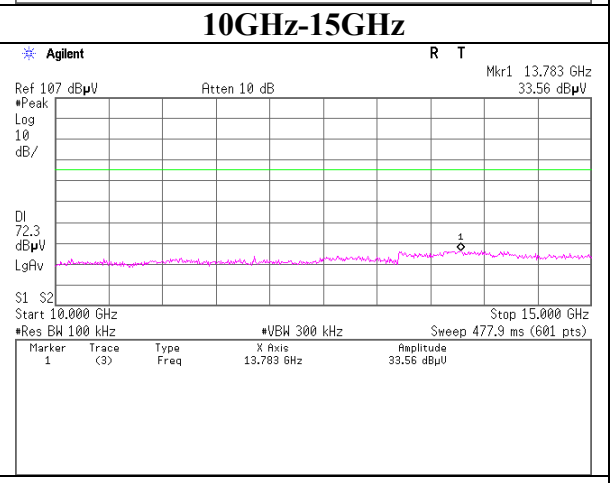
1GHz-5GHz



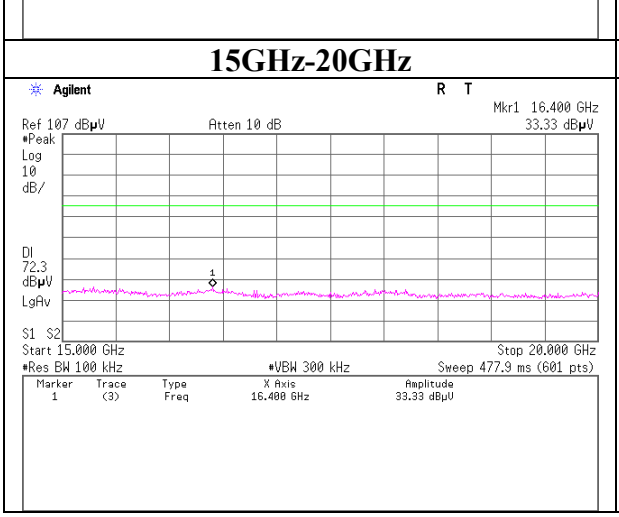
5GHz-10GHz



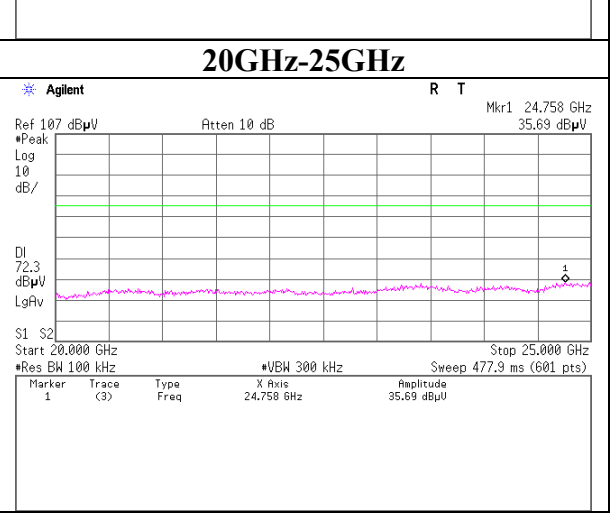
10GHz-15GHz



15GHz-20GHz



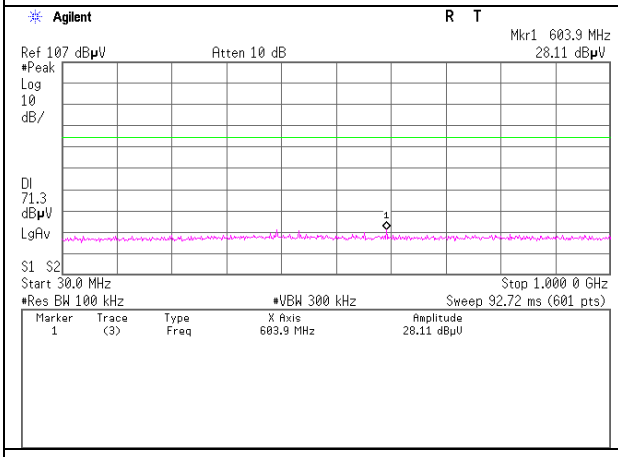
20GHz-25GHz



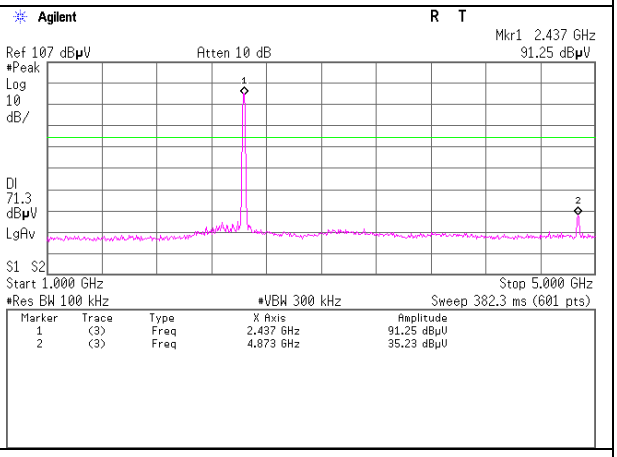
Conducted Spurious Emission

Tx, 11b, Ch: Mid

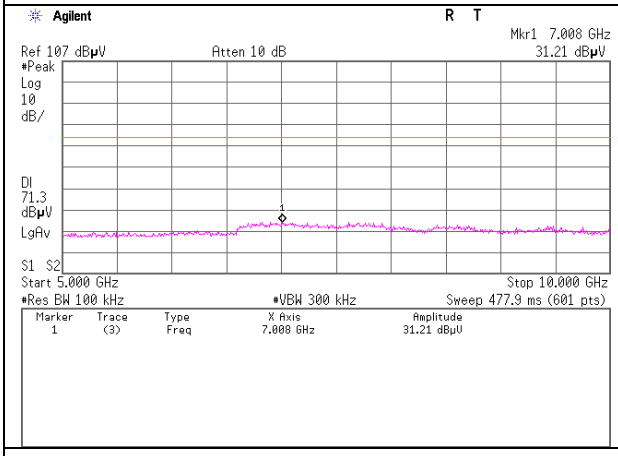
30MHz-1GHz



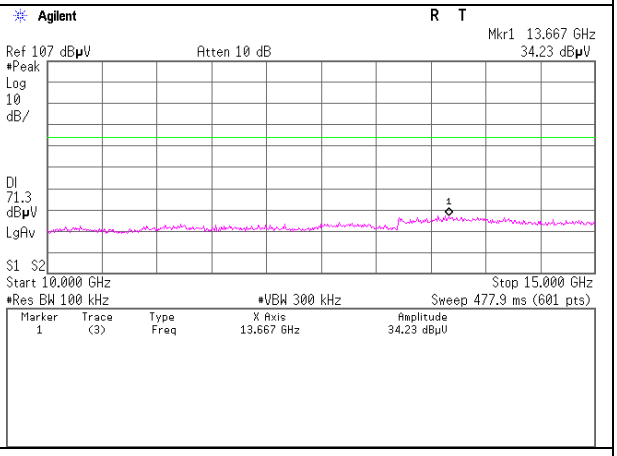
1GHz-5GHz



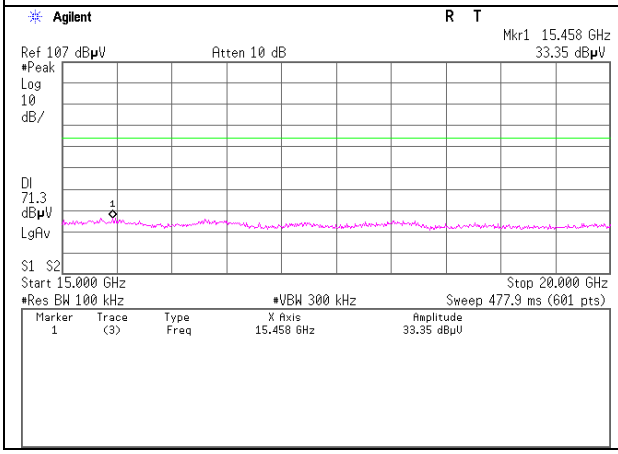
5GHz-10GHz



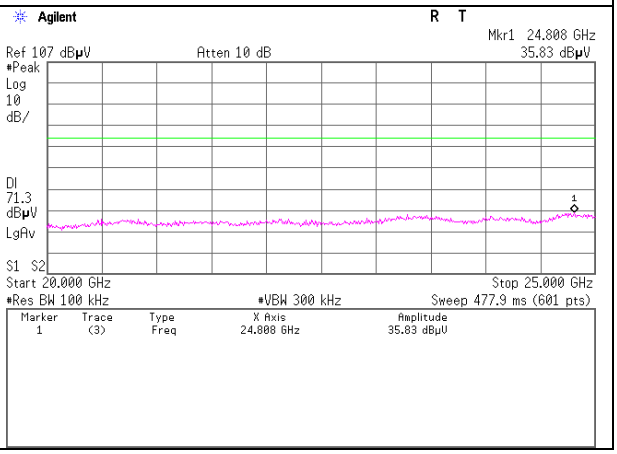
10GHz-15GHz



15GHz-20GHz



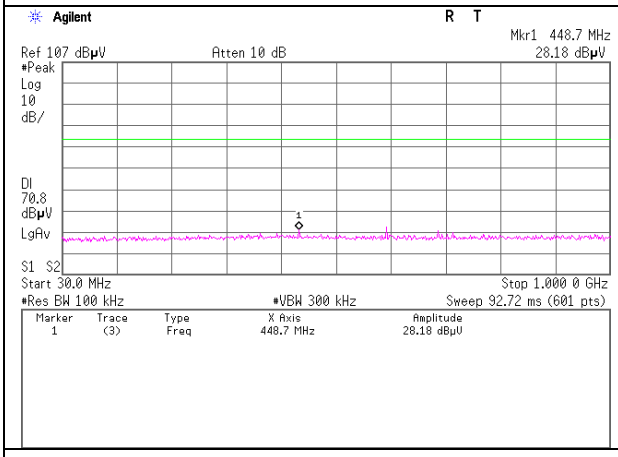
20GHz-25GHz



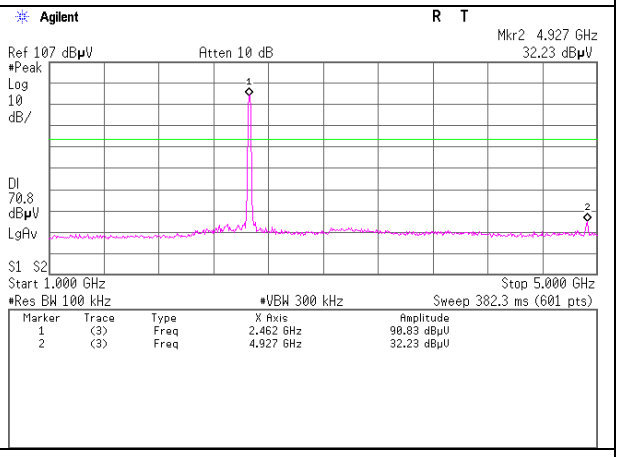
Conducted Spurious Emission

Tx, 11b, Ch: High

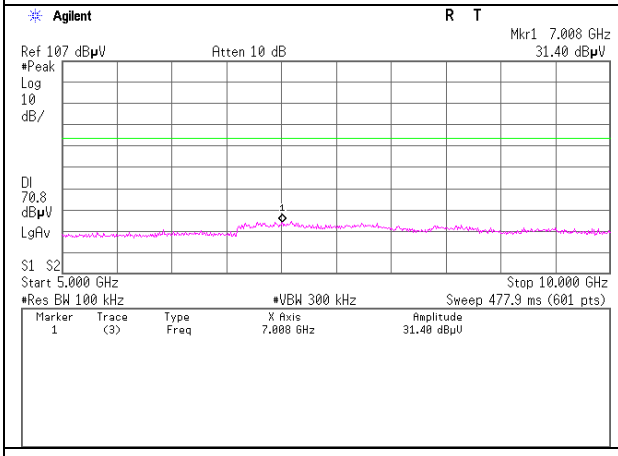
30MHz-1GHz



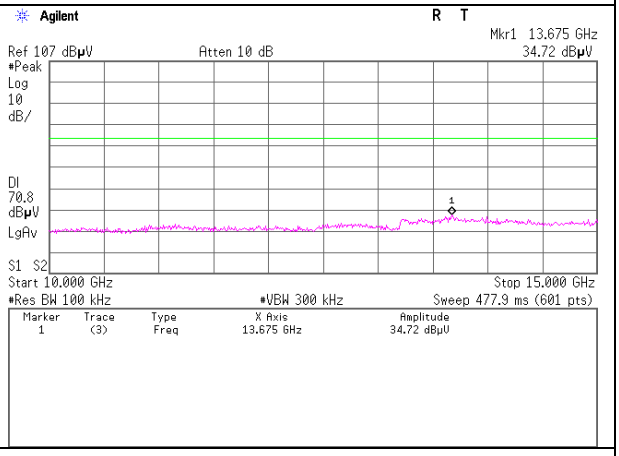
1GHz-5GHz



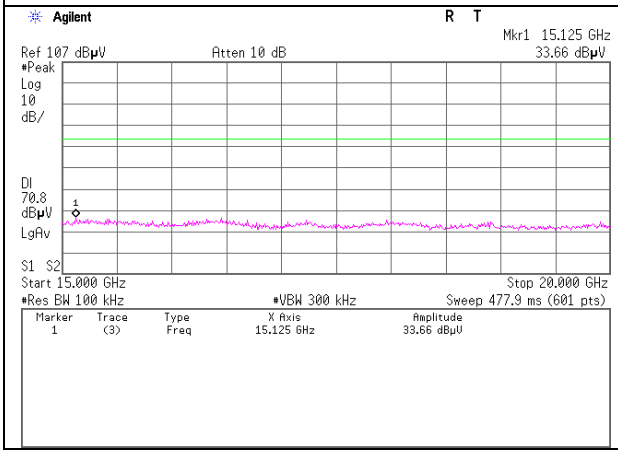
5GHz-10GHz



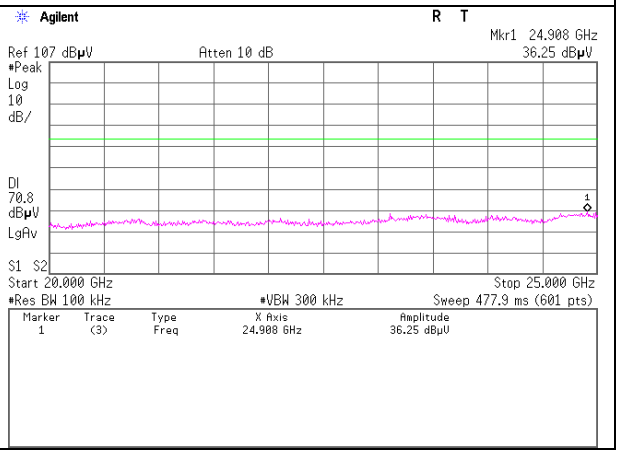
10GHz-15GHz



15GHz-20GHz



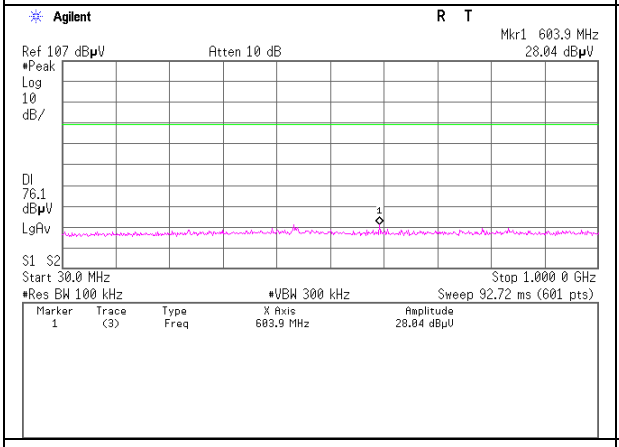
20GHz-25GHz



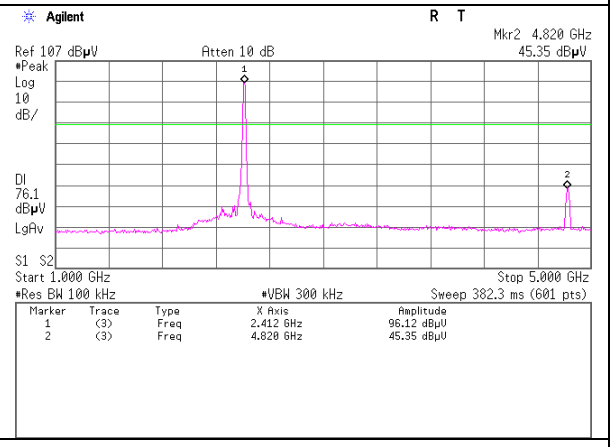
Conducted Spurious Emission

Tx, 11g, Ch: Low

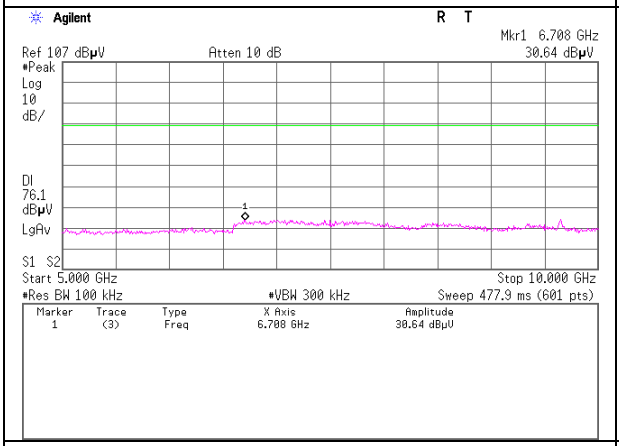
30MHz-1GHz



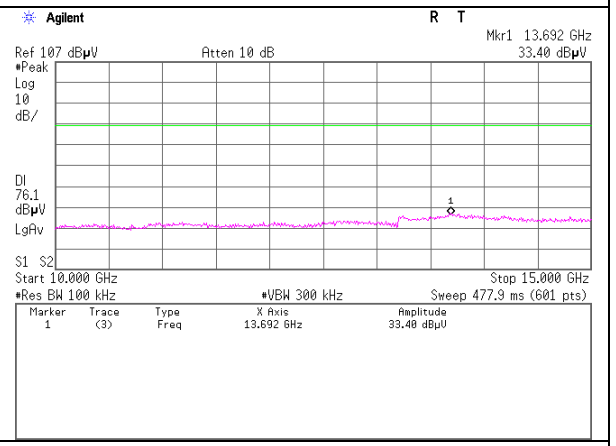
1GHz-5GHz



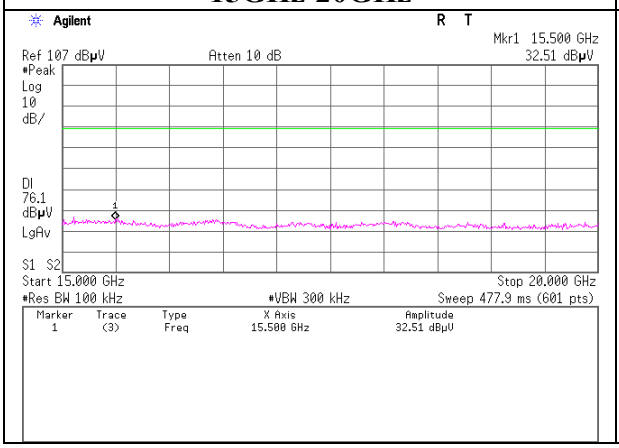
5GHz-10GHz



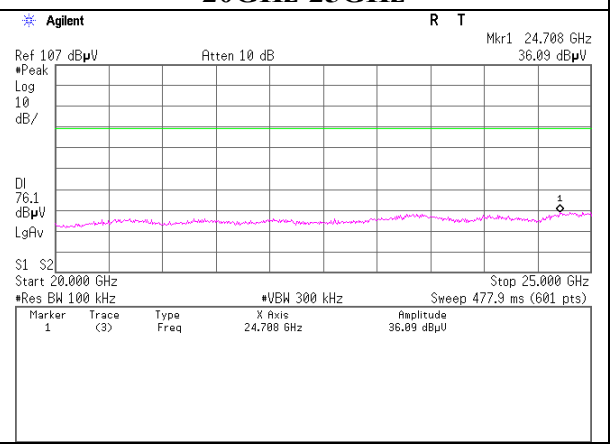
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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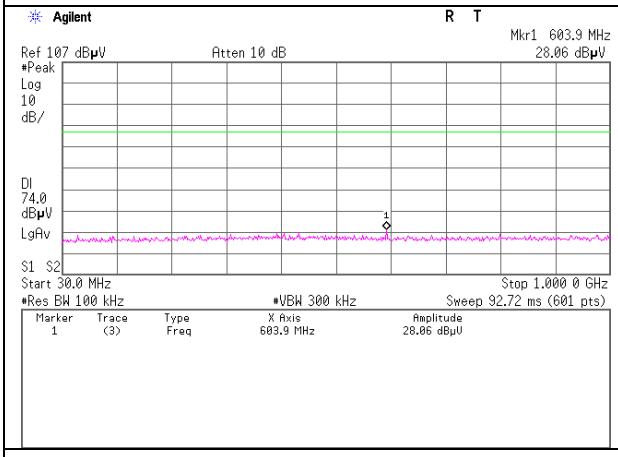
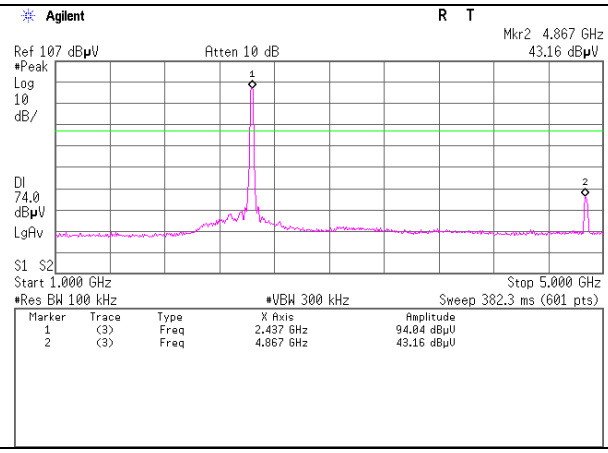
Conducted Spurious Emission

Tx, 11g, Ch: Mid

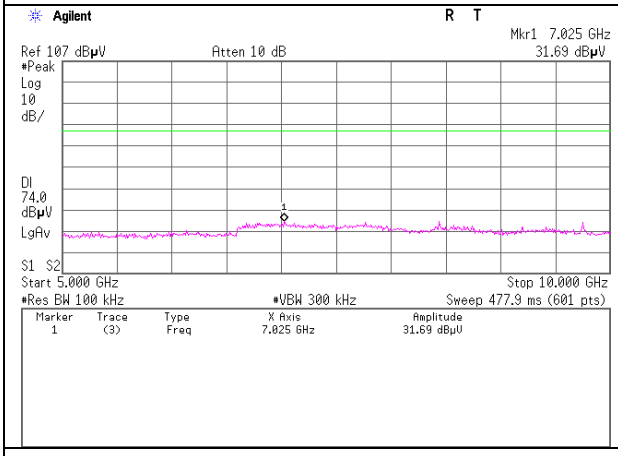
30MHz-1GHz



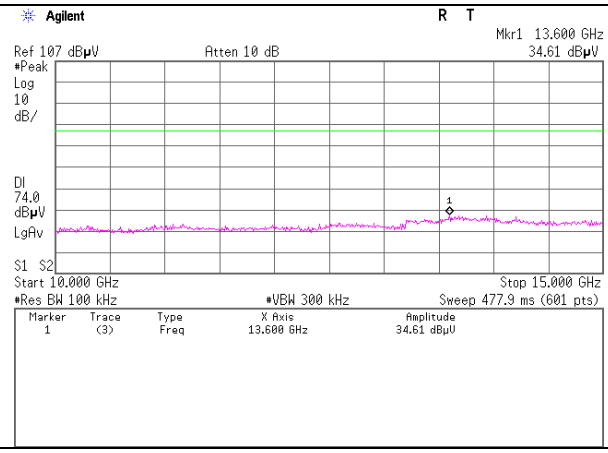
1GHz-5GHz



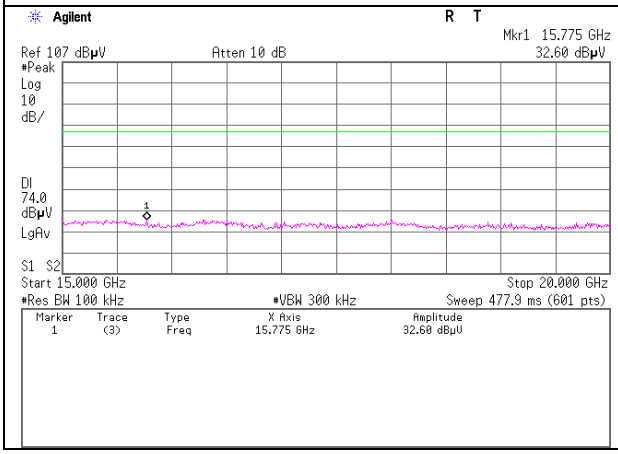
5GHz-10GHz



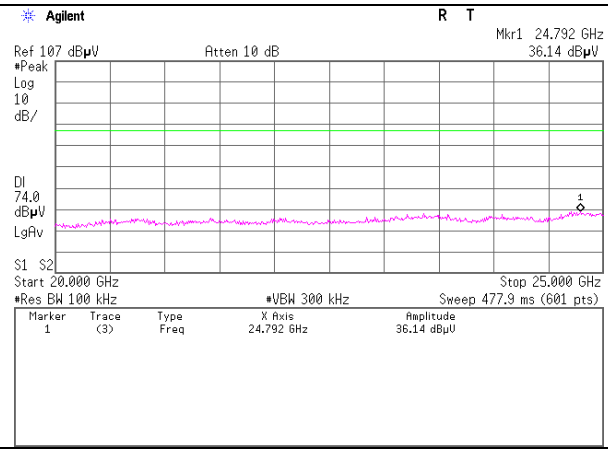
10GHz-15GHz



15GHz-20GHz



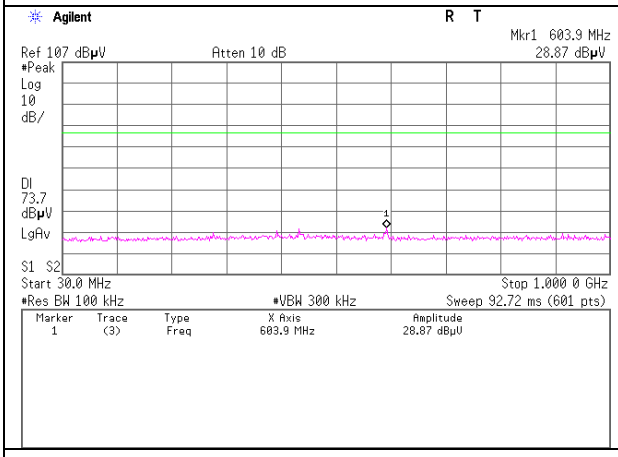
20GHz-25GHz



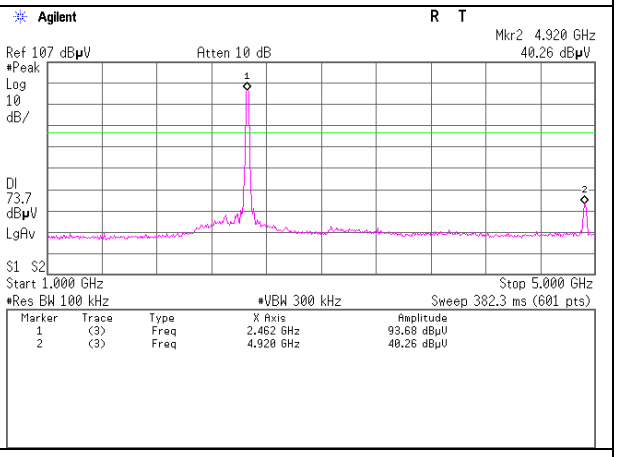
Conducted Spurious Emission

Tx, 11g, Ch: High

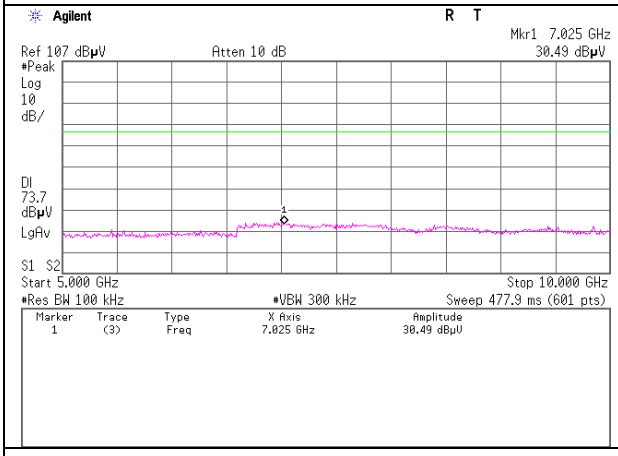
30MHz-1GHz



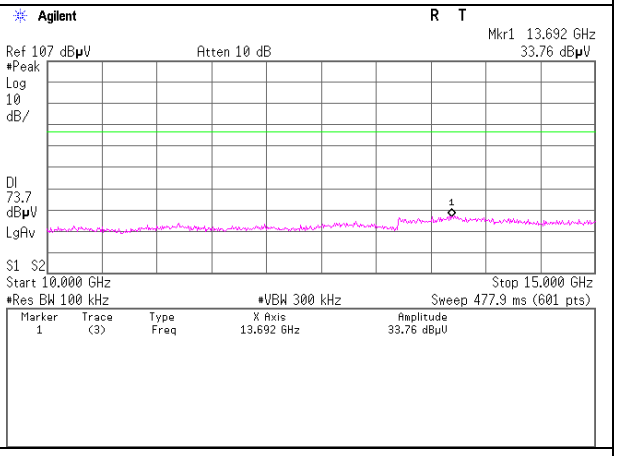
1GHz-5GHz



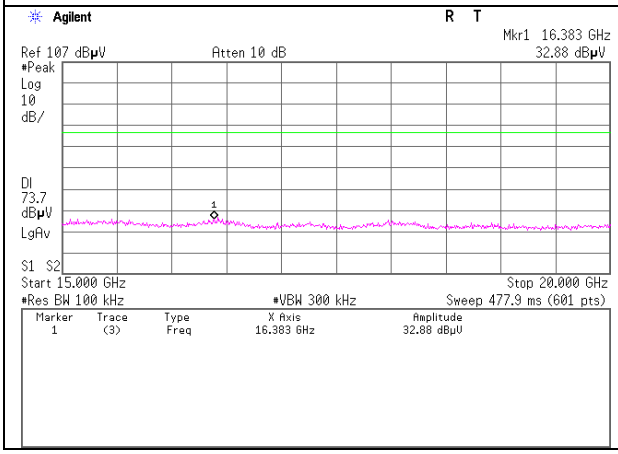
5GHz-10GHz



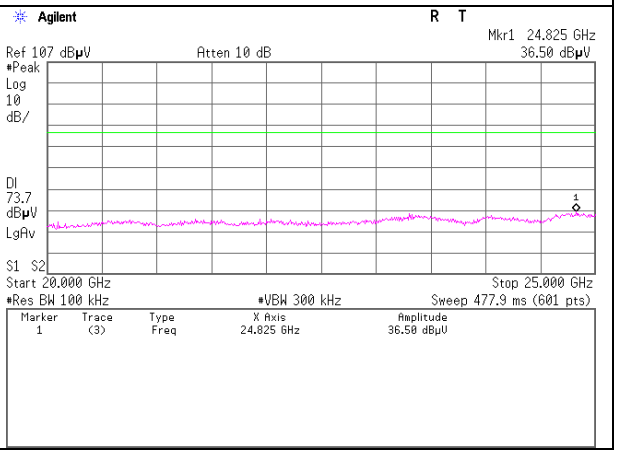
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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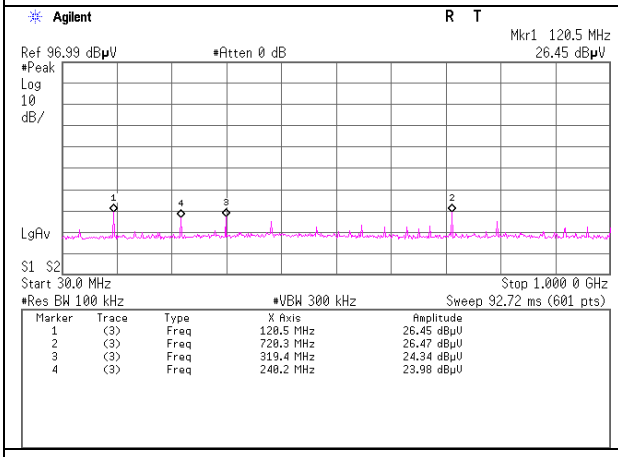
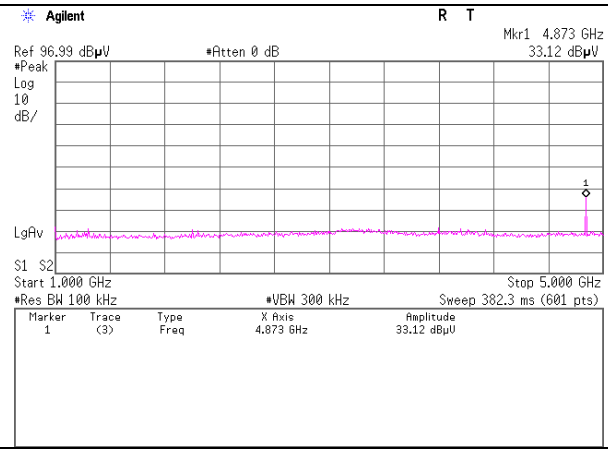
Conducted Spurious Emission

Rx, 11b/g, Ch: Mid

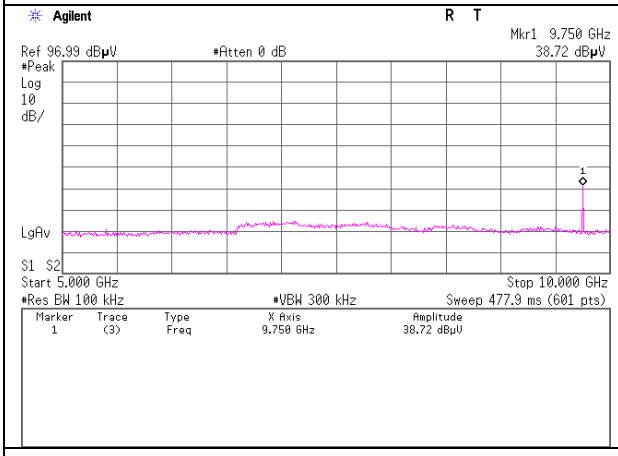
30MHz-1GHz



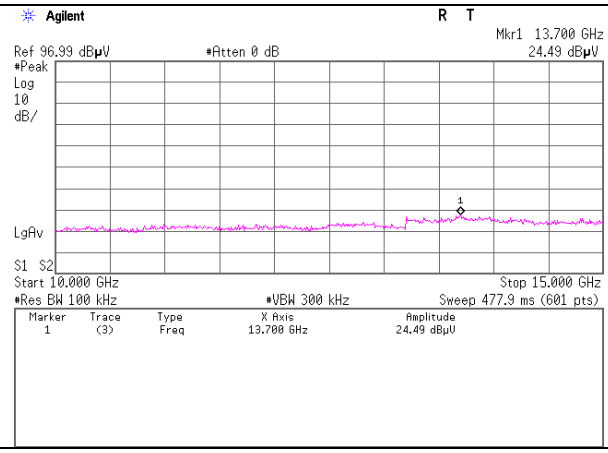
1GHz-5GHz



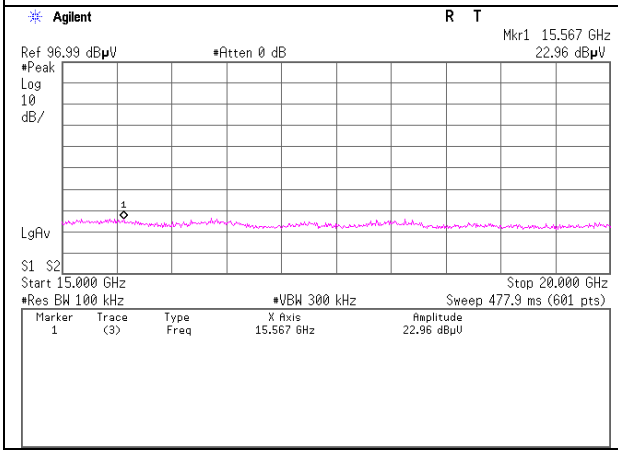
5GHz-10GHz



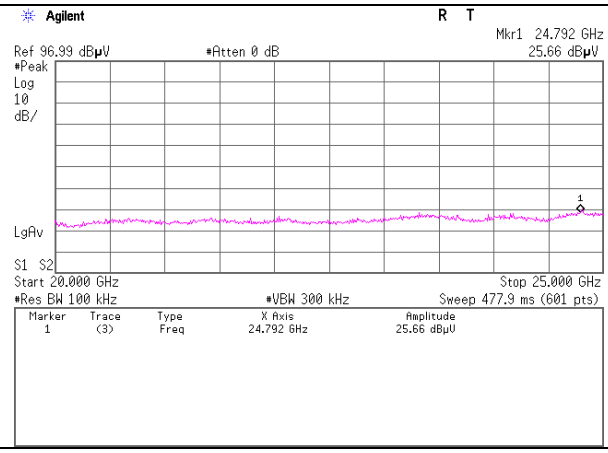
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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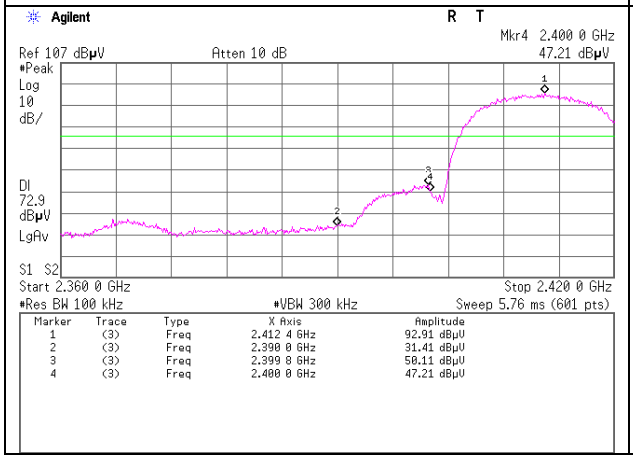
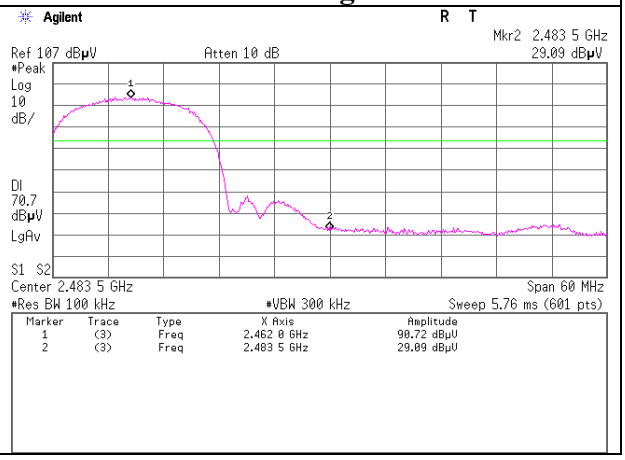
Conducted emission Band Edge compliance

11b

Ch: Low

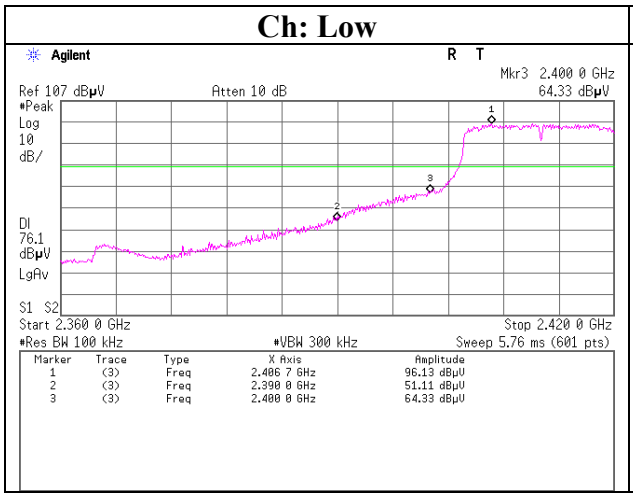


Ch: High

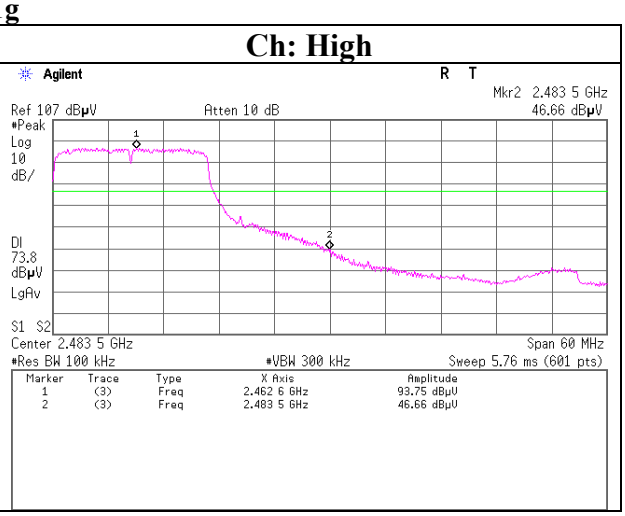


11g

Ch: Low



Ch: High



Power Density

UL Japan, Inc.
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Company	: YAMAHA CORPORATION	Test Report No.	: 29CE0117-HO-01
Equipment	: YAMAHA Wi-Fi PCB	Regulation	: FCC15.247(e)/RSS-210A8.2(b)
Model No.	: WR11780	Test distance	: -
Serial No.	: 1	Date	: November 14, 2008
Power	: DC5V	Temperature	: 21deg. C.
Mode	: Tx 11b, 11Mbps (2412MHz, 2437MHz, 2462MHz)	Humidity	: 36%
	: Tx 11g, 54Mbps (2412MHz, 2437MHz, 2462MHz)	Engineer	: Takeshi Choda

[IEEE802.11b]

Ch	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2412.3	-17.14	1.7	10.2	-5.3	8.0	13.3
Mid	2436.9	-18.29	1.7	10.2	-6.4	8.0	14.4
High	2462.6	-19.41	1.7	10.2	-7.5	8.0	15.5

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

[IEEE802.11g]

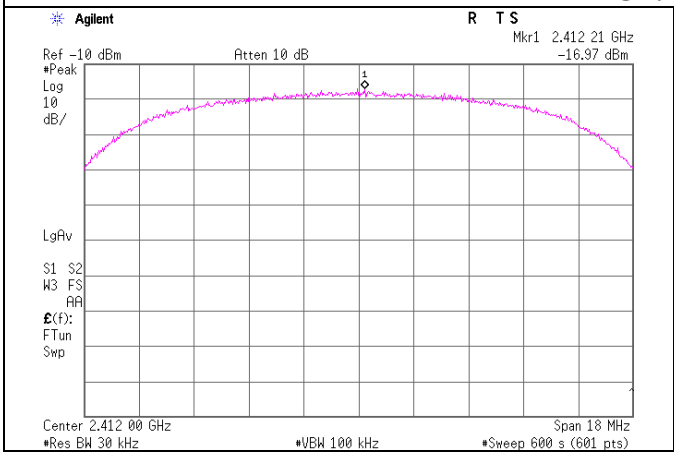
Ch	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low	2410.7	-13.75	1.7	10.2	-1.9	8.0	9.9
Mid	2437.3	-13.95	1.7	10.2	-2.1	8.0	10.1
High	2456.4	-16.08	1.7	10.2	-4.2	8.0	12.2

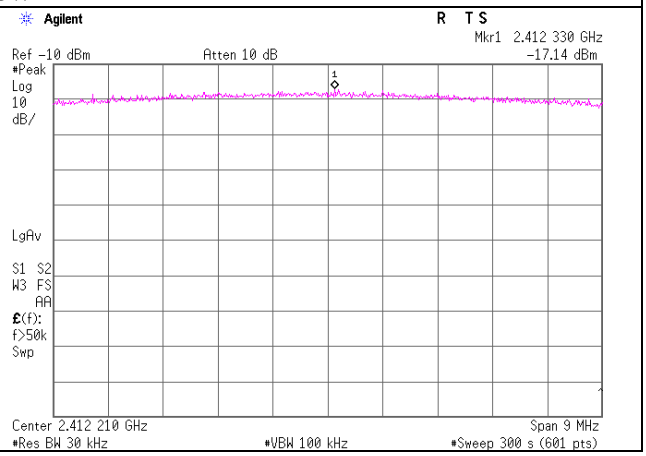
Sample Calculation:
Result = Reading + Cable Loss + Attenuator

Power Density

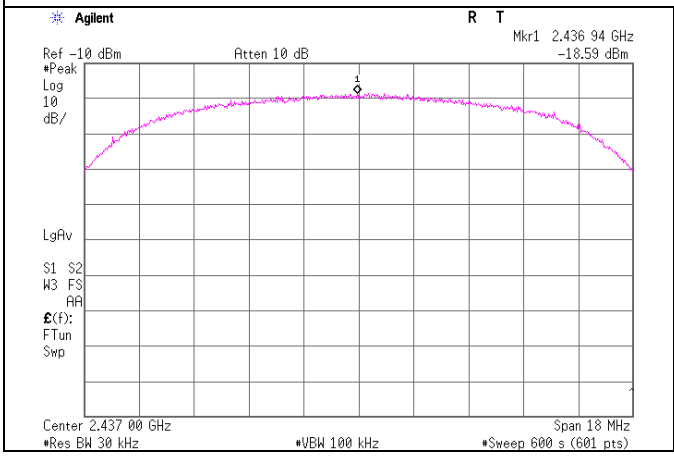
11b

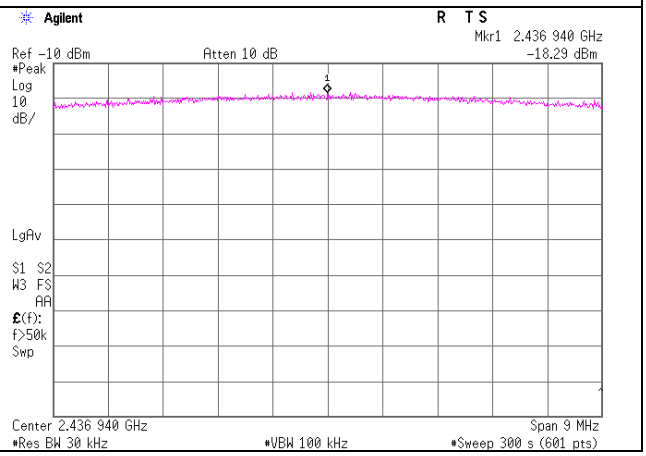
Ch: Low



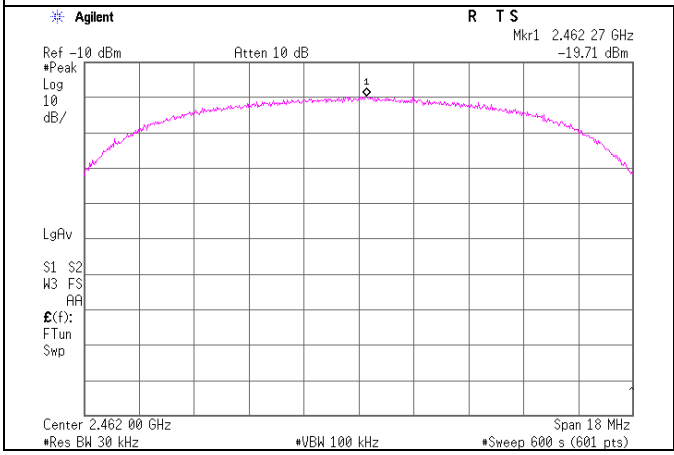


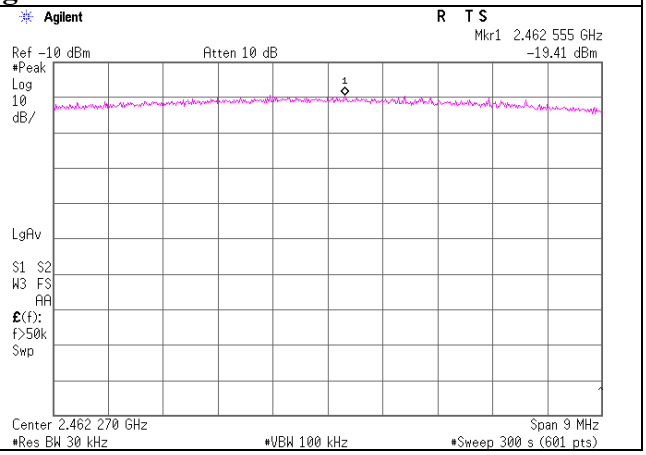
Ch: Mid





Ch: High

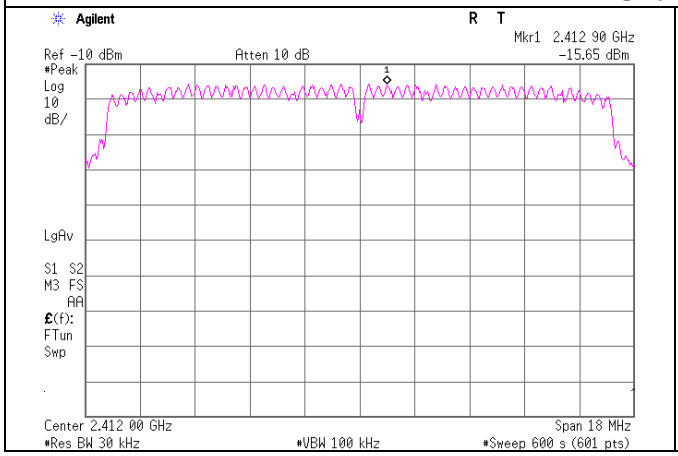


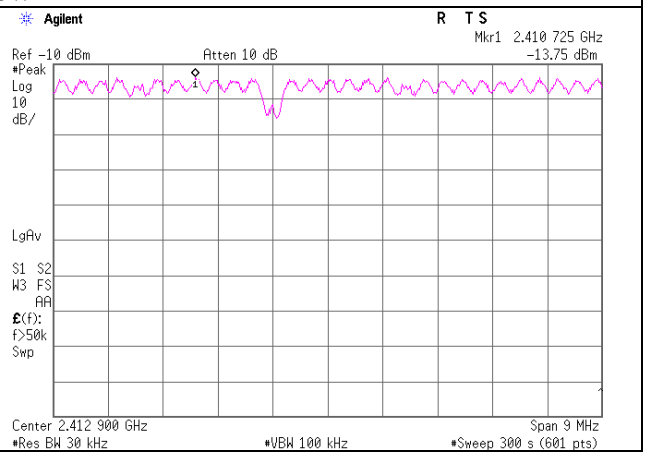


Power Density

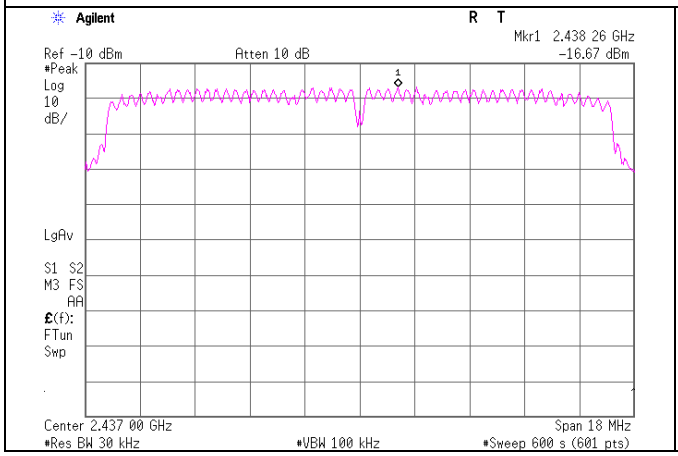
11g

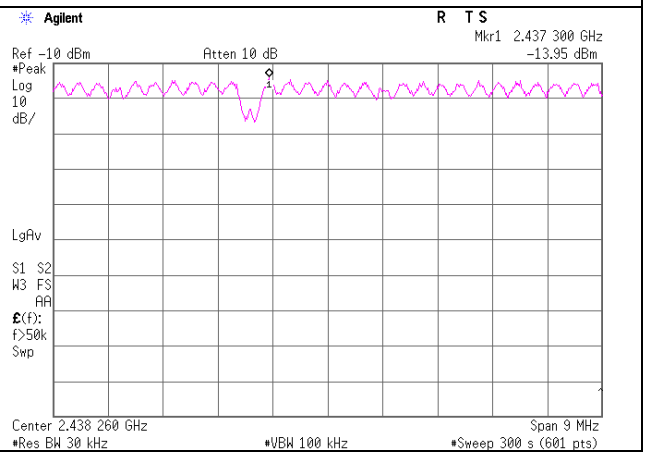
Ch: Low



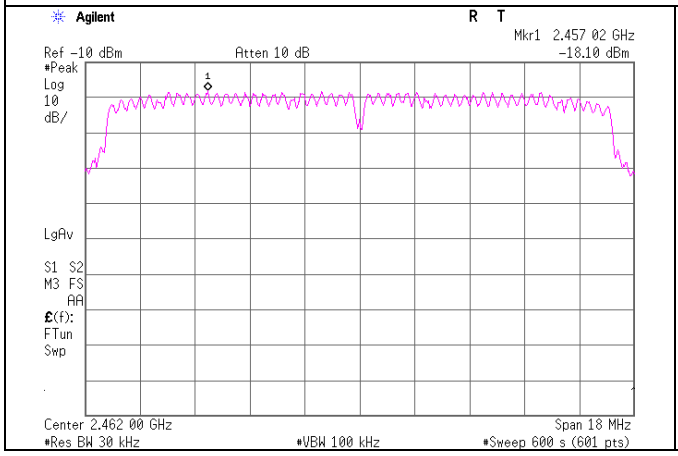


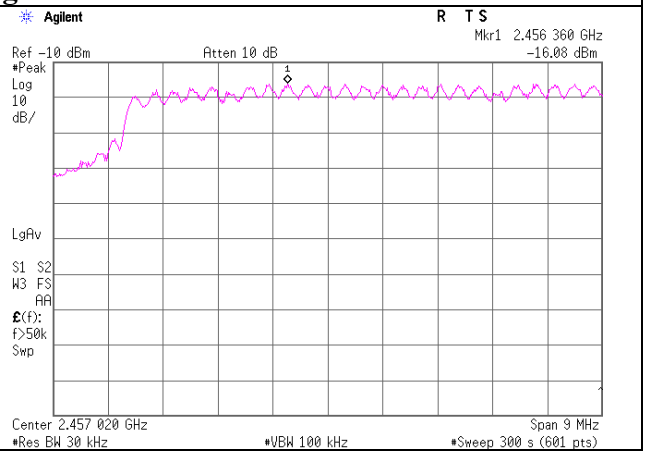
Ch: Mid





Ch: High

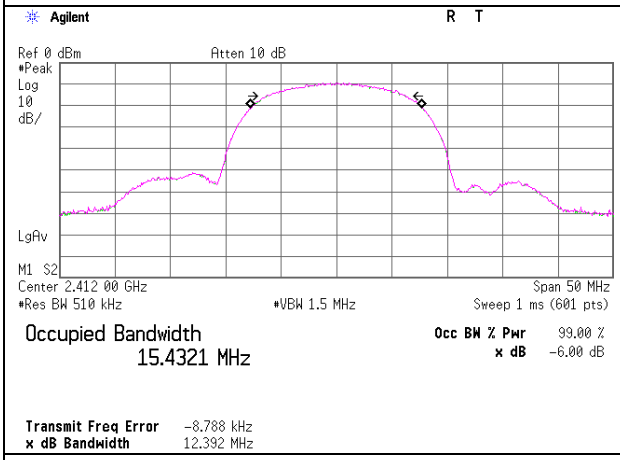




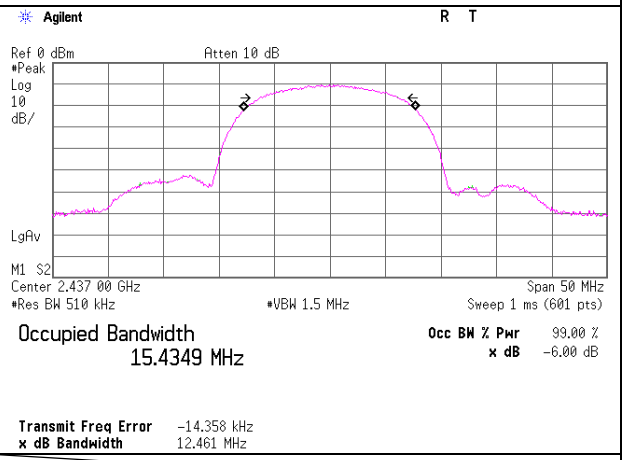
99%Occupied Bandwidth

11b

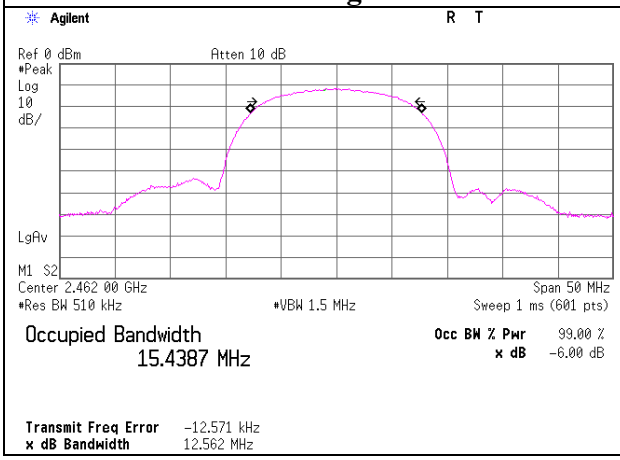
Ch: Low



Ch: Mid



Ch: High



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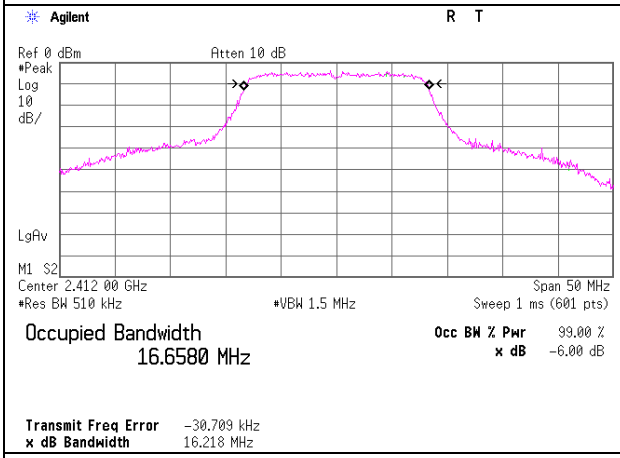
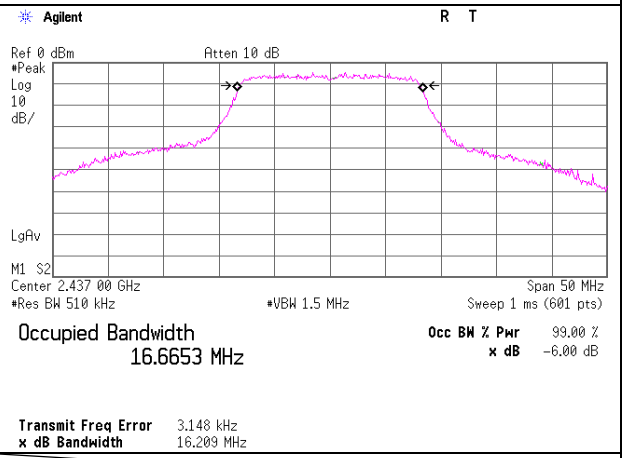
99%Occupied Bandwidth

11g

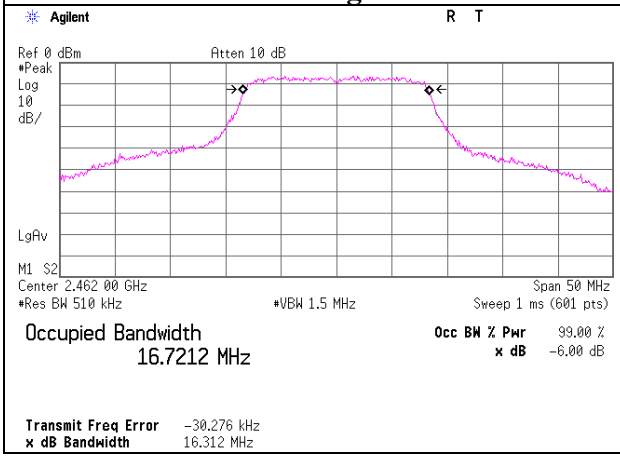
Ch: Low



Ch: Mid



Ch: High



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APPENDIX 3: Test instruments

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2008/04/17 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE/AT	2007/12/27 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	MY46180653	RE	2007/11/27 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2008/01/19 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	284646(5m) / 287573(1m)	RE	2008/05/12 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2008/09/17 * 12
MHF-18	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	7002	RE	2007/12/10 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2007/12/26 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2008/09/24 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2008/09/24 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2008/01/09 * 12
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2007/11/06 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2008/02/27 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	-	AT	2008/01/10 * 12
MBM-10	Barometer	Sunoh	SBR121	832	AT	2007/12/27 * 36
MCC-114	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	290212/4	AT	2008/08/01 * 12
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	DA-10005	CE/RE	2008/03/25 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	CE/RE	2008/01/10 * 12
MJM-06	Measure	PROMART	SEN1955	-	CE/RE	-
MSA-09	Spectrum Analyzer	Advantest	R3273	95090115	CE/RE	2007/12/21 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE/RE	2008/06/12 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	8127383	CE	2008/06/27 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	-	-	CE	2008/07/03 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2008/04/23 * 12
MCC-56	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	287602(1m) / 284655(5m)	RE	2008/03/12 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2008/04/30 * 12
MHF-19	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	602	RE	2007/12/10 * 12
MCC-78	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278993/4	RE	2007/12/26 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2008/01/12 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2008/01/12 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2008/07/18 * 12
MAT-30	Attenuator(6dB)	TME	UFA-01	-	RE	2008/03/10 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2008/03/06 * 12

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test

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