APPENDIX 2: Data of EMI test

Carrier Frequency Separation

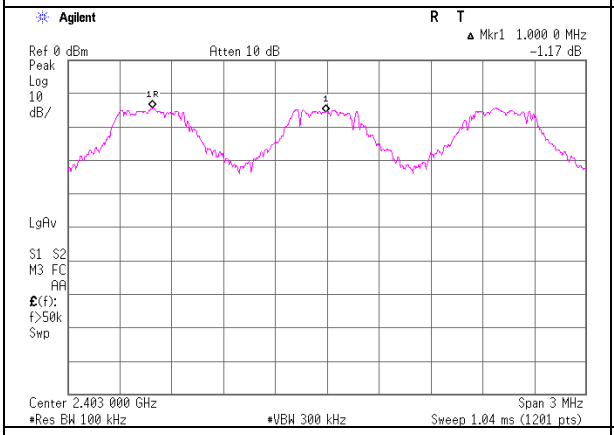
UL Japan, Inc.
Head Office EMC Lab. No.6 Shielded Room

Company	:	Mitsubishi Electric Corporation Sanda works	Test Report No.	:	28JE0209-HO-01
Equipment	:	Navigation system	Regulation	:	FCC15.247(a)(1)/RSS-210A8.1(b)
Model No.	:	NR-212-6U	Test distance	:	-
Serial No.	:	ME395084170044	Date	:	07/28/2008
Power	:	DC 12V	Temperature	:	26deg.C
Mode	:	Tx(Hopping on)/Inquiry	Humidity	:	64%
			Engineer	:	Shinya Watanabe

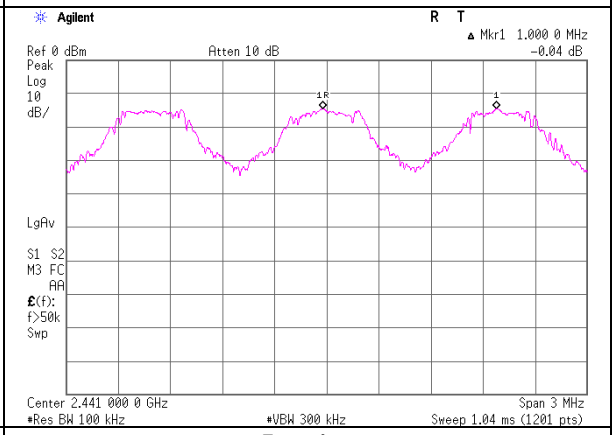
Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.000	> 0.536 [MHz] (two-thirds of 20dB Bandwidth (0.804 [MHz])) or 25[kHz] (whichever is grater)
Mid	2441.0	1.000	> 0.537 [MHz] (two-thirds of 20dB Bandwidth (0.806 [MHz])) or 25[kHz] (whichever is grater)
High	2480.0	1.000	> 0.536 [MHz] (two-thirds of 20dB Bandwidth (0.804 [MHz])) or 25[kHz] (whichever is grater)
Inquiry	2441.0	2.000	> 0.503 [MHz] (two-thirds of 20dB Bandwidth (0.754 [MHz])) or 25[kHz] (whichever is grater)

Carrier Frequency Separation

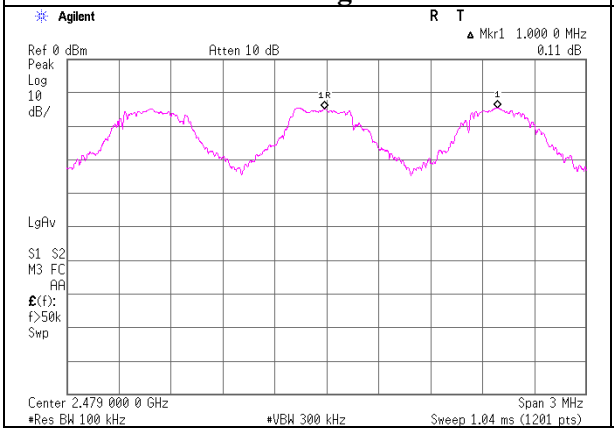
Ch: Low



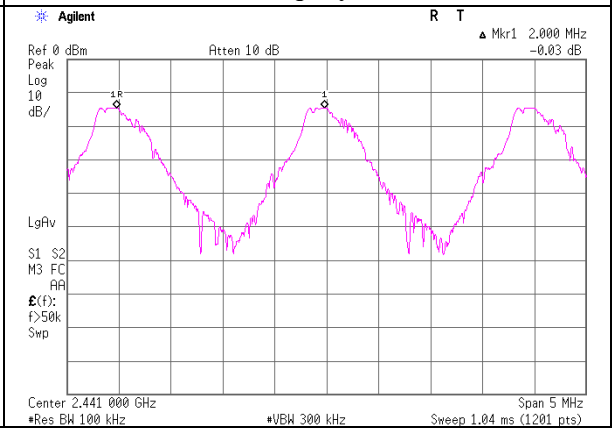
Ch: Mid



Ch: High



Inquiry



20dB Bandwidth

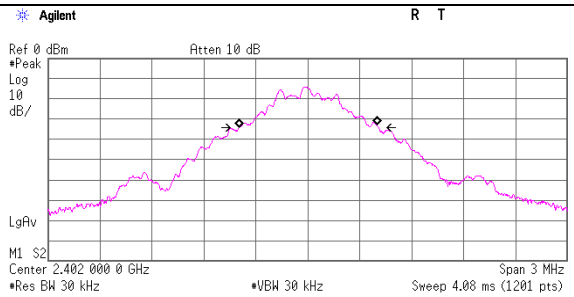
UL Japan, Inc.
Head Office EMC Lab. No.6 Shielded Room

Company	:	Mitsubishi Electric Corporation Sanda works	Test Report No.	:	28JE0209-HO-01
Equipment	:	Navigation system	Regulation	:	FCC15.247(a)(1)/RSS-210A8.1(a)
Model No.	:	NR-212-6U	Test distance	:	-
Serial No.	:	ME395084170044	Date	:	07/28/2008
Power	:	DC 12V	Temperature	:	26deg.C
Mode	:	Tx(Hopping off)/Inquiry	Humidity	:	64%
			Engineer	:	Shinya Watanabe

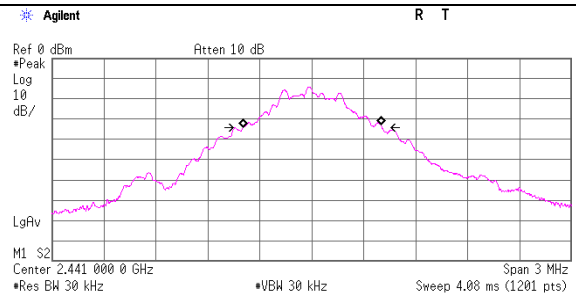
Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.804	-
Mid	2441.0	0.806	-
High	2480.0	0.804	-
Inquiry	2441.0	0.754	-

20dB Bandwidth

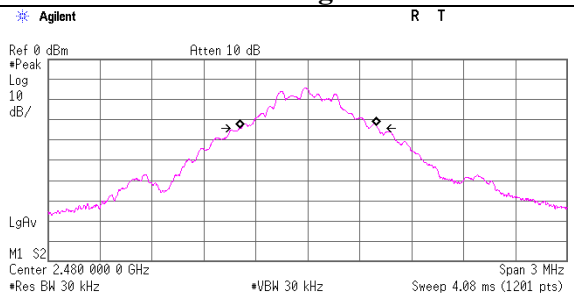
Ch: Low



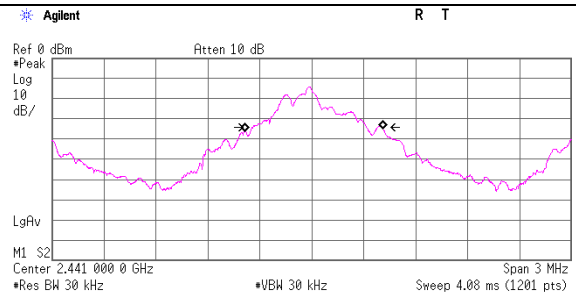
Ch: Mid



Ch: High



Inquiry



Number of Hopping Frequency

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

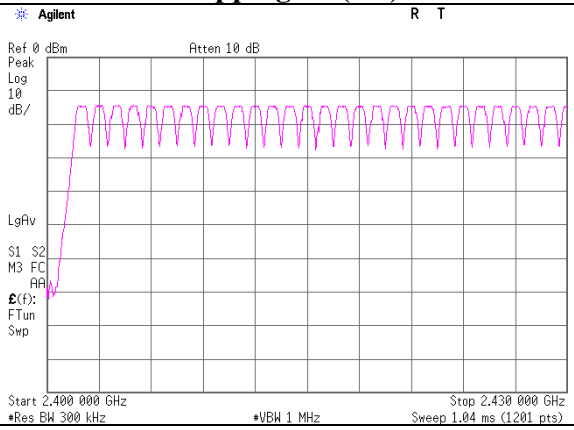
Company	:	Mitsubishi Electric Corporation Sanda works	Test Report No.	:	28JE0209-HO-01
Equipment	:	Navigation system	Regulation	:	FCC15.247(a)(1)(iii)/RSS-210A8.1(d)
Model No.	:	NR-212-6U	Test distance	:	-
Serial No.	:	ME395084170044	Date	:	07/28/2008
Power	:	DC 12V	Temperature	:	26deg.C
Mode	:	Tx (Hopping on) /Inquiry	Humidity	:	64%
			Engineer	:	Shinya Watanabe

Mode	Number of channel [number]	Limit [time]
Tx(Hopping on)	79	≧15

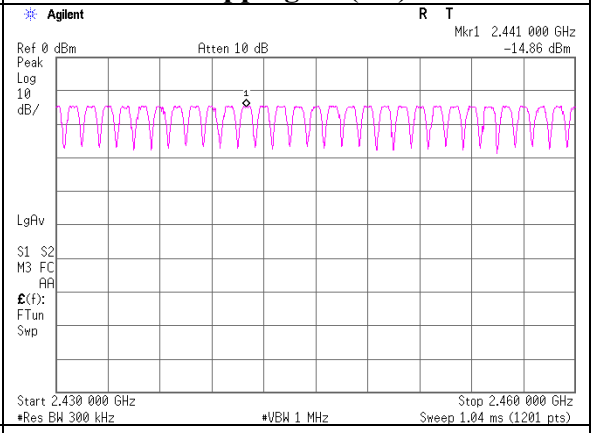
Mode	Number of channel [number]	Limit [time]
Inquiry	32	≧15

Number of Hopping Frequency

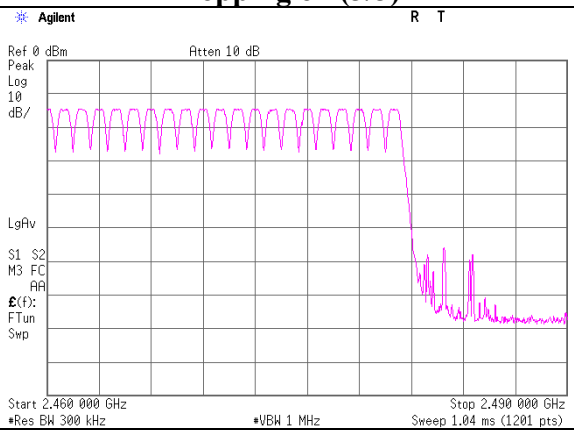
Hopping on (1/3)



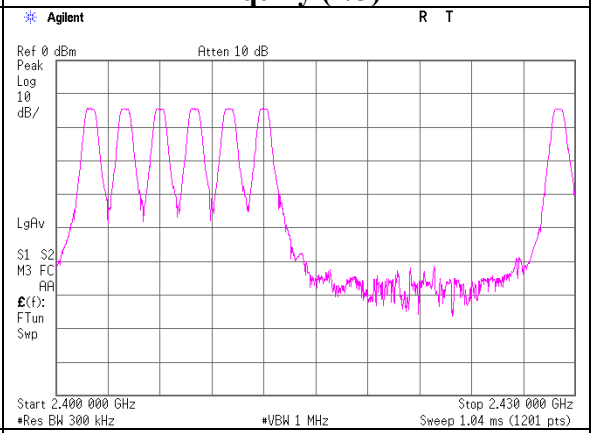
Hopping on (2/3)



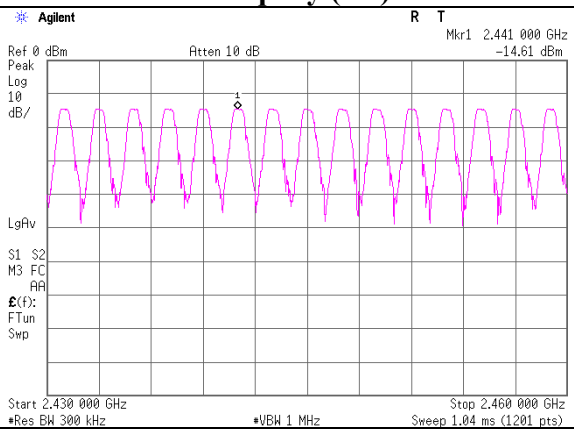
Hopping on (3/3)



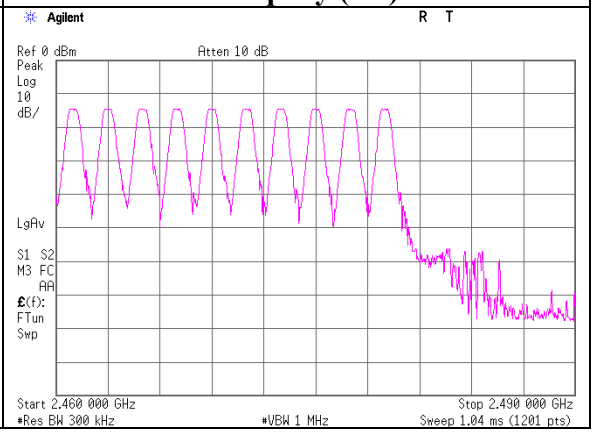
Inquiry (1/3)



Inquiry (2/3)



Inquiry (3/3)



Dwell time

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

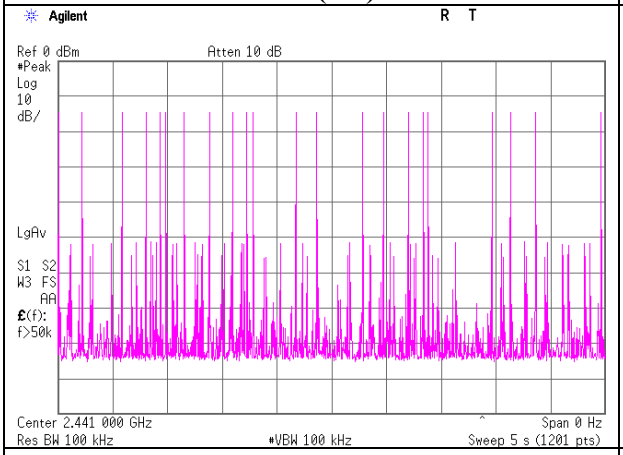
			Test Report No.	:	28JE0209-HO-01
Company	:	Mitsubishi Electric Corporation Sanda work	Regulation	:	FCC15.247(a)(1)(iii)/RSS-210A8.1(d)
Equipment	:	Navigation system	Test distance	:	-
Model No.	:	NR-212-6U	Date	:	07/28/2008
Serial No.	:	ME395084170044	Temperature	:	26deg.C
Power	:	DC 12V	Humidity	:	64%
Mode	:	Tx (Hopping on) /Inquiry	Engineer	:	Shinya Watanabe

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	24 times* / 5 sec. x 31.6 sec. = 152 times	0.585	89	400
DH3	24 times* / 10 sec. x 31.6 sec. = 76 times	1.829	139	400
DH5	15 times* / 10 sec. x 31.6 sec. = 48 times	3.070	147	400
Inquiry	100 times / 1 sec. x 12.8 sec. = 1280 times	0.260	333	400

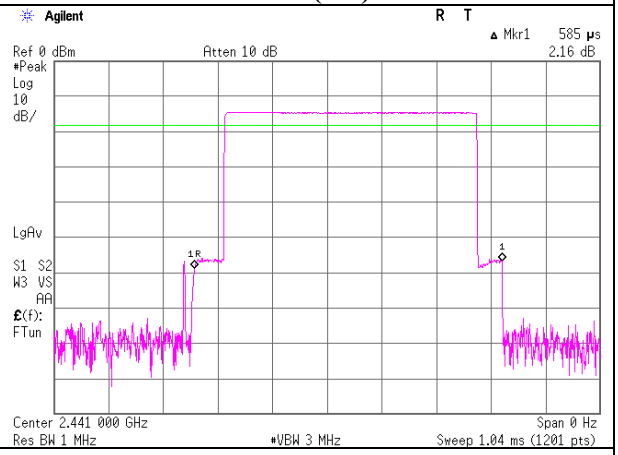
* Average data of 5 tests.

Dwell time

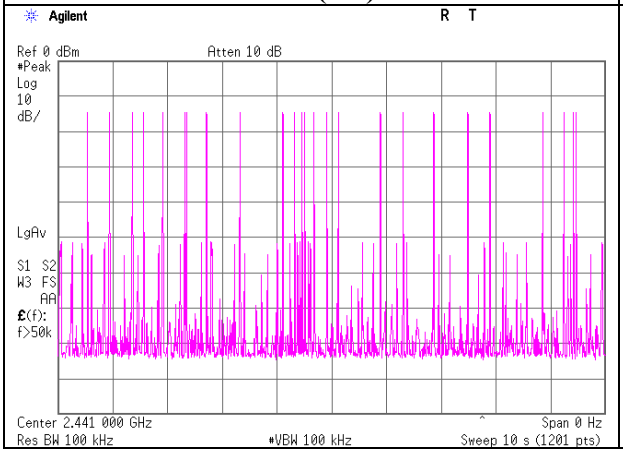
DH1 (1/2)



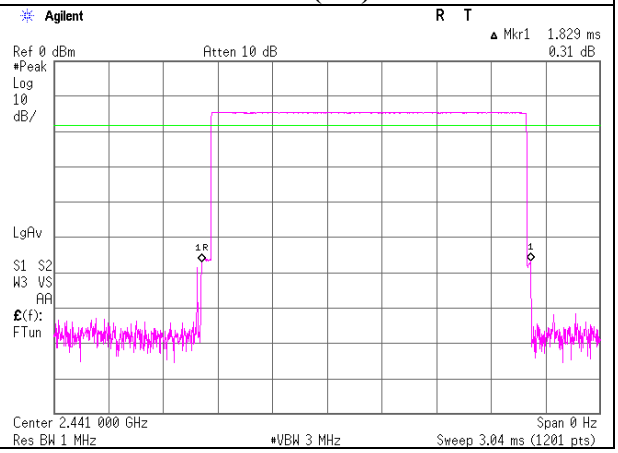
DH1 (2/2)



DH3 (1/2)

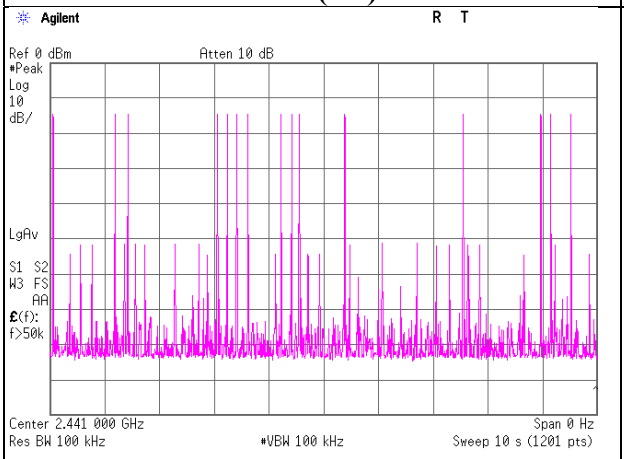


DH3 (2/2)

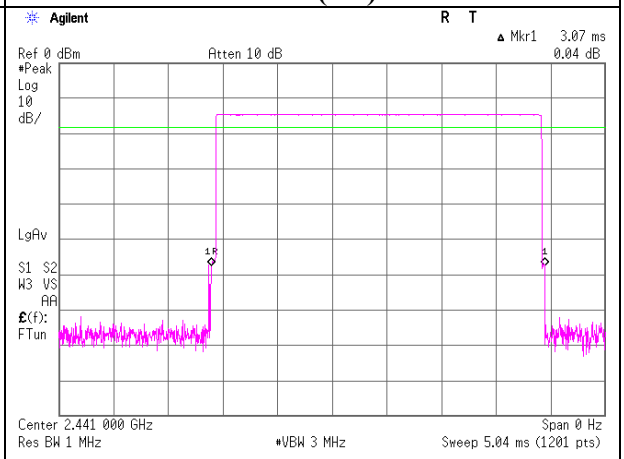


Dwell time

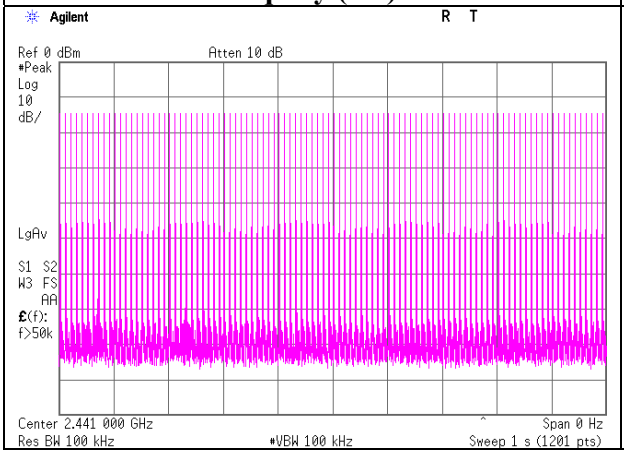
DH5 (1/2)



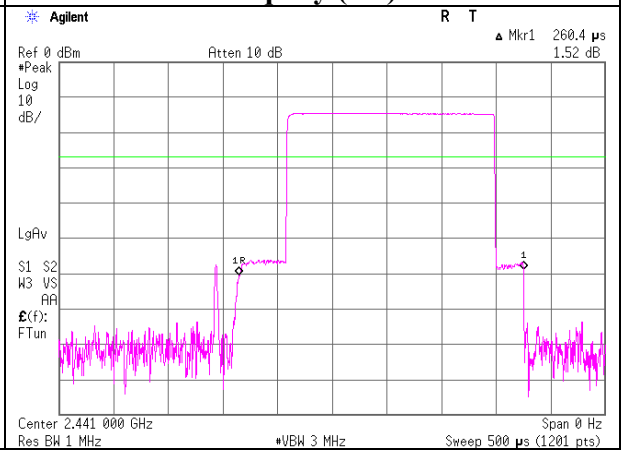
DH5 (2/2)



Inquiry (1/2)



Inquiry (2/2)



Maximum Peak Output Power

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

Company	:	Mitsubishi Electric Corporation Sanda works	Test Report No.	:	28JE0209-HO-01
Equipment	:	Navigation system	Regulation	:	FCC15.247(b)(1)/RSS-210A8.4(2)
Model No.	:	NR-212-6U	Test distance	:	-
Serial No.	:	ME395084170044	Date	:	07/28/2008
Power	:	DC 12V	Temperature	:	26deg.C
Mode	:	Tx(Hopping Off)/Inquiry	Humidity	:	64%
			Engineer	:	Shinya Watanabe

Ch	Freq.	P/M Reading	Cable Loss	Atten.	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2402.0	-14.05	1.57	10.09	-2.39	0.58	20.97	125	23.36
Mid	2441.0	-14.18	1.58	10.09	-2.51	0.56	20.97	125	23.48
High	2480.0	-14.18	1.59	10.09	-2.50	0.56	20.97	125	23.47
Inquiry	2441.0	-14.08	1.58	10.09	-2.41	0.57	20.97	125	23.38

Sample Calculation:
Result = Reading + Cable Loss (supplied by customer)+ Attenuator

Radiated Spurious Emission (below 1GHz)
Tx, Ch: Low

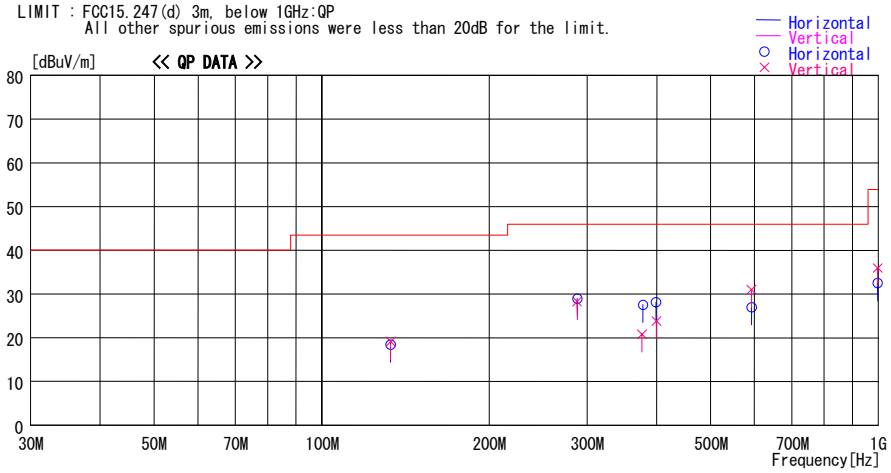
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/09/26

Company	: Mitsubishi Electric Corporation Sanda works	Report No.	: 28JE0209-HO-01
Kind of EUT	: Navigation system	Power	: DC12.0V
Model No.	: NR-212-6U	Temp./Humi.	: 24deg.C. / 63%
Serial No.	: ME395084170044	Engineer	: Takumi Shimada

Mode / Remarks : BT Tx DH5 2402MHz, ANT Worst-axis (H:X-axis, V:Y-axis)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP
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
133.066	28.1	QP	13.8	-23.5	18.4	233	240	Hori.	43.5	25.1	
133.067	28.8	QP	13.8	-23.5	19.1	348	100	Vert.	43.5	24.4	
287.916	32.0	QP	19.2	-22.2	29.0	108	122	Hori.	46.0	17.1	
287.917	31.2	QP	19.2	-22.2	28.2	88	100	Vert.	46.0	17.8	
378.244	32.2	QP	16.8	-21.4	27.6	82	100	Hori.	46.0	18.4	
376.474	25.5	QP	16.8	-21.5	20.8	359	100	Vert.	46.0	25.2	
399.191	32.1	QP	17.3	-21.3	28.1	237	100	Hori.	46.0	17.9	
399.616	27.8	QP	17.3	-21.3	23.8	359	100	Vert.	46.0	22.2	
592.721	28.0	QP	19.2	-20.2	27.0	135	180	Hori.	46.0	19.0	
592.723	32.0	QP	19.2	-20.2	31.0	0	100	Vert.	46.0	15.0	
999.040	26.1	QP	23.2	-16.8	32.5	158	100	Hori.	53.9	21.4	
999.039	29.5	QP	23.2	-16.8	35.9	174	100	Vert.	53.9	18.0	

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, Ch: Mid

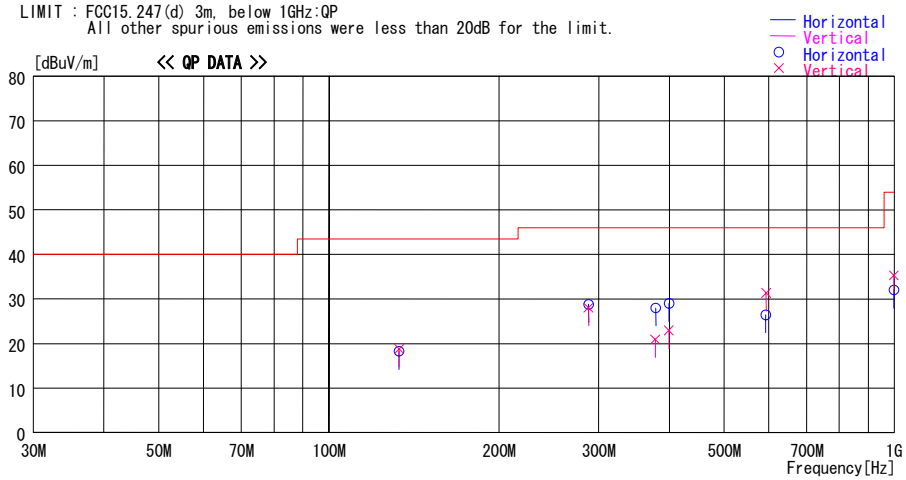
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/09/26

Company : Mitsubishi Electric Corporation Sanda works
Kind of EUT : Navigation system
Model No. : NR-212-6U
Serial No. : ME395084170044
Report No. : 28JE0209-HO-01
Power : DC12.0V
Temp./Humi. : 24deg.C. / 63%
Engineer : Takumi Shimada

Mode / Remarks : BT Tx DH5 2441MHz, ANT Worst-axis (H:X-axis, V:Y-axis)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP
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
133.057	28.0	QP	13.8	-23.5	18.3	237	245	Hori.	43.5	25.2	
133.059	28.5	QP	13.8	-23.5	18.8	348	100	Vert.	43.5	24.7	
287.921	31.8	QP	19.2	-22.2	28.8	110	120	Hori.	46.0	17.2	
287.924	31.0	QP	19.2	-22.2	28.0	88	100	Vert.	46.0	18.0	
378.310	32.6	QP	16.8	-21.4	28.0	82	100	Hori.	46.0	18.0	
377.943	25.5	QP	16.8	-21.4	20.9	359	100	Vert.	46.0	25.1	
399.532	33.0	QP	17.3	-21.3	29.0	240	100	Hori.	46.0	17.0	
399.453	26.9	QP	17.3	-21.3	22.9	359	100	Vert.	46.0	23.1	
592.735	27.4	QP	19.2	-20.2	26.4	130	180	Hori.	46.0	19.6	
593.733	32.3	QP	19.2	-20.2	31.3	0	100	Vert.	46.0	14.7	
999.044	25.6	QP	23.2	-16.8	32.0	155	100	Hori.	53.9	21.9	
999.047	28.9	QP	23.2	-16.8	35.3	170	100	Vert.	53.9	18.6	

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 round 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

Radiated Spurious Emission (below 1GHz)
Tx, Ch: High

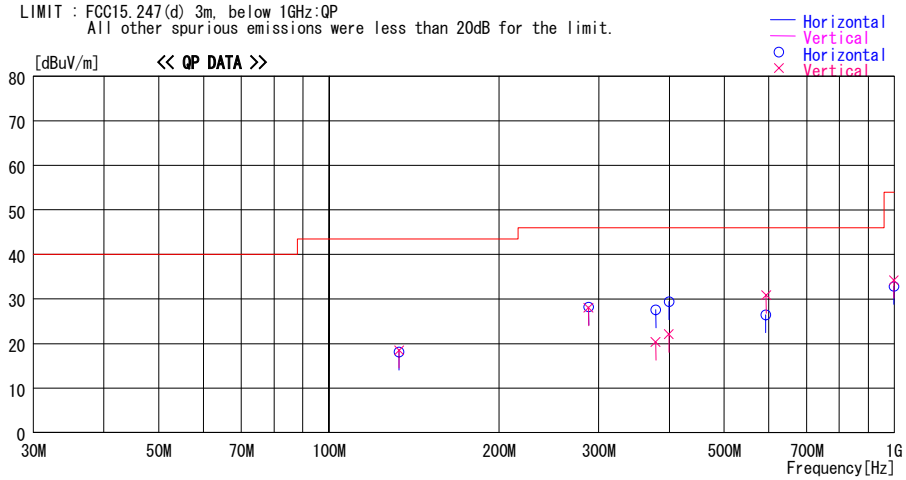
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/09/26

Company : Mitsubishi Electric Corporation Sanda works
Kind of EUT : Navigation system
Model No. : NR-212-6U
Serial No. : ME395084170044
Report No. : 28JE0209-HO-01
Power : DC12.0V
Temp./Humi. : 24deg.C. / 63%
Engineer : Takumi Shimada

Mode / Remarks : BT Tx DH5 2480MHz, ANT Worst-axis (H:X-axis, V:Y-axis)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP
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
133.057	27.8	QP	13.8	-23.5	18.1	235	245	Hori.	43.5	25.4	
133.054	28.2	QP	13.8	-23.5	18.5	352	100	Vert.	43.5	25.0	
287.914	31.2	QP	19.2	-22.2	28.2	110	115	Hori.	46.0	17.8	
287.914	31.0	QP	19.2	-22.2	28.0	90	100	Vert.	46.0	18.0	
378.319	32.2	QP	16.8	-21.4	27.6	80	100	Hori.	46.0	18.4	
378.332	24.9	QP	16.8	-21.4	20.3	359	100	Vert.	46.0	25.7	
399.452	33.4	QP	17.3	-21.3	29.4	240	100	Hori.	46.0	16.6	
399.359	26.1	QP	17.3	-21.3	22.1	359	100	Vert.	46.0	23.9	
592.665	27.4	QP	19.2	-20.2	26.4	130	180	Hori.	46.0	19.6	
593.672	31.8	QP	19.2	-20.2	30.8	0	100	Vert.	46.0	15.2	
999.051	26.4	QP	23.2	-16.8	32.8	155	100	Hori.	53.9	21.1	
999.051	27.8	QP	23.2	-16.8	34.2	168	100	Vert.	53.9	19.7	

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 round off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (below 1GHz)

Rx, Ch: Mid

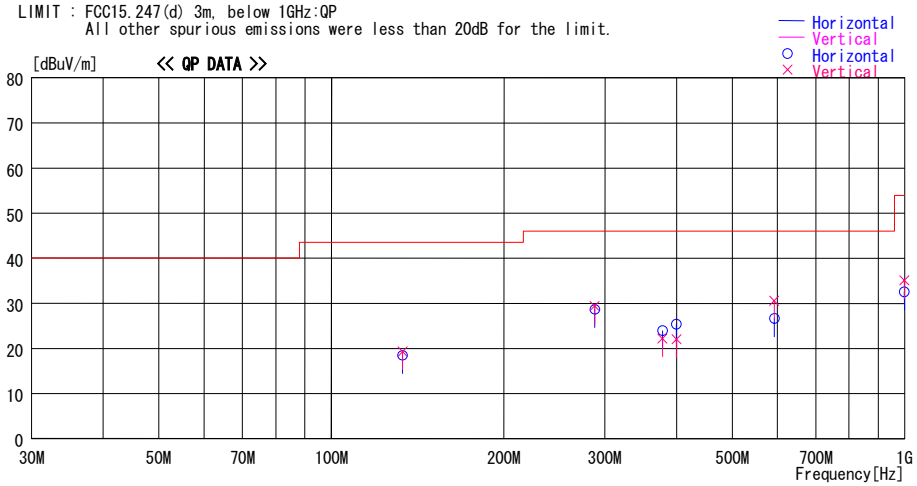
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/09/26

Company	: Mitsubishi Electric Corporation Sanda works	Report No.	: 28JE0209-HO-01
Kind of EUT	: Navigation system	Power	: DC12.0V
Model No.	: NR-212-6U	Temp./Humi.	: 24deg.C. / 63%
Serial No.	: ME395084170044	Engineer	: Takumi Shimada

Mode / Remarks : BT Rx 2441MHz, ANT Worst-axis (H:X-axis, V:Y-axis)

LIMIT : FCC15.247(d) 3m, below 1GHz:QP
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
133.064	28.2	QP	13.8	-23.5	18.5	240	230	Hori.	43.5	25.0	
133.064	29.0	QP	13.8	-23.5	19.3	219	100	Vert.	43.5	24.2	
287.914	31.7	QP	19.2	-22.2	28.7	130	125	Hori.	46.0	17.3	
287.917	32.4	QP	19.2	-22.2	29.4	94	100	Vert.	46.0	16.6	
378.241	28.5	QP	16.8	-21.4	23.9	120	100	Hori.	46.0	22.1	
378.242	26.8	QP	16.8	-21.4	22.2	359	100	Vert.	46.0	23.8	
399.452	29.4	QP	17.3	-21.3	25.4	240	100	Hori.	46.0	20.6	
399.622	26.0	QP	17.3	-21.3	22.0	359	100	Vert.	46.0	24.0	
592.724	27.7	QP	19.2	-20.2	26.7	143	173	Hori.	46.0	19.3	
592.720	31.6	QP	19.2	-20.2	30.6	0	100	Vert.	46.0	15.4	
999.042	26.2	QP	23.2	-16.8	32.6	359	100	Hori.	53.9	21.3	
999.040	28.7	QP	23.2	-16.8	35.1	173	100	Vert.	53.9	18.8	

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 round off to one or two decimal places, so some differences might be observed.

Radiated Spurious Emission (above 1GHz)

Tx, Ch: Low

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

Company : Mitsubishi Electric Corporation Sanda works
Equipmen : Navigation system
Model : NR-212-6U
S/N : ME395084170044
Power : DC 12.0V
Mode : Transmitting 2402 MHz
Position : Hor X-axis, Ver Y-axis

Regulation : FCC15.247(d) / RSS-210 A8.5
Test Distance : 3m (1G-10GHz) / 1m (above10GHz)
Date : September 9, 2008
Temperature : 25 deg.C.
Humidity : 63 %
Engineer : Shinya Watanabe

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	43.1	42.5	26.8	32.5	2.6	0.0	40.0	39.4	73.9	33.9	34.5
2	2400.00	54.4	53.0	26.8	32.5	2.6	0.0	51.3	49.9	73.9	22.6	24.0
3	4804.00	44.7	44.2	31.2	31.4	4.1	0.7	49.3	48.8	73.9	24.6	25.1
4	7206.00	42.1	41.2	35.5	31.0	4.4	0.6	51.6	50.7	73.9	22.3	23.2
5	9608.00	40.8	41.6	38.6	31.4	5.1	0.9	54.0	54.8	73.9	19.9	19.1
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12010.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	14412.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	16814.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	19216.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	21618.00	NS	NS	-	-	-	-	-	-	73.9	-	-
11	24020.00	45.8	45.0	39.8	29.9	7.7	0.0	53.9	53.1	73.9	20.0	20.8

AV DETECT (RBW: 1MHz, VBW: 150Hz)

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	28.9	29.0	26.8	32.5	2.6	0.0	25.8	25.9	53.9	28.1	28.0
2	2400.00	32.8	32.7	26.8	32.5	2.6	0.0	29.7	29.6	53.9	24.2	24.3
3	4804.00	34.7	33.8	31.2	31.4	4.1	0.7	39.3	38.4	53.9	14.6	15.5
4	7206.00	28.3	28.9	35.5	31.0	4.4	0.6	37.8	38.4	53.9	16.1	15.5
5	9608.00	28.0	29.1	38.6	31.4	5.1	0.9	41.2	42.3	53.9	12.7	**11.6**
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	12010.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	14412.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	16814.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	19216.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	21618.00	NS	NS	-	-	-	-	-	-	53.9	-	-
11	24020.00	33.8	34.0	39.8	29.9	7.7	0.0	41.9	42.1	53.9	12.0	11.8

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.5 dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.
*In the frequency over the 6th harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The test result is rounded off to one or two decimal places, so some differences might be observed.
*NS: No detect Signal.

Radiated Spurious Emission (above 1GHz)

Tx, Ch: Mid

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

Company : Mitsubishi Electric Corporation Sanda works
Equipmen : Navigation system
Model : NR-212-6U
S/N : ME395084170044
Power : DC 12.0V
Mode : Transmitting 2441 MHz
Position : Hor X-axis, Ver Y-axis

Regulation : FCC15.247(d) / RSS-210 A8.5
Test Distance : 3m (1G-10GHz) / 1m (above10GHz)
Date : September 9, 2008
Temperature : 25 deg.C.
Humidity : 63 %
Engineer : Shinya Watanabe

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

No.	FREQ	S/A READING HOR	S/A READING VER	ANT Factor	AMP GAIN	CABLE LOSS	Hi-Pass Filter	RESULT HOR	RESULT VER	Limit PK	MARGIN HOR	MARGIN 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	4882.00	44.8	44.1	31.4	31.4	4.1	0.7	49.6	48.9	73.9	24.3	25.0
2	7323.00	42.3	42.2	35.7	31.0	4.5	0.6	52.1	52.0	73.9	21.8	21.9
3	9764.00	40.7	41.4	38.7	31.4	5.2	0.9	54.1	54.8	73.9	19.8	19.1
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.00	NS	NS	-	-	-	-	-	-	73.9	-	-
5	14646.00	NS	NS	-	-	-	-	-	-	73.9	-	-
6	17087.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	19528.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	21969.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	24410.00	45.2	45.3	40.1	30.0	7.9	0.0	53.7	53.8	73.9	20.2	20.1

AV DETECT (RBW: 1MHz, VBW: 150Hz)

No.	FREQ	S/A READING HOR	S/A READING VER	ANT Factor	AMP GAIN	CABLE LOSS	Hi-Pass Filter	RESULT HOR	RESULT VER	Limit AV	MARGIN HOR	MARGIN 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	4882.00	37.2	35.5	31.4	31.4	4.1	0.7	42.0	40.3	53.9	11.9	13.6
2	7323.00	28.3	28.7	35.7	31.0	4.5	0.6	38.1	38.5	53.9	15.8	15.4
3	9764.00	28.9	27.7	38.7	31.4	5.2	0.9	42.3	41.1	53.9	11.6	12.8
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
4	12205.00	NS	NS	-	-	-	-	-	-	53.9	-	-
5	14646.00	NS	NS	-	-	-	-	-	-	53.9	-	-
6	17087.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	19528.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	21969.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	24410.00	34.5	34.6	40.1	30.0	7.9	0.0	43.0	43.1	53.9	10.9	**10.8**

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.5 dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.
*In the frequency over the 6th harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The test result is rounded off to one or two decimal places, so some differences might be observed.
*NS: No detect Signal.

Radiated Spurious Emission (above 1GHz)

Tx, Ch: High

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

Company : Mitsubishi Electric Corporation Sanda works
Equipmen : Navigation system
Model : NR-212-6U
S/N : ME395084170044
Power : DC 12.0V
Mode : Transmitting 2480 MHz
Position : Hor X-axis, Ver Y-axis

Regulation : FCC15.247(d) / RSS-210 A8.5
Test Distance : 3m (1G-10GHz) / 1m (above10GHz)
Date : September 9, 2008
Temperature : 25 deg.C.
Humidity : 63 %
Engineer : Shinya Watanabe

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	54.9	56.0	27.0	32.5	2.6	0.0	52.0	53.1	73.9	21.9	20.8
2	4960.00	43.6	44.3	31.5	31.4	4.2	0.7	48.6	49.3	73.9	25.3	24.6
3	7440.00	41.8	41.3	36.0	31.0	4.6	0.6	52.0	51.5	73.9	21.9	22.4
4	9920.00	41.2	41.7	38.9	31.4	5.2	0.9	54.8	55.3	73.9	19.1	18.6
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.00	NS	NS	-	-	-	-	-	-	73.9	-	-
6	14880.00	NS	NS	-	-	-	-	-	-	73.9	-	-
7	17360.00	NS	NS	-	-	-	-	-	-	73.9	-	-
8	19840.00	NS	NS	-	-	-	-	-	-	73.9	-	-
9	22320.00	NS	NS	-	-	-	-	-	-	73.9	-	-
10	24800.00	45.0	45.8	40.4	30.1	8.0	0.0	53.8	54.6	73.9	20.1	19.3

AV DETECT (RBW: 1MHz, VBW: 150Hz)

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	30.6	31.1	27.0	32.5	2.6	0.0	27.7	28.2	53.9	26.2	25.7
2	4960.00	34.4	35.1	31.5	31.4	4.2	0.7	39.4	40.1	53.9	14.5	13.8
3	7440.00	28.2	28.3	36.0	31.0	4.6	0.6	38.4	38.5	53.9	15.5	15.4
4	9920.00	28.2	28.4	38.9	31.4	5.2	0.9	41.8	42.0	53.9	12.1	11.9
Test distance 1meter RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
5	12400.00	NS	NS	-	-	-	-	-	-	53.9	-	-
6	14880.00	NS	NS	-	-	-	-	-	-	53.9	-	-
7	17360.00	NS	NS	-	-	-	-	-	-	53.9	-	-
8	19840.00	NS	NS	-	-	-	-	-	-	53.9	-	-
9	22320.00	NS	NS	-	-	-	-	-	-	53.9	-	-
10	24800.00	34.3	34.2	40.4	30.1	8.0	0.0	43.1	43.0	53.9	**10.8**	10.9

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3.0/1.0) = 9.5 dB
*Except for the above table : All other spurious emissions were less than 20dB for the limit.
*Hi-Pass Fiter was not used for factor 0.0dB of the above table.
*In the frequency over the 6th harmonic, the noise from the EUT was not seen.The data above is its base noise.
*The test result is rounded off to one or two decimal places, so some differences might be observed.
*NS: No detect Signal.

Radiated Spurious Emission (above 1GHz)
Rx, Ch:Mid

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

Company : Mitsubishi Electric Corporation Sanda works
Equipmen : Navigation system
Model : NR-212-6U
S/N : ME395084170044
Power : DC 12.0V
Mode : Receiving 2441 MHz
Position : Hor X-axis, Ver Y-axis

Regulation : FCC15.247(d) / RSS-210 A8.5
Test Distance : 3m (1G-10GHz) / 1m (above10GHz)
Date : September 9, 2008
Temperature : 25 deg.C.
Humidity : 63 %
Engineer : Shinya Watanabe

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

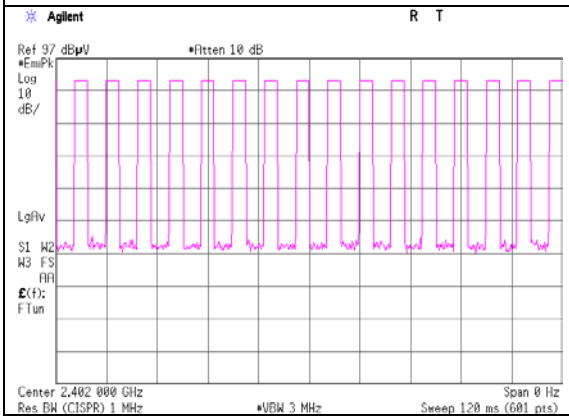
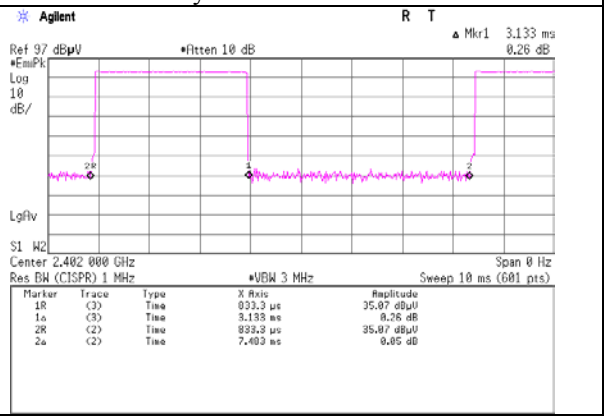
No.	FREQ	S/A READING		ANT	AMP	CABLE	Hi-Pass	RESULT		Limit	MARGIN	
		HOR	VER	Factor	GAIN	LOSS	Filter	HOR	VER	PK	HOR	VER
	[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]		[dBuV/m]	[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	2441.0	42.9	42.9	26.9	32.5	2.6	0.0	39.9	39.9	73.9	34.0	34.0
2	4882.0	41.8	40.5	31.4	31.4	3.6	0.0	45.4	44.1	73.9	28.5	29.8
3	7323.0	41.7	41.1	35.7	31.0	3.9	0.0	50.3	49.7	73.9	23.6	24.2

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	2441.0	29.5	28.9	26.9	32.5	2.6	0.0	26.5	25.9	53.9	27.4	28.0
2	4882.0	28.2	27.7	31.4	31.4	3.6	0.0	31.8	31.3	53.9	22.1	22.6
3	7323.0	28.2	27.8	35.7	31.0	3.9	0.0	36.8	36.4	53.9	17.1	17.5

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

VBW setting to use of the radiated emission (Average detector function)

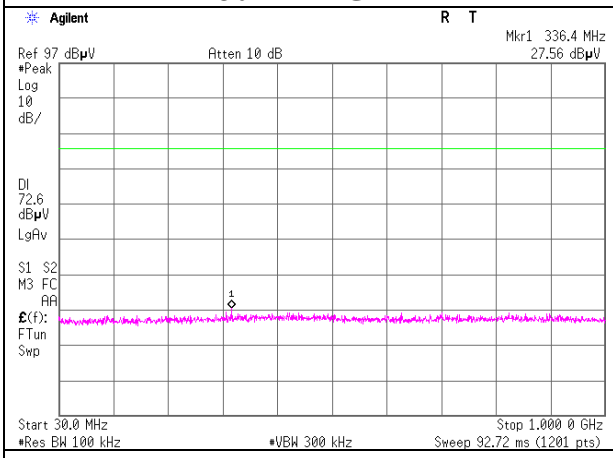
120ms chart	1cycle time: 7.483msec.
	

--- VBW Setting ---
VBW = 1 / (1cycle time) = 1 / 7.483ms = 133.6 Hz -> Therefore, we use VBW=150Hz for Spurious Emission Test (Average)

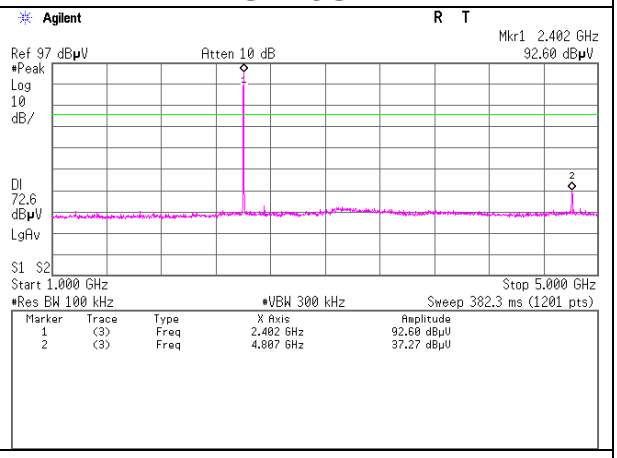
Conducted Spurious Emission

Tx, Ch: Low

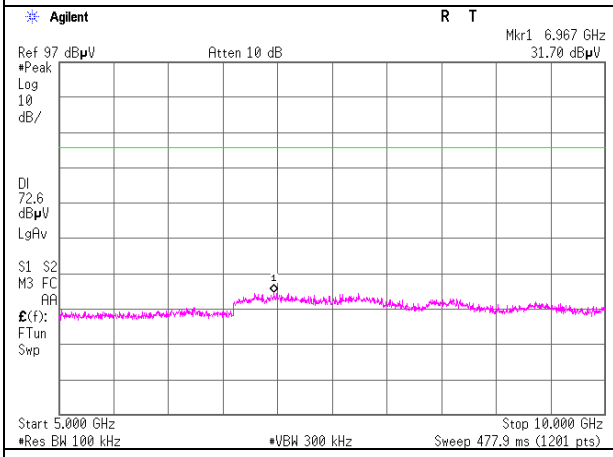
30MHz-1GHz



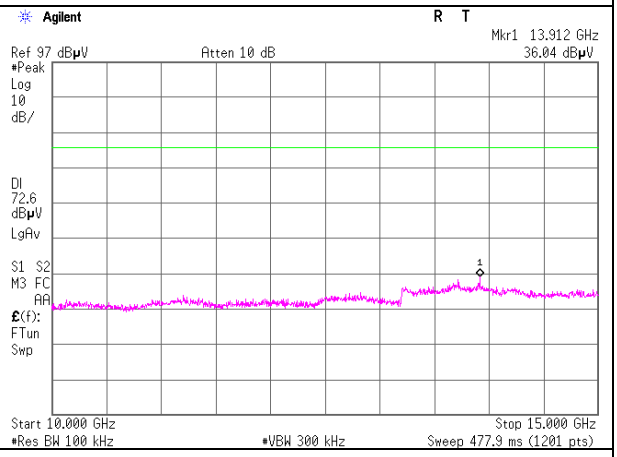
1GHz-5GHz



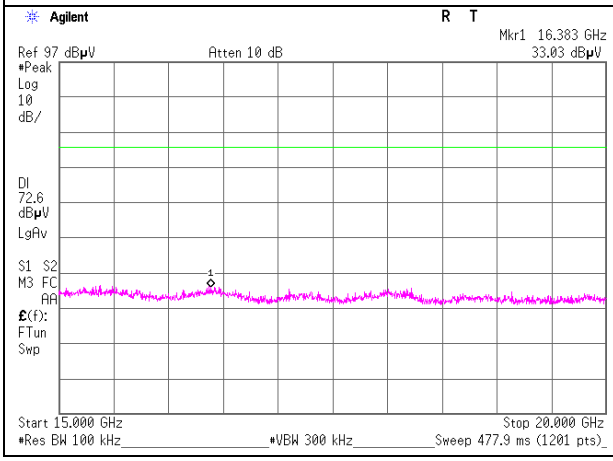
5GHz-10GHz



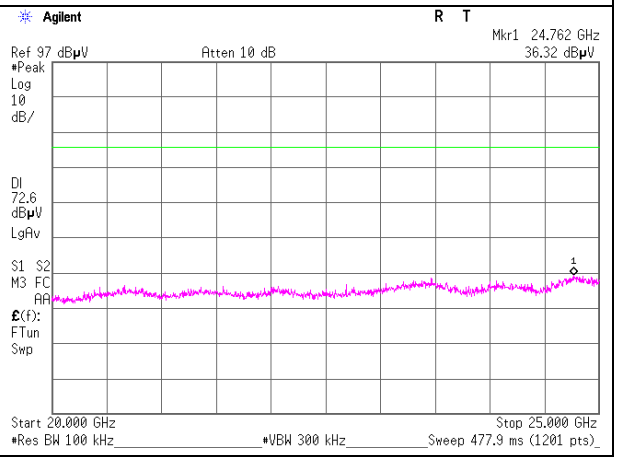
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

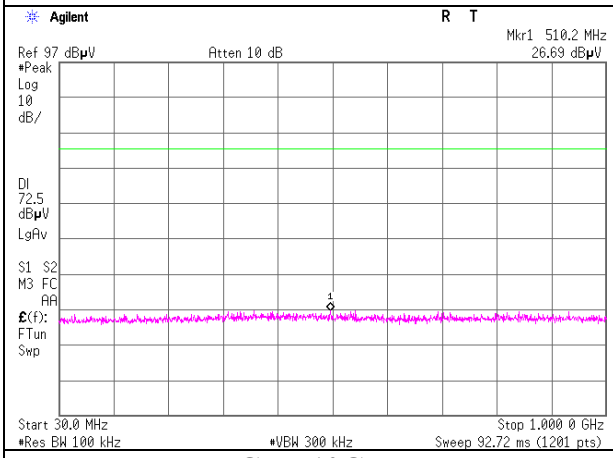


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

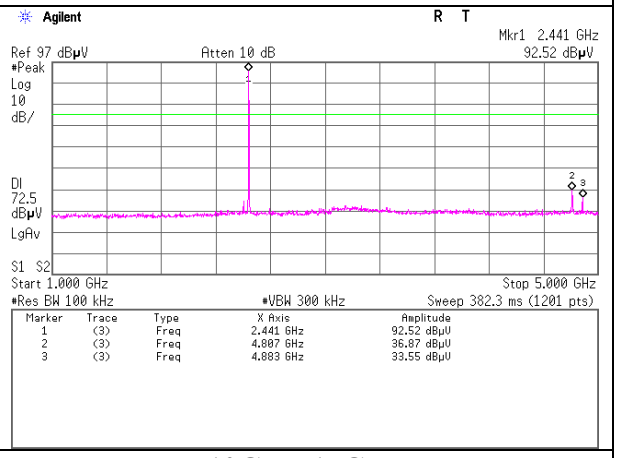
Conducted Spurious Emission

Tx, Ch: Mid

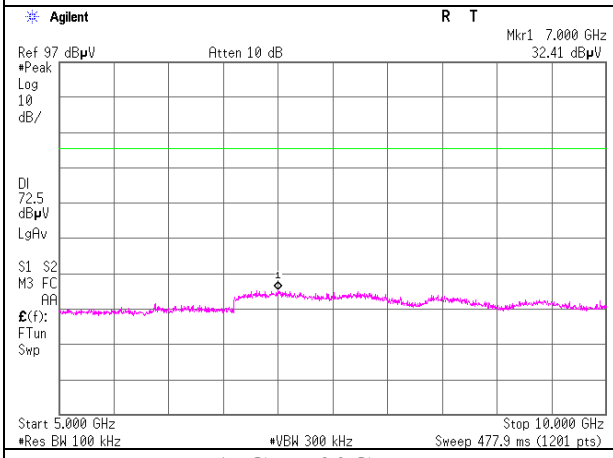
30MHz-1GHz



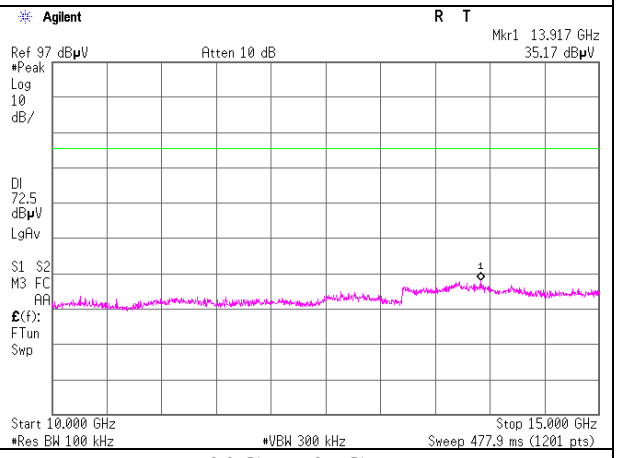
1GHz-5GHz



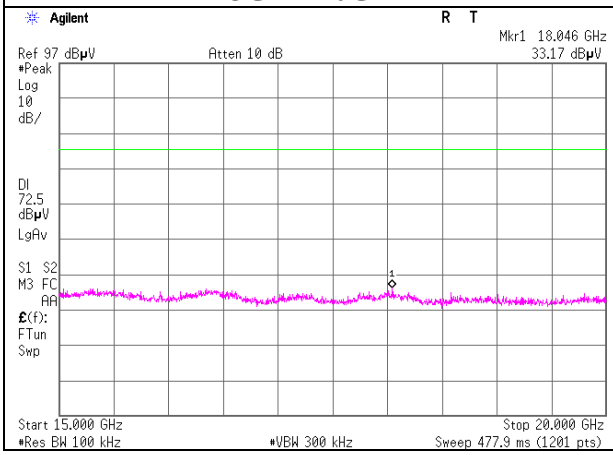
5GHz-10GHz



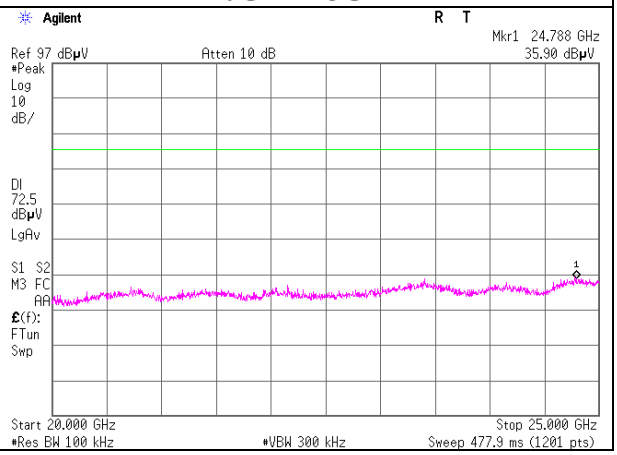
10GHz-15GHz



15GHz-20GHz



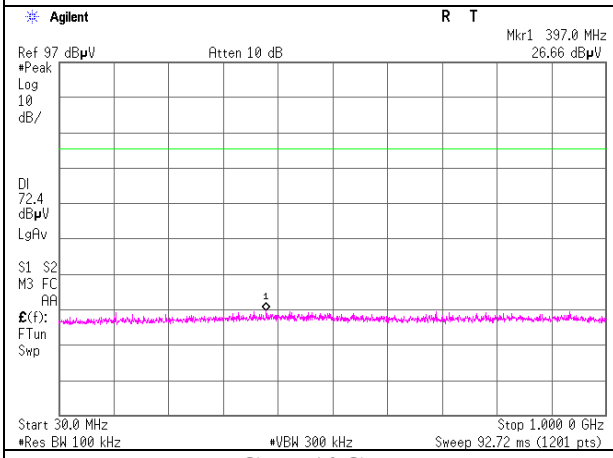
20GHz-25GHz



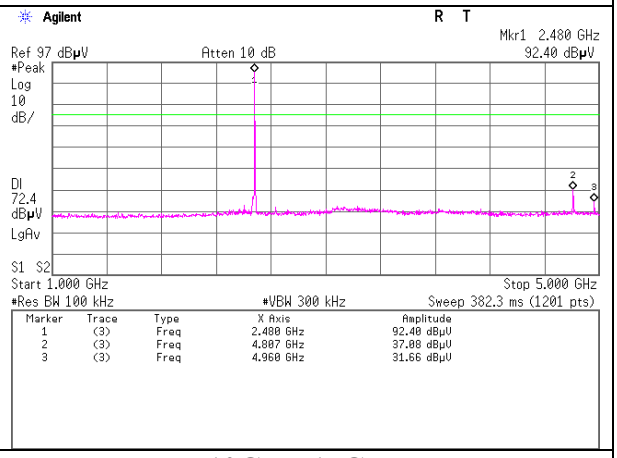
Conducted Spurious Emission

Tx, Ch: High

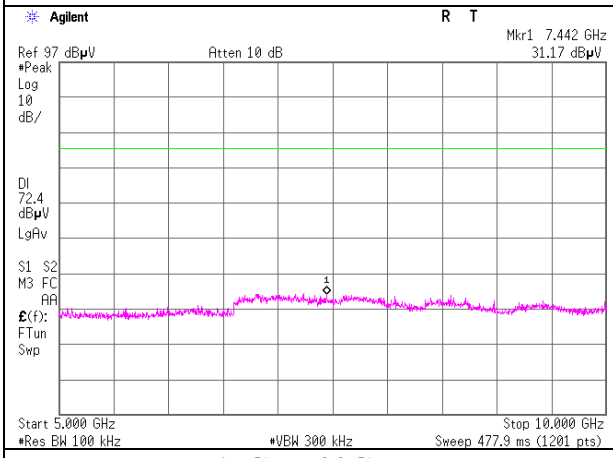
30MHz-1GHz



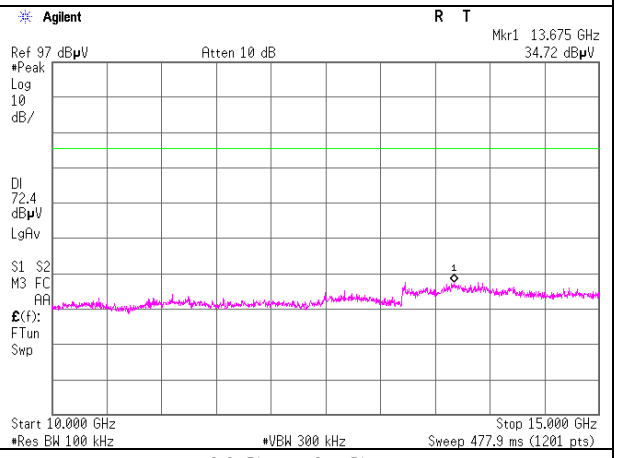
1GHz-5GHz



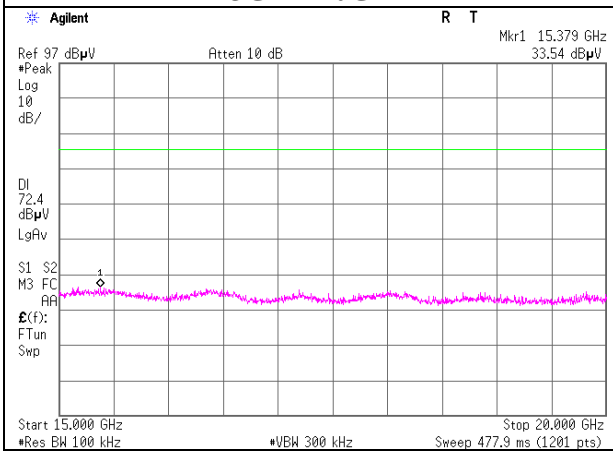
5GHz-10GHz



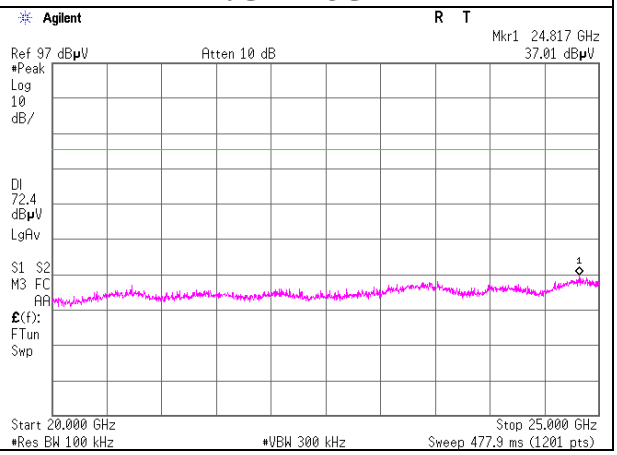
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

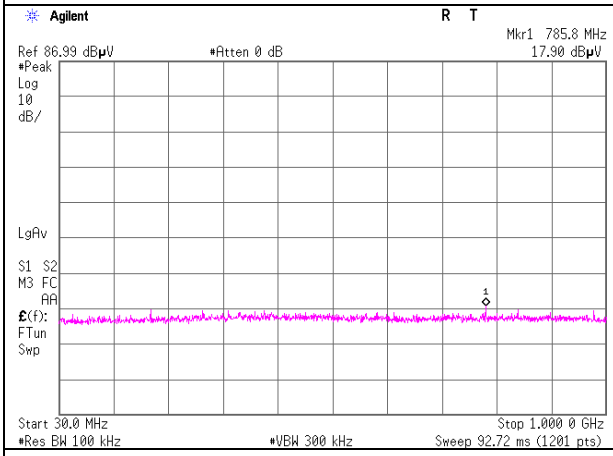


UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

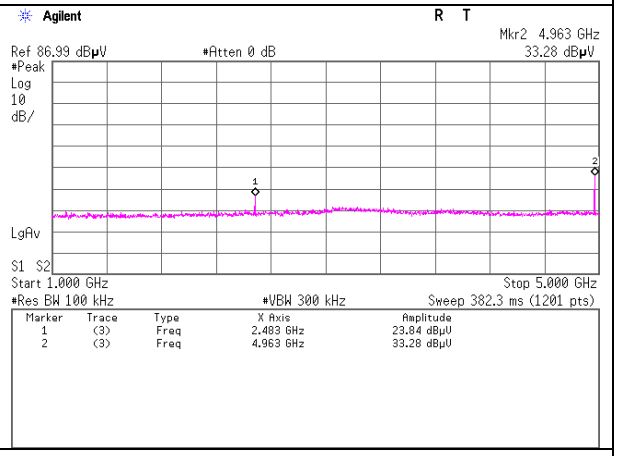
Conducted Spurious Emission

Rx, Ch: Mid

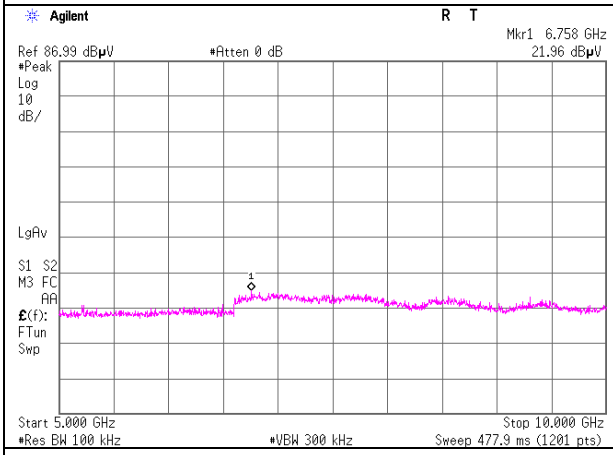
30MHz-1GHz



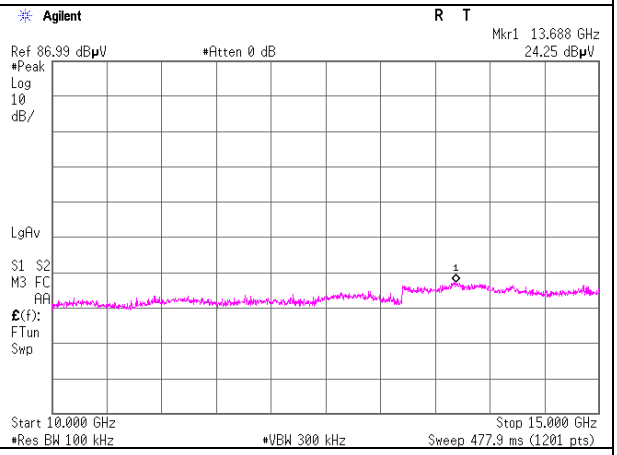
1GHz-5GHz



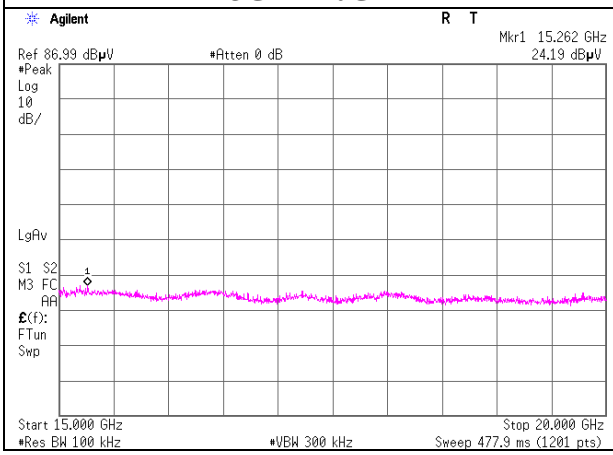
5GHz-10GHz



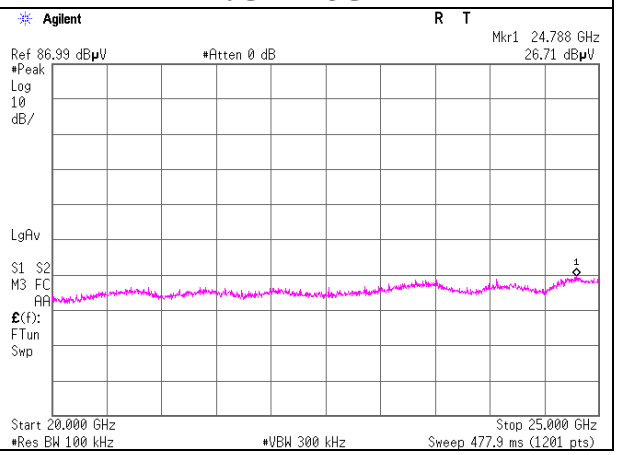
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



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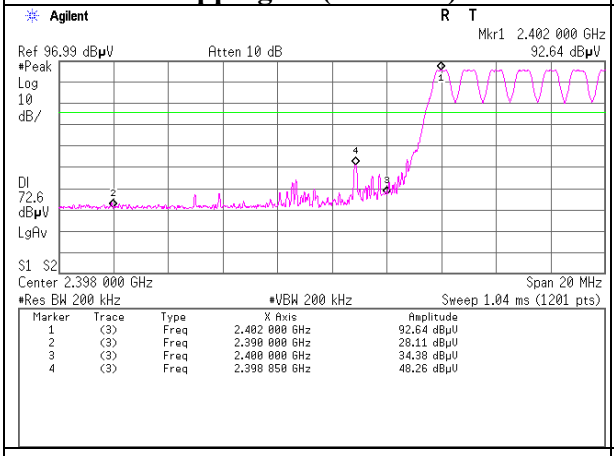
Facsimile : +81 596 24 8124

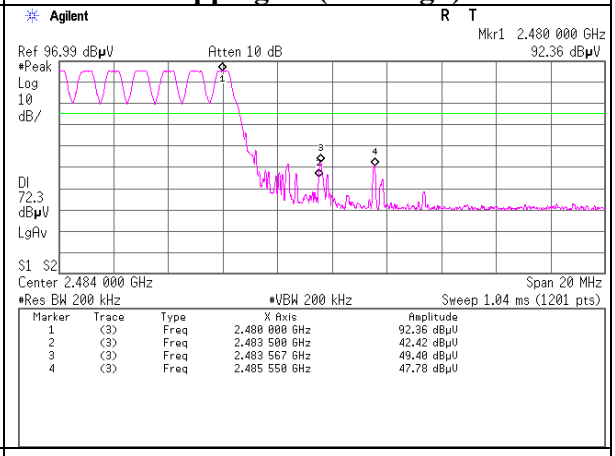
Conducted Spurious Emission
Band Edge compliance

Hopping on (Ch: Low)



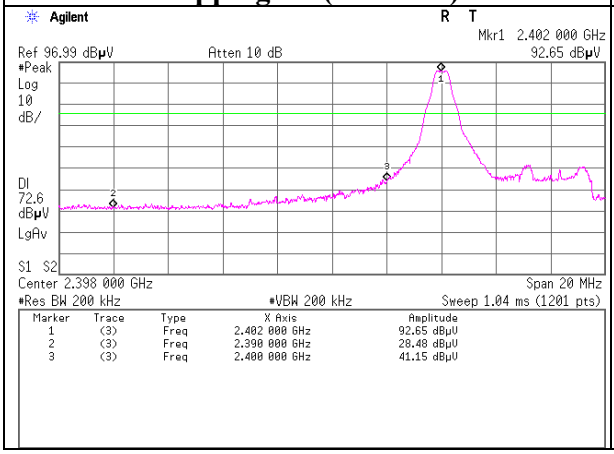
Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.402 000 GHz	92.64 dBµV
2	(3)	Freq	2.390 000 GHz	28.11 dBµV
3	(3)	Freq	2.400 000 GHz	34.38 dBµV
4	(3)	Freq	2.398 850 GHz	48.26 dBµV

Hopping on (Ch: High)



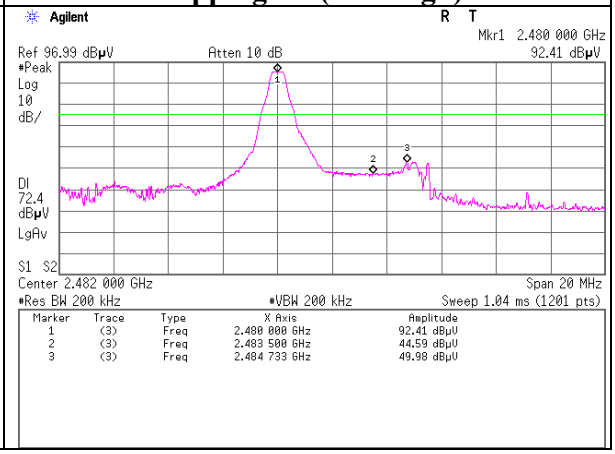
Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.480 000 GHz	92.36 dBµV
2	(3)	Freq	2.483 500 GHz	42.42 dBµV
3	(3)	Freq	2.483 567 GHz	49.40 dBµV
4	(3)	Freq	2.485 550 GHz	47.78 dBµV

Hopping off (Ch: Low)



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.402 000 GHz	92.65 dBµV
2	(3)	Freq	2.390 000 GHz	28.48 dBµV
3	(3)	Freq	2.400 000 GHz	41.15 dBµV

Hopping off (Ch: High)



Marker	Trace	Type	X Axis	Amplitude
1	(3)	Freq	2.480 000 GHz	92.41 dBµV
2	(3)	Freq	2.483 500 GHz	44.59 dBµV
3	(3)	Freq	2.484 733 GHz	49.98 dBµV

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116
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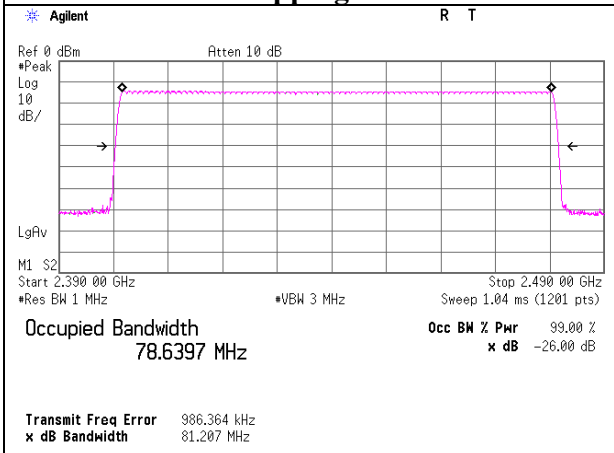
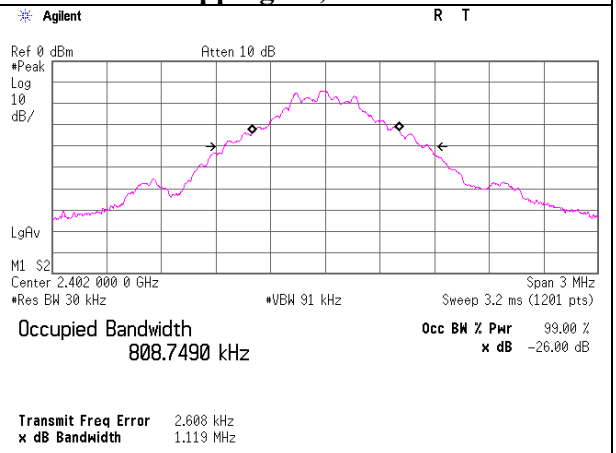
99% Occupied Bandwidth

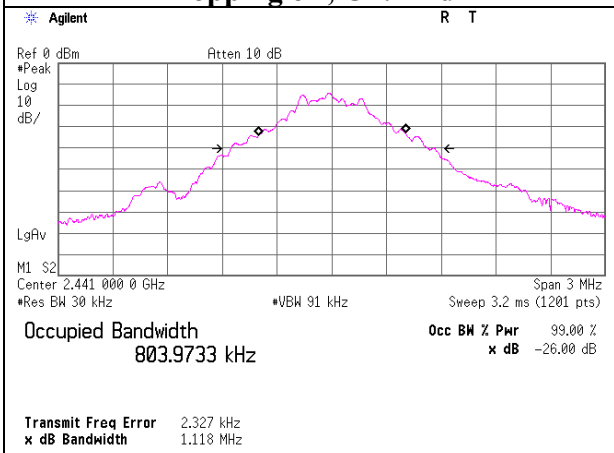
Hopping on



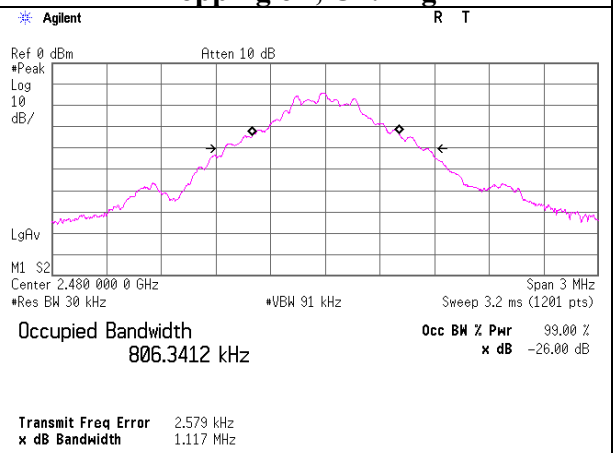
Hopping off, Ch: Low



Hopping off, Ch: Mid



Hopping off, Ch: High



***Refer to 20dB Bandwidth for 99% Occupied Bandwidth, inquiry mode**

APPENDIX 3:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MSA-10	Spectrum Analyzer	Agilent	E4448A	AT	2008/02/27 * 12
MCC-66	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	AT	2008/04/04 * 12
MAT-23	Attenuator(10dB) DC-18GHz	Orient Microwave	BX10-0476-00	AT	2008/03/05 * 12
MPM-08	Power Meter	Anritsu	ML2495A	AT	2007/09/12 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	AT	2007/09/12 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	AT	2008/01/10 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2008/04/17 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	RE	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	RE	2007/11/27 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	RE	2008/04/02 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2008/01/19 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2008/05/12 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2008/09/17 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE	2008/01/19 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2007/12/26 * 12
MHF-18	High Pass Filter 3.5-18.0GHz	TOKIMEC	TF323DCA	RE	2007/12/10 * 12
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2008/03/25 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	RE	2008/01/10 * 12
MJM-06	Measure	PROMART	SEN1955	RE	-
MSA-09	Spectrum Analyzer	Advantest	R3273	RE	2007/12/21 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	RE	2008/06/12 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2008/01/12 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	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	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: RE: Radiated Emission
AT: Antenna Terminal Conducted test