

APPENDIX 2: Data of EMI test

Conducted emission
[Antenna terminal: 50 ohm terminated]

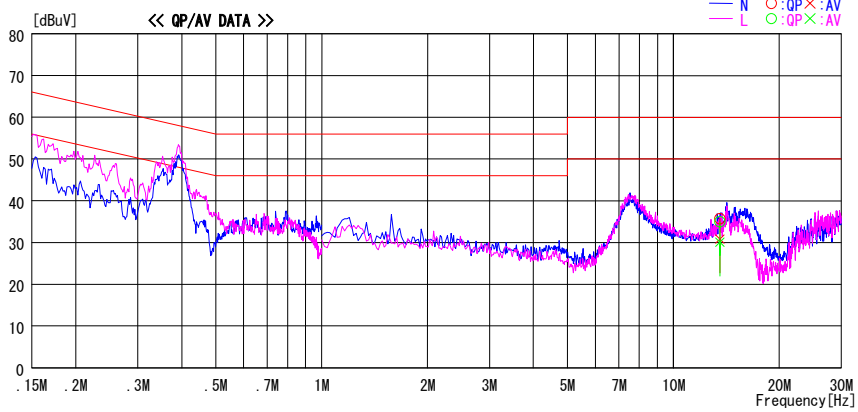
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 22deg. C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Communication with PLC, ANT:50ohm terminated

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
13.56000	34.1	29.2	1.6	35.7	30.8	60.0	50.0	24.3	19.2	N
13.56000	33.4	28.5	1.6	35.0	30.1	60.0	50.0	25.0	19.9	L

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

*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
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Conducted emission
[Antenna: V680-HS65-W (2.0m), with Tag]

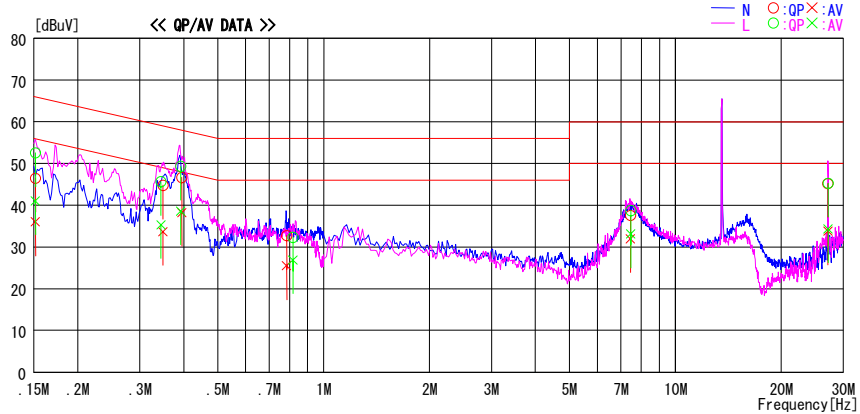
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Communication with PLC, ANT:HS65-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15152	46.2	35.7	0.3	46.5	36.0	65.9	55.9	19.4	19.9	N
0.34950	44.5	33.4	0.3	44.8	33.7	59.0	49.0	14.2	15.3	N
0.39545	46.3	37.9	0.3	46.6	38.2	57.9	47.9	11.3	9.7	N
0.78430	32.3	25.1	0.4	32.7	25.5	56.0	46.0	23.3	20.5	N
7.44543	36.4	30.8	1.2	37.6	32.0	60.0	50.0	22.4	18.0	N
27.12036	42.8	31.4	2.4	45.2	33.8	60.0	50.0	14.8	16.2	N
0.15150	52.2	40.7	0.3	52.5	41.0	65.9	55.9	13.4	14.9	L
0.34481	45.4	35.0	0.3	45.7	35.3	59.1	49.1	13.4	13.8	L
0.39248	49.0	38.3	0.3	49.3	38.6	58.0	48.0	8.7	9.4	L
0.81812	31.9	26.5	0.4	32.3	26.9	56.0	46.0	23.7	19.1	L
7.46761	37.5	31.9	1.2	38.7	33.1	60.0	50.0	21.3	16.9	L
27.15454	42.9	31.9	2.4	45.3	34.3	60.0	50.0	14.7	15.7	L

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

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

Conducted emission
[Antenna: V680-HS65-W (2.0m), without Tag]

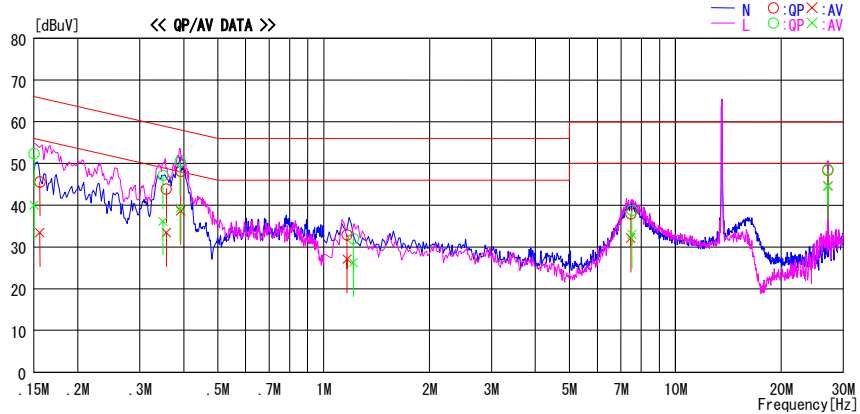
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Communication with PLC, ANT:HS65-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15595	45.3	33.1	0.3	45.6	33.4	65.7	55.7	20.1	22.3	N
0.35712	43.6	33.1	0.3	43.9	33.4	58.8	48.8	14.9	15.4	N
0.39217	47.8	38.4	0.3	48.1	38.7	58.0	48.0	9.9	9.3	N
1.16592	32.5	26.7	0.4	32.9	27.1	56.0	46.0	23.1	18.9	N
7.46351	36.8	30.9	1.2	38.0	32.1	60.0	50.0	22.0	17.9	N
27.12024	46.0	42.2	2.4	48.4	44.6	60.0	50.0	11.6	5.4	N
0.15026	52.1	39.7	0.3	52.4	40.0	66.0	56.0	13.6	16.0	L
0.34908	46.9	35.8	0.3	47.2	36.1	59.0	49.0	11.8	12.9	L
0.39092	50.2	39.0	0.3	50.5	39.3	58.0	48.0	7.5	8.7	L
1.21378	31.6	25.8	0.4	32.0	26.2	56.0	46.0	24.0	19.8	L
7.52279	37.6	31.8	1.2	38.8	33.0	60.0	50.0	21.2	17.0	L
27.11968	46.2	42.2	2.4	48.6	44.6	60.0	50.0	11.4	5.4	L

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

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Conducted emission
[Antenna: V680-HS63-W (12.5m), with Tag]

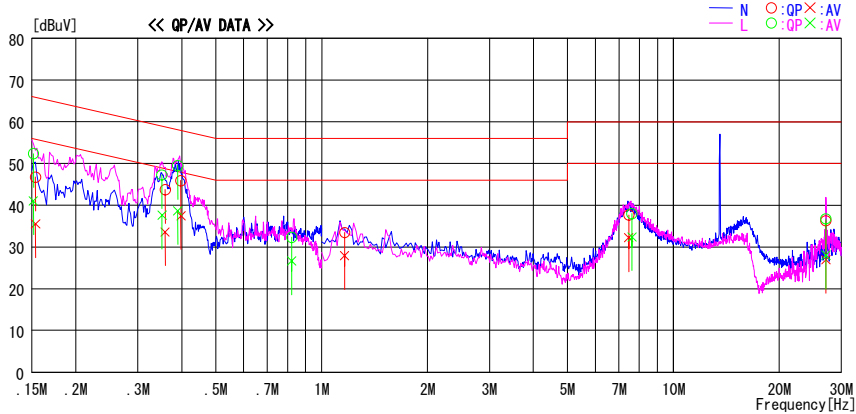
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Communication with PLC, ANT:HS63-W 12.5m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15376	46.4	35.2	0.3	46.7	35.5	65.8	55.8	19.1	20.3	N
0.35916	43.4	33.3	0.3	43.7	33.6	58.7	48.7	15.0	15.1	N
0.39811	45.6	37.2	0.3	45.9	37.5	57.9	47.9	12.0	10.4	N
1.16181	33.1	27.5	0.4	33.5	27.9	56.0	46.0	22.5	18.1	N
7.46682	36.5	31.0	1.2	37.7	32.2	60.0	50.0	22.3	17.8	N
27.12032	33.9	24.6	2.4	36.3	27.0	60.0	50.0	23.7	23.0	N
0.15162	52.1	40.7	0.3	52.4	41.0	65.9	55.9	13.5	14.9	L
0.35184	47.0	37.3	0.3	47.3	37.6	58.9	48.9	11.6	11.3	L
0.38948	49.2	38.4	0.3	49.5	38.7	58.1	48.1	8.6	9.4	L
0.82180	31.9	26.2	0.4	32.3	26.6	56.0	46.0	23.7	19.4	L
7.62547	36.8	31.2	1.2	38.0	32.4	60.0	50.0	22.0	17.6	L
27.12004	34.4	25.6	2.4	36.8	28.0	60.0	50.0	23.2	22.0	L

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

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

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Conducted emission
[Antenna: V680-HS63-W (12.5m), without Tag]

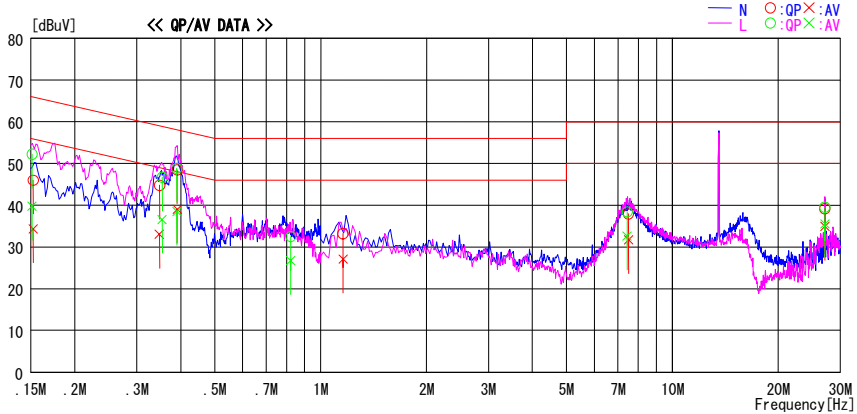
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Communication with PLC, ANT:HS63-W 12.5m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15231	45.7	34.0	0.3	46.0	34.3	65.9	55.9	19.9	21.6	N
0.34836	44.5	32.7	0.3	44.8	33.0	59.0	49.0	14.2	16.0	N
0.39108	48.2	38.7	0.3	48.5	39.0	58.0	48.0	9.5	9.0	N
1.15763	32.8	26.7	0.4	33.2	27.1	56.0	46.0	22.8	18.9	N
7.50210	36.7	30.5	1.2	37.9	31.7	60.0	50.0	22.1	18.3	N
27.12002	36.8	32.5	2.4	39.2	34.9	60.0	50.0	20.8	15.1	N
0.15120	51.9	39.4	0.3	52.2	39.7	65.9	55.9	13.7	16.2	L
0.35436	46.4	36.3	0.3	46.7	36.6	58.9	48.9	12.2	12.3	L
0.39018	48.5	38.2	0.3	48.8	38.5	58.1	48.1	9.3	9.6	L
0.82122	32.1	26.3	0.4	32.5	26.7	56.0	46.0	23.5	19.3	L
7.42846	37.2	31.4	1.2	38.4	32.6	60.0	50.0	21.6	17.4	L
27.12003	37.1	33.1	2.4	39.5	35.5	60.0	50.0	20.5	14.5	L

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

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

Conducted emission
[Antenna: V680-HS2-W (2.0m), with Tag]

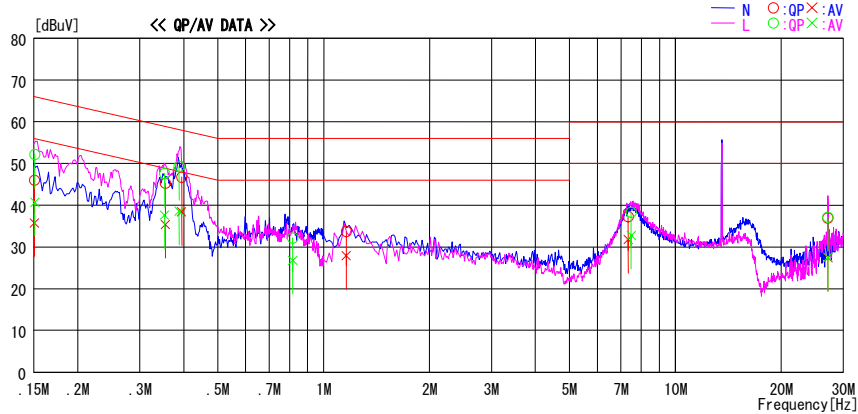
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg. C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Communication with PLC, ANT:HS2-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15061	45.7	35.5	0.3	46.0	35.8	66.0	56.0	20.0	20.2	N
0.35496	45.0	35.1	0.3	45.3	35.4	58.8	48.8	13.5	13.4	N
0.39507	46.4	38.1	0.3	46.7	38.4	58.0	48.0	11.3	9.6	N
1.15862	33.3	27.5	0.4	33.7	27.9	56.0	46.0	22.3	18.1	N
7.34112	36.1	30.6	1.2	37.3	31.8	60.0	50.0	22.7	18.2	N
27.11894	34.5	25.0	2.4	36.9	27.4	60.0	50.0	23.1	22.6	N
0.15103	51.8	40.4	0.3	52.1	40.7	65.9	55.9	13.8	15.2	L
0.35286	47.3	37.3	0.3	47.6	37.6	58.9	48.9	11.3	11.3	L
0.38821	49.0	38.3	0.3	49.3	38.6	58.1	48.1	8.8	9.5	L
0.81698	31.8	26.4	0.4	32.2	26.8	56.0	46.0	23.8	19.2	L
7.48890	37.1	31.6	1.2	38.3	32.8	60.0	50.0	21.7	17.2	L
27.12058	34.7	25.1	2.4	37.1	27.5	60.0	50.0	22.9	22.5	L

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

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

Conducted emission
[Antenna: V680-HS52-W (2.0m), without Tag]

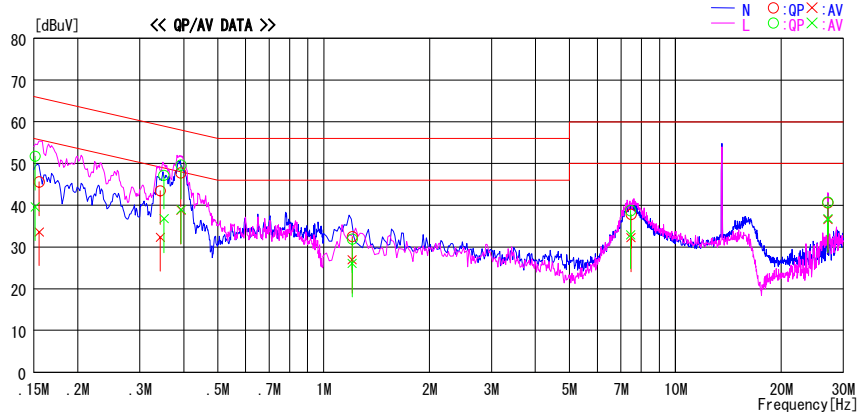
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
 Date : 2008/02/01

Company : OMRON Corporation
 Kind of EUT : RFID System
 Model No. : V680-HAM42-DRT
 Serial No. : 6
 Report No. : 28DE0079-HO-01
 Power : DC 24.0V(AC120V / 60Hz)
 Temp./Humi. : 22deg. C / 30%
 Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Communication with PLC, ANT:HS52-W 2m

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15545	45.3	33.3	0.3	45.6	33.6	65.7	55.7	20.1	22.1	N
0.34321	43.2	32.0	0.3	43.5	32.3	59.1	49.1	15.6	16.8	N
0.39264	47.5	38.5	0.3	47.8	38.8	58.0	48.0	10.2	9.2	N
1.20655	32.1	26.6	0.4	32.5	27.0	56.0	46.0	23.5	19.0	N
7.47675	36.6	31.0	1.2	37.8	32.2	60.0	50.0	22.2	17.8	N
27.12012	38.2	34.2	2.4	40.6	36.6	60.0	50.0	19.4	13.4	N
0.15131	51.4	39.3	0.3	51.7	39.6	65.9	55.9	14.2	16.3	L
0.35172	46.9	36.4	0.3	47.2	36.7	58.9	48.9	11.7	12.2	L
0.39337	49.3	38.6	0.3	49.6	38.9	58.0	48.0	8.4	9.1	L
1.20632	31.5	25.7	0.4	31.9	26.1	56.0	46.0	24.1	19.9	L
7.46025	37.5	31.7	1.2	38.7	32.9	60.0	50.0	21.3	17.1	L
27.12048	38.3	34.4	2.4	40.7	36.8	60.0	50.0	19.3	13.2	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT[dBuV]=READING[dBuV]+C.F[dB] (LISN LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

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Conducted emission
[Antenna: V680-HS51, with Tag]

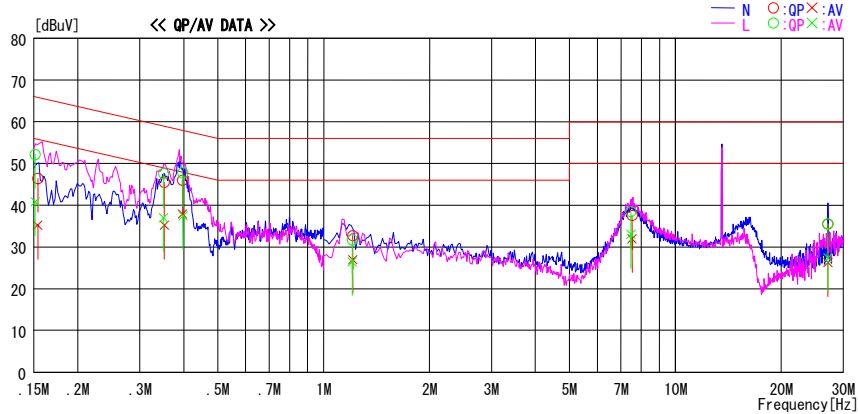
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Communication with PLC, ANT:HS51 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15382	46.1	34.9	0.3	46.4	35.2	65.8	55.8	19.4	20.6	N
0.35256	45.2	34.9	0.3	45.5	35.2	58.9	48.9	13.4	13.7	N
0.39727	45.7	37.6	0.3	46.0	37.9	57.9	47.9	11.9	10.0	N
1.21021	32.3	26.6	0.4	32.7	27.0	56.0	46.0	23.3	19.0	N
7.52871	36.4	30.8	1.2	37.6	32.0	60.0	50.0	22.4	18.0	N
27.12005	33.1	23.8	2.4	35.5	26.2	60.0	50.0	24.5	23.8	N
0.15131	51.8	40.5	0.3	52.1	40.8	65.9	55.9	13.8	15.1	L
0.35064	47.3	36.7	0.3	47.6	37.0	58.9	48.9	11.3	11.9	L
0.39812	47.5	37.2	0.3	47.8	37.5	57.9	47.9	10.1	10.4	L
1.20587	31.3	26.0	0.4	31.7	26.4	56.0	46.0	24.3	19.6	L
7.47641	37.3	31.8	1.2	38.5	33.0	60.0	50.0	21.5	17.0	L
27.12022	33.2	25.0	2.4	35.6	27.4	60.0	50.0	24.4	22.6	L

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

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Conducted emission
[Antenna: V680-HS51, without Tag]

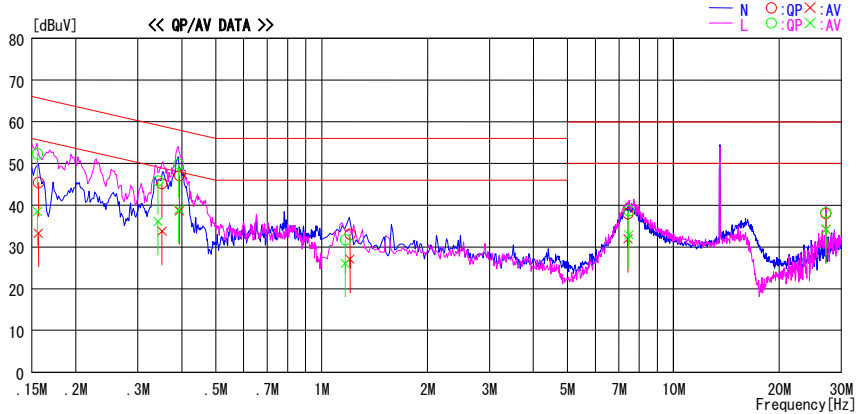
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 22deg.C / 30%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Communication with PLC, ANT:HS51 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]	
0.15671	45.1	33.0	0.3	45.4	33.3	65.6	55.6	20.2	22.3	N
0.35167	44.9	33.5	0.3	45.2	33.8	58.9	48.9	13.7	15.1	N
0.39405	46.8	38.4	0.3	47.1	38.7	58.0	48.0	10.9	9.3	N
1.20316	32.7	26.7	0.4	33.1	27.1	56.0	46.0	22.9	18.9	N
7.42456	36.8	30.8	1.2	38.0	32.0	60.0	50.0	22.0	18.0	N
27.12002	35.7	31.8	2.4	38.1	34.2	60.0	50.0	21.9	15.8	N
0.15561	52.0	38.2	0.3	52.3	38.5	65.7	55.7	13.4	17.2	L
0.34265	45.5	35.8	0.3	45.8	36.1	59.1	49.1	13.3	13.0	L
0.39256	49.6	38.7	0.3	49.9	39.0	58.0	48.0	8.1	9.0	L
1.16745	31.3	25.7	0.4	31.7	26.1	56.0	46.0	24.3	19.9	L
7.47586	37.5	31.7	1.2	38.7	32.9	60.0	50.0	21.3	17.1	L
27.11988	35.8	31.8	2.4	38.2	34.2	60.0	50.0	21.8	15.8	L

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT[dBuV]=READING[dBuV]+C.F[dB] (LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS65-W (2.0m), with Tag]

DATA OF RADIATED EMISSION TEST

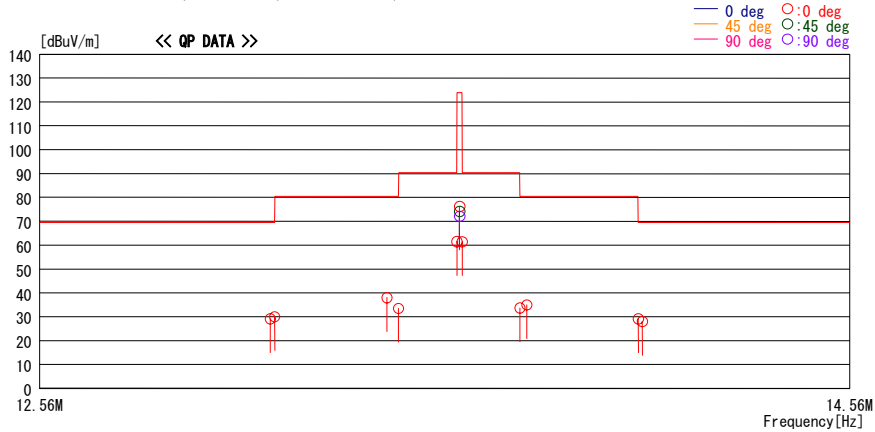
UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6

Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS65-W 2m Y-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	40.3	QP	20.2	0.8	32.2	29.1	69.5	40.4	0deg	176	
13.11000	41.2	QP	20.2	0.8	32.2	30.0	69.5	39.5	0deg	176	
13.38200	49.2	QP	20.2	0.8	32.2	38.0	80.5	42.5	0deg	176	
13.41000	44.8	QP	20.2	0.8	32.2	33.6	80.5	46.9	0deg	176	
13.55300	72.8	QP	20.2	0.8	32.2	61.6	90.4	28.8	0deg	176	
13.56000	83.4	QP	20.2	0.8	32.2	72.2	123.9	51.7	90deg	238	
13.56000	87.5	QP	20.2	0.8	32.2	76.3	123.9	47.6	0deg	176	Worst
13.56000	85.3	QP	20.2	0.8	32.2	74.1	123.9	49.8	45deg	336	
13.56700	72.6	QP	20.2	0.8	32.2	61.4	90.4	29.0	0deg	176	
13.71000	44.9	QP	20.2	0.8	32.2	33.7	80.5	46.8	0deg	176	
13.72700	46.1	QP	20.2	0.8	32.2	34.9	80.5	45.6	0deg	176	
14.01000	40.2	QP	20.3	0.8	32.2	29.1	69.5	40.4	0deg	176	
14.02000	39.1	QP	20.3	0.8	32.2	28.0	69.5	41.5	0deg	176	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS65-W (2.0m), without Tag]

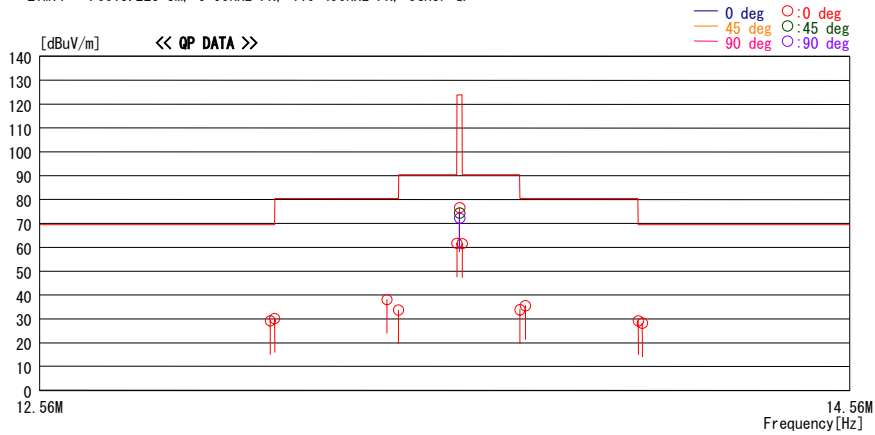
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS65-W 2m Y-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	40.3	QP	20.2	0.8	32.2	29.1	69.5	40.4	Odeg	188	
13.11000	41.3	QP	20.2	0.8	32.2	30.1	69.5	39.4	Odeg	188	
13.38200	49.3	QP	20.2	0.8	32.2	38.1	80.5	42.4	Odeg	188	
13.41000	44.9	QP	20.2	0.8	32.2	33.7	80.5	46.8	Odeg	188	
13.55300	72.9	QP	20.2	0.8	32.2	61.7	90.4	28.7	Odeg	188	
13.56000	85.6	QP	20.2	0.8	32.2	74.4	123.9	49.5	45deg	340	
13.56000	87.8	QP	20.2	0.8	32.2	76.6	123.9	47.3	Odeg	188	Worst
13.56000	83.5	QP	20.2	0.8	32.2	72.3	123.9	51.6	90deg	248	
13.56700	72.7	QP	20.2	0.8	32.2	61.5	90.4	28.9	Odeg	188	
13.71000	45.0	QP	20.2	0.8	32.2	33.8	80.5	46.7	Odeg	188	
13.72400	46.7	QP	20.2	0.8	32.2	35.5	80.5	45.0	Odeg	188	
14.01000	40.2	QP	20.3	0.8	32.2	29.1	69.5	40.4	Odeg	188	
14.02000	39.2	QP	20.3	0.8	32.2	28.1	69.5	41.4	Odeg	188	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below :adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS63-W (2.0m), with Tag]

DATA OF RADIATED EMISSION TEST

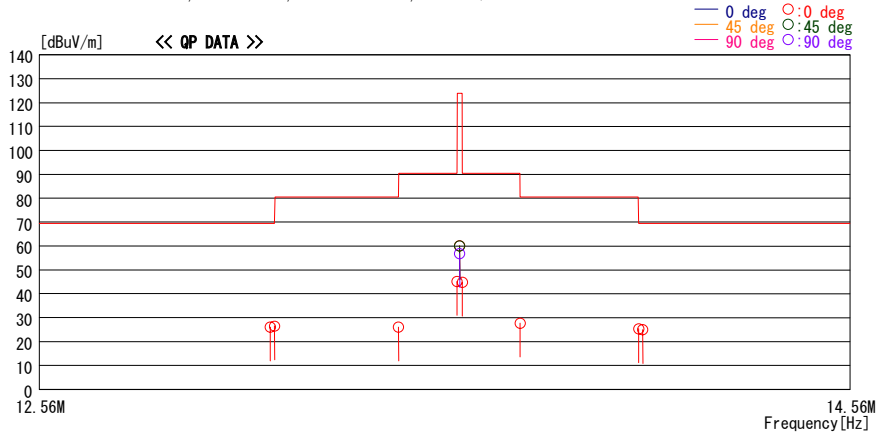
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6

Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks: Transmitting with Tag, ANT:HS63-W 2m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	37.2	QP	20.2	0.8	32.2	26.0	69.5	43.5	0deg	173	
13.11000	37.6	QP	20.2	0.8	32.2	26.4	69.5	43.1	0deg	173	
13.41000	37.2	QP	20.2	0.8	32.2	26.0	80.5	54.5	0deg	173	
13.55300	56.3	QP	20.2	0.8	32.2	45.1	90.4	45.3	0deg	173	
13.56000	71.2	QP	20.2	0.8	32.2	60.0	123.9	63.9	45deg	173	
13.56000	68.1	QP	20.2	0.8	32.2	56.9	123.9	67.0	90deg	117	
13.56000	71.3	QP	20.2	0.8	32.2	60.1	123.9	63.8	0deg	173	Worst
13.56700	56.1	QP	20.2	0.8	32.2	44.9	90.4	45.5	0deg	173	
13.71000	38.9	QP	20.2	0.8	32.2	27.7	80.5	52.8	0deg	173	
14.01000	36.4	QP	20.3	0.8	32.2	25.3	69.5	44.2	0deg	173	
14.02000	36.1	QP	20.3	0.8	32.2	25.0	69.5	44.5	0deg	173	

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS63-W (2.0m), without Tag]

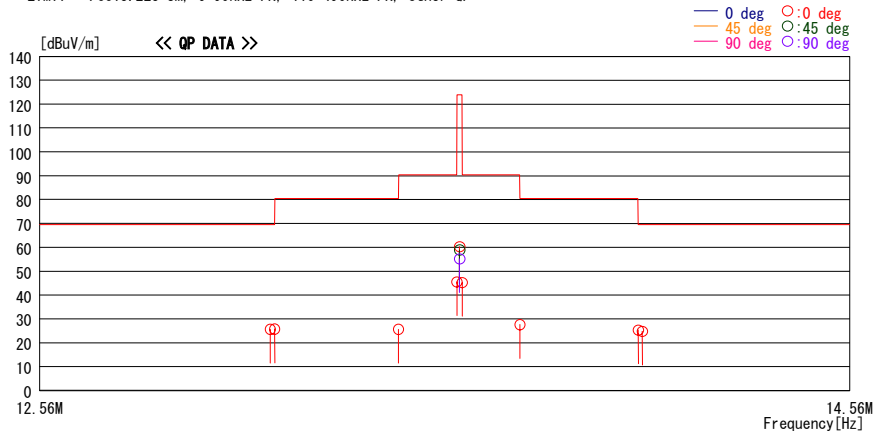
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS63-W 2m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	36.8	QP	20.2	0.8	32.2	25.6	69.5	43.9	0deg	331	
13.11000	37.0	QP	20.2	0.8	32.2	25.8	69.5	43.7	0deg	331	
13.41000	36.8	QP	20.2	0.8	32.2	25.6	80.5	54.9	0deg	331	
13.55300	56.7	QP	20.2	0.8	32.2	45.5	90.4	44.9	0deg	331	
13.56000	71.5	QP	20.2	0.8	32.2	60.3	123.9	63.6	0deg	186	Worst
13.56000	70.1	QP	20.2	0.8	32.2	58.9	123.9	65.0	45deg	171	
13.56000	66.3	QP	20.2	0.8	32.2	55.1	123.9	68.8	90deg	120	
13.56700	56.5	QP	20.2	0.8	32.2	45.3	90.4	45.1	0deg	186	
13.71000	38.8	QP	20.2	0.8	32.2	27.6	80.5	52.9	0deg	186	
14.01000	36.5	QP	20.3	0.8	32.2	25.4	69.5	44.1	0deg	186	
14.02000	35.9	QP	20.3	0.8	32.2	24.8	69.5	44.7	0deg	186	

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS52-W (12.5m), with Tag]

DATA OF RADIATED EMISSION TEST

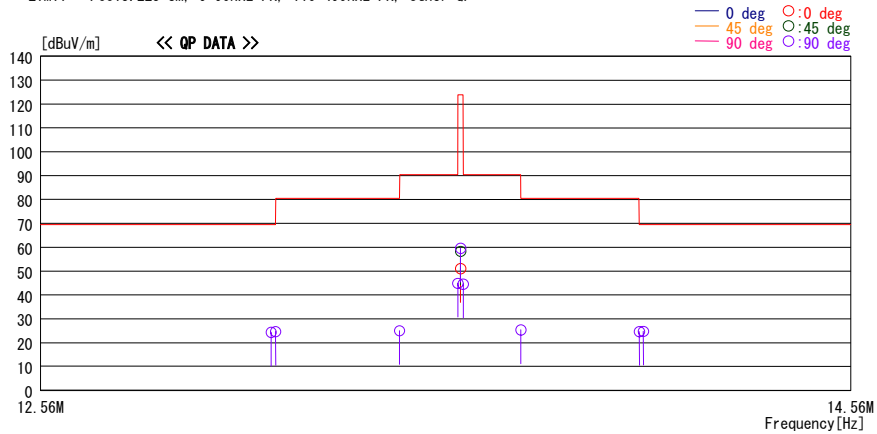
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6

Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS52-W 12.5m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	35.5	QP	20.2	0.8	32.2	24.3	69.5	45.2	90deg	245	
13.11000	35.8	QP	20.2	0.8	32.2	24.6	69.5	44.9	90deg	245	
13.41000	36.3	QP	20.2	0.8	32.2	25.1	80.5	55.4	90deg	245	
13.55300	56.0	QP	20.2	0.8	32.2	44.8	90.4	45.6	90deg	245	
13.56000	69.5	QP	20.2	0.8	32.2	58.3	123.9	65.6	45deg	310	
13.56000	70.7	QP	20.2	0.8	32.2	59.5	123.9	64.4	90deg	245	Worst
13.56000	62.3	QP	20.2	0.8	32.2	51.1	123.9	72.8	0deg	351	
13.56700	55.8	QP	20.2	0.8	32.2	44.6	90.4	45.8	90deg	245	
13.71000	36.5	QP	20.2	0.8	32.2	25.3	80.5	55.2	90deg	245	
14.01000	35.7	QP	20.3	0.8	32.2	24.6	69.5	44.9	90deg	245	
14.02000	35.8	QP	20.3	0.8	32.2	24.7	69.5	44.8	90deg	245	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS52-W (12.5m), without Tag]

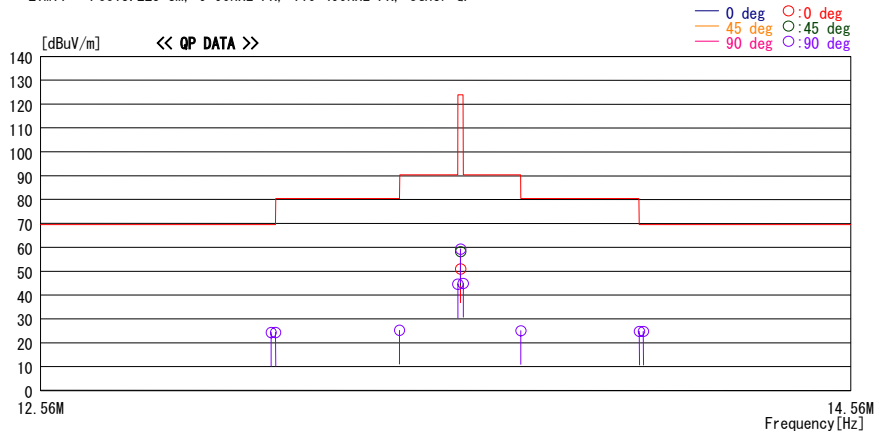
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS52-W 12.5m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	35.6	QP	20.2	0.8	32.2	24.4	69.5	45.1	90deg	239	
13.11000	35.6	QP	20.2	0.8	32.2	24.4	69.5	45.1	90deg	239	
13.41000	36.4	QP	20.2	0.8	32.2	25.2	80.5	55.3	90deg	239	
13.55300	55.8	QP	20.2	0.8	32.2	44.6	90.4	45.8	90deg	239	
13.56000	62.1	QP	20.2	0.8	32.2	50.9	123.9	73.0	0deg	359	
13.56000	69.4	QP	20.2	0.8	32.2	58.2	123.9	65.7	45deg	324	
13.56000	70.4	QP	20.2	0.8	32.2	59.2	123.9	64.7	90deg	239	Worst
13.56700	56.0	QP	20.2	0.8	32.2	44.8	90.4	45.6	90deg	239	
13.71000	36.3	QP	20.2	0.8	32.2	25.1	80.5	55.4	90deg	239	
14.01000	35.8	QP	20.3	0.8	32.2	24.7	69.5	44.8	90deg	239	
14.02000	35.8	QP	20.3	0.8	32.2	24.7	69.5	44.8	90deg	239	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS51 (2.0m), with Tag]

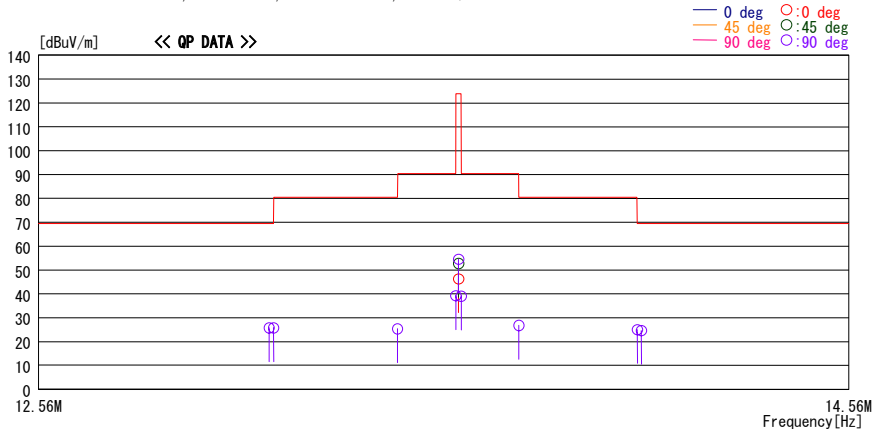
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS51 2m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15, 225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	36.9	QP	20.2	0.8	32.2	25.7	69.5	43.8	90deg	127	
13.11000	36.9	QP	20.2	0.8	32.2	25.7	69.5	43.8	90deg	127	
13.41000	36.5	QP	20.2	0.8	32.2	25.3	80.5	55.2	90deg	127	
13.55300	50.4	QP	20.2	0.8	32.2	39.2	90.4	51.2	90deg	127	
13.56000	57.4	QP	20.2	0.8	32.2	46.2	123.9	77.7	0deg	183	
13.56000	63.9	QP	20.2	0.8	32.2	52.7	123.9	71.2	45deg	155	
13.56000	65.6	QP	20.2	0.8	32.2	54.4	123.9	69.5	90deg	127	Worst
13.56700	50.2	QP	20.2	0.8	32.2	39.0	90.4	51.4	90deg	127	
13.71000	37.9	QP	20.2	0.8	32.2	26.7	80.5	53.8	90deg	127	
14.01000	36.1	QP	20.3	0.8	32.2	25.0	69.5	44.5	90deg	127	
14.02000	35.7	QP	20.3	0.8	32.2	24.6	69.5	44.9	90deg	127	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTN. - AMP.)

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

Radiated emission(Fundamental emission and Spectrum Mask)
[Antenna: V680-HS51 (2.0m), without Tag]

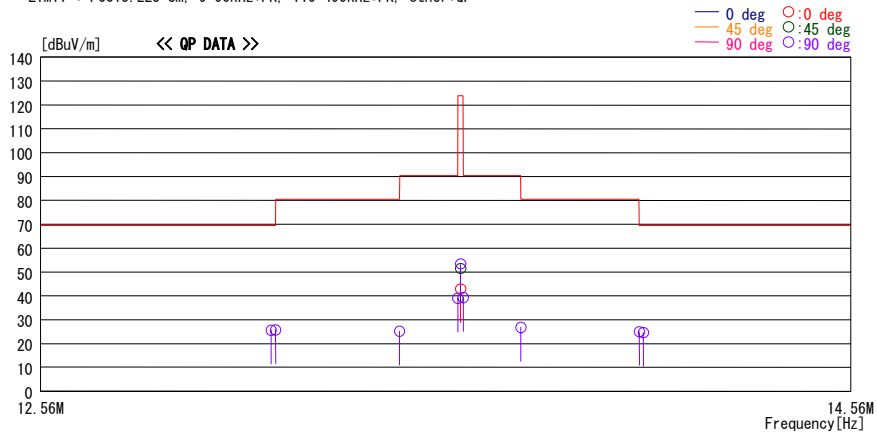
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/01

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS51 2m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15, 225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
13.10000	36.8	QP	20.2	0.8	32.2	25.6	69.5	43.9	90deg	125	
13.11000	36.9	QP	20.2	0.8	32.2	25.7	69.5	43.8	90deg	125	
13.41000	36.4	QP	20.2	0.8	32.2	25.2	80.5	55.3	90deg	125	
13.55300	50.2	QP	20.2	0.8	32.2	39.0	90.4	51.4	90deg	125	
13.56000	54.0	QP	20.2	0.8	32.2	42.8	123.9	81.1	0deg	175	
13.56000	62.7	QP	20.2	0.8	32.2	51.5	123.9	72.4	45deg	146	
13.56000	64.7	QP	20.2	0.8	32.2	53.5	123.9	70.4	90deg	125	Worst
13.56700	50.5	QP	20.2	0.8	32.2	39.3	90.4	51.1	90deg	125	
13.71000	37.9	QP	20.2	0.8	32.2	26.7	80.5	53.8	90deg	125	
14.01000	36.2	QP	20.3	0.8	32.2	25.1	69.5	44.4	90deg	125	
14.02000	35.7	QP	20.3	0.8	32.2	24.6	69.5	44.9	90deg	125	

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS65-W (12.5m), with Tag]

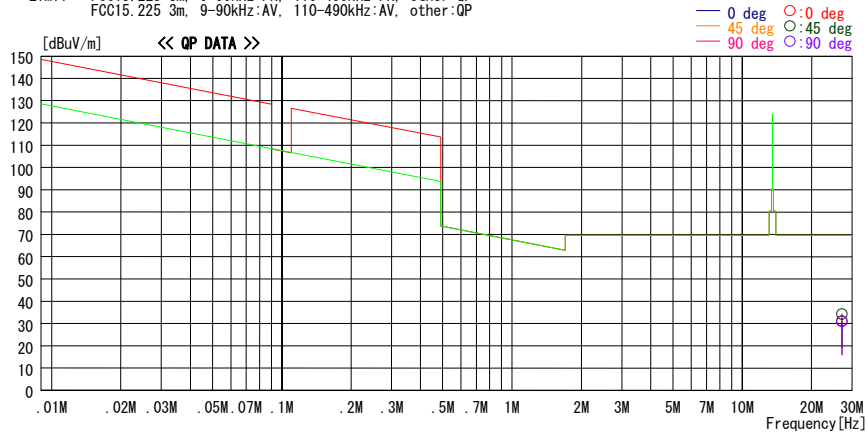
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
 Kind of EUT : RFID System
 Model No. : V680-HAM42-DRT
 Serial No. : 6
 Report No. : 28DE0079-HO-01
 Power : DC 24.0V (AC 120V / 60Hz)
 Temp. / Humi. : 24deg. C. / 38%
 Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS65-W 12.5m Y-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15 225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15 225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]
27.12000	41.8	QP	20.6	1.1	32.2	31.3	69.5	38.2	0deg	3
27.12000	44.8	QP	20.6	1.1	32.2	34.3	69.5	35.2	45deg	342
27.12000	41.4	QP	20.6	1.1	32.2	30.9	69.5	38.6	90deg	4

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below : adequate margin data below the limits.
 CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS65-W (12.5m), without Tag]

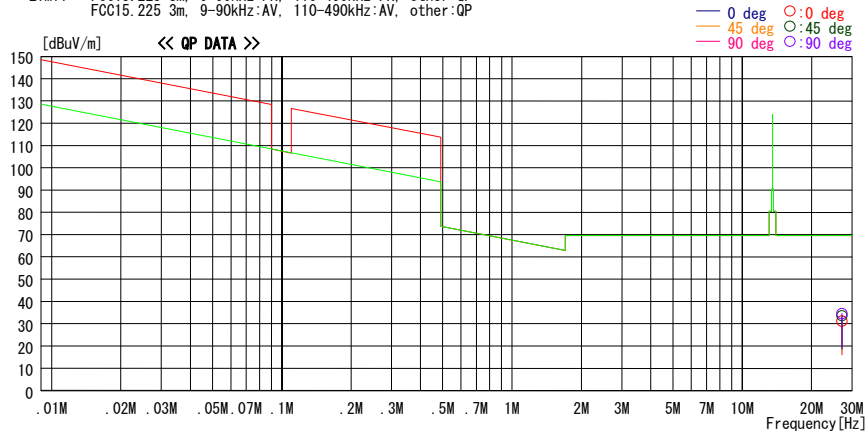
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS65-W 12.5m Y-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]
27.12000	41.8	QP	20.6	1.1	32.2	31.3	69.5	38.2	0deg	2
27.12000	44.2	QP	20.6	1.1	32.2	33.7	69.5	35.8	45deg	314
27.12000	45.0	QP	20.6	1.1	32.2	34.5	69.5	35.0	90deg	351

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below : adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS63-W (12.5m), with Tag]

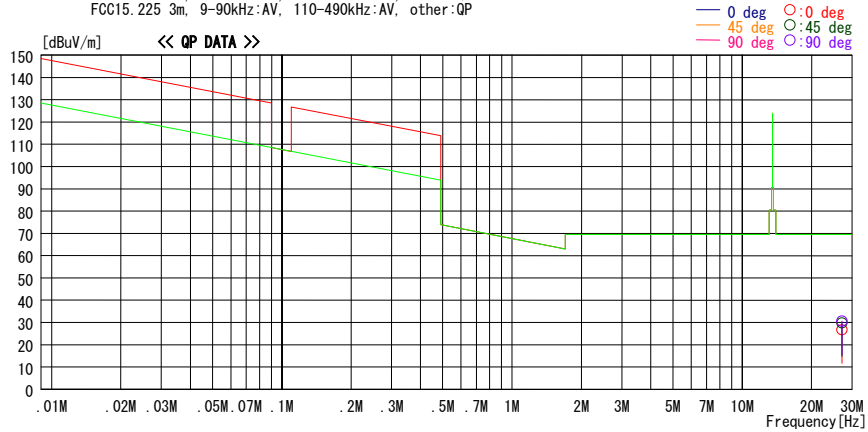
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS63-W 12.5m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table
			[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		
27.12000	37.4	QP	20.6	1.1	32.2	26.9	69.5	42.6	0deg	218
27.12000	40.4	QP	20.6	1.1	32.2	29.9	69.5	39.6	45deg	209
27.12000	41.1	QP	20.6	1.1	32.2	30.6	69.5	38.9	90deg	362

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS63-W (12.5m), without Tag]

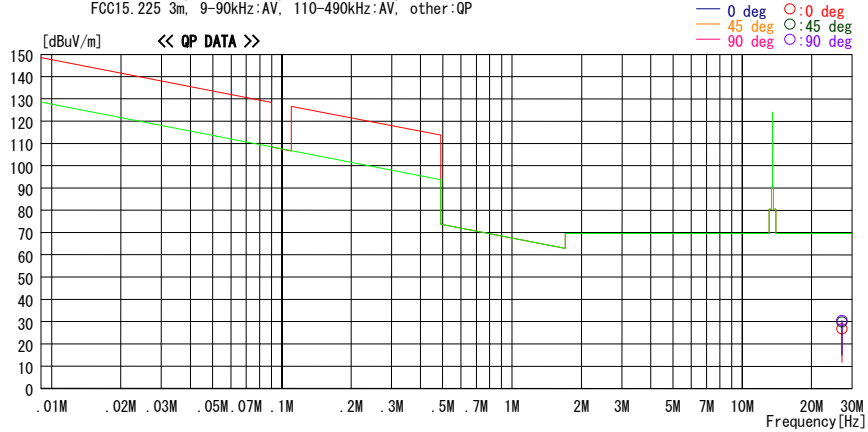
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2008/02/02

Company : OMRON Corporation
 Kind of EUT : RFID System
 Model No. : V680-HAM42-DRT
 Serial No. : 6
 Report No. : 28DE0079-HO-01
 Power : DC 24.0V (AC 120V / 60Hz)
 Temp./ Humi. : 24deg. C. / 38%
 Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS63-W 12.5m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna	Table
										[deg]
27.12000	37.4	QP	20.6	1.1	32.2	26.9	69.5	-42.6	0deg	188
27.12000	40.3	QP	20.6	1.1	32.2	29.8	69.5	-39.7	45deg	217
27.12000	41.1	QP	20.6	1.1	32.2	30.6	69.5	-38.9	90deg	352

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
 CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS52-W (2.0m), with Tag]

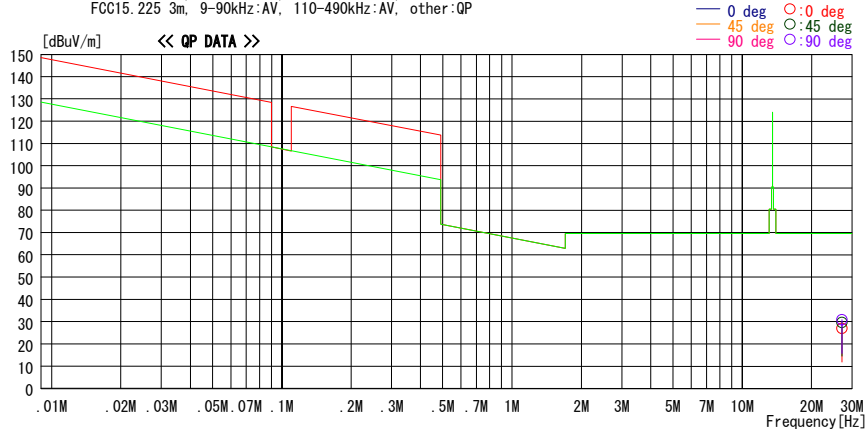
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2008/02/02

Company : OMRON Corporation
 Kind of EUT : RFID System
 Model No. : V680-HAM42-DRT
 Serial No. : 6
 Report No. : 28DE0079-HO-01
 Power : DC 24.0V (AC 120V / 60Hz)
 Temp./ Humi. : 24deg. C. / 38%
 Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS52-W 2m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna	Table
										[deg]
27.12000	37.5	QP	20.6	1.1	32.2	27.0	69.5	-42.5	0deg	132
27.12000	40.2	QP	20.6	1.1	32.2	29.7	69.5	-39.8	45deg	301
27.12000	41.5	QP	20.6	1.1	32.2	31.0	69.5	-38.5	90deg	223

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
 CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS52-W (2.0m), without Tag]

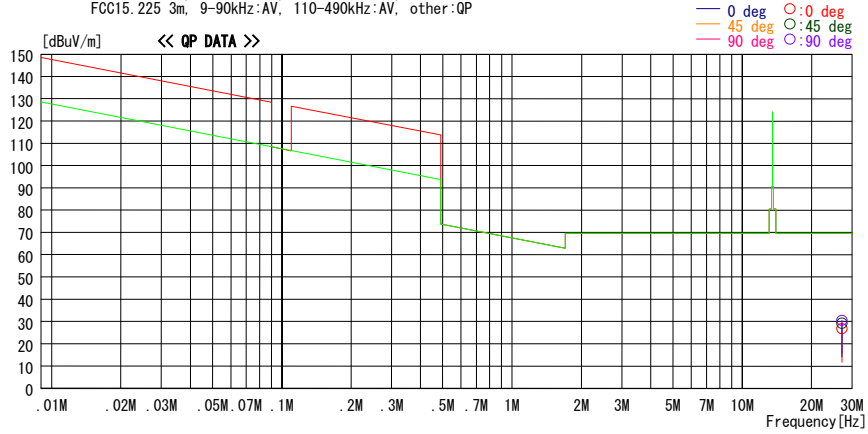
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS52-W 2m Z-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table
			[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		
27.12000	37.3	QP	20.6	1.1	32.2	26.8	69.5	42.7	0deg	128
27.12000	39.8	QP	20.6	1.1	32.2	29.3	69.5	40.2	45deg	336
27.12000	41.1	QP	20.6	1.1	32.2	30.6	69.5	38.9	90deg	212

CHART: WITH FACTOR, ANT TYPE: LOOP, Except for the data below: adequate margin data below the limits.
CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS51 (2.0m), with Tag]

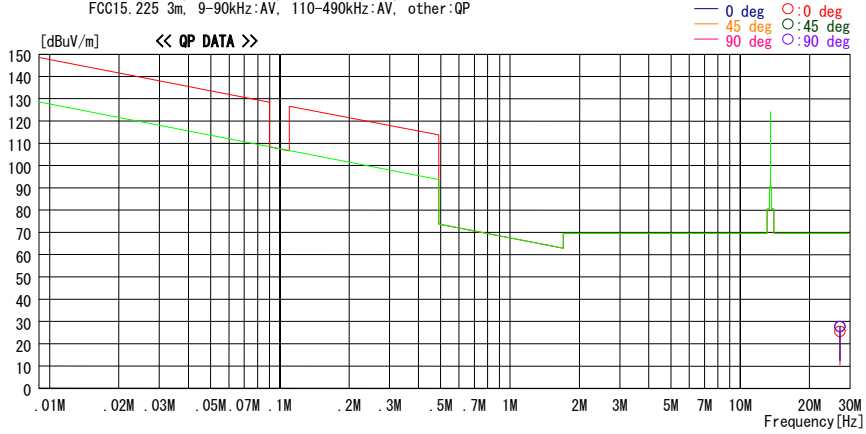
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/02/02

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp./ Humi. : 24deg. C. / 38%
Operator : Shinya Watanabe

Mode / Remarks : Transmitting with Tag, ANT:HS51 2m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table
			[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		
27.12000	36.1	QP	20.6	1.1	32.2	25.6	69.5	43.9	0deg	10
27.12000	38.3	QP	20.6	1.1	32.2	27.8	69.5	41.7	45deg	278
27.12000	38.2	QP	20.6	1.1	32.2	27.7	69.5	41.8	90deg	182

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
CALCULATION: RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission : below 30MHz)
[Antenna: V680-HS51 (2.0m), without Tag]

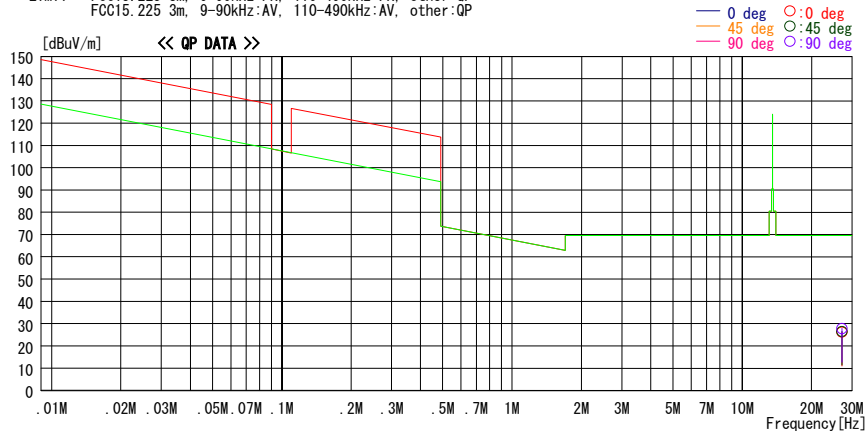
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2008/02/02

Company : OMRON Corporation
 Kind of EUT : RFID System
 Model No. : V680-HAM42-DRT
 Serial No. : 6
 Report No. : 28DE0079-HO-01
 Power : DC 24.0V (AC 120V / 60Hz)
 Temp./ Humi. : 24deg. C. / 38%
 Operator : Shinya Watanabe

Mode / Remarks : Transmitting without Tag, ANT:HS51 2m X-axis, V680-HAM42-DRT Z-axis

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15.225 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq. [MHz]	Reading [dBuV]	DET	Ant. Fac [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Antenna	Table
										[deg]
27.12000	36.7	QP	20.6	1.1	32.2	26.2	69.5	43.3	0deg	208
27.12000	37.1	QP	20.6	1.1	32.2	26.6	69.5	42.9	45deg	271
27.12000	38.4	QP	20.6	1.1	32.2	27.9	69.5	41.6	90deg	192

CHART: WITH FACTOR, ANT TYPE: LOOP. Except for the data below: adequate margin data below the limits.
 CALCULATION : RESULT[dBuV] = READING[dBuV] + ANT FACTOR[dB] + LOSS[dB] (CABLE + ATTEN. - AMP.)

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

Radiated emission (Spurious emission: above 30MHz)
Antenna: V680-HS65-W (12.5m), with Tag]

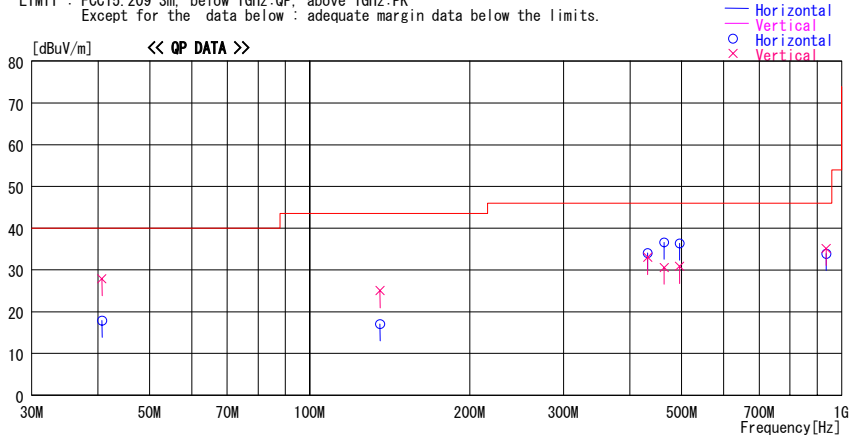
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Antenna:HS65-W 12.5m Y-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain							
40.681	29.2	QP	13.5	-24.8	17.9	195	320	Hori.	40.0	22.1	
40.694	39.2	QP	13.5	-24.8	27.9	277	100	Vert.	40.0	12.1	
135.601	34.2	QP	14.3	-23.5	25.0	326	100	Vert.	43.5	18.5	
135.608	26.3	QP	14.3	-23.5	17.1	359	297	Hori.	43.5	26.4	
431.949	37.5	QP	17.7	-21.2	34.0	39	100	Hori.	46.0	12.0	
431.949	36.5	QP	17.7	-21.2	33.0	231	122	Vert.	46.0	13.0	
463.933	33.5	QP	18.1	-21.0	30.6	55	141	Vert.	46.0	15.4	
463.936	39.5	QP	18.1	-21.0	36.6	327	100	Hori.	46.0	9.4	
495.941	38.8	QP	18.4	-20.8	36.4	321	100	Hori.	46.0	9.6	
495.942	33.2	QP	18.4	-20.8	30.8	281	127	Vert.	46.0	15.2	
935.634	29.2	QP	22.3	-17.6	33.9	201	100	Hori.	46.0	12.1	
935.638	30.4	QP	22.3	-17.6	35.1	282	119	Vert.	46.0	10.9	

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 emission (Spurious emission : above 30MHz)
[Antenna: V680-HS65-W (12.5m), without Tag]

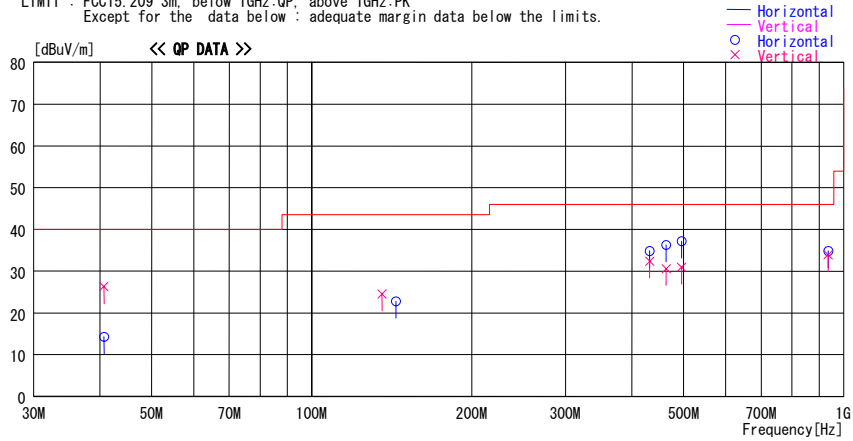
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazutumi Nakai

Mode / Remarks : Transmitting without Tag, Antenna:HS65-W 12.5m Y-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
40.684	25.6	QP	13.5	-24.8	14.3	179	301	Hori.	40.0	25.7	
40.691	37.6	QP	13.5	-24.8	26.3	142	100	Vert.	40.0	13.7	
135.607	33.7	QP	14.3	-23.5	24.5	331	100	Vert.	43.5	19.0	
143.991	31.3	QP	14.9	-23.4	22.8	7	300	Hori.	43.5	20.7	
431.944	38.3	QP	17.7	-21.2	34.8	34	100	Hori.	46.0	11.2	
431.946	35.9	QP	17.7	-21.2	32.4	224	138	Vert.	46.0	13.6	
463.944	39.2	QP	18.1	-21.0	36.3	324	100	Hori.	46.0	9.7	
463.950	33.5	QP	18.1	-21.0	30.6	55	132	Vert.	46.0	15.4	
495.937	33.3	QP	18.4	-20.8	30.9	282	126	Vert.	46.0	15.1	
495.938	39.6	QP	18.4	-20.8	37.2	325	100	Hori.	46.0	8.8	
935.632	30.1	QP	22.3	-17.6	34.8	199	100	Hori.	46.0	11.2	
935.638	29.2	QP	22.3	-17.6	33.9	191	117	Vert.	46.0	12.1	

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

Radiated emission (Spurious emission : above 30MHz)
[Antenna: V680-HS63-W (12.5m), with Tag]

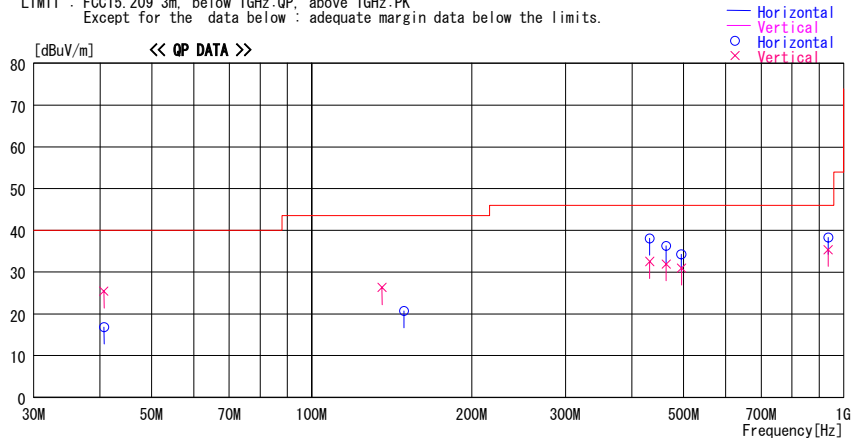
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Antenna:HS63-W 12.5m Z-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15, 209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
40.685	36.7	QP	13.5	-24.8	25.4	87	100	Vert.	40.0	14.6	
40.687	28.1	QP	13.5	-24.8	16.8	350	350	Hori.	40.0	23.2	
135.596	35.5	QP	14.3	-23.5	26.3	310	100	Vert.	43.5	17.2	
149.172	29.0	QP	15.1	-23.4	20.7	56	231	Hori.	43.5	22.8	
431.944	41.6	QP	17.7	-21.2	38.1	45	100	Hori.	46.0	7.9	
431.950	36.0	QP	17.7	-21.2	32.5	208	130	Vert.	46.0	13.5	
463.937	34.8	QP	18.1	-21.0	31.9	218	120	Vert.	46.0	14.1	
463.944	39.2	QP	18.1	-21.0	36.3	50	100	Hori.	46.0	9.7	
495.303	36.7	QP	18.4	-20.8	34.3	25	100	Hori.	46.0	11.7	
495.939	33.3	QP	18.4	-20.8	30.9	221	123	Vert.	46.0	15.1	
935.630	30.7	QP	22.3	-17.6	35.4	298	115	Vert.	46.0	10.6	
935.631	33.6	QP	22.3	-17.6	38.3	235	144	Hori.	46.0	7.7	

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 emission (Spurious emission : above 30MHz)
[Antenna: V680-HS63-W (12.5m), without Tag]

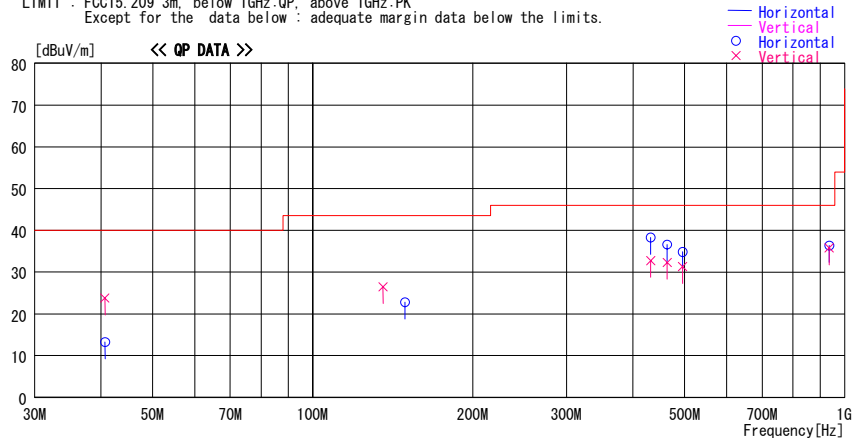
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Antenna:HS63-W 12.5m Z-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
40.681	24.6	QP	13.5	-24.8	13.3	233	281	Hori.	40.0	26.7	
40.686	35.1	QP	13.5	-24.8	23.8	277	100	Vert.	40.0	16.2	
135.607	35.7	QP	14.3	-23.5	26.5	322	100	Vert.	43.5	17.0	
149.167	31.1	QP	15.1	-23.4	22.8	38	233	Hori.	43.5	20.7	
431.946	36.2	QP	17.7	-21.2	32.7	179	100	Vert.	46.0	13.3	
431.949	41.8	QP	17.7	-21.2	38.3	30	100	Hori.	46.0	7.7	
463.939	39.5	QP	18.1	-21.0	36.6	332	100	Hori.	46.0	9.4	
463.943	35.2	QP	18.1	-21.0	32.3	218	122	Vert.	46.0	13.7	
495.933	33.7	QP	18.4	-20.8	31.3	230	124	Vert.	46.0	14.7	
495.938	37.2	QP	18.4	-20.8	34.8	45	100	Hori.	46.0	11.2	
935.623	31.7	QP	22.3	-17.6	36.4	264	145	Hori.	46.0	9.6	
935.626	31.1	QP	22.3	-17.6	35.8	286	122	Vert.	46.0	10.2	

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

Radiated emission (Spurious emission : above 30MHz)
[Antenna: V680-HS52-W (2.0m), with Tag]

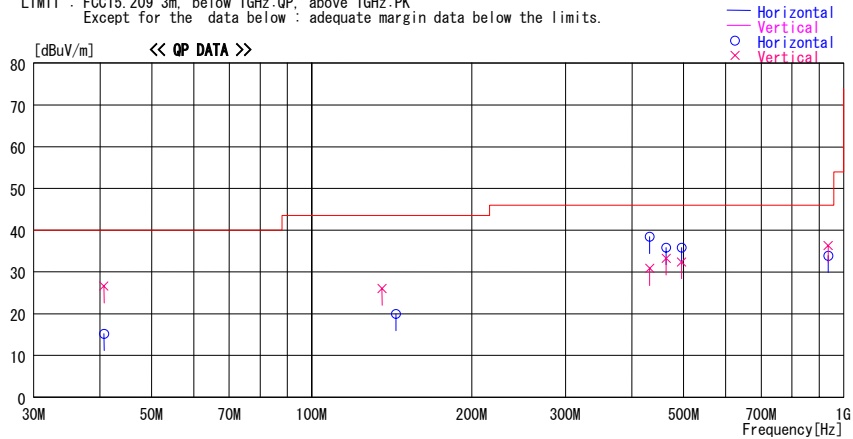
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Antenna:HS52-W 2m Z-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain							
40.678	26.5	QP	13.5	-24.8	15.2	238	331	Hori.	40.0	24.8	
40.683	37.9	QP	13.5	-24.8	26.6	299	100	Vert.	40.0	13.4	
135.603	35.2	QP	14.3	-23.5	26.0	301	100	Vert.	43.5	17.5	
143.984	28.5	QP	14.9	-23.4	20.0	359	213	Hori.	43.5	23.5	
431.945	42.0	QP	17.7	-21.2	38.5	24	100	Hori.	46.0	7.5	
431.952	34.3	QP	17.7	-21.2	30.8	312	125	Vert.	46.0	15.2	
463.944	38.7	QP	18.1	-21.0	35.8	330	100	Hori.	46.0	10.2	
463.944	36.2	QP	18.1	-21.0	33.3	41	130	Vert.	46.0	12.7	
495.935	34.8	QP	18.4	-20.8	32.4	44	133	Vert.	46.0	13.6	
495.944	38.2	QP	18.4	-20.8	35.8	348	100	Hori.	46.0	10.2	
935.631	31.6	QP	22.3	-17.6	36.3	280	125	Vert.	46.0	9.7	
935.636	29.2	QP	22.3	-17.6	33.9	11	100	Hori.	46.0	12.1	

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

Radiated emission (Spurious emission : above 30MHz)
[Antenna: V680-HS52-W (2.0m), without Tag]

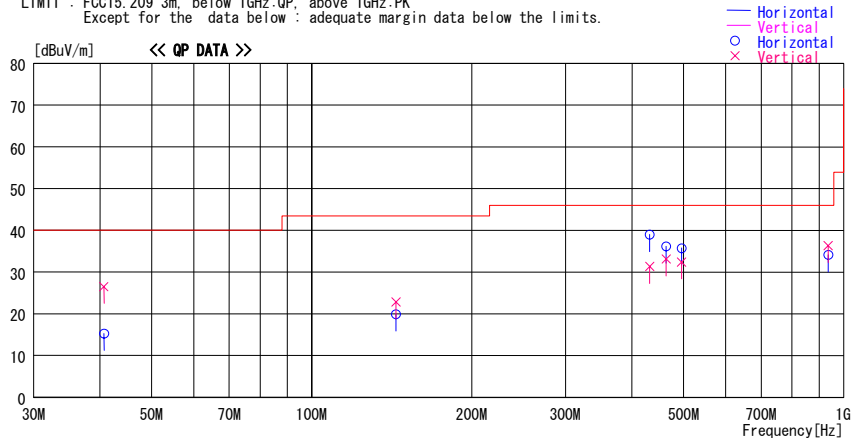
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Antenna:HS52-W 2m Z-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



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
40.686	37.8	QP	13.5	-24.8	26.5	298	100	Vert.	40.0	13.5	
40.693	26.6	QP	13.5	-24.8	15.3	252	326	Hori.	40.0	24.7	
143.971	28.4	QP	14.9	-23.4	19.9	359	236	Hori.	43.5	23.6	
143.982	31.3	QP	14.9	-23.4	22.8	284	100	Vert.	43.5	20.7	
431.602	42.5	QP	17.7	-21.2	39.0	63	100	Hori.	46.0	7.0	
431.948	34.8	QP	17.7	-21.2	31.3	218	131	Vert.	46.0	14.7	
463.941	36.0	QP	18.1	-21.0	33.1	53	137	Vert.	46.0	12.9	
463.945	39.0	QP	18.1	-21.0	36.1	322	100	Hori.	46.0	9.9	
495.931	38.1	QP	18.4	-20.8	35.7	40	100	Hori.	46.0	10.3	
495.942	34.8	QP	18.4	-20.8	32.4	43	125	Vert.	46.0	13.6	
935.633	29.4	QP	22.3	-17.6	34.1	9	100	Hori.	46.0	11.9	
935.638	31.6	QP	22.3	-17.6	36.3	276	125	Vert.	46.0	9.7	

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 emission (Spurious emission : above 30MHz)
Antenna: V680-HSS1 (2.0m), with Tag]

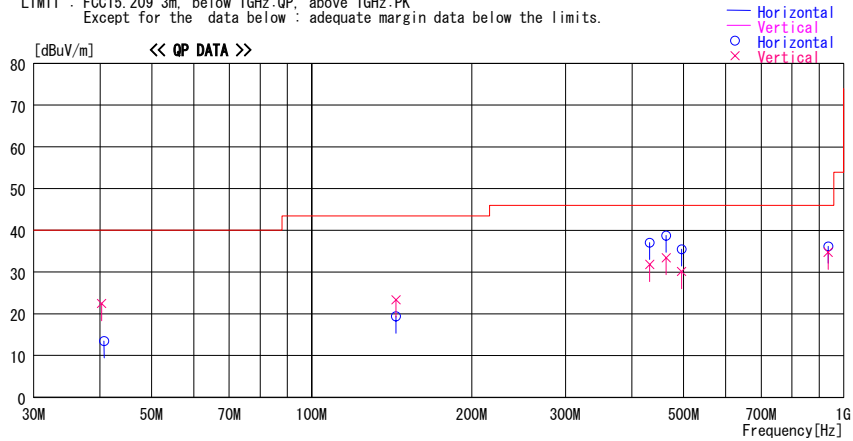
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation
Kind of EUT : RFID System
Model No. : V680-HAM42-DRT
Serial No. : 6
Report No. : 28DE0079-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 23deg. C. / 33%
Operator : Kazufumi Nakai

Mode / Remarks : Transmitting with Tag, Antenna:HS51 X-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
40.260	33.5	QP	13.7	-24.8	22.4	89	100	Vert.	40.0	17.6	
40.685	24.8	QP	13.5	-24.8	13.5	359	322	Hori.	40.0	26.5	
143.983	27.9	QP	14.9	-23.4	19.4	137	146	Hori.	43.5	24.1	
143.984	31.8	QP	14.9	-23.4	23.3	237	100	Vert.	43.5	20.2	
431.942	40.5	QP	17.7	-21.2	37.0	115	100	Hori.	46.0	9.0	
431.946	35.3	QP	17.7	-21.2	31.8	243	132	Vert.	46.0	14.2	
463.944	41.6	QP	18.1	-21.0	38.7	39	100	Hori.	46.0	7.3	
463.945	36.3	QP	18.1	-21.0	33.4	239	107	Vert.	46.0	12.6	
495.935	32.5	QP	18.4	-20.8	30.1	202	101	Vert.	46.0	15.9	
495.936	37.9	QP	18.4	-20.8	35.5	43	100	Hori.	46.0	10.5	
935.631	30.0	QP	22.3	-17.6	34.7	282	100	Vert.	46.0	11.3	
935.634	31.4	QP	22.3	-17.6	36.1	144	155	Hori.	46.0	9.9	

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 emission (Spurious emission : above 30MHz)
[Antenna: V680-HS51 (2.0m), without Tag]

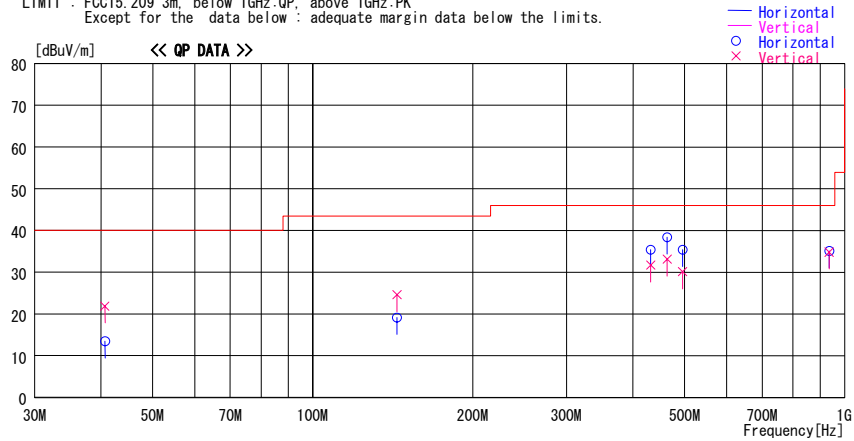
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2008/01/16

Company : OMRON Corporation Report No. : 28DE0079-HO-01
Kind of EUT : RFID System Power : DC 24.0V (AC120V / 60Hz)
Model No : V680-HAM42-DRT Temp./Humi. : 23deg. C. / 33%
Serial No. : 6 Operator : Kazufumi Nakai

Mode / Remarks : Transmitting without Tag, Antenna:HS51 X-axis, V680-HAM42-DRT:Z-axis

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
40.678	33.2	QP	13.5	-24.8	21.9	108	100	Vert.	40.0	18.1	
40.701	24.8	QP	13.5	-24.8	13.5	359	322	Hori.	40.0	26.5	
143.985	33.1	QP	14.9	-23.4	24.6	229	100	Vert.	43.5	18.9	
143.986	27.7	QP	14.9	-23.4	19.2	149	138	Hori.	43.5	24.3	
431.948	38.9	QP	17.7	-21.2	35.4	38	100	Hori.	46.0	10.6	
431.949	35.2	QP	17.7	-21.2	31.7	245	145	Vert.	46.0	14.3	
463.937	41.3	QP	18.1	-21.0	38.4	34	100	Hori.	46.0	7.6	
463.949	36.0	QP	18.1	-21.0	33.1	241	113	Vert.	46.0	12.9	
495.937	32.5	QP	18.4	-20.8	30.1	199	100	Vert.	46.0	15.9	
495.944	37.8	QP	18.4	-20.8	35.4	46	100	Hori.	46.0	10.6	
935.624	30.4	QP	22.3	-17.6	35.1	110	162	Hori.	46.0	10.9	
935.632	30.1	QP	22.3	-17.6	34.8	283	100	Vert.	46.0	11.2	

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)

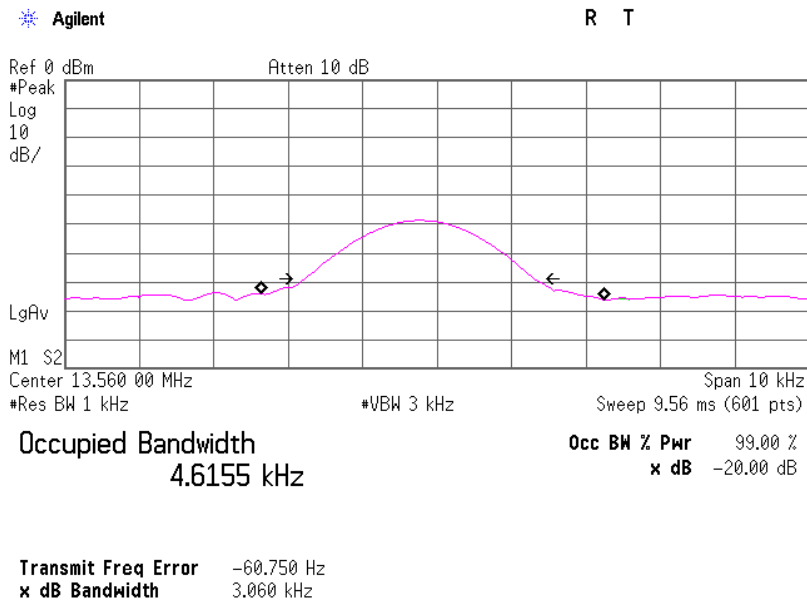
*The test result is round off to one or two decimal places, so some differences might be observed.

20dB Bandwidth

Company OMRON Corporation
 Equipment RFID System
 Model V680-HAM42-DRT
 S/N 6
 Power DC 24.0V (DC power supply: AC120V / 60Hz)
 Mode Tx 13.56MHz

UL Japan, Inc.
 Head Office EMC Lab. No.4 Semi Anechoinc Chamber
 Regulation FCC15.225 / -
 Test Distance 3m
 Date 12/19/2007
 Temperature 22 deg.C.
 Humidity 38 %
 Engineer Kazufumi Nakai

FREQ [MHz]	20dB Bandwidth [kHz]
13.56	3.060

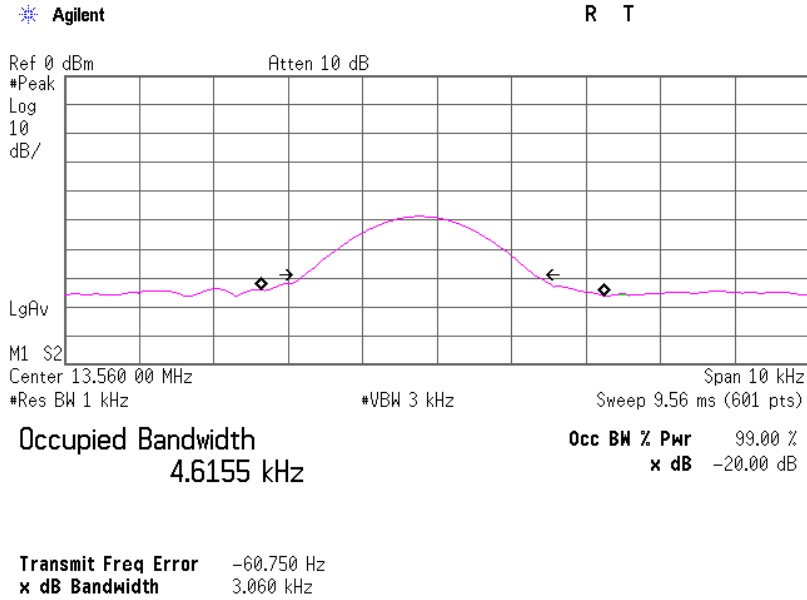


UL Japan, Inc.
Head Office EMC Lab.
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 Telephone : +81 596 24 8116
 Facsimile : +81 596 24 8124

99% Occupied Bandwidth

	UL Japan, Inc.
Company	OMRON Corporation
Equipment	RFID System
Model	V680-HAM42-DRT
S/N	6
Power	DC 24.0V (DC power supply: AC120V / 60Hz)
Mode	Tx 13.56MHz
	Head Office EMC Lab. No.4 Semi Anechoic Chamber
	Regulation RSS-Gen 4.6.1
	Test Distance 3m
	Date 12/19/2007
	Temperature 22 deg.C.
	Humidity 38 %
	Engineer Kazufumi Nakai

FREQ [MHz]	99% Occupied Bandwidth [kHz]
13.56	4.6155



UL Japan, Inc.
Head Office EMC Lab.
 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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Frequency Tolerance

Company OMRON Corporation
Equipment RFID System
Model V680-HAM42-DRT
S/N 6
Power DC 24.0V (DC power supply: AC120V / 60Hz)
Mode Continuous Transmitting (No Modulation)

UL Japan, Inc.
Head Office EMC Lab. No.6 Shielded Room
Regulation FCC15.225 (e) / RSS-210 A2.6
Test Distance -
Date 12/13/2007
Temperature 26 deg.C.
Humidity 40 %
Engineer Kazufumi Nakai

Test Condition	Test Timing	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.01%) [+/- ppm]	Margin [ppm]
T nom 20deg.C Vmax DC27.6V (115%)	Power on	13.55983891	-0.00016109	-11.88	100.00	88.12
	on 2min.	13.55984289	-0.00015711	-11.59	100.00	88.41
	on 5min.	13.55984717	-0.00015283	-11.27	100.00	88.73
	on 10min.	13.55984928	-0.00015072	-11.12	100.00	88.88
T nom 20deg.C Vnom DC24.0V (100%)	Power on	13.55985322	-0.00014678	-10.82	100.00	89.18
	on 2min.	13.55985159	-0.00014841	-10.94	100.00	89.06
	on 5min.	13.55985138	-0.00014862	-10.96	100.00	89.04
	on 10min.	13.55985177	-0.00014823	-10.93	100.00	89.07
T nom 20deg.C Vmin DC20.4V (85%)	Power on	13.55985225	-0.00014775	-10.90	100.00	89.10
	on 2min.	13.55985122	-0.00014878	-10.97	100.00	89.03
	on 5min.	13.55985121	-0.00014879	-10.97	100.00	89.03
	on 10min.	13.55985143	-0.00014857	-10.96	100.00	89.04
T max 50deg.C. Vnom DC24.0V (100%)	Power on	13.55980733	-0.00019267	-14.21	100.00	85.79
	on 2min.	13.55977476	-0.00022524	-16.61	100.00	83.39
	on 5min.	13.55977340	-0.00022660	-16.71	100.00	83.29
	on 10min.	13.55977309	-0.00022691	-16.73	100.00	83.27
40deg.C. Vnom DC24.0V (100%)	Power on	13.55981358	-0.00018642	-13.75	100.00	86.25
	on 2min.	13.55980733	-0.00019267	-14.21	100.00	85.79
	on 5min.	13.55979379	-0.00020621	-15.21	100.00	84.79
	on 10min.	13.55978871	-0.00021129	-15.58	100.00	84.42
30deg.C. Vnom DC24.0V (100%)	Power on	13.55983789	-0.00016211	-11.96	100.00	88.04
	on 2min.	13.55982778	-0.00017222	-12.70	100.00	87.30
	on 5min.	13.55982122	-0.00017878	-13.18	100.00	86.82
	on 10min.	13.55981999	-0.00018001	-13.27	100.00	86.73
20deg.C. Vnom DC24.0V (100%)	Power on	13.55987101	-0.00012899	-9.51	100.00	90.49
	on 2min.	13.55985945	-0.00014055	-10.37	100.00	89.63
	on 5min.	13.55985482	-0.00014518	-10.71	100.00	89.29
	on 10min.	13.55988390	-0.00011610	-8.56	100.00	91.44
10deg.C. Vnom DC24.0V (100%)	Power on	13.55990809	-0.00009192	-6.78	100.00	93.22
	on 2min.	13.55989452	-0.00010548	-7.78	100.00	92.22
	on 5min.	13.55988655	-0.00011345	-8.37	100.00	91.63
	on 10min.	13.55988390	-0.00011610	-8.56	100.00	91.44
0deg.C. Vnom DC24.0V (100%)	Power on	13.55992054	-0.00007946	-5.86	100.00	94.14
	on 2min.	13.55991969	-0.00008031	-5.92	100.00	94.08
	on 5min.	13.55991712	-0.00008288	-6.11	100.00	93.89
	on 10min.	13.55991579	-0.00008421	-6.21	100.00	93.79
-10deg.C. Vnom DC24.0V (100%)	Power on	13.55990802	-0.00009198	-6.78	100.00	93.22
	on 2min.	13.55991488	-0.00008512	-6.28	100.00	93.72
	on 5min.	13.55991734	-0.00008266	-6.10	100.00	93.90
	on 10min.	13.55991787	-0.00008213	-6.06	100.00	93.94
-20deg.C Vnom DC24.0V (100%)	Power on	13.55984461	-0.00015539	-11.46	100.00	88.54
	on 2min.	13.55988247	-0.00011753	-8.67	100.00	91.33
	on 5min.	13.55989445	-0.00010555	-7.78	100.00	92.22
	on 10min.	13.55990135	-0.00009865	-7.27	100.00	92.73
T min -30deg.C Vnom DC24.0V (100%)	Power on	13.55979421	-0.00020579	-15.18	100.00	84.82
	on 2min.	13.55982034	-0.00017966	-13.25	100.00	86.75
	on 5min.	13.55983132	-0.00016868	-12.44	100.00	87.56
	on 10min.	13.55983259	-0.00016741	-12.35	100.00	87.65

Limit : 13.56 MHz +/-0.01 % (+/- 100ppm) = +/- 0.001356 MHz

* for IC application (RSS-Gen 4.7 requirement)

APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/ME	2007/03/05 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2008/01/12 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2008/01/12 * 12
MAT-30	Attenuator(6dB)	TME	UFA-01	RE	2007/03/05 * 12
MCC-51	Coaxial cable	UL Japan	-	RE/ME	2007/07/26 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	RE/ME	2007/03/16 * 12
MSA-09	Spectrum Analyzer	Advantest	R3273	RE/ME	2007/12/21 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE/ME	2007/02/03 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	RE/ME	2008/01/10 * 12
MJM-06	Measure	PROMART	SEN1955	RE/ME	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/ME/CE	-
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	CE	2007/04/02 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2007/02/22 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	CE(AE)	2007/02/22 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	CE	2007/02/27 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	CE	2007/03/01 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	CE	2007/11/12 * 12
MJM-05	Measure	PROMART	SEN1955	CE	-
MTA-07	Terminator	MCL	BTRM-50	CE	2007/02/01 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2007/12/12 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	FT	2006/01/19 * 24
MCH-04	Temperature and Humidity Chamber	Espec	PL-2KP	FT	2007/08/30 * 12
MAT-17	Attenuator(20dB)_ DC-1GHz_N	Weinschel Corp	MODEL 1	FT	2007/01/11 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	FT	2007/07/04 * 12
MAEC-04	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	ME	2007/03/03 * 12
MCC-31	Coaxial cable	UL Japan	-	ME	2007/06/04 * 12
MCC-50	Coaxial cable	UL Japan	-	ME	2007/03/06 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	ME	2007/03/12 * 12
MRENT-62	Spectrum Analyzer	Agilent	E4448A	ME	2007/11/27 * 12
MJM-07	Measure	PROMART	SEN1955	ME	-
MOS-15	Thermo-Hygrometer	Custom	CTH-180	ME	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.

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
ME: Radiated Emission (below 30MHz)
RE: Radiated Emission (above 30MHz)
FT: Frequency Tolerance**

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