

APPENDIX 2: Data of EMI test

Conducted Emission

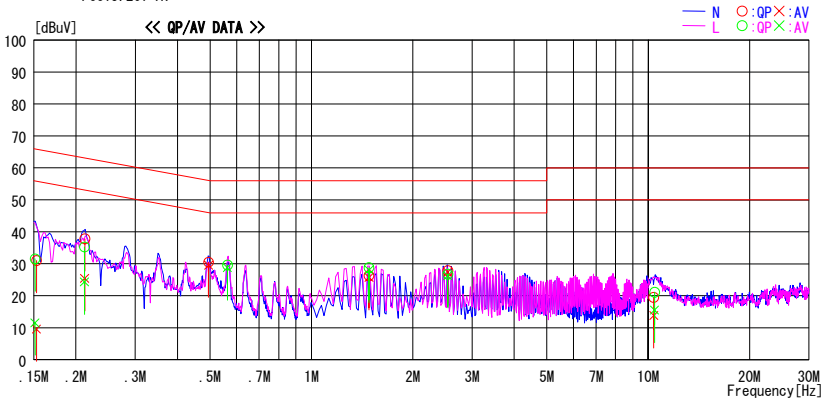
DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Date : 2007/04/13

Company : SATO CORPORATION
Kind of EUT : BARCODE PRINTER
Model No. : MB400i-B1
Serial No. : 3
Report No. : 271E0037-HO
Power : AC120V / 60Hz
Temp./Humi. : 24deg.C / 30%
Operator : Yutaka Yoshida

Mode / Remarks : Bluetooth Tx 2402MHz, DH5 packet, PRBS9

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15250	30.7	9.3	0.3	31.0	9.6	65.9	55.9	34.9	46.3	N	
0.21243	37.5	25.1	0.3	37.8	25.4	63.1	53.1	25.3	27.7	N	
0.49489	30.2	29.3	0.3	30.5	29.6	56.1	46.1	25.6	16.5	N	
1.48264	25.8	25.2	0.5	26.3	25.7	56.0	46.0	29.7	20.3	N	
2.54127	27.3	26.8	0.6	27.9	27.4	56.0	46.0	28.1	18.6	N	
10.37960	18.1	12.4	1.4	19.5	13.8	60.0	50.0	40.5	36.2	N	
0.15120	31.2	11.2	0.3	31.5	11.5	65.9	55.9	34.4	44.4	L	
0.21183	35.0	24.0	0.3	35.3	24.3	63.1	53.1	27.8	28.8	L	
0.56329	29.3	28.4	0.3	29.6	28.7	56.0	46.0	26.4	17.3	L	
1.48234	28.3	27.5	0.5	28.8	28.0	56.0	46.0	27.2	18.0	L	
2.54127	26.2	25.7	0.6	26.8	26.3	56.0	46.0	29.2	19.7	L	
10.44088	19.7	14.1	1.4	21.1	15.5	60.0	50.0	38.9	34.5	L	

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2007/04/13

Company

Kind of EUT

Model No.

Serial No.

: SATO CORPORATION

: BARCODE PRINTER

: MB4001-B1

: 3

Report No.

Power

Temp./Humi.

Operator

: 27IE0037-HO

: AC120V / 60Hz

: 24deg. C / 30%

: Yutaka Yoshida

Mode / Remarks : Bluetooth Tx 2441MHz, DH5 packet, PRBS9

LIMIT : FCC15.207 QP
FCC15.207 AV

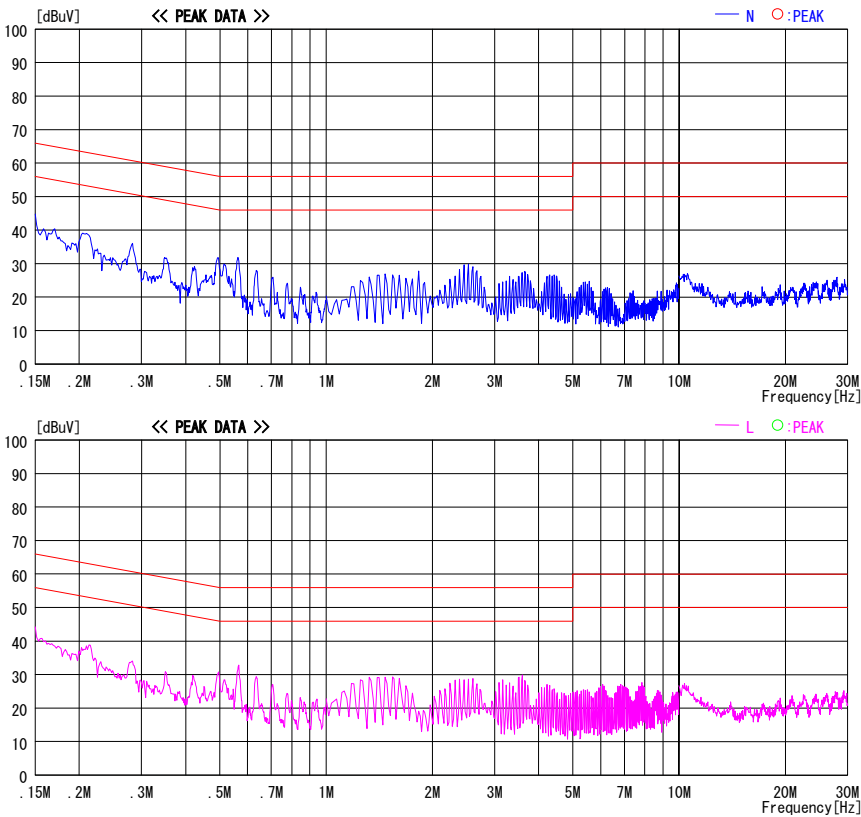


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2007/04/13

Company

Kind of EUT

Model No.

Serial No.

: SATO CORPORATION

: BARCODE PRINTER

: MB4001-B1

: 3

Report No.

Power

Temp./Humi.

Operator

: 27IE0037-H0

: AC120V / 60Hz

: 24deg. C / 30%

: Yutaka Yoshida

Mode / Remarks : Bluetooth Tx 2480MHz, DH5 packet, PRBS9

LIMIT : FCC15.207 QP
FCC15.207 AV

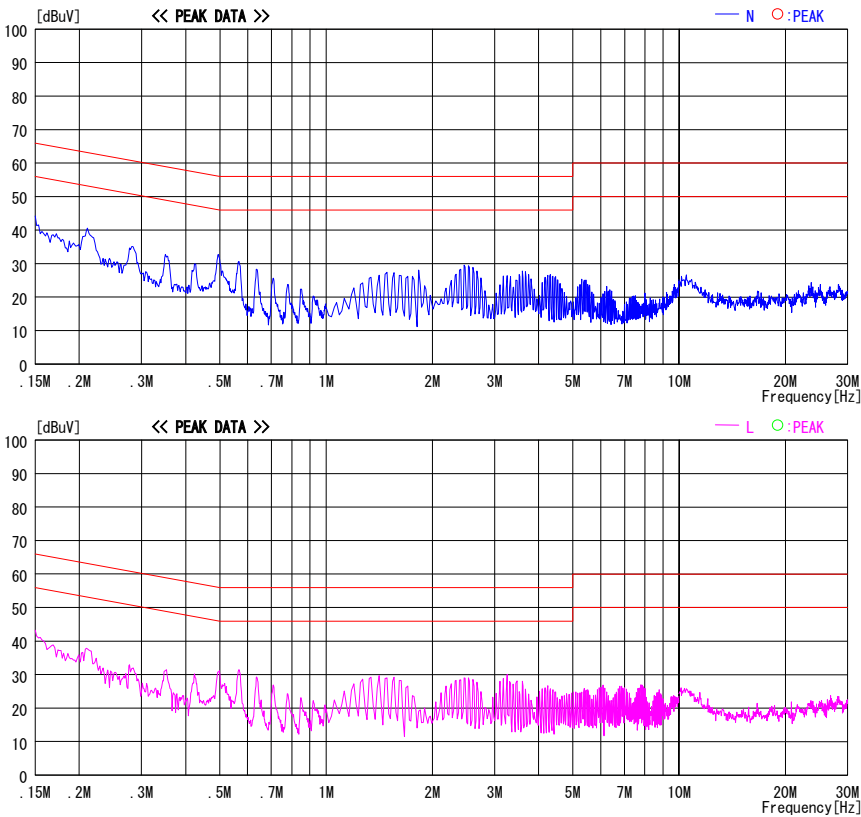


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

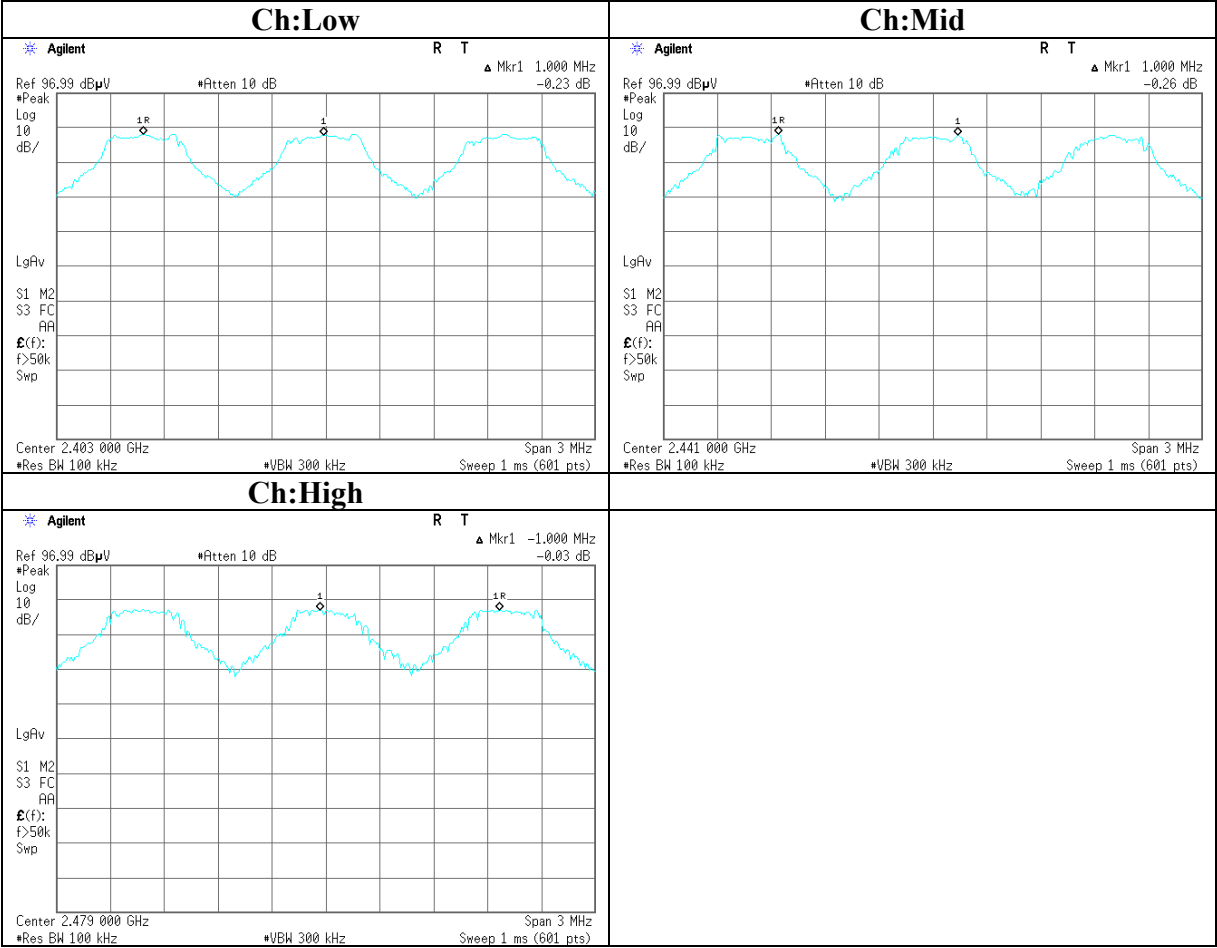
Carrier Frequency Separation

UL Apex Co., Ltd.
Head Office EMC Lab. No.6 Shielded Room

COMPANY	: SATO CORPORATION	REGULATION	: FCC15.247(a)(1)
EQUIPMENT	: BARCODE PRINTER	TEST DISTANCE	: -
MODEL	: MB400i-B1	DATE	: 04/10/2007
S/N	: 3	TEMPERATURE	: 25deg.C
POWER	: 120V/60Hz	HUMIDITY	: 32%
MODE	: Tx(Hopping on)	ENGINEER	: Tomotaka Sasagawa

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.000	>0.950[MHz] or 25[kHz](whichever is greater)
Mid	2441.0	1.000	>0.945[MHz] or 25[kHz](whichever is greater)
High	2480.0	1.000	>0.950[MHz] or 25[kHz](whichever is greater)

Carrier Frequency Separation



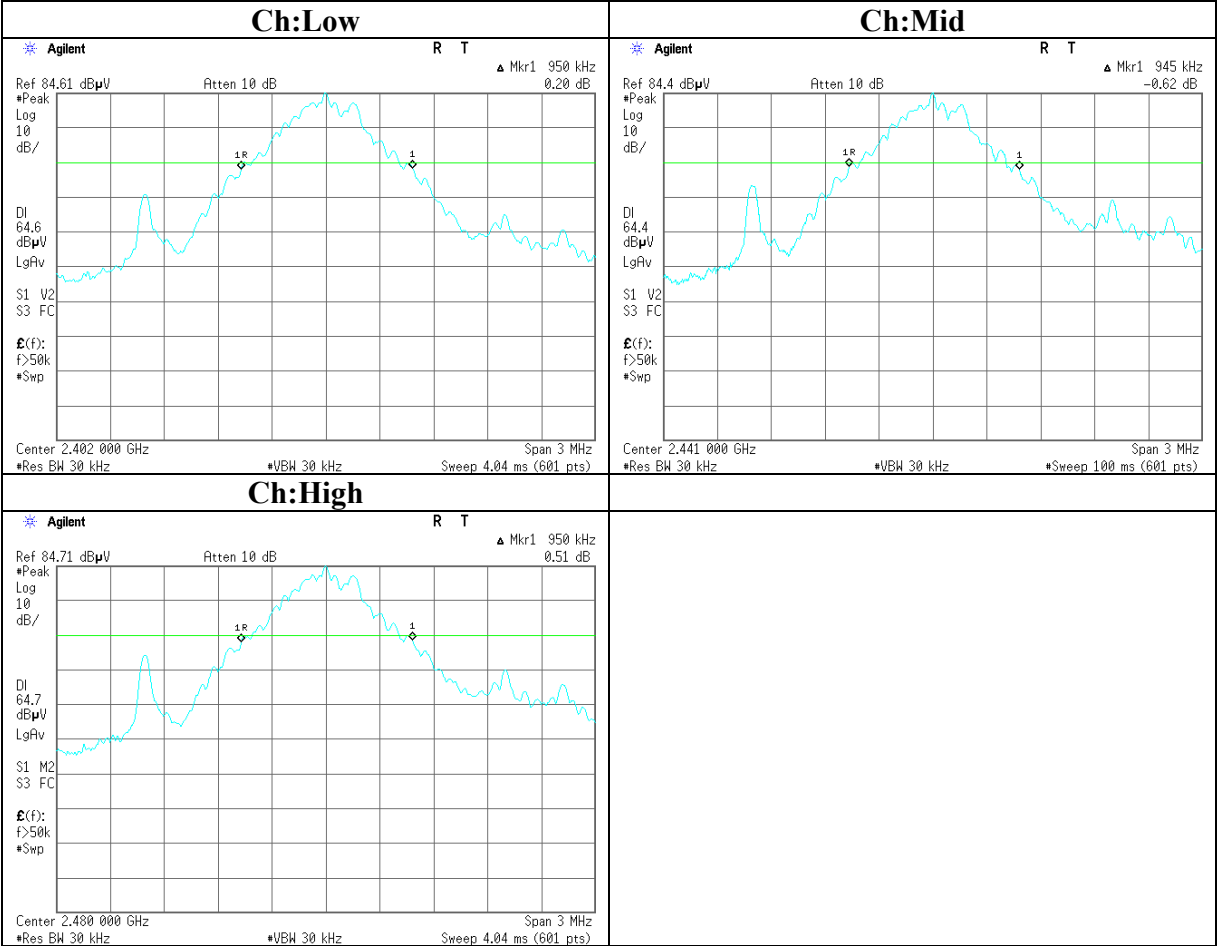
20dB Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.6 Shielded Room

COMPANY	:	SATO CORPORATION	REGULATION	:	FCC15.247(a)(1)
EQUIPMENT	:	BARCODE PRINTER	TEST DISTANCE	:	-
MODEL	:	MB400i-B1	DATE	:	04/10/2007
S/ N	:	3	TEMPERATURE	:	25deg.C
POWER	:	120V/60Hz	HUMIDITY	:	32%
MODE	:	Tx (Hopping off)	ENGINEER	:	Tomotaka Sasagawa

Ch	Freq.	20dB Bandwidth	Limit
	[MHz]	[MHz]	[MHz]
Low	2402.0	0.950	-
Mid	2441.0	0.945	-
High	2480.0	0.950	-

20dB Bandwidth



Number of Hopping Frequency

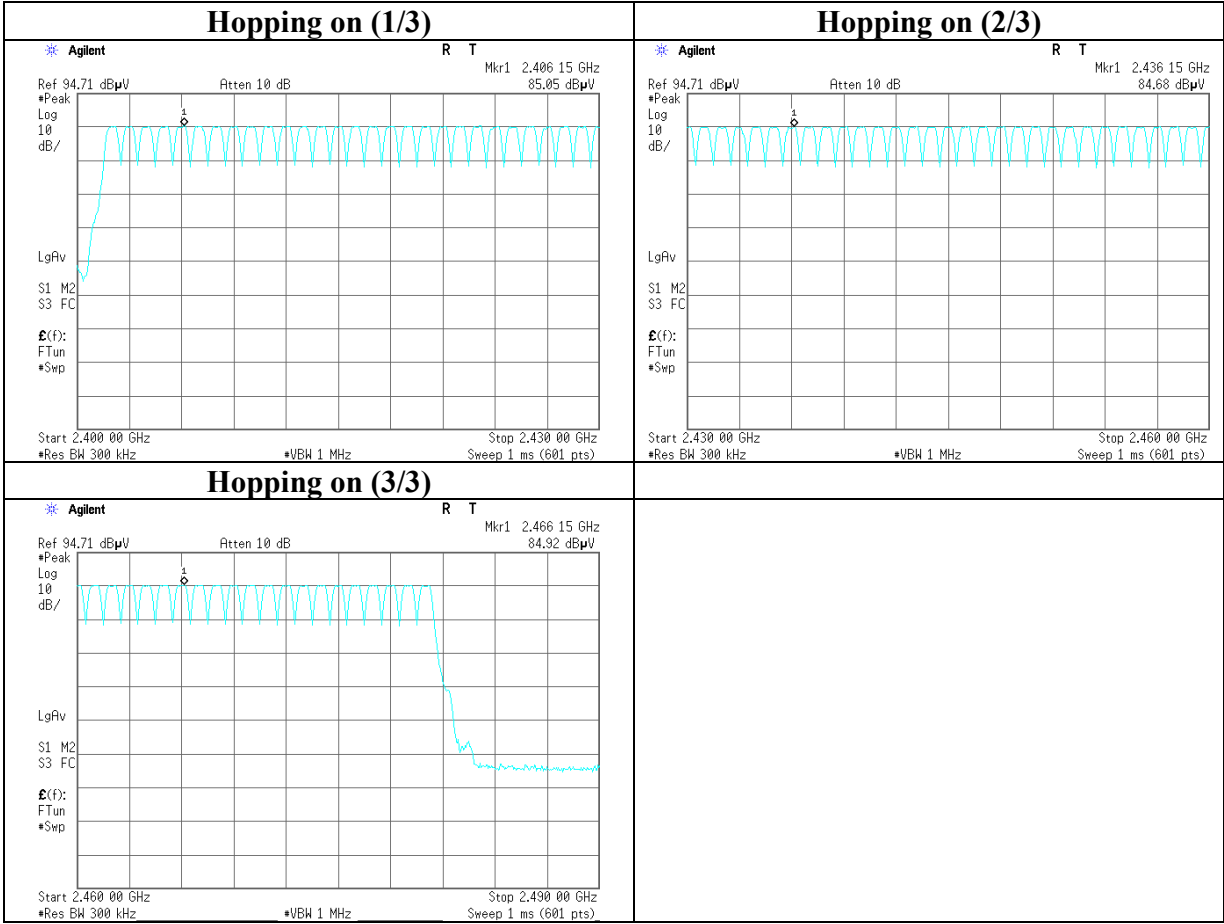
UL Apex Co., Ltd.
Head Office EMC Lab. No.6 Shielded Room

COMPANY : SATO CORPORATION
EQUIPMENT : BARCODE PRINTER
MODEL : MB400i-B1
S/ N : 3
POWER : 120V/60Hz
MODE : Tx (Hopping on)

REGULATION : FCC15.247(a)(1)(iii)
TEST DISTANCE : -
DATE : 04/10/2007
TEMPERATURE : 25deg.C
HUMIDITY : 32%
ENGINEER : Tomotaka Sasagawa

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

Number of Hopping Frequency



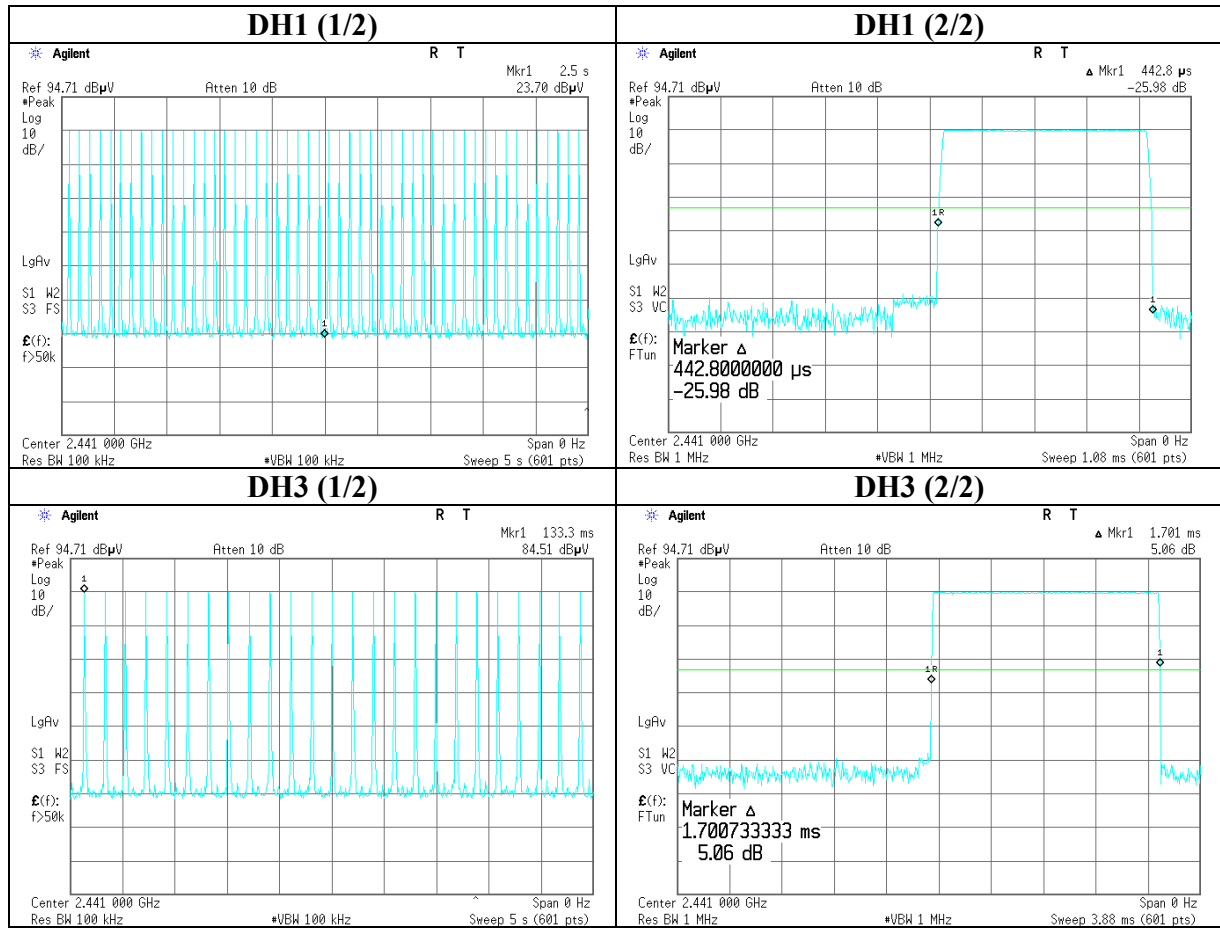
Dwell time

UL Apex Co., Ltd.
Head Office EMC Lab. No.6 Shielded Room

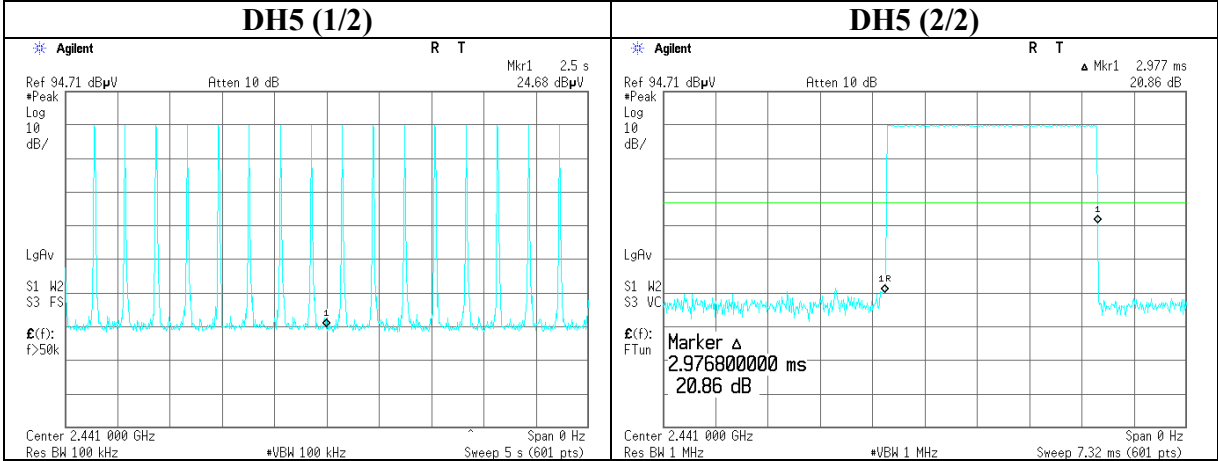
COMPANY	: SATO CORPORATION	REGULATION	: FCC15.247(a)(1)(iii)
EQUIPMENT	: BARCODE PRINTER	TEST DISTANCE	: -
MODEL	: MB400i-B1	DATE	: 04/10/2007
S/ N	: 3	TEMPERATURE	: 25deg.C
POWER	: 120V/60Hz	HUMIDITY	: 32%
MODE	: Tx (Hopping on)	ENGINEER	: Tomotaka Sasagawa

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	50 times / 5 sec. x 31.6 sec. = 316 times	0.443	140	400
DH3	25 times / 5 sec. x 31.6 sec. = 158 times	1.701	269	400
DH5	16 times / 5 sec. x 31.6 sec. = 102 times	2.977	304	400

Dwell time



Dwell time



Maximum Peak Output Power

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

COMPANY	: SATO CORPORATION	REGULATION	: FCC15.247(b)(1)
EQUIPMENT	: BARCODE PRINTER	TEST DISTANCE	: -
MODEL	: MB400i-B1	DATE	: 06/06/2007
S/ N	: 3	TEMPERATURE	: 27deg.C
POWER	: 120V/60Hz	HUMIDITY	: 34%
MODE	: Tx(Hopping Off)	ENGINEER	: Tomotaka Sasagawa

Ch	Freq. [MHz]	P/M (PK) Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2402.0	-13.75	1.76	10.02	-1.97	0.64	30.00	1000	31.97
Mid	2441.0	-13.49	1.76	10.02	-1.71	0.67	30.00	1000	31.71
High	2480.0	-13.78	1.70	10.02	-2.06	0.62	30.00	1000	32.06

Sample Calculation:

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

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

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

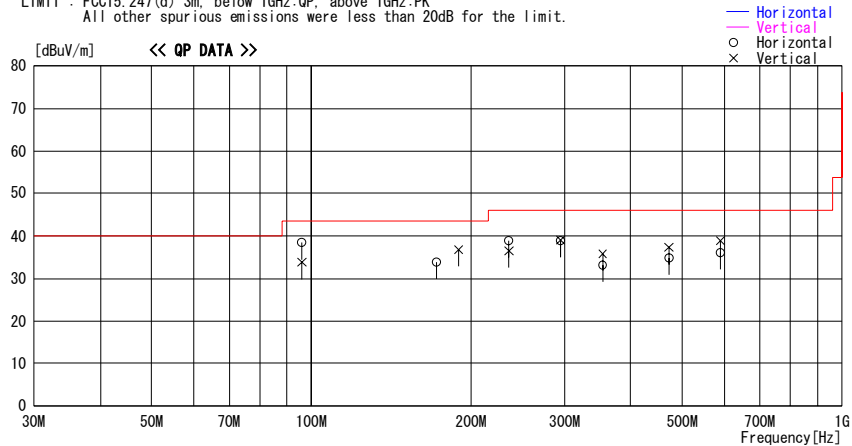
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Date : 2007/05/31

Company : SATO CORPORATION
Kind of EUT : BARCODE PRINTER
Model No. : MB400I-B1
Serial No. : 3
Report No. : 27IE0037-HO
Power : AC 120V/60Hz
Temp./Humi. : 25deg. C. / 42%
Operator : Takahiro Hatakeda

Mode / Remarks : Bluetooth, Tx 2402MHz, Hor:X-axis, Ver:Y-axis

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



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
96.002	50.6	QP	9.1	-21.3	38.4	189	309	Hor i.	43.5	5.1
96.002	46.0	QP	9.1	-21.3	33.8	111	100	Ver t.	43.5	9.7
171.858	38.3	QP	16.0	-20.4	33.9	297	300	Hor i.	43.5	9.6
189.239	40.0	QP	16.9	-20.1	36.8	359	100	Ver t.	43.5	6.7
235.940	41.6	QP	16.9	-19.6	38.9	163	100	Hor i.	46.0	7.1
235.938	39.2	QP	16.9	-19.6	36.5	203	100	Ver t.	46.0	9.5
294.924	38.1	QP	19.8	-19.0	38.9	123	300	Hor i.	46.0	7.1
294.920	38.2	QP	19.8	-19.0	39.0	184	100	Ver t.	46.0	7.0
353.902	36.0	QP	16.5	-19.3	33.2	18	224	Hor i.	46.0	12.8
353.910	38.6	QP	16.5	-19.3	35.8	359	100	Ver t.	46.0	10.2
471.870	36.0	QP	18.3	-19.5	34.8	158	236	Hor i.	46.0	11.2
471.878	38.5	QP	18.3	-19.5	37.3	348	100	Ver t.	46.0	8.7
589.848	35.8	QP	19.4	-19.1	36.1	218	100	Hor i.	46.0	9.9
589.847	38.6	QP	19.4	-19.1	38.9	24	117	Ver t.	46.0	7.1

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 result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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Radiated Spurious Emission (below 1GHz) Tx, Ch. Mid

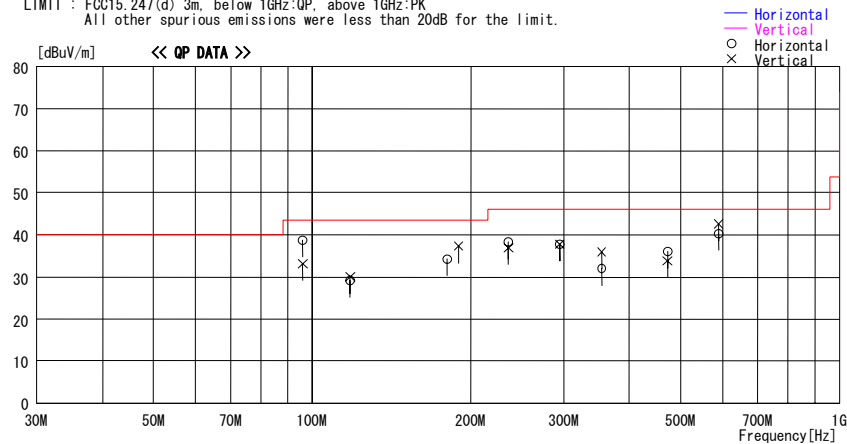
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2007/05/31

Company : SATO CORPORATION
Kind of EUT : BARCODE PRINTER
Model No. : MB400I-B1
Serial No. : 3
Report No. : 27IE0037-HO
Power : AC 120V/60Hz
Temp./Humi. : 25deg. C. / 42%
Operator : Takahiro Hatakeda

Mode / Remarks : Bluetooth, Tx 2441MHz, Hor:X-axis, Ver:Y-axis

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



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
96.003	45.4	QP	9.1	-21.3	33.2	141	100	Vert.	43.5	10.3
96.006	51.0	QP	9.1	-21.3	38.8	11	346	Hori.	43.5	4.7
117.969	37.6	QP	12.6	-21.0	29.2	38	310	Hori.	43.5	14.3
117.965	38.5	QP	12.6	-21.0	30.1	359	100	Vert.	43.5	13.4
180.339	38.0	QP	16.5	-20.2	34.3	313	277	Hori.	43.5	9.2
189.222	40.5	QP	16.9	-20.1	37.3	7	100	Vert.	43.5	6.2
235.937	41.0	QP	16.9	-19.6	38.3	174	100	Hori.	46.0	7.7
235.940	39.6	QP	16.9	-19.6	36.9	195	100	Vert.	46.0	9.1
294.920	37.0	QP	19.8	-19.0	37.8	323	116	Hori.	46.0	8.2
294.923	37.0	QP	19.8	-19.0	37.8	337	100	Vert.	46.0	8.2
353.907	34.8	QP	16.5	-19.3	32.0	7	164	Hori.	46.0	14.0
353.907	38.8	QP	16.5	-19.3	36.0	359	165	Vert.	46.0	10.0
471.875	37.3	QP	18.3	-19.5	36.1	320	100	Hori.	46.0	9.9
471.874	35.1	QP	18.3	-19.5	33.9	340	161	Vert.	46.0	12.1
589.846	40.0	QP	19.4	-19.1	40.3	38	100	Hori.	46.0	5.7
589.846	42.3	QP	19.4	-19.1	42.6	17	130	Vert.	46.0	3.4

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 result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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Head Office EMC Lab.
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Radiated Spurious Emission (below 1GHz)
Tx, Ch. High

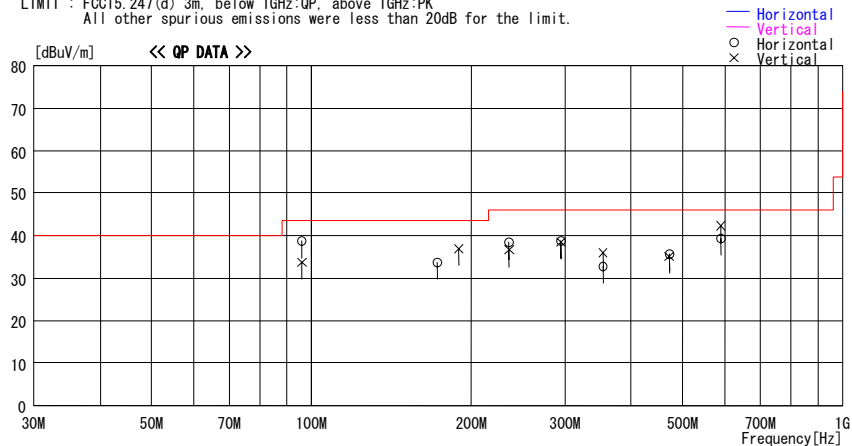
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2007/05/31

Company : SATO CORPORATION
Kind of EUT : BARCODE PRINTER
Model No. : MB4001-B1
Serial No. : 3
Report No. : 271E0037-HO
Power : AC 120V/60Hz
Temp./Humi. : 25deg. C. / 42%
Operator : Takahiro Hatakeda

Mode / Remarks : Bluetooth, Tx 2480MHz, Hor:X-axis, Ver:Y-axis

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



Frequency	Reading	DET	Antenna Factor	Loss & Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
96.003	50.9	QP	9.1	-21.3	38.7	358	323	Hori.	43.5	4.8
96.003	45.9	QP	9.1	-21.3	33.7	118	100	Vert.	43.5	9.8
172.337	38.1	QP	16.0	-20.4	33.7	314	299	Hori.	43.5	9.8
189.214	40.1	QP	16.9	-20.1	36.9	36	100	Vert.	43.5	6.6
235.935	41.1	QP	16.9	-19.6	38.4	175	166	Hori.	46.0	7.6
235.934	39.3	QP	16.9	-19.6	36.6	193	100	Vert.	46.0	9.4
294.922	37.9	QP	19.8	-19.0	38.7	135	299	Hori.	46.0	7.3
294.922	37.7	QP	19.8	-19.0	38.5	350	100	Vert.	46.0	7.5
353.909	35.5	QP	16.5	-19.3	32.7	22	217	Hori.	46.0	13.3
353.910	38.7	QP	16.5	-19.3	35.9	359	100	Vert.	46.0	10.1
471.877	36.9	QP	18.3	-19.5	35.7	165	222	Hori.	46.0	10.3
471.877	36.3	QP	18.3	-19.5	35.1	313	155	Vert.	46.0	10.9
589.846	39.0	QP	19.4	-19.1	39.3	44	100	Hori.	46.0	6.7
589.847	42.0	QP	19.4	-19.1	42.3	15	117	Vert.	46.0	3.7

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 result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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Radiated Spurious Emission (above 1GHz)

Tx, Ch. Low

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company	: SATO CORPORATION	Report No.	: 27IE0037-HO
Equipment	: BARCODE PRINTER	Regulation	: FCC Part15 Subpart C 15.247(d)
Model	: MB400i-B1	Test distance	: 3/1m
Sample No.	: 3	Date	: 04/10/2007 04/11/2007
Power	: AC 120V / 60Hz	Temperature	: 22deg.C 23deg.C
Mode	: Bluetooth, Tx 2402MHz	Humidity	: 31% 31%
Remarks	: Hor X-axis / Ver Y-axis	Engineer	: Takahiro Hatakeda Tomotaka Sasagawa

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit PK [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1200.5	49.9	52.6	24.8	33.6	2.1	0.0	43.2	45.9	74.0	30.8	28.1
2	1769.5	49.7	45.6	26.2	32.8	2.7	0.0	45.8	41.7	74.0	28.2	32.3
3	2386.1	47.2	47.0	27.1	32.3	3.2	0.0	45.2	45.0	74.0	28.8	29.0
4	2400.0*	65.6	66.3	27.1	32.3	3.3	0.0	63.7	64.4	74.0	-	-
5	4804.0	42.4	42.6	31.3	31.6	4.5	0.1	46.7	46.9	74.0	27.3	27.1
6	7206.0	43.2	42.7	35.7	31.4	5.2	0.3	53.0	52.5	74.0	21.0	21.5
7	9608.0	42.6	43.0	38.5	31.9	6.2	0.7	56.1	56.5	74.0	17.9	17.5
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
8	24020.0	43.1	44.4	40.6	30.7	10.3	0.0	53.8	55.1	74.0	20.2	18.9

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1200.5	41.6	47.6	24.8	33.6	2.1	0.0	34.9	40.9	54.0	19.1	13.1
2	1769.5	43.6	33.6	26.2	32.8	2.7	0.0	39.7	29.7	54.0	14.3	24.3
3	2386.1	33.6	34.3	27.1	32.3	3.2	0.0	31.6	32.3	54.0	22.4	21.7
4	2400.0*	51.9	52.2	27.1	32.3	3.3	0.0	50.0	50.3	54.0	-	-
5	4804.0	29.4	29.3	31.3	31.6	4.5	0.1	33.7	33.6	54.0	20.3	20.4
6	7206.0	29.6	29.6	35.7	31.4	5.2	0.3	39.4	39.4	54.0	14.6	14.6
7	9608.0	29.9	29.9	38.5	31.9	6.2	0.7	43.4	43.4	54.0	10.6	10.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
8	24020.0	32.9	33.0	40.6	30.7	10.3	0.0	43.6	43.7	54.0	10.4	10.3

* Reference data

20dBc(Fundamental 2402MHz) (RBW: 100kHz, VBW: 300kHz)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit 20dBc [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
0	2402.0	99.0	99.7	27.1	32.3	3.3	0.0	97.1	97.8	-	-	-
2	2400.0	56.3	56.7	27.1	32.3	3.3	0.0	54.4	54.8	Funda-20dB	22.7	23.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

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

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

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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

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Test report No. : 27IE0037-HO-A-R1
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Issued date : June 21, 2007
Revised date : June 28, 2007
FCC ID : MMFMB4001-B1

Radiated Spurious Emission (above 1GHz)

Tx, Ch. Mid

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : SATO CORPORATION	Report No. : 27IE0037-HO
Equipment : BARCODE PRINTER	Regulation : FCC Part15 Subpart C 15.247(d)
Model : MB400i-B1	Test distance : 3/1m
Sample No. : 3	Date : 04/10/2007 04/11/2007
Power : AC 120V / 60Hz	Temperature : 22deg.C 23deg.C
Mode : Bluetooth, Tx 2441MHz	Humidity : 31% 31%
Remarks : Hor X-axis / Ver Y-axis	Engineer : Takahiro Hatakeda Tomotaka Sasagawa

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

No.	FREQ	S/A READING		ANT Factor	AMP GAIN	CABLE LOSS	Hi-Pass Filter	RESULT		Limit PK	MARGIN	
		HOR	VER					HOR	VER		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	1220.0	50.1	52.8	24.9	33.6	2.1	0.0	43.5	46.2	74.0	30.5	27.8
2	1769.5	47.9	47.8	26.2	32.8	2.7	0.0	44.0	43.9	74.0	30.0	30.1
3	4882.0	44.3	43.1	31.4	31.6	4.5	0.0	48.6	47.4	74.0	25.4	26.6
4	7323.0	42.3	42.8	36.0	31.4	5.3	0.4	52.6	53.1	74.0	21.4	20.9
5	9764.0	43.6	42.8	38.7	32.0	6.2	0.7	57.2	56.4	74.0	16.8	17.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	24410.0	43.1	42.0	40.7	30.6	10.5	0.0	54.2	53.1	74.0	19.8	20.9

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

No.	FREQ	S/A READING		ANT Factor	AMP GAIN	CABLE LOSS	Hi-Pass Filter	RESULT		Limit AV	MARGIN	
		HOR	VER					HOR	VER		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	1220.0	43.0	48.3	24.9	33.6	2.1	0.0	36.4	41.7	54.0	17.6	12.3
2	1769.5	39.5	37.7	26.2	32.8	2.7	0.0	35.6	33.8	54.0	18.4	20.2
3	4882.0	30.9	30.2	31.4	31.6	4.5	0.0	35.2	34.5	54.0	18.8	19.5
4	7323.0	29.7	29.6	36.0	31.4	5.3	0.4	40.0	39.9	54.0	14.0	14.1
5	9764.0	29.8	29.8	38.7	32.0	6.2	0.7	43.4	43.4	54.0	10.6	10.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
6	24410.0	32.1	32.9	40.7	30.6	10.5	0.0	43.2	44.0	54.0	10.8	10.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

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

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

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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

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Radiated Spurious Emission (above 1GHz)

Tx, Ch. High

UL Apex Co., Ltd.
Head Office EMC Lab. No.2 Semi Anechoic Chamber

Company : SATO CORPORATION	Report No. : 27IE0037-HO
Equipment : BARCODE PRINTER	Regulation : FCC Part15 Subpart C 15.247(d)
Model : MB400i-B1	Test distance : 3/1m
Sample No. : 3	Date : 04/10/2007 04/11/2007
Power : AC 120V / 60Hz	Temperature : 22deg.C 23deg.C
Mode : Bluetooth, Tx 2480MHz	Humidity : 31% 31%
Remarks : Hor X-axis / Ver Y-axis	Engineer : Takahiro Hatakeda Tomotaka Sasagawa

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

No.	FREQ	S/A READING		ANT Factor	AMP GAIN	CABLE LOSS	Hi-Pass Filter	RESULT		Limit PK	MARGIN	
		HOR	VER					HOR	VER		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	1239.5	49.4	51.8	25.0	33.5	2.1	0.0	43.0	45.4	74.0	31.0	28.6
2	1769.6	49.6	46.9	26.2	32.8	2.7	0.0	45.7	43.0	74.0	28.3	31.0
3	2483.5	51.0	51.4	27.2	32.3	3.1	0.0	49.0	49.4	74.0	25.0	24.6
4	4960.0	44.0	42.3	31.5	31.6	4.6	0.0	48.5	46.8	74.0	25.5	27.2
5	7440.0	43.1	42.8	36.2	31.4	5.4	0.5	53.8	53.5	74.0	20.2	20.5
6	9920.0	43.3	43.6	38.9	32.0	6.2	0.7	57.1	57.4	74.0	16.9	16.6
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
7	24800.0	42.2	42.8	40.8	30.5	10.7	0.0	53.7	54.3	74.0	20.3	19.7

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

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	Hi-Pass Filter [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
		HOR	VER					HOR	VER		HOR	VER
		[dBuV]						[dBuV/m]			[dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss												
1	1239.5	42.5	47.5	25.0	33.5	2.1	0.0	36.1	41.1	54.0	17.9	12.9
2	1769.6	42.9	34.6	26.2	32.8	2.7	0.0	39.0	30.7	54.0	15.0	23.3
3	2483.5	36.8	37.7	27.2	32.3	3.1	0.0	34.8	35.7	54.0	19.2	18.3
4	4960.0	32.3	29.5	31.5	31.6	4.6	0.0	36.8	34.0	54.0	17.2	20.0
5	7440.0	29.8	29.8	36.2	31.4	5.4	0.5	40.5	40.5	54.0	13.5	13.5
6	9920.0	30.3	30.3	38.9	32.0	6.2	0.7	44.1	44.1	54.0	9.9	9.9
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + Cable Loss + Filter Loss - Dfac												
7	24800.0	31.1	31.9	40.8	30.5	10.7	0.0	42.6	43.4	54.0	11.4	10.6

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5dB

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

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

*The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

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

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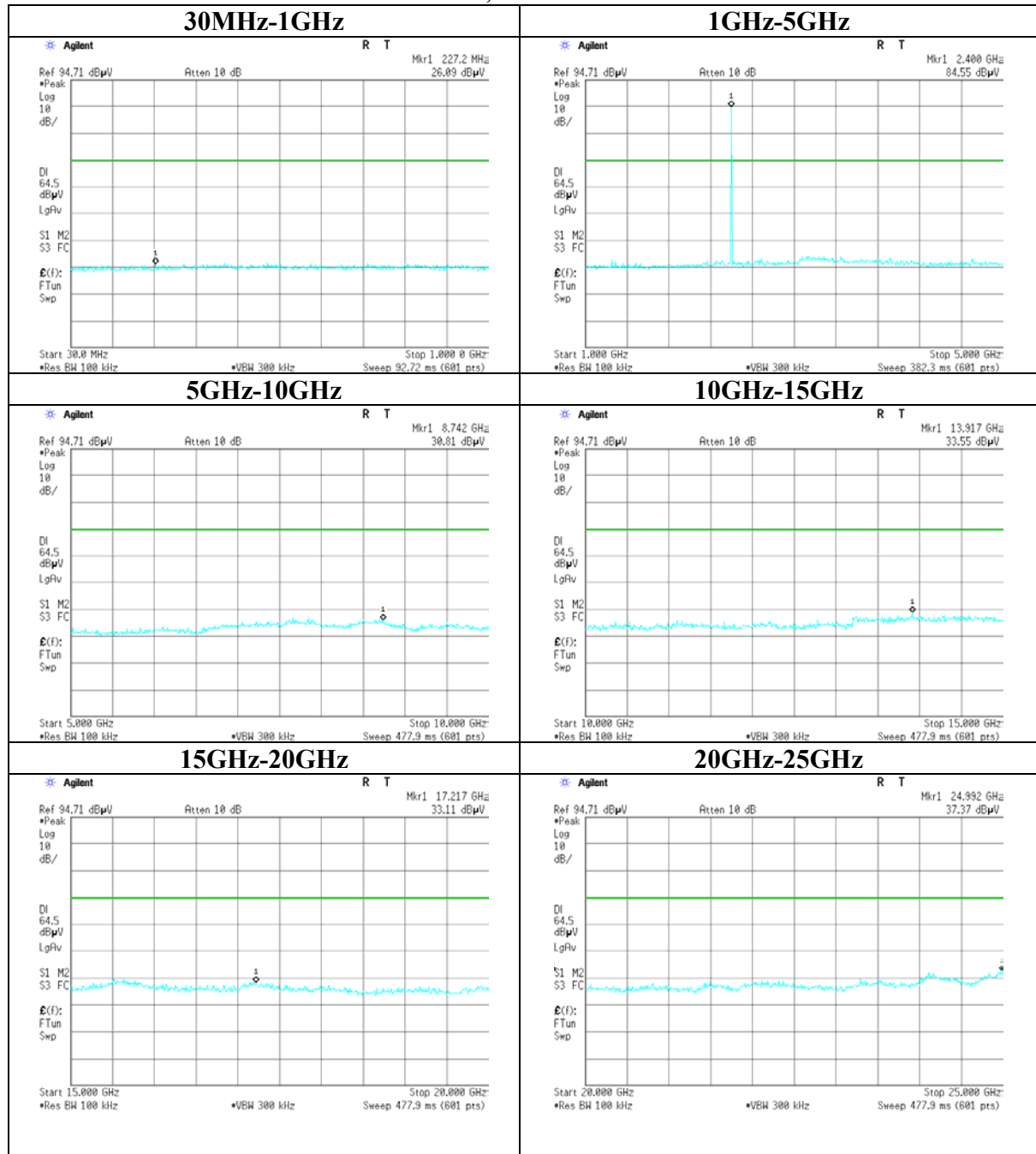
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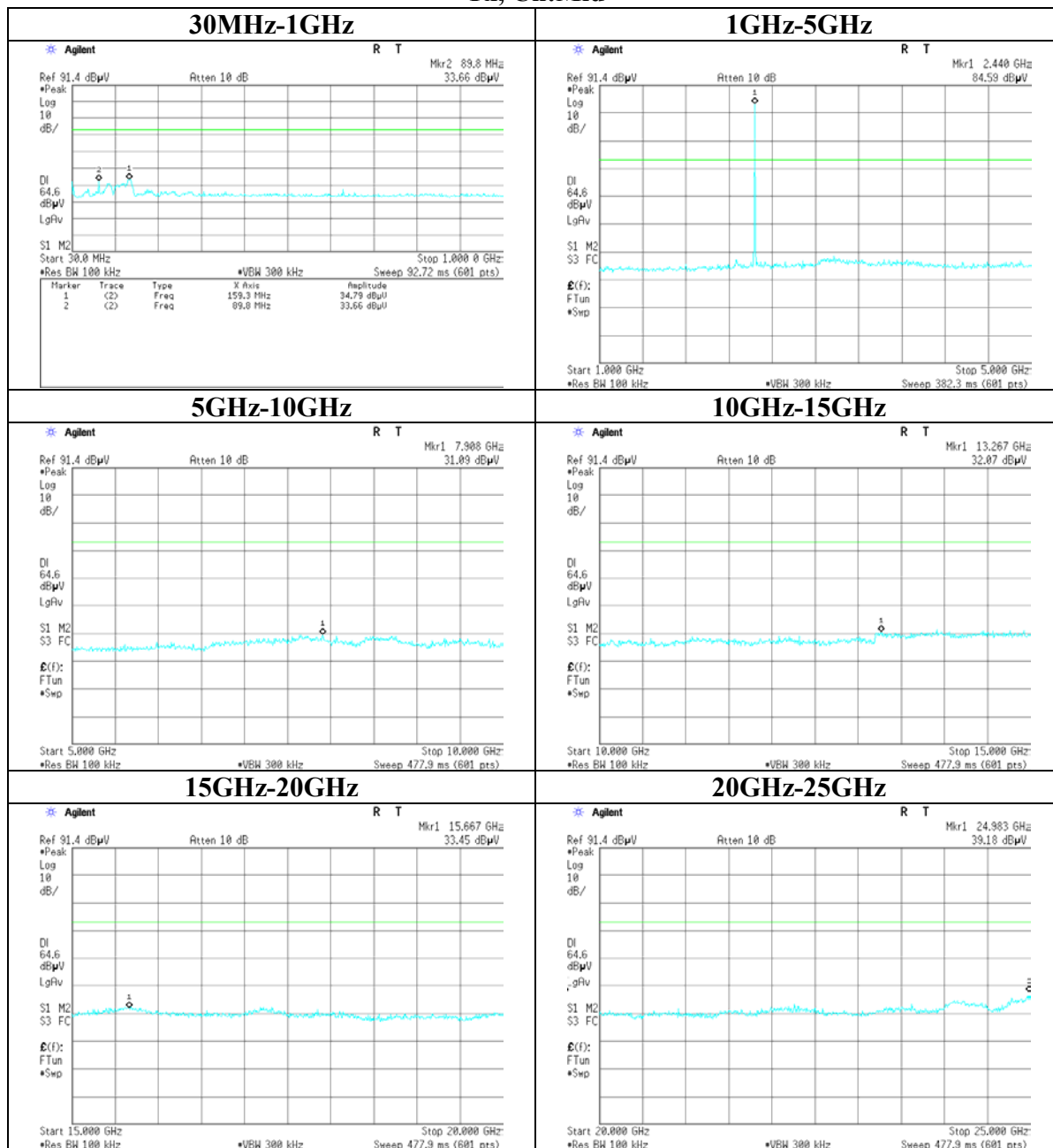
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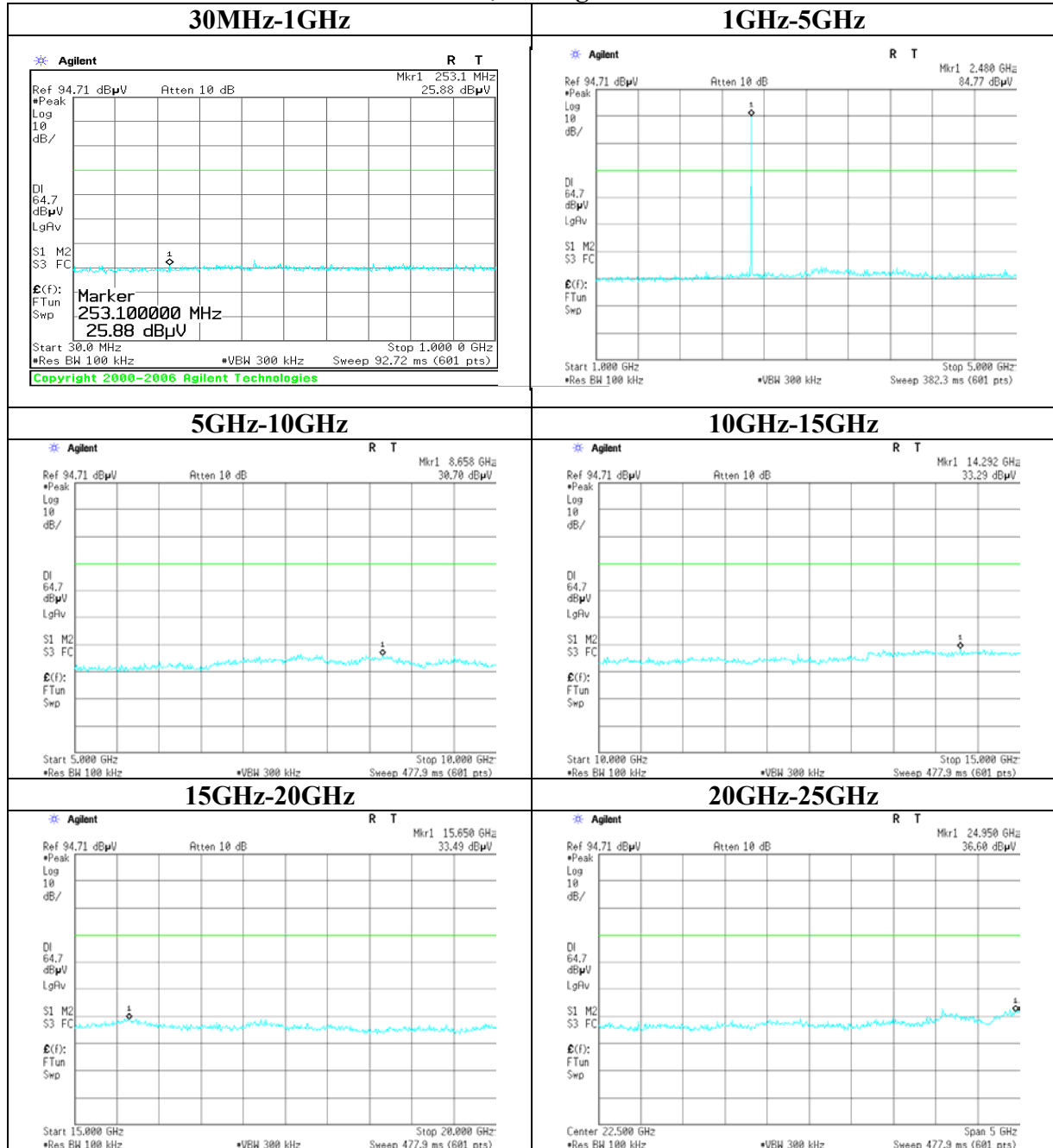
Conducted Spurious Emission Tx, Ch:Low



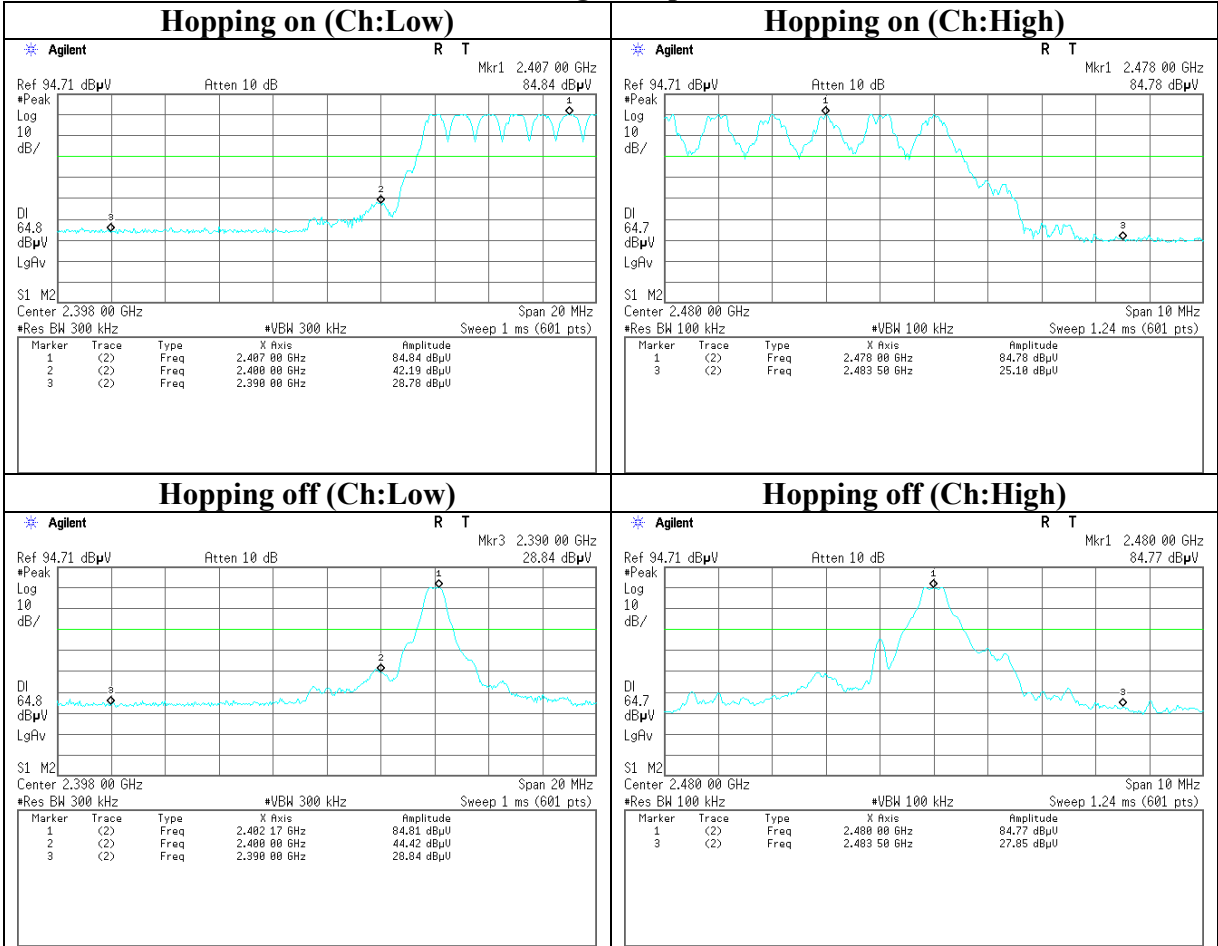
Conducted Spurious Emission Tx, Ch:Mid



Conducted Spurious Emission Tx, Ch:High



Conducted Spurious Emission
Band Edge compliance



APPENDIX 3:Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/CE	2007/04/02 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	RE/CE	2006/11/27 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/CE	-
MJM-05	Measure	PROMART	SEN1955	RE/CE	-
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2007/01/30 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	RE	2006/08/29 * 12
MCC-16	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX 104	RE	2007/02/22 * 12
MPA-10	Pre Amplifier	Agilent	8449B	RE	2006/09/11 * 12
MHF-06	High Pass Filter 3.5-24GHz	Tokimec	TF323DCA	RE	2006/05/20 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	RE	2006/09/13 * 12
MHA-02	Horn Antenna	EMCO	3160-09	RE(MW)	2007/01/30 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE (EUT)	2007/02/22 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE (AE)	2007/02/22 * 12
MTA-06	Terminator	MCL	BTRM-50	CE	2007/02/01 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2007/02/27 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	CE	2007/03/01 * 12
MCC-28	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX101	AT	2006/08/30 * 12
MAT-23	Attenuator(10dB) DC-18GHz	Orient Microwave	BX10-0476-00	AT	2007/03/07 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2006/10/07 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	RE	2006/10/07 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2006/12/27 * 12
MPA-09	Pre Amplifier	Agilent	8447D	RE	2006/09/07 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2007/02/27 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	RE	2006/05/20 * 12
MTR-05	Test Receiver	Rohde & Schwarz	ESVS30	RE	2006/05/10 * 12
MPM-09	Power Meter	Anritsu	ML2495A	AT	2006/09/20 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	AT	2006/06/02 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	AT	2006/09/20 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	AT	2006/01/19 * 24

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.

Test Item: CE: Conducted Emission

RE: Radiated Emission

AT: Antenna Terminal Conducted test

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