APPENDIX 2: Data of EMI test

Conducted emission

[Antenna terminal: 50 ohm terminated]

DATA OF CONDUCTED EMISSION TEST

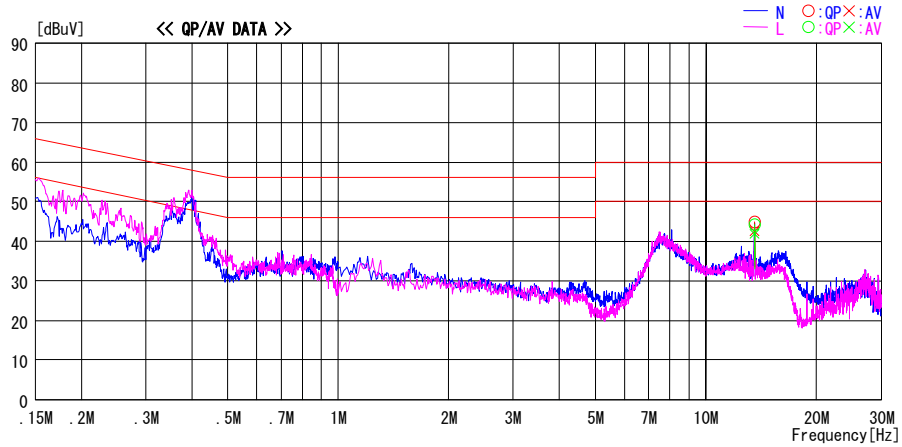
UL Japan,Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:50ohm terminated

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
13.56000	43.4	41.1	1.4	44.8	42.5	60.0	50.0	15.2	7.5	N	
13.56000	42.8	40.5	1.4	44.2	41.9	60.0	50.0	15.8	8.1	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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
Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

Conducted emission

[Antenna: V680-HS65-W (2m), without Tag]

DATA OF CONDUCTED EMISSION TEST

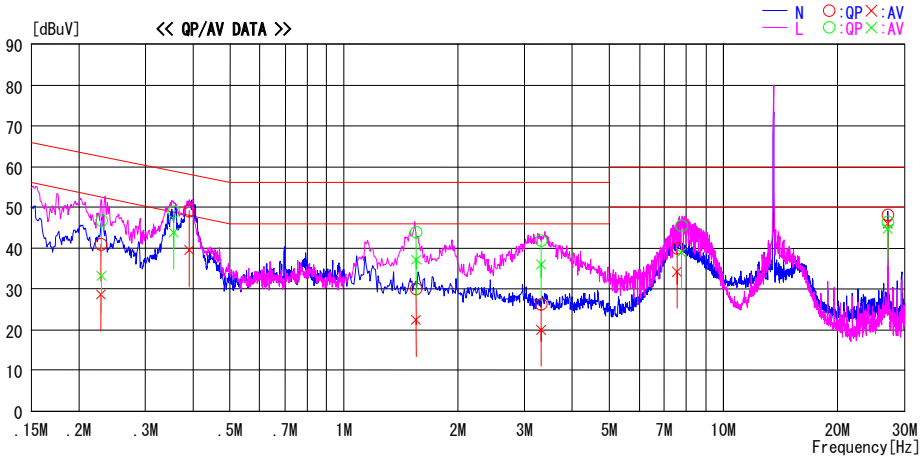
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, ANT:HS65-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.22859	40.6	28.3	0.3	40.9	28.6	62.5	52.5	21.6	23.9	N	
0.22921	46.5	32.9	0.3	46.8	33.2	62.5	52.5	15.7	19.3	L	
0.35603	48.6	43.4	0.3	48.9	43.7	58.8	48.8	9.9	5.1	L	
0.39057	48.8	39.2	0.3	49.1	39.5	58.1	48.1	9.0	8.6	N	
1.55215	29.6	22.0	0.5	30.1	22.5	56.0	46.0	25.9	23.5	N	
1.55351	43.4	36.7	0.5	43.9	37.2	56.0	46.0	12.1	8.8	L	
3.31160	41.2	35.4	0.6	41.8	36.0	56.0	46.0	14.2	10.0	L	
3.31216	25.6	19.4	0.6	26.2	20.0	56.0	46.0	29.8	26.0	N	
7.54851	39.0	33.2	1.0	40.0	34.2	60.0	50.0	20.0	15.8	N	
7.75662	44.5	37.9	1.0	45.5	38.9	60.0	50.0	14.5	11.1	L	
27.12000	46.0	43.9	2.1	48.1	46.0	60.0	50.0	11.9	4.0	N	
27.12000	44.3	42.6	2.1	46.4	44.7	60.0	50.0	13.6	5.3	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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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4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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Facsimile : +81 596 24 8124

Conducted emission

[Antenna: V680-HS65-W (2m), with Tag]

DATA OF CONDUCTED EMISSION TEST

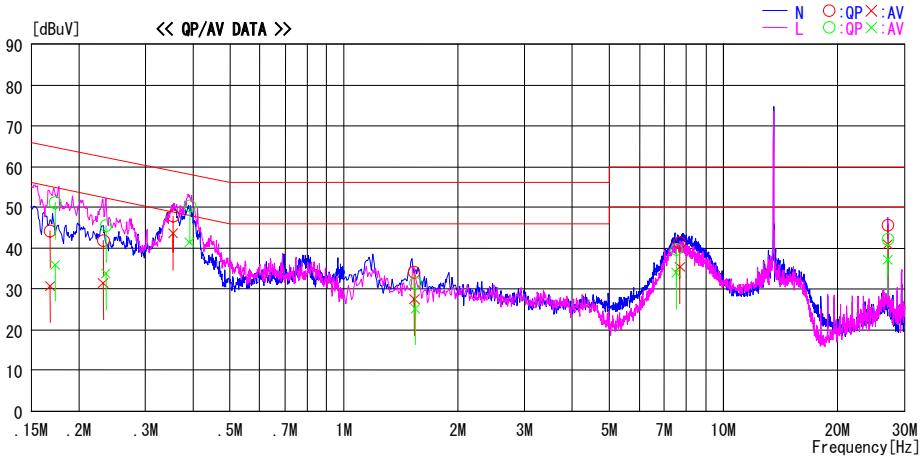
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, ANT:HS65-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.16813	43.9	30.4	0.3	44.2	30.7	65.1	55.1	20.9	24.4	N	
0.17297	50.8	35.6	0.3	51.1	35.9	64.8	54.8	13.7	18.9	L	
0.23160	41.6	31.2	0.3	41.9	31.5	62.4	52.4	20.5	20.9	N	
0.23561	45.1	33.5	0.3	45.4	33.8	62.2	52.2	16.8	18.4	L	
0.35438	47.6	43.3	0.3	47.9	43.6	58.9	48.9	11.0	5.3	N	
0.39171	50.0	41.1	0.3	50.3	41.4	58.0	48.0	7.7	6.6	L	
1.53581	33.7	27.0	0.5	34.2	27.5	56.0	46.0	21.8	18.5	N	
1.54613	31.0	24.7	0.5	31.5	25.2	56.0	46.0	24.5	20.8	L	
7.52979	38.6	33.0	1.0	39.6	34.0	60.0	50.0	20.4	16.0	L	
7.69421	40.4	34.4	1.0	41.4	35.4	60.0	50.0	18.6	14.6	N	
27.12000	43.6	38.8	2.1	45.7	40.9	60.0	50.0	14.3	9.1	N	
27.12000	40.1	35.0	2.1	42.2	37.1	60.0	50.0	17.8	12.9	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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

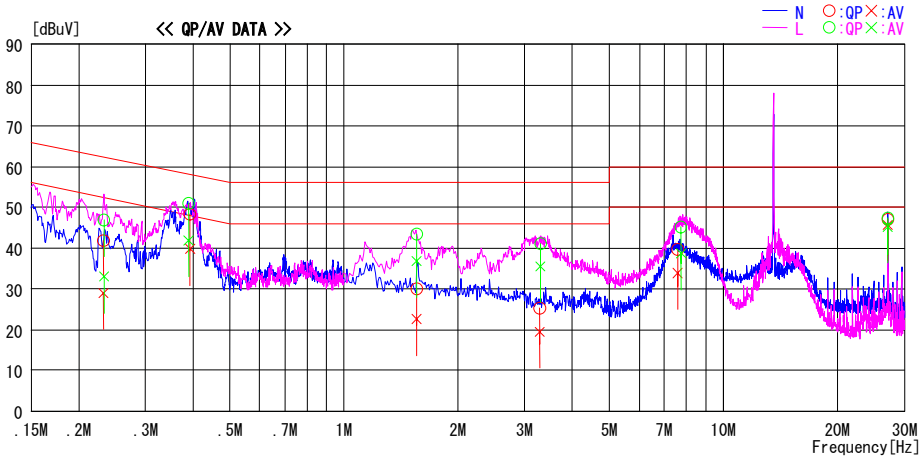
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, ANT:HS63-W 12.5m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.23187	41.6	28.7	0.3	41.9	29.0	62.4	52.4	20.5	23.4	N	
0.23330	46.6	32.7	0.3	46.9	33.0	62.3	52.3	15.4	19.3	L	
0.38905	50.7	41.6	0.3	51.0	41.9	58.1	48.1	7.1	6.2	L	
0.39295	48.0	39.5	0.3	48.3	39.8	58.0	48.0	9.7	8.2	N	
1.55424	29.5	22.1	0.5	30.0	22.6	56.0	46.0	26.0	23.4	N	
1.55735	43.0	36.3	0.5	43.5	36.8	56.0	46.0	12.5	9.2	L	
3.28453	24.8	18.9	0.6	25.4	19.5	56.0	46.0	30.6	26.5	N	
3.29835	40.5	35.0	0.6	41.1	35.6	56.0	46.0	14.9	10.4	L	
7.57991	38.6	32.9	1.0	39.6	33.9	60.0	50.0	20.4	16.1	N	
7.75496	44.1	37.7	1.0	45.1	38.7	60.0	50.0	14.9	11.3	L	
27.12000	45.0	43.6	2.1	47.1	45.7	60.0	50.0	12.9	4.3	N	
27.12000	45.2	43.1	2.1	47.3	45.2	60.0	50.0	12.7	4.8	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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), with Tag]

DATA OF CONDUCTED EMISSION TEST

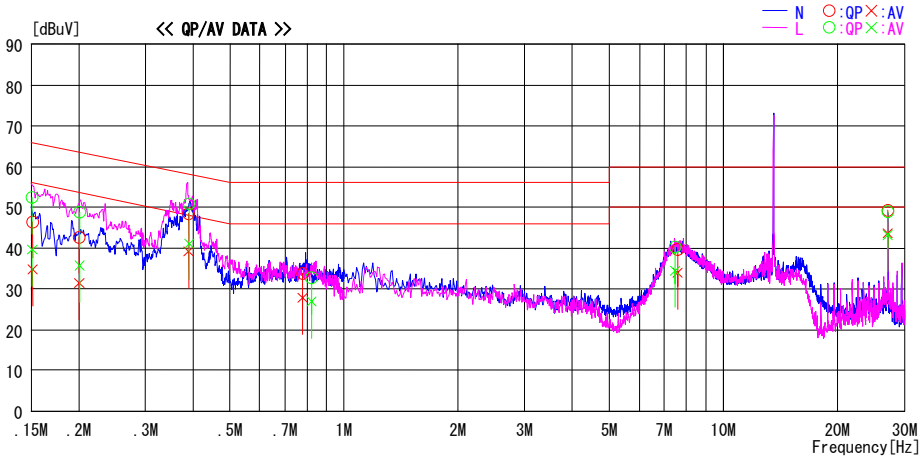
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, ANT:HS63-W 12.5m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15085	52.1	39.3	0.3	52.4	39.6	66.0	56.0	13.6	16.4	L	
0.15136	46.2	34.5	0.3	46.5	34.8	65.9	55.9	19.4	21.1	N	
0.20042	42.4	31.2	0.3	42.7	31.5	63.6	53.6	20.9	22.1	N	
0.20085	48.5	35.4	0.3	48.8	35.7	63.6	53.6	14.8	17.9	L	
0.38945	48.2	38.9	0.3	48.5	39.2	58.1	48.1	9.6	8.9	N	
0.39015	50.5	40.8	0.3	50.8	41.1	58.1	48.1	7.3	7.0	L	
0.77976	33.6	27.5	0.3	33.9	27.8	56.0	46.0	22.1	18.2	N	
0.82351	32.4	26.6	0.3	32.7	26.9	56.0	46.0	23.3	19.1	L	
7.47454	39.3	33.5	1.0	40.3	34.5	60.0	50.0	19.7	15.5	L	
7.59102	38.6	33.0	1.0	39.6	34.0	60.0	50.0	20.4	16.0	N	
27.12000	47.1	41.5	2.1	49.2	43.6	60.0	50.0	10.8	6.4	N	
27.12000	46.9	41.1	2.1	49.0	43.2	60.0	50.0	11.0	6.8	L	

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

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Conducted emission

[Antenna: V680-HS52-W (2m), without Tag]

DATA OF CONDUCTED EMISSION TEST

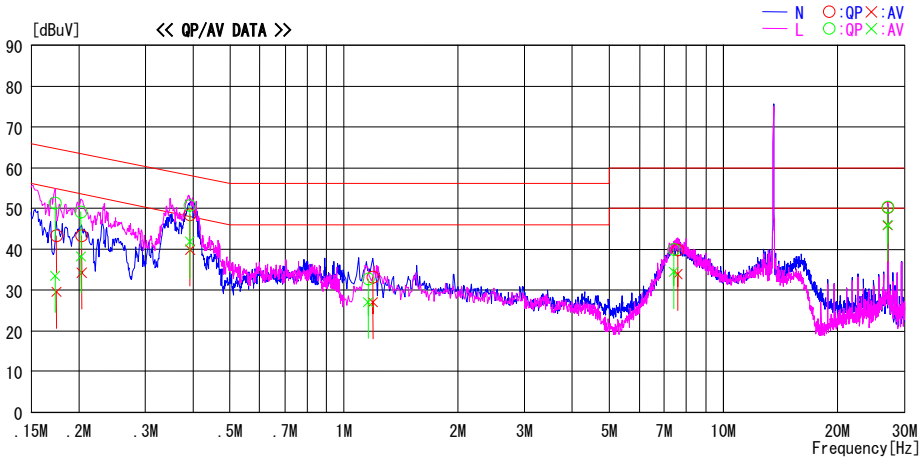
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, ANT:HS52-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.17295	51.0	33.2	0.3	51.3	33.5	64.8	54.8	13.5	21.3	L	
0.17465	42.9	29.3	0.3	43.2	29.6	64.7	54.7	21.5	25.1	N	
0.20270	48.8	37.9	0.3	49.1	38.2	63.5	53.5	14.4	15.3	L	
0.20355	43.0	33.9	0.3	43.3	34.2	63.5	53.5	20.2	19.3	N	
0.39225	50.3	41.5	0.3	50.6	41.8	58.0	48.0	7.4	6.2	L	
0.39310	48.1	39.6	0.3	48.4	39.9	58.0	48.0	9.6	8.1	N	
1.15601	32.3	26.6	0.5	32.8	27.1	56.0	46.0	23.2	18.9	L	
1.18901	32.7	26.5	0.5	33.2	27.0	56.0	46.0	22.8	19.0	N	
7.40724	39.0	33.4	1.0	40.0	34.4	60.0	50.0	20.0	15.6	L	
7.57894	38.8	32.9	1.0	39.8	33.9	60.0	50.0	20.2	16.1	N	
27.12000	48.1	43.7	2.1	50.2	45.8	60.0	50.0	9.8	4.2	N	
27.12000	48.3	43.9	2.1	50.4	46.0	60.0	50.0	9.6	4.0	L	

CHART:WITH FACTOR, Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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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Facsimile : +81 596 24 8124

Conducted emission

[Antenna: V680-HS52-W (2m), with Tag]

DATA OF CONDUCTED EMISSION TEST

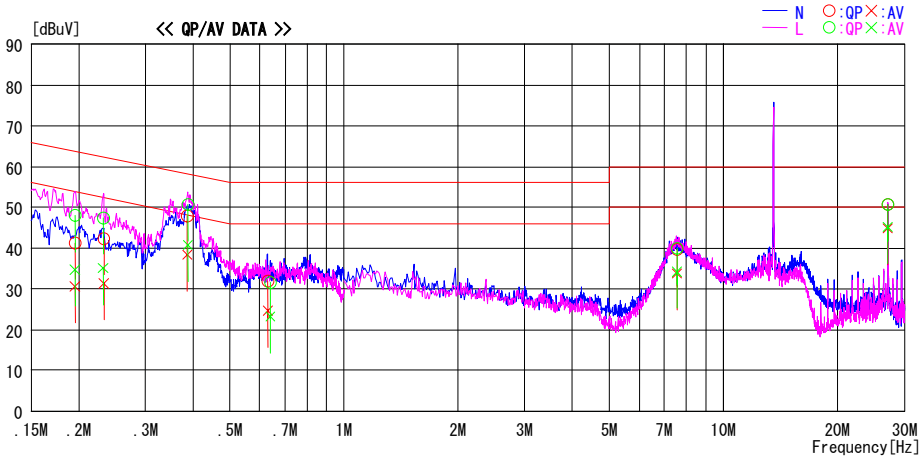
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, ANT:HS52-W 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.19505	41.0	30.3	0.3	41.3	30.6	63.8	53.8	22.5	23.2	N	
0.19505	47.7	34.4	0.3	48.0	34.7	63.8	53.8	15.9	19.1	L	
0.23160	47.1	34.8	0.3	47.4	35.1	62.4	52.4	15.0	17.3	L	
0.23245	42.1	31.1	0.3	42.4	31.4	62.4	52.4	20.0	21.0	N	
0.38630	47.6	38.1	0.3	47.9	38.4	58.1	48.1	10.2	9.7	N	
0.38715	50.3	40.4	0.3	50.6	40.7	58.1	48.1	7.5	7.4	L	
0.63025	31.6	24.4	0.3	31.9	24.7	56.0	46.0	24.1	21.3	N	
0.64011	31.4	23.0	0.3	31.7	23.3	56.0	46.0	24.3	22.7	L	
7.56994	38.6	32.8	1.0	39.6	33.8	60.0	50.0	20.4	16.2	N	
7.56994	39.0	33.2	1.0	40.0	34.2	60.0	50.0	20.0	15.8	L	
27.12000	48.6	42.7	2.1	50.7	44.8	60.0	50.0	9.3	5.2	N	
27.12000	48.5	43.0	2.1	50.6	45.1	60.0	50.0	9.4	4.9	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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-HS51, without Tag]

DATA OF CONDUCTED EMISSION TEST

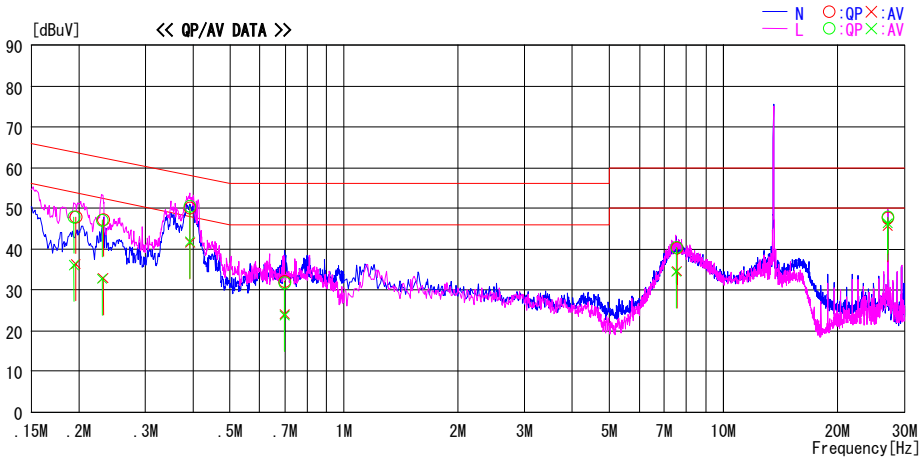
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, ANT:HS51 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.19420	47.6	35.8	0.3	47.9	36.1	63.9	53.9	16.0	17.8	L	
0.19590	47.5	36.0	0.3	47.8	36.3	63.8	53.8	16.0	17.5	N	
0.22990	46.7	32.4	0.3	47.0	32.7	62.5	52.5	15.5	19.8	L	
0.23161	46.9	32.6	0.3	47.2	32.9	62.4	52.4	15.2	19.5	N	
0.39225	50.2	41.5	0.3	50.5	41.8	58.0	48.0	7.5	6.2	L	
0.39312	49.8	41.3	0.3	50.1	41.6	58.0	48.0	7.9	6.4	N	
0.69825	31.5	23.5	0.3	31.8	23.8	56.0	46.0	24.2	22.2	L	
0.69910	31.8	23.8	0.3	32.1	24.1	56.0	46.0	23.9	21.9	N	
7.54294	39.5	33.5	1.0	40.5	34.5	60.0	50.0	19.5	15.5	L	
7.55194	39.3	33.6	1.0	40.3	34.6	60.0	50.0	19.7	15.4	N	
27.12000	45.5	43.6	2.1	47.6	45.7	60.0	50.0	12.4	4.3	N	
27.12000	45.8	44.1	2.1	47.9	46.2	60.0	50.0	12.1	3.8	L	

CHART:WITH FACTOR,Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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-HS51, with Tag]

DATA OF CONDUCTED EMISSION TEST

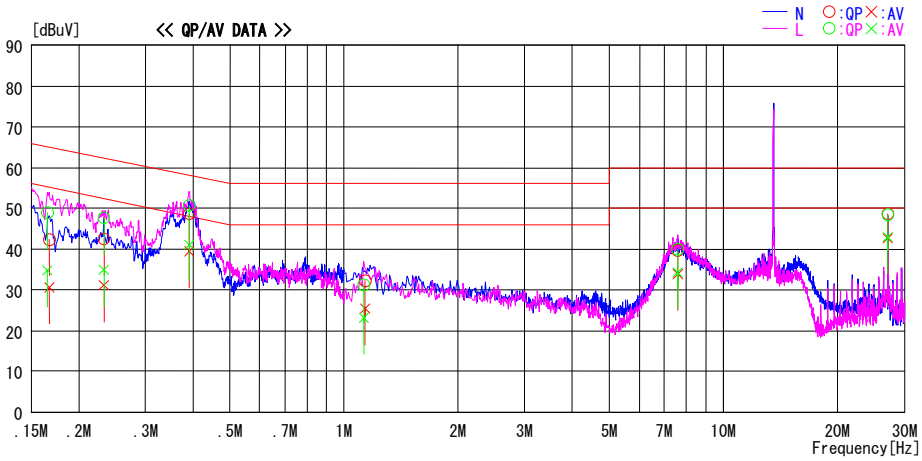
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/22

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC120V / 60Hz)
Temp./Humi. : 24deg.C / 35%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, ANT:HS51 2m

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level QP	Reading Level AV	Corr. Factor	Results QP	Results AV	Limit QP	Limit AV	Margin QP	Margin AV	Phase	Comment
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.16530	48.6	34.5	0.3	48.9	34.8	65.2	55.2	16.3	20.4	L	
0.16710	42.1	30.3	0.3	42.4	30.6	65.1	55.1	22.7	24.5	N	
0.23245	42.2	30.8	0.3	42.5	31.1	62.4	52.4	19.9	21.3	N	
0.23245	47.3	34.7	0.3	47.6	35.0	62.4	52.4	14.8	17.4	L	
0.39055	48.3	39.1	0.3	48.6	39.4	58.1	48.1	9.5	8.7	N	
0.39055	50.3	40.8	0.3	50.6	41.1	58.1	48.1	7.5	7.0	L	
1.12601	30.8	22.7	0.5	31.3	23.2	56.0	46.0	24.7	22.8	L	
1.13513	31.8	25.0	0.5	32.3	25.5	56.0	46.0	23.7	20.5	N	
7.58794	38.9	33.3	1.0	39.9	34.3	60.0	50.0	20.1	15.7	L	
7.60594	38.7	32.9	1.0	39.7	33.9	60.0	50.0	20.3	16.1	N	
27.12000	46.5	40.6	2.1	48.6	42.7	60.0	50.0	11.4	7.3	N	
27.12000	46.4	40.8	2.1	48.5	42.9	60.0	50.0	11.5	7.1	L	

CHART:WITH FACTOR, Peak hold data. CALCURATION:RESULT[dBuV]=READING[dBuV]+C.F[dB](LISN Fac+CABLE LOSS)
Data is uncorrected. 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
Telephone : +81 596 24 8116
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Radiated emission(Fundamental emission and Spectrum Mask)

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

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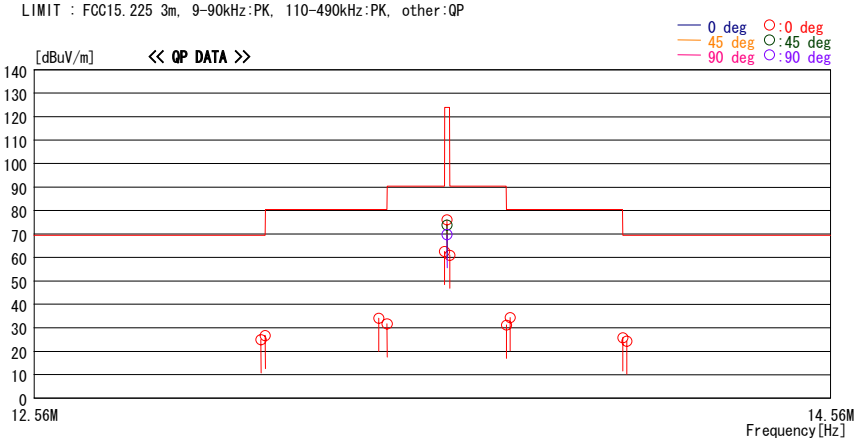
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company	: OMRON Corporation	Report No.	: 28DE0078-HO-01
Kind of EUT	: RFID System(ReaderWriter)	Power	: DC 24.0V (AC 120V / 60Hz)
Model No.	: V680-HAM81	Temp. / Humi.	: 20deg.C. / 31%
Serial No.	: SP-001	Operator	: Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS65-W 2m Y-axis, ReaderWriter:X-axis, IF 2m

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	36.0	QP	20.2	0.8	32.1	24.9	69.5	44.6	0deg	179	
13.11000	37.9	QP	20.2	0.8	32.1	26.8	69.5	42.7	0deg	179	
13.38901	45.2	QP	20.2	0.8	32.1	34.1	80.5	46.4	0deg	179	
13.41000	42.8	QP	20.2	0.8	32.1	31.7	80.5	48.8	0deg	179	
13.55300	73.6	QP	20.2	0.8	32.1	62.5	90.4	27.9	0deg	179	
13.55991	85.0	QP	20.2	0.8	32.1	73.9	123.9	50.0	45deg	164	
13.55991	80.9	QP	20.2	0.8	32.1	69.8	123.9	54.1	90deg	259	
13.55991	87.2	QP	20.2	0.8	32.1	76.1	123.9	47.8	0deg	179	Worst
13.56700	72.1	QP	20.2	0.8	32.1	61.0	90.4	29.4	0deg	179	
13.71000	42.2	QP	20.2	0.8	32.1	31.1	80.5	49.4	0deg	179	
13.71924	45.5	QP	20.2	0.8	32.1	34.4	80.5	46.1	0deg	179	
14.01000	36.8	QP	20.3	0.8	32.1	25.8	69.5	43.7	0deg	179	
14.02000	35.4	QP	20.3	0.8	32.1	24.4	69.5	45.1	0deg	179	

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]

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DATA OF RADIATED EMISSION TEST

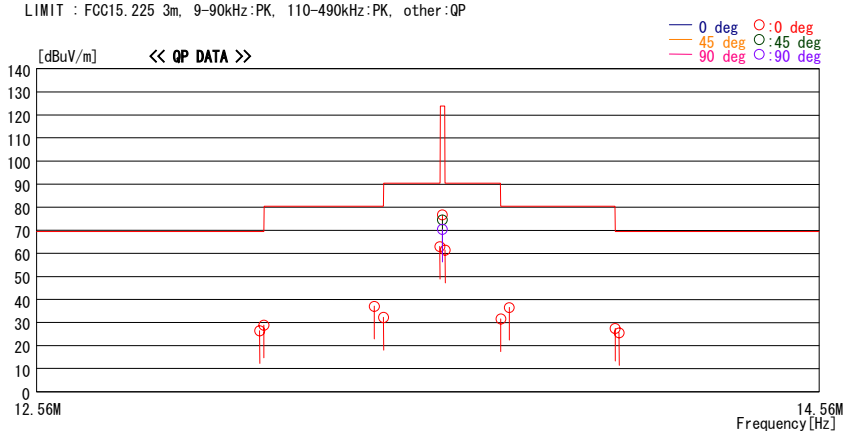
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS65-W 2m Y-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	37.5	QP	20.2	0.8	32.1	26.4	69.5	43.1	0deg	178	
13.11000	40.0	QP	20.2	0.8	32.1	28.9	69.5	40.6	0deg	178	
13.38674	48.2	QP	20.2	0.8	32.1	37.1	80.5	43.4	0deg	178	
13.41000	43.3	QP	20.2	0.8	32.1	32.2	80.5	48.3	0deg	178	
13.55300	74.1	QP	20.2	0.8	32.1	63.0	90.4	27.4	0deg	178	
13.55991	85.6	QP	20.2	0.8	32.1	74.5	123.9	49.4	45deg	161	
13.55991	81.5	QP	20.2	0.8	32.1	70.4	123.9	53.5	90deg	257	
13.55991	87.8	QP	20.2	0.8	32.1	76.7	123.9	47.2	0deg	178	Worst
13.56700	72.5	QP	20.2	0.8	32.1	61.4	90.4	29.0	0deg	178	
13.71000	42.7	QP	20.2	0.8	32.1	31.6	80.5	48.9	0deg	178	
13.73229	47.6	QP	20.2	0.8	32.1	36.5	80.5	44.0	0deg	178	
14.01000	38.5	QP	20.3	0.8	32.1	27.5	69.5	42.0	0deg	178	
14.02000	36.6	QP	20.3	0.8	32.1	25.6	69.5	43.9	0deg	178	

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

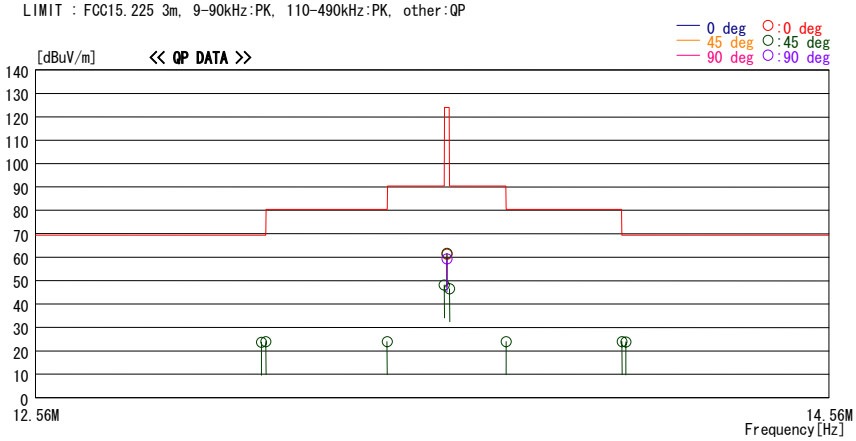
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	34.8	QP	20.2	0.8	32.1	23.7	69.5	45.8	45deg	168	
13.11000	35.0	QP	20.2	0.8	32.1	23.9	69.5	45.6	45deg	168	
13.41000	35.0	QP	20.2	0.8	32.1	23.9	80.5	56.6	45deg	168	
13.55300	59.2	QP	20.2	0.8	32.1	48.1	90.4	42.3	45deg	168	
13.55979	70.3	QP	20.2	0.8	32.1	59.2	123.9	64.7	90deg	121	
13.55979	72.3	QP	20.2	0.8	32.1	61.2	123.9	62.7	0deg	183	
13.55979	72.8	QP	20.2	0.8	32.1	61.7	123.9	62.2	45deg	168	Worst
13.56700	57.7	QP	20.2	0.8	32.1	46.6	90.4	43.8	45deg	168	
13.71000	35.0	QP	20.2	0.8	32.1	23.9	80.5	56.6	45deg	168	
14.01000	34.9	QP	20.3	0.8	32.1	23.9	69.5	45.6	45deg	168	
14.02000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	45deg	168	

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

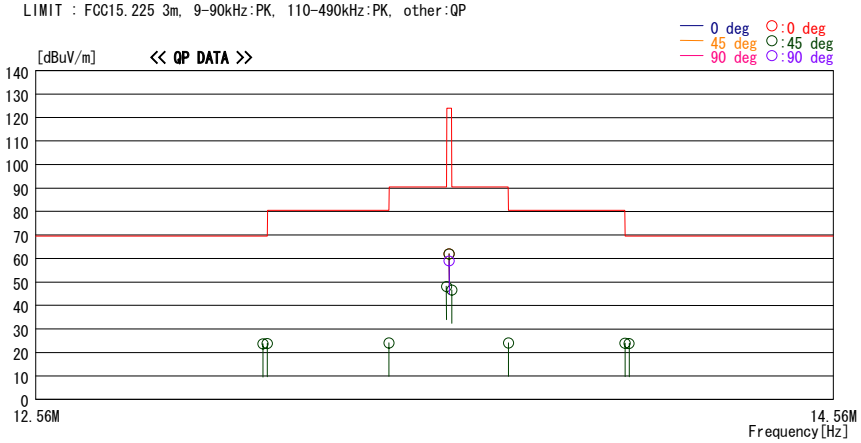
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

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	34.8	QP	20.2	0.8	32.1	23.7	69.5	45.8	45deg	167	
13.11000	34.9	QP	20.2	0.8	32.1	23.8	69.5	45.7	45deg	167	
13.41000	35.1	QP	20.2	0.8	32.1	24.0	80.5	56.5	45deg	167	
13.55300	59.2	QP	20.2	0.8	32.1	48.1	90.4	42.3	45deg	167	
13.55979	73.1	QP	20.2	0.8	32.1	62.0	123.9	61.9	45deg	167	Worst
13.55979	73.0	QP	20.2	0.8	32.1	61.9	123.9	62.0	0deg	186	
13.55979	70.1	QP	20.2	0.8	32.1	59.0	123.9	64.9	90deg	123	
13.56700	57.7	QP	20.2	0.8	32.1	46.6	90.4	43.8	45deg	167	
13.71000	35.1	QP	20.2	0.8	32.1	24.0	80.5	56.5	45deg	167	
14.01000	34.9	QP	20.3	0.8	32.1	23.9	69.5	45.6	45deg	167	
14.02000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	45deg	167	

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), with Tag]

DATA OF RADIATED EMISSION TEST

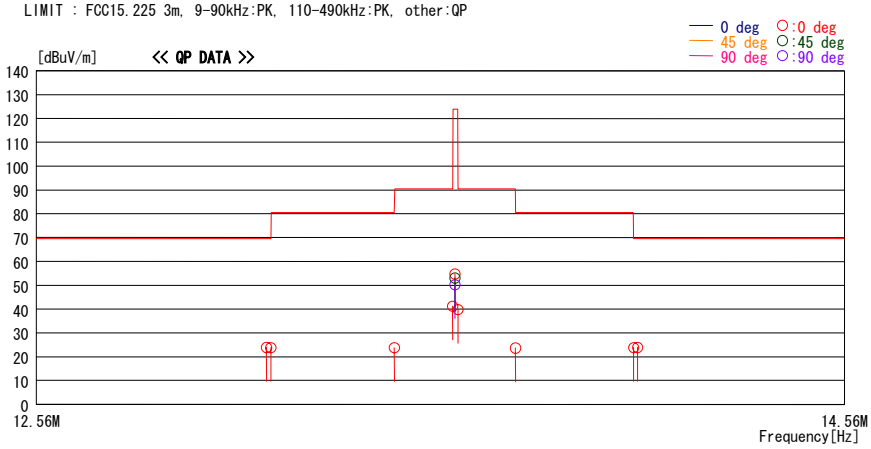
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS52-W 12.5m X-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	35.0	QP	20.2	0.8	32.1	23.9	69.5	45.6	0deg	157	
13.11000	34.9	QP	20.2	0.8	32.1	23.8	69.5	45.7	0deg	157	
13.41000	34.9	QP	20.2	0.8	32.1	23.8	80.5	56.7	0deg	157	
13.55300	52.3	QP	20.2	0.8	32.1	41.2	90.4	49.2	0deg	157	
13.55931	61.3	QP	20.2	0.8	32.1	50.2	123.9	73.7	90deg	234	
13.55931	65.9	QP	20.2	0.8	32.1	54.8	123.9	69.1	0deg	157	Worst
13.55931	64.2	QP	20.2	0.8	32.1	53.1	123.9	70.8	45deg	314	
13.56700	50.8	QP	20.2	0.8	32.1	39.7	90.4	50.7	0deg	157	
13.71000	34.8	QP	20.2	0.8	32.1	23.7	80.5	56.8	0deg	157	
14.01000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	0deg	157	
14.02000	34.9	QP	20.3	0.8	32.1	23.9	69.5	45.6	0deg	157	

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

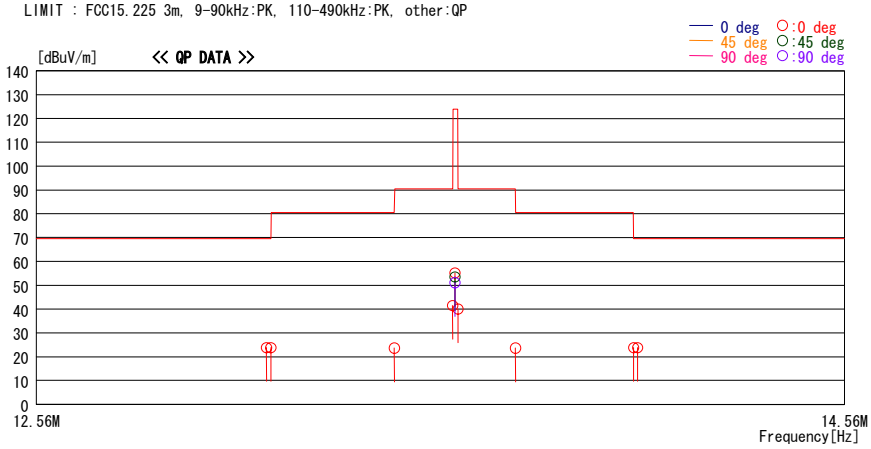
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS52-W 12.5m X-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	34.9	QP	20.2	0.8	32.1	23.8	69.5	45.7	0deg	160	
13.11000	34.9	QP	20.2	0.8	32.1	23.8	69.5	45.7	0deg	160	
13.41000	34.8	QP	20.2	0.8	32.1	23.7	80.5	56.8	0deg	160	
13.55300	52.6	QP	20.2	0.8	32.1	41.5	90.4	48.9	0deg	160	
13.55931	62.2	QP	20.2	0.8	32.1	51.1	123.9	72.8	90deg	237	
13.55931	66.2	QP	20.2	0.8	32.1	55.1	123.9	68.8	0deg	160	Worst
13.55931	64.6	QP	20.2	0.8	32.1	53.5	123.9	70.4	45deg	312	
13.56700	51.1	QP	20.2	0.8	32.1	40.0	90.4	50.4	0deg	160	
13.71000	34.8	QP	20.2	0.8	32.1	23.7	80.5	56.8	0deg	160	
14.01000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	0deg	160	
14.02000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	0deg	160	

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

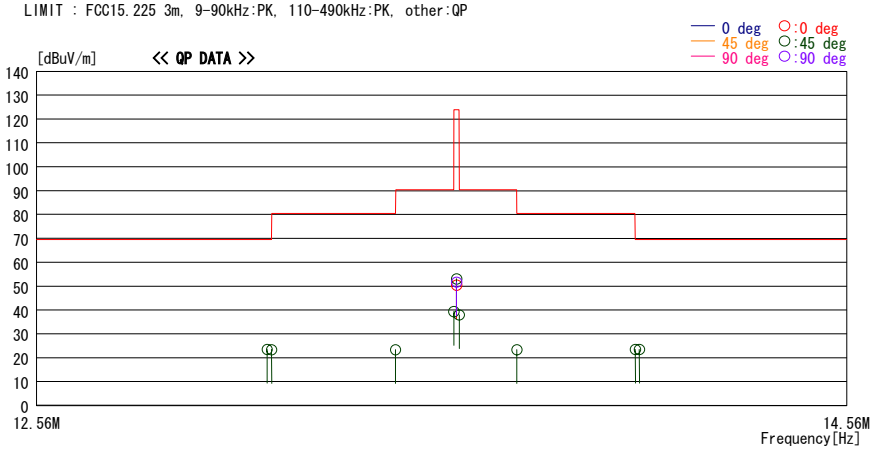
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	34.6	QP	20.2	0.8	32.1	23.5	69.5	46.0	45deg	162	
13.11000	34.5	QP	20.2	0.8	32.1	23.4	69.5	46.1	45deg	162	
13.41000	34.5	QP	20.2	0.8	32.1	23.4	80.5	57.1	45deg	162	
13.55300	50.5	QP	20.2	0.8	32.1	39.4	90.4	51.0	45deg	162	
13.55973	61.5	QP	20.2	0.8	32.1	50.4	123.9	73.5	0deg	195	
13.55973	62.8	QP	20.2	0.8	32.1	51.7	123.9	72.2	90deg	126	
13.55973	64.1	QP	20.2	0.8	32.1	53.0	123.9	70.9	45deg	162	Worst
13.56700	49.0	QP	20.2	0.8	32.1	37.9	90.4	52.5	45deg	162	
13.71000	34.5	QP	20.2	0.8	32.1	23.4	80.5	57.1	45deg	162	
14.01000	34.5	QP	20.3	0.8	32.1	23.5	69.5	46.0	45deg	162	
14.02000	34.5	QP	20.3	0.8	32.1	23.5	69.5	46.0	45deg	162	

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), without Tag]

DATA OF RADIATED EMISSION TEST

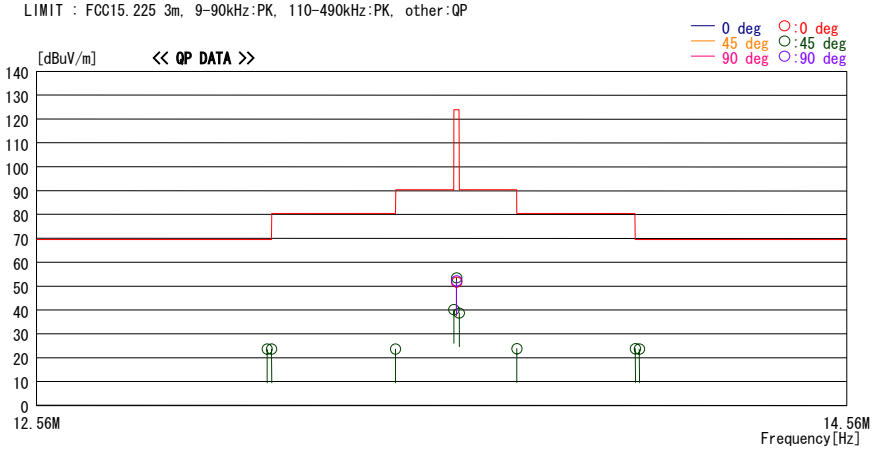
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 31%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis, IF 2m

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, 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]	Comment
13.10000	34.8	QP	20.2	0.8	32.1	23.7	69.5	45.8	45deg	163	
13.11000	34.7	QP	20.2	0.8	32.1	23.6	69.5	45.9	45deg	163	
13.41000	34.7	QP	20.2	0.8	32.1	23.6	80.5	56.9	45deg	163	
13.55300	51.3	QP	20.2	0.8	32.1	40.2	90.4	50.2	45deg	163	
13.55973	62.7	QP	20.2	0.8	32.1	51.6	123.9	72.3	0deg	193	
13.55973	63.3	QP	20.2	0.8	32.1	52.2	123.9	71.7	90deg	129	
13.55973	64.6	QP	20.2	0.8	32.1	53.5	123.9	70.4	45deg	163	Worst
13.56700	49.8	QP	20.2	0.8	32.1	38.7	90.4	51.7	45deg	163	
13.71000	34.9	QP	20.2	0.8	32.1	23.8	80.5	56.7	45deg	163	
14.01000	34.8	QP	20.3	0.8	32.1	23.8	69.5	45.7	45deg	163	
14.02000	34.7	QP	20.3	0.8	32.1	23.7	69.5	45.8	45deg	163	

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

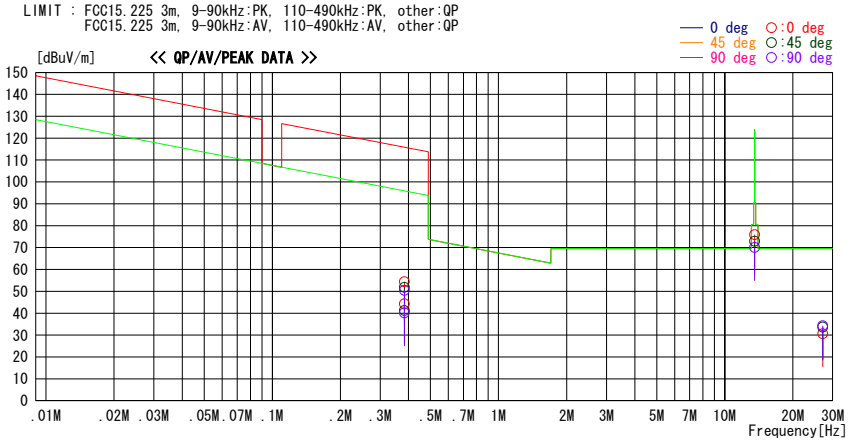
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS65-W 12.5m Y-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38442	64.2	PEAK	19.6	0.2	32.1	51.9	115.9	64.0	45deg	209	
0.38442	62.8	PEAK	19.6	0.2	32.1	50.5	115.9	65.4	90deg	162	
0.38442	66.7	PEAK	19.6	0.2	32.1	54.4	115.9	61.5	0deg	78	
0.38442	53.5	AV	19.6	0.2	32.1	41.2	95.9	54.7	45deg	209	
0.38442	56.5	AV	19.6	0.2	32.1	44.2	95.9	51.7	0deg	78	
0.38442	52.4	AV	19.6	0.2	32.1	40.1	95.9	55.8	90deg	162	
13.56046	87.0	QP	20.2	0.8	32.1	75.9	123.9	48.0	0deg	165	
13.56046	84.0	QP	20.2	0.8	32.1	72.9	123.9	51.0	45deg	149	
13.56046	81.1	QP	20.2	0.8	32.1	70.0	123.9	53.9	90deg	235	
27.11968	40.9	QP	20.6	1.2	32.1	30.6	69.5	38.9	0deg	34	
27.11968	43.9	QP	20.6	1.2	32.1	33.6	69.5	35.9	45deg	199	
27.11968	44.6	QP	20.6	1.2	32.1	34.3	69.5	35.2	90deg	295	

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

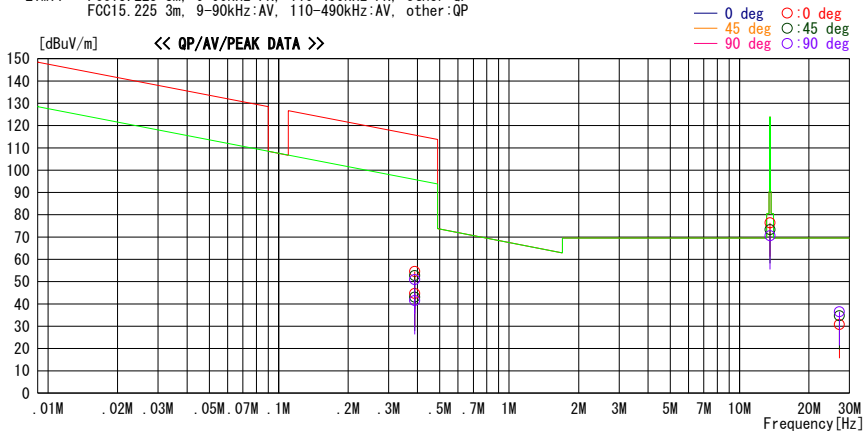
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS65-W 12.5m Y-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38971	66.9	PEAK	19.6	0.2	32.1	54.6	115.8	61.2	0deg	81	
0.38971	63.3	PEAK	19.6	0.2	32.1	51.0	115.8	64.8	90deg	186	
0.38971	65.1	PEAK	19.6	0.2	32.1	52.8	115.8	63.0	45deg	213	
0.38971	57.0	AV	19.6	0.2	32.1	44.7	95.8	51.1	0deg	81	
0.38971	53.9	AV	19.6	0.2	32.1	41.6	95.8	54.2	90deg	186	
0.38971	55.4	AV	19.6	0.2	32.1	43.1	95.8	52.7	45deg	213	
13.55956	87.5	QP	20.2	0.8	32.1	76.4	123.9	47.5	0deg	166	
13.55956	84.5	QP	20.2	0.8	32.1	73.4	123.9	50.5	45deg	155	
13.55956	81.7	QP	20.2	0.8	32.1	70.6	123.9	53.3	90deg	240	
27.11878	41.1	QP	20.6	1.2	32.1	30.8	69.5	38.7	0deg	29	
27.11878	45.0	QP	20.6	1.2	32.1	34.7	69.5	34.8	45deg	189	
27.11878	46.8	QP	20.6	1.2	32.1	36.5	69.5	33.0	90deg	13	

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 (2.0m), with Tag]

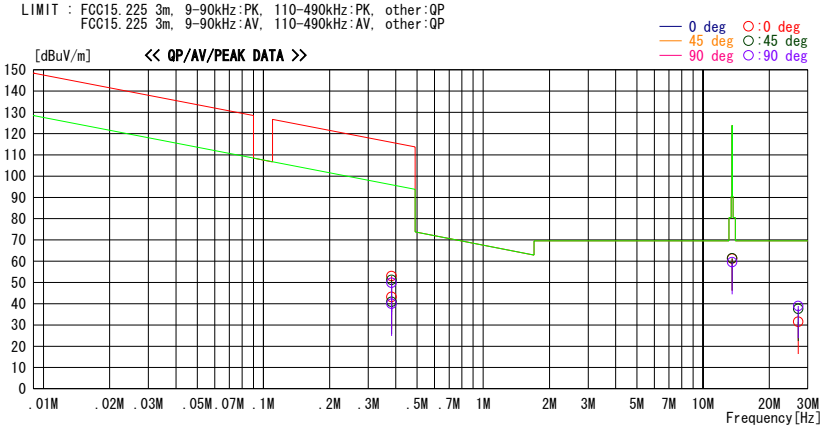
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company	: OMRON Corporation	Report No.	: 28DE0078-HO
Kind of EUT	: RFID System(ReaderWriter)	Power	: DC 24.0V (AC 120V / 60Hz)
Model No.	: V680-HAM81	Temp./ Humi.	: 20deg.C, / 43%
Serial No.	: SP-001	Operator	: Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis IF 2m

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	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]	
0.38295	62.2	PEAK	19.6	0.2	32.1	49.9	115.9	66.0	90deg	149	
0.38295	52.3	AV	19.6	0.2	32.1	40.0	95.9	55.9	90deg	149	
0.38295	63.5	PEAK	19.6	0.2	32.1	51.2	115.9	64.7	45deg	194	
0.38295	53.3	AV	19.6	0.2	32.1	41.0	95.9	54.9	45deg	194	
0.38295	65.3	PEAK	19.6	0.2	32.1	53.0	115.9	62.9	0deg	220	
0.38295	55.5	AV	19.6	0.2	32.1	43.2	95.9	52.7	0deg	220	
13.56021	70.7	QP	20.2	0.8	32.1	59.6	123.9	64.3	90deg	128	
13.56021	72.3	QP	20.2	0.8	32.1	61.2	123.9	62.7	0deg	172	
13.56021	72.5	QP	20.2	0.8	32.1	61.4	123.9	62.5	45deg	170	
27.11982	47.9	QP	20.6	1.2	32.1	37.6	69.5	31.9	45deg	178	
27.11982	49.3	QP	20.6	1.2	32.1	39.0	69.5	30.5	90deg	327	
27.11982	41.9	QP	20.6	1.2	32.1	31.6	69.5	37.9	0deg	203	

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 (2.0m), without Tag]

DATA OF RADIATED EMISSION TEST

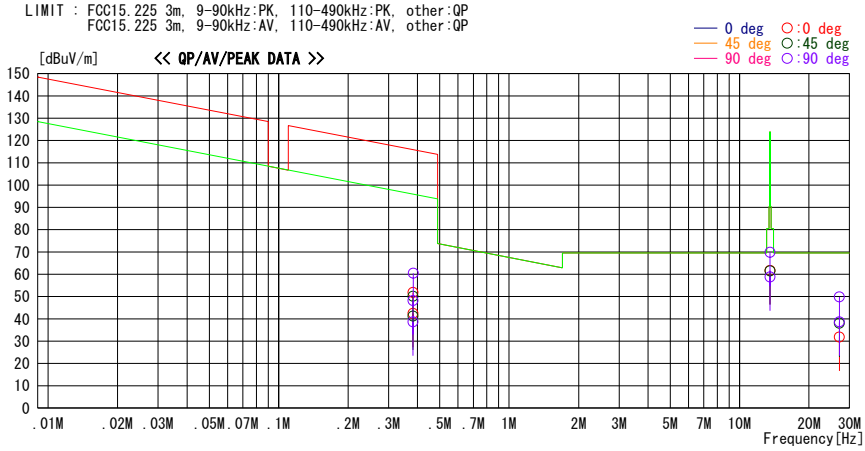
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38288	60.5	PEAK	19.6	0.2	32.1	48.2	115.9	67.7	90deg	148	
0.38288	62.5	PEAK	19.6	0.2	32.1	50.2	115.9	65.7	45deg	60	
0.38288	64.1	PEAK	19.6	0.2	32.1	51.8	115.9	64.1	0deg	214	
0.38288	50.9	AV	19.6	0.2	32.1	38.6	95.9	57.3	90deg	148	
0.38288	53.6	AV	19.6	0.2	32.1	41.3	95.9	54.6	45deg	60	
0.38288	54.8	AV	19.6	0.2	32.1	42.5	95.9	53.4	0deg	214	
13.56019	72.8	QP	20.2	0.8	32.1	61.7	123.9	62.2	0deg	177	
13.56019	72.7	QP	20.2	0.8	32.1	61.6	123.9	62.3	45deg	167	
13.56019	69.9	QP	20.2	0.8	32.1	58.8	123.9	65.1	90deg	104	
27.12013	42.2	QP	20.6	1.2	32.1	31.9	69.5	37.6	0deg	210	
27.12013	48.4	QP	20.6	1.2	32.1	38.1	69.5	31.4	45deg	137	
27.12013	48.9	QP	20.6	1.2	32.1	38.6	69.5	30.9	90deg	100	

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

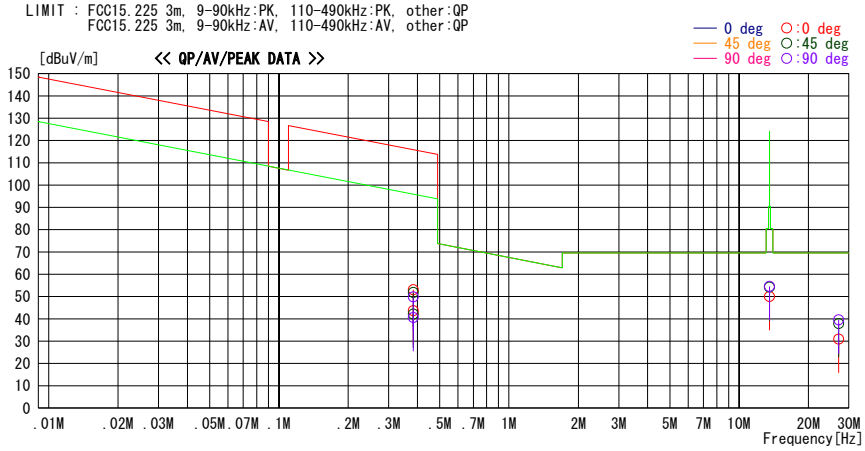
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS52-W 2m Z-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38419	62.2	PEAK	19.6	0.2	32.1	49.9	115.9	66.0	90deg	141	
0.38419	52.9	AV	19.6	0.2	32.1	40.6	95.9	55.3	90deg	141	
0.38419	65.3	PEAK	19.6	0.2	32.1	53.0	115.9	62.9	0deg	207	
0.38419	55.9	AV	19.6	0.2	32.1	43.6	95.9	52.3	0deg	207	
0.38419	64.2	PEAK	19.6	0.2	32.1	51.9	115.9	64.0	45deg	77	
0.38419	54.5	AV	19.6	0.2	32.1	42.2	95.9	53.7	45deg	77	
13.56015	65.6	QP	20.2	0.8	32.1	54.5	123.9	69.4	90deg	171	
13.56015	65.3	QP	20.2	0.8	32.1	54.2	123.9	69.7	45deg	191	
13.56015	61.1	QP	20.2	0.8	32.1	50.0	123.9	73.9	0deg	215	
27.12032	49.8	QP	20.6	1.2	32.1	39.5	69.5	30.0	90deg	7	
27.12032	48.2	QP	20.6	1.2	32.1	37.9	69.5	31.6	45deg	186	
27.12032	41.2	QP	20.6	1.2	32.1	30.9	69.5	38.6	0deg	52	

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

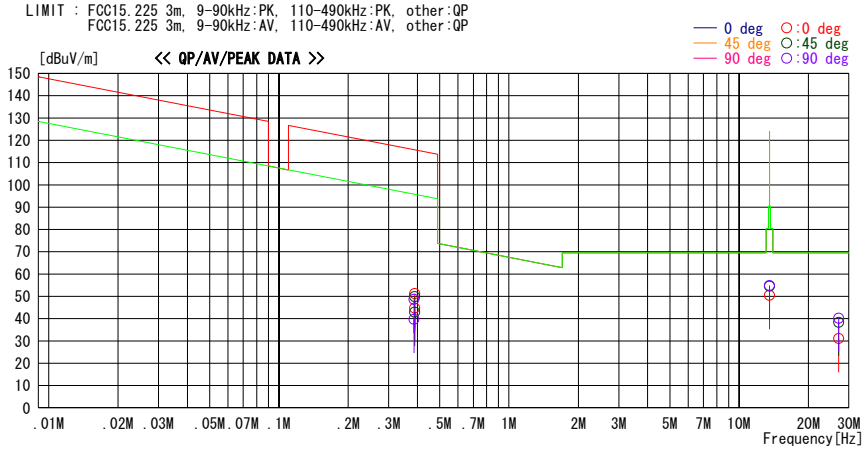
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS52-W 2m Z-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38621	60.9	PEAK	19.6	0.2	32.1	48.6	115.9	67.3	90deg	150	
0.38621	52.0	AV	19.6	0.2	32.1	39.7	95.9	56.2	90deg	150	
0.38971	63.6	PEAK	19.6	0.2	32.1	51.3	115.8	64.5	0deg	227	
0.38971	62.1	PEAK	19.6	0.2	32.1	49.8	115.8	66.0	45deg	60	
0.38971	55.2	AV	19.6	0.2	32.1	42.9	95.8	52.9	45deg	60	
0.38971	57.0	AV	19.6	0.2	32.1	44.7	95.8	51.1	0deg	227	
13.56015	65.6	QP	20.2	0.8	32.1	54.5	123.9	69.4	45deg	195	
13.56015	66.0	QP	20.2	0.8	32.1	54.9	123.9	69.0	90deg	174	
13.56015	61.6	QP	20.2	0.8	32.1	50.5	123.9	73.4	0deg	220	
27.12032	48.7	QP	20.6	1.2	32.1	38.4	69.5	31.1	45deg	191	
27.12032	50.4	QP	20.6	1.2	32.1	40.1	69.5	29.4	90deg	14	
27.12032	41.4	QP	20.6	1.2	32.1	31.1	69.5	38.4	0deg	35	

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

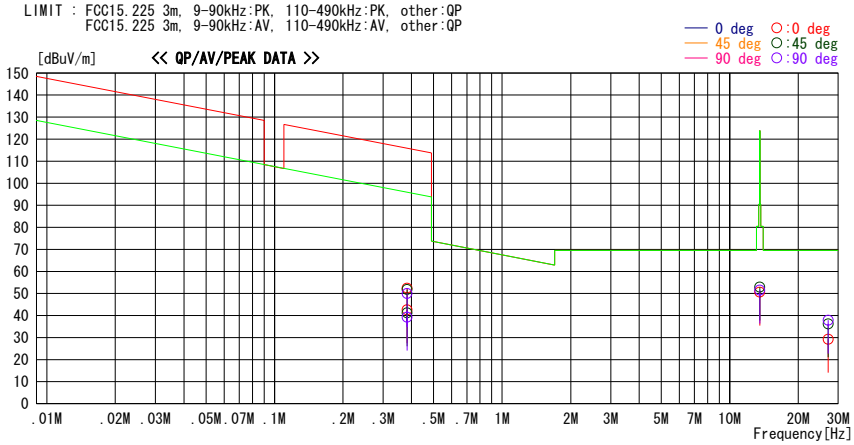
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38195	62.3	PEAK	19.6	0.2	32.1	50.0	116.0	66.0	90deg	157	
0.38195	51.5	AV	19.6	0.2	32.1	39.2	96.0	56.8	90deg	157	
0.38195	64.8	PEAK	19.6	0.2	32.1	52.5	116.0	63.5	0deg	236	
0.38195	54.9	AV	19.6	0.2	32.1	42.6	96.0	53.4	0deg	236	
0.38195	64.1	PEAK	19.6	0.2	32.1	51.8	116.0	64.2	45deg	202	
0.38195	53.5	AV	19.6	0.2	32.1	41.2	96.0	54.8	45deg	202	
13.55973	64.0	QP	20.2	0.8	32.1	52.9	123.9	71.0	45deg	158	
13.55973	62.6	QP	20.2	0.8	32.1	51.5	123.9	72.4	90deg	121	
13.55973	61.8	QP	20.2	0.8	32.1	50.7	123.9	73.2	0deg	184	
27.11816	46.6	QP	20.6	1.2	32.1	36.3	69.5	33.2	45deg	184	
27.11816	39.5	QP	20.6	1.2	32.1	29.2	69.5	40.3	0deg	53	
27.11816	48.2	QP	20.6	1.2	32.1	37.9	69.5	31.6	90deg	13	

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

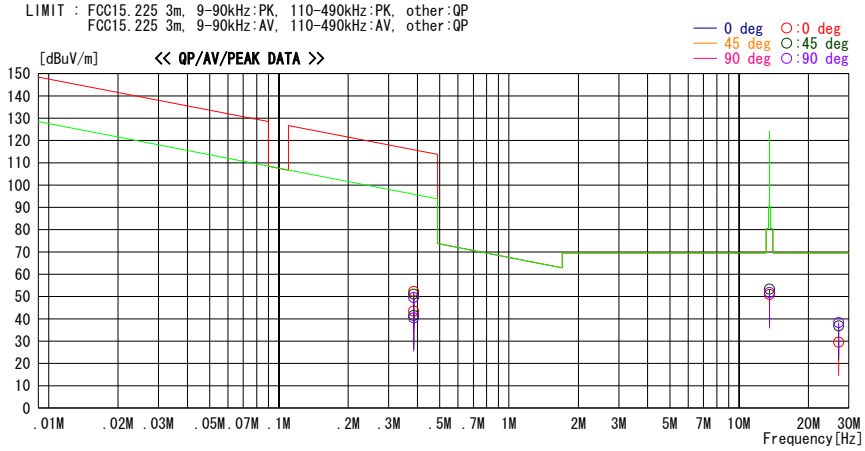
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2008/01/07

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO
Power : DC 24.0V (AC 120V / 60Hz)
Temp. / Humi. : 20deg.C. / 43%
Operator : Kazufumi Nakai

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis IF 2m

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]	Comment
0.38465	61.8	PEAK	19.6	0.2	32.1	49.5	115.9	66.4	90deg	148	
0.38465	52.7	AV	19.6	0.2	32.1	40.4	95.9	55.5	90deg	148	
0.38465	64.6	PEAK	19.6	0.2	32.1	52.3	115.9	63.6	0deg	222	
0.38465	55.8	AV	19.6	0.2	32.1	43.5	95.9	52.4	0deg	222	
0.38465	63.4	PEAK	19.6	0.2	32.1	51.1	115.9	64.8	45deg	209	
0.38465	53.8	AV	19.6	0.2	32.1	41.5	95.9	54.4	45deg	209	
13.55973	64.4	QP	20.2	0.8	32.1	53.3	123.9	70.6	45deg	160	
13.55973	63.0	QP	20.2	0.8	32.1	51.9	123.9	72.0	90deg	120	
13.55973	62.1	QP	20.2	0.8	32.1	51.0	123.9	72.9	0deg	187	
27.11816	47.2	QP	20.6	1.2	32.1	36.9	69.5	32.6	45deg	180	
27.11816	39.8	QP	20.6	1.2	32.1	29.5	69.5	40.0	0deg	47	
27.11816	48.7	QP	20.6	1.2	32.1	38.4	69.5	31.1	90deg	15	

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]

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DATA OF RADIATED EMISSION TEST

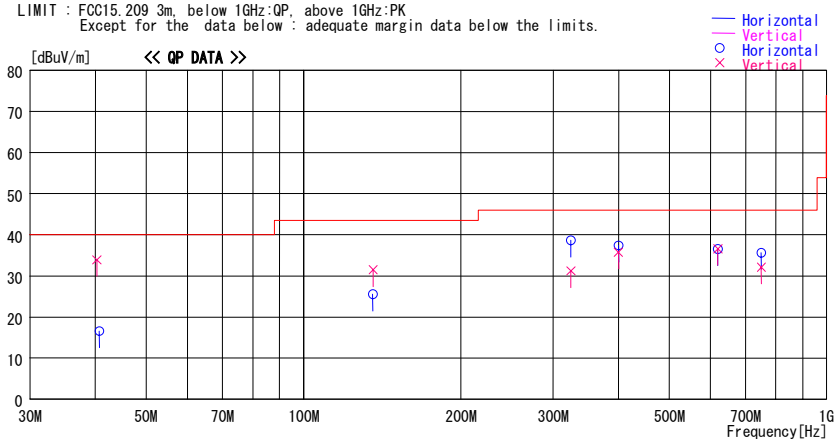
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS65-W 12.5m Y-axis, ReaderWriter:X-axis, IF 2m

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]
40.690	27.6	QP	13.7	-24.7	16.6	272	296	Hori.	40.0	23.4
40.260	44.9	QP	13.8	-24.8	33.9	108	100	Vert.	40.0	6.1
135.673	34.8	QP	14.3	-23.5	25.6	0	343	Hori.	43.5	18.0
135.886	40.7	QP	14.3	-23.5	31.5	349	100	Vert.	43.5	12.0
324.394	44.2	QP	16.4	-21.9	38.7	170	100	Hori.	46.0	7.3
324.395	36.7	QP	16.4	-21.9	31.2	172	123	Vert.	46.0	14.8
400.006	41.2	QP	17.6	-21.4	37.4	0	100	Hori.	46.0	8.6
400.001	39.6	QP	17.6	-21.4	35.8	277	137	Vert.	46.0	10.2
619.302	36.6	QP	20.2	-20.3	36.5	234	167	Hori.	46.0	9.5
619.305	36.7	QP	20.2	-20.3	36.6	270	100	Vert.	46.0	9.4
749.996	33.1	QP	22.1	-19.6	35.6	167	178	Hori.	46.0	10.4
749.996	29.6	QP	22.1	-19.6	32.1	31	100	Vert.	46.0	13.9

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

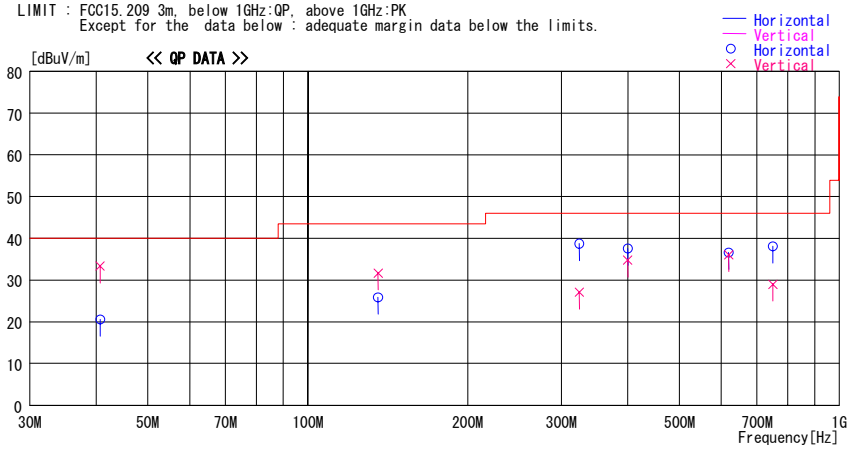
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/21

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No. : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS65-W 12.5m Y-axis, ReaderWriter:X-axis, IF 2m

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]
40.672	31.5	QP	13.7	-24.7	20.5	187	348	Hori.	40.0	19.5
40.677	44.3	QP	13.7	-24.7	33.3	359	100	Vert.	40.0	6.7
135.669	35.0	QP	14.3	-23.5	25.8	352	224	Hori.	43.5	17.7
135.679	40.9	QP	14.3	-23.5	31.7	270	100	Vert.	43.5	11.8
324.399	44.2	QP	16.4	-21.9	38.7	170	100	Hori.	46.0	7.3
324.398	32.6	QP	16.4	-21.9	27.1	92	100	Vert.	46.0	18.9
399.997	41.5	QP	17.5	-21.4	37.6	356	100	Hori.	46.0	8.4
399.992	38.7	QP	17.5	-21.4	34.8	113	100	Vert.	46.0	11.2
619.302	36.7	QP	20.2	-20.3	36.6	222	158	Hori.	46.0	9.4
619.302	36.1	QP	20.2	-20.3	36.0	261	100	Vert.	46.0	10.0
750.004	35.6	QP	22.1	-19.6	38.1	201	208	Hori.	46.0	7.9
750.004	26.5	QP	22.1	-19.6	29.0	0	100	Vert.	46.0	17.0

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

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

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Radiated emission (Spurious emission : above 30MHz)

[Antenna: V680-HS63-W (2.0m), with Tag]

DATA OF RADIATED EMISSION TEST

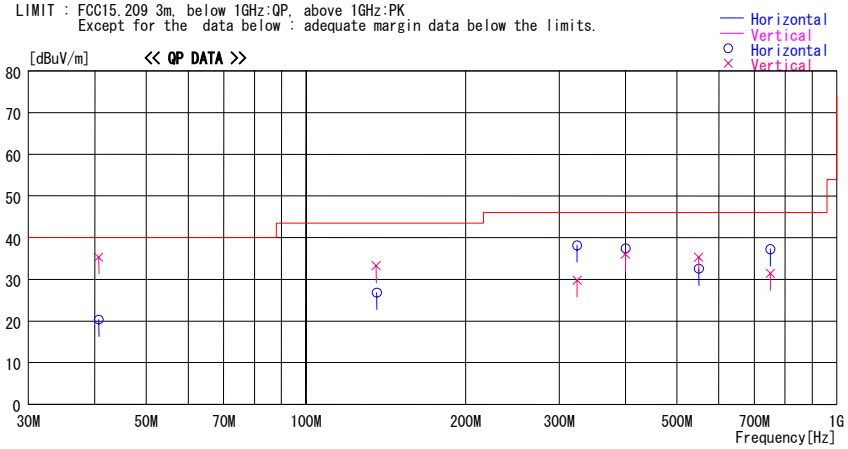
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

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]
40.677	31.4	QP	13.7	-24.7	20.4	182	271	Hori.	40.0	19.6
40.676	46.3	QP	13.7	-24.7	35.3	80	100	Vert.	40.0	4.7
135.892	36.0	QP	14.3	-23.5	26.8	195	228	Hori.	43.5	16.7
135.670	42.5	QP	14.3	-23.5	33.3	278	100	Vert.	43.5	10.2
324.397	43.7	QP	16.4	-21.9	38.2	163	100	Hori.	46.0	7.8
324.401	35.3	QP	16.4	-21.9	29.8	84	115	Vert.	46.0	16.2
399.997	41.3	QP	17.5	-21.4	37.4	323	100	Hori.	46.0	8.6
399.992	39.9	QP	17.5	-21.4	36.0	277	147	Vert.	46.0	10.0
550.008	33.5	QP	19.7	-20.6	32.6	347	100	Hori.	46.0	13.4
550.004	36.2	QP	19.7	-20.6	35.3	250	100	Vert.	46.0	10.7
749.998	34.8	QP	22.1	-19.6	37.3	71	100	Hori.	46.0	8.7
749.991	28.9	QP	22.1	-19.6	31.4	2	100	Vert.	46.0	14.6

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

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

Radiated emission (Spurious emission : above 30MHz)

[Antenna: V680-HS63-W (2.0m), without Tag]

DATA OF RADIATED EMISSION TEST

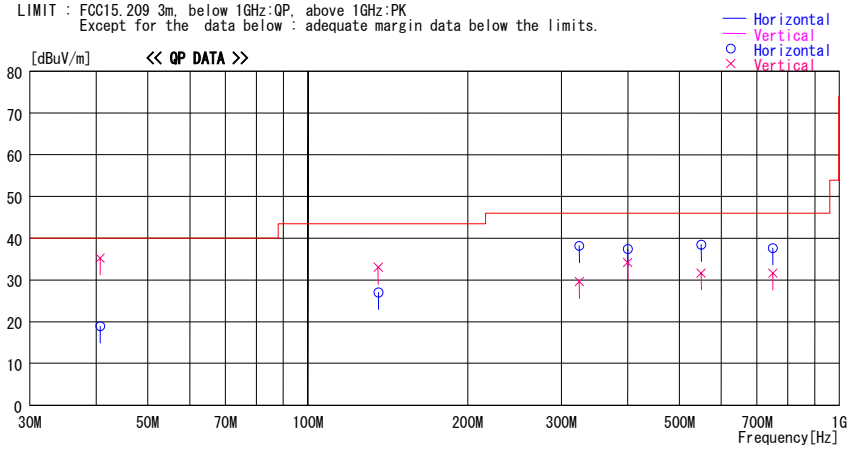
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS63-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

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]
40.685	29.9	QP	13.7	-24.7	18.9	160	290	Hori.	40.0	21.1
40.685	46.2	QP	13.7	-24.7	35.2	145	100	Vert.	40.0	4.8
135.667	42.2	QP	14.3	-23.5	33.0	284	100	Vert.	43.5	10.5
135.885	36.2	QP	14.3	-23.5	27.0	202	237	Hori.	43.5	16.5
324.393	43.6	QP	16.4	-21.9	38.1	165	100	Hori.	46.0	7.9
324.391	35.1	QP	16.4	-21.9	29.6	100	100	Vert.	46.0	16.4
400.008	41.3	QP	17.6	-21.4	37.5	0	100	Hori.	46.0	8.5
400.001	38.0	QP	17.6	-21.4	34.2	296	191	Vert.	46.0	11.8
549.997	39.3	QP	19.7	-20.6	38.4	353	175	Hori.	46.0	7.6
549.998	32.6	QP	19.7	-20.6	31.7	183	129	Vert.	46.0	14.3
750.004	35.2	QP	22.1	-19.6	37.7	193	197	Hori.	46.0	8.3
750.004	29.1	QP	22.1	-19.6	31.6	356	100	Vert.	46.0	14.4

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

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Head Office EMC Lab.
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Telephone : +81 596 24 8116
Facsimile : +81 596 24 8124

Radiated emission (Spurious emission : above 30MHz)

[Antenna: V680-HS52-W (2.0m), with Tag]

DATA OF RADIATED EMISSION TEST

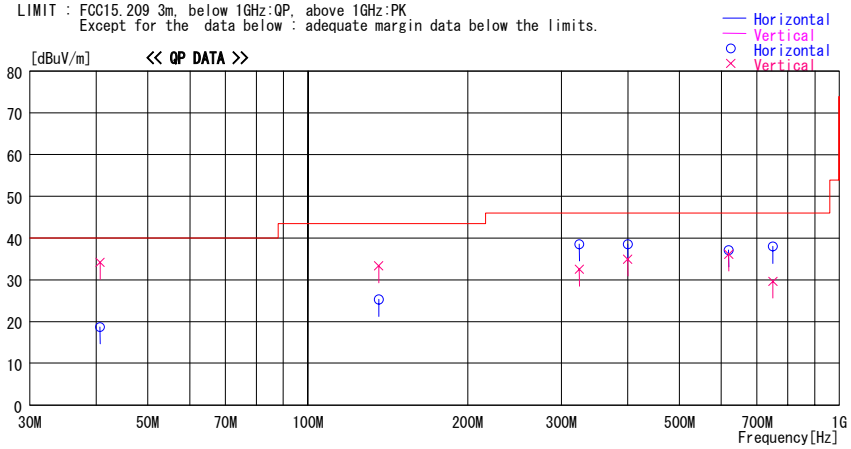
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS52-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

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]
40.667	29.7	QP	13.7	-24.7	18.7	178	336	Hori.	40.0	21.3
40.673	45.2	QP	13.7	-24.7	34.2	155	100	Vert.	40.0	5.8
135.900	42.5	QP	14.3	-23.5	33.3	205	100	Vert.	43.5	10.2
135.894	34.5	QP	14.3	-23.5	25.3	210	205	Hori.	43.5	18.2
324.392	44.1	QP	16.4	-21.9	38.6	165	100	Hori.	46.0	7.4
324.395	38.0	QP	16.4	-21.9	32.5	116	126	Vert.	46.0	13.5
399.986	42.4	QP	17.5	-21.4	38.5	333	100	Hori.	46.0	7.5
399.993	38.8	QP	17.5	-21.4	34.9	84	119	Vert.	46.0	11.1
619.308	37.2	QP	20.2	-20.3	37.1	215	147	Hori.	46.0	8.9
619.301	36.2	QP	20.2	-20.3	36.1	274	100	Vert.	46.0	9.9
749.997	35.5	QP	22.1	-19.6	38.0	203	195	Hori.	46.0	8.0
749.995	27.2	QP	22.1	-19.6	29.7	359	100	Vert.	46.0	16.4

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 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

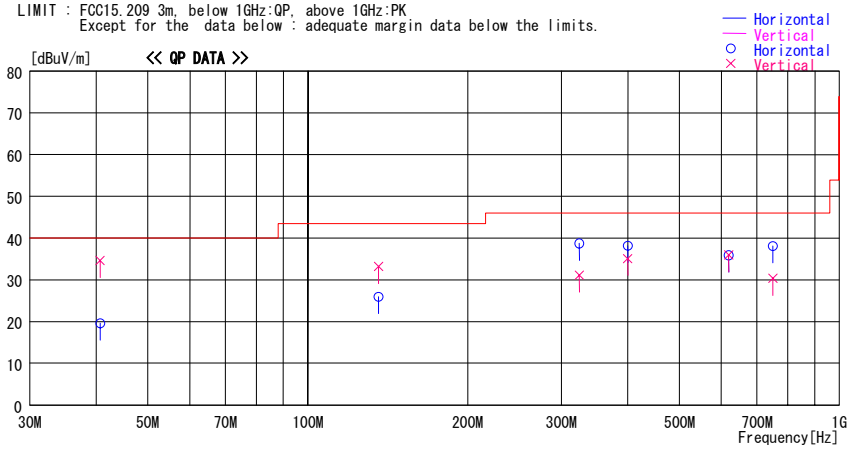
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS52-W 2m Z-axis, ReaderWriter:X-axis, IF 2m

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]
40.673	30.6	QP	13.7	-24.7	19.6	169	353	Hori.	40.0	20.4
40.673	45.6	QP	13.7	-24.7	34.6	146	100	Vert.	40.0	5.4
135.885	42.4	QP	14.3	-23.5	33.2	203	100	Vert.	43.5	10.3
135.891	35.2	QP	14.3	-23.5	26.0	183	239	Hori.	43.5	17.5
324.394	36.6	QP	16.4	-21.9	31.1	97	134	Vert.	46.0	14.9
324.394	44.2	QP	16.4	-21.9	38.7	164	100	Hori.	46.0	7.3
400.003	41.9	QP	17.6	-21.4	38.1	329	100	Hori.	46.0	7.9
399.993	39.0	QP	17.5	-21.4	35.1	98	121	Vert.	46.0	10.9
619.304	36.0	QP	20.2	-20.3	35.9	197	137	Hori.	46.0	10.1
619.301	36.0	QP	20.2	-20.3	35.9	265	100	Vert.	46.0	10.1
749.991	35.6	QP	22.1	-19.6	38.1	208	210	Hori.	46.0	7.9
749.991	27.8	QP	22.1	-19.6	30.3	324	100	Vert.	46.0	15.7

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-HS51 (2.0m), with Tag]

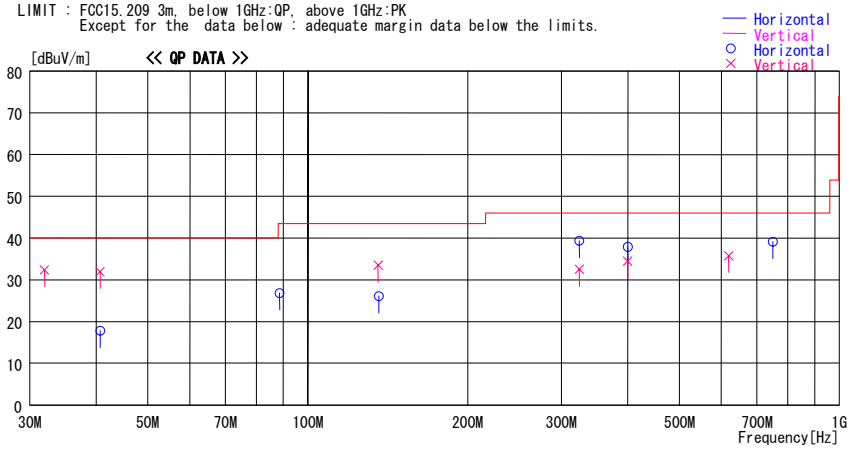
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company	: OMRON Corporation	Report No.	: 28DE0078-HO-01
Kind of EUT	: RFID System(ReaderWriter)	Power	: DC 24.0V(AC120V / 60Hz)
Model No	: V680-HAM81	Temp./Humi.	: 25deg.C. / 28%
Serial No.	: SP-001	Operator	: Kazufumi Nakai

Mode / Remarks : Tx with Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis, IF 2m

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]
31.981	38.7	QP	18.6	-24.9	32.4	43	100	Vert.	40.0	7.6
40.677	43.0	QP	13.7	-24.7	32.0	155	100	Vert.	40.0	8.0
40.683	28.8	QP	13.7	-24.7	17.8	170	338	Hori.	40.0	22.2
88.477	42.5	QP	8.4	-24.1	26.8	183	218	Hori.	43.5	16.7
135.671	42.7	QP	14.3	-23.5	33.5	207	100	Vert.	43.5	10.0
135.903	35.3	QP	14.3	-23.5	26.1	177	227	Hori.	43.5	17.4
324.390	44.9	QP	16.4	-21.9	39.4	162	100	Hori.	46.0	6.6
324.397	38.0	QP	16.4	-21.9	32.5	117	100	Vert.	46.0	13.5
399.985	41.8	QP	17.5	-21.4	37.9	338	100	Hori.	46.0	8.1
399.997	38.4	QP	17.5	-21.4	34.5	110	118	Vert.	46.0	11.5
619.296	35.9	QP	20.2	-20.3	35.8	268	100	Vert.	46.0	10.2
749.997	36.6	QP	22.1	-19.6	39.1	193	194	Hori.	46.0	6.9

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

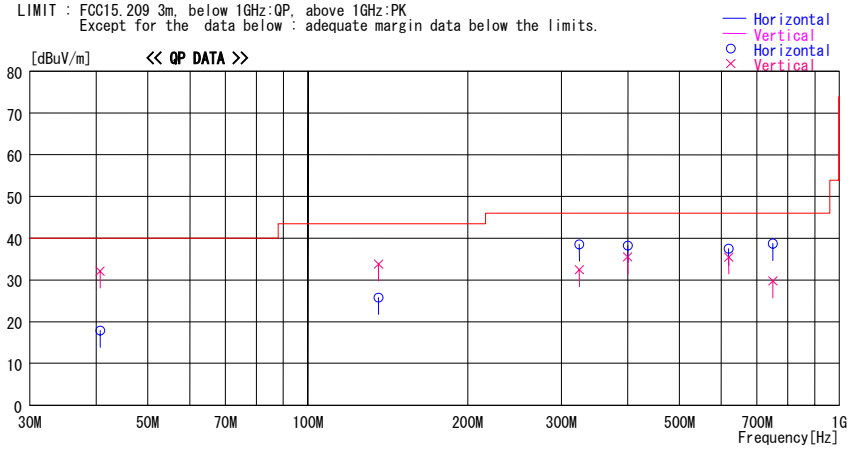
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2007/12/20

Company : OMRON Corporation
Kind of EUT : RFID System(ReaderWriter)
Model No : V680-HAM81
Serial No. : SP-001

Report No. : 28DE0078-HO-01
Power : DC 24.0V(AC120V / 60Hz)
Temp./Humi. : 25deg.C. / 30%
Operator : Takumi Shimada

Mode / Remarks : Tx without Tag, Com with PLC, Antenna:HS51 2m X-axis, ReaderWriter:X-axis, IF 2m

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]
40.695	28.9	QP	13.7	-24.7	17.9	157	300	Hori.	40.0	22.1
40.672	43.1	QP	13.7	-24.7	32.1	140	100	Vert.	40.0	7.9
135.887	35.0	QP	14.3	-23.5	25.8	170	234	Hori.	43.5	17.7
135.882	43.0	QP	14.3	-23.5	33.8	216	100	Vert.	43.5	9.7
324.399	44.0	QP	16.4	-21.9	38.5	158	110	Hori.	46.0	7.5
324.495	38.0	QP	16.4	-21.9	32.5	111	130	Vert.	46.0	13.6
399.994	42.2	QP	17.5	-21.4	38.3	313	100	Hori.	46.0	7.7
400.004	39.3	QP	17.6	-21.4	35.5	295	142	Vert.	46.0	10.5
619.298	37.6	QP	20.2	-20.3	37.5	202	154	Hori.	46.0	8.5
619.298	35.6	QP	20.2	-20.3	35.5	283	100	Vert.	46.0	10.6
749.999	36.2	QP	22.1	-19.6	38.7	204	203	Hori.	46.0	7.3
749.999	27.3	QP	22.1	-19.6	29.8	0	100	Vert.	46.0	16.3

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

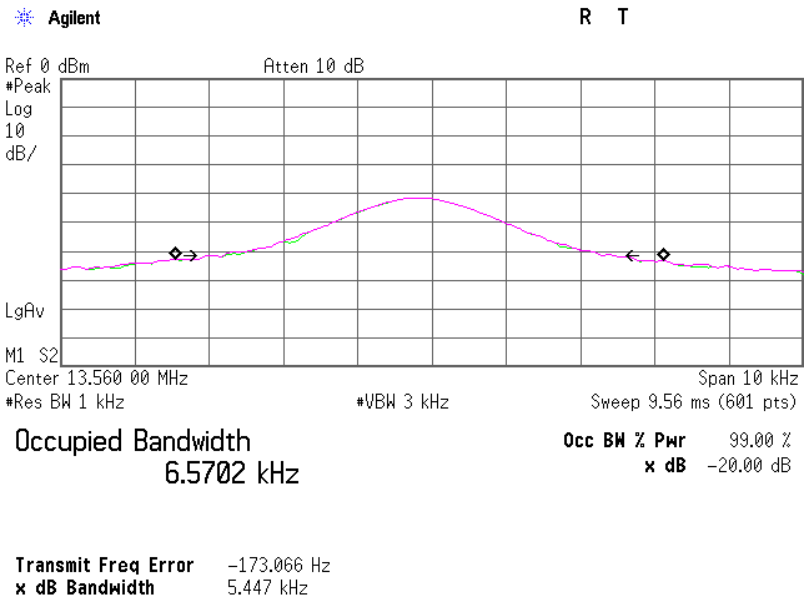
*The test result is round off to one or two decimal places, so some differences might be observed.

20dB Bandwidth

UL Japan, Inc.
Head Office EMC Lab. No.3 Semi Anechoinc Chamber

Company	OMRON Corporation	Regulation	FCC15.225 / -
Equipment	RFID System (ReaderWriter)	Test Distance	3m
Model	V680-HAM81	Date	12/21/2007
S/N	SP-001	Temperature	20 deg.C.
Power	DC 24.0V (DC power supply: AC120V / 60Hz)	Humidity	31 %
Mode	Tx 13.56MHz	Engineer	Kazufumi Nakai

FREQ [MHz]	20dB Bandwidth [kHz]
13.56	5.447

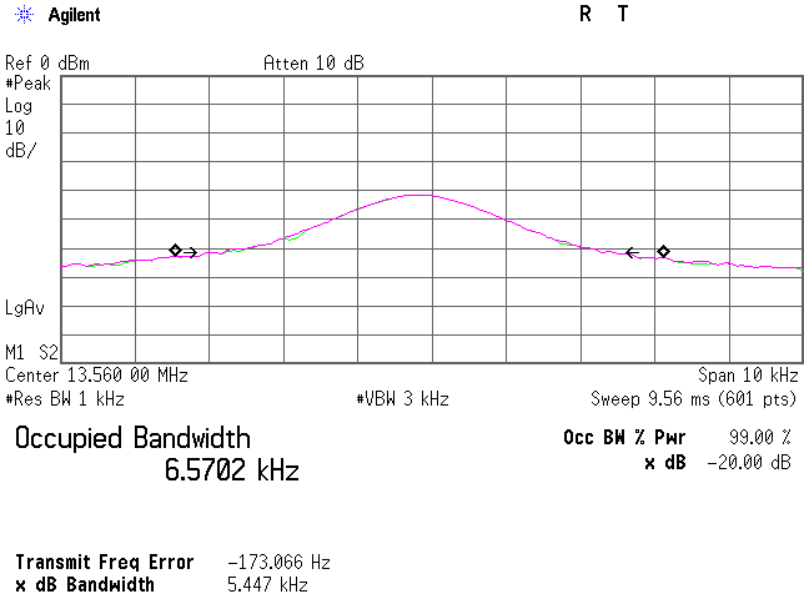


99% Occupied Bandwidth

UL Japan, Inc.
Head Office EMC Lab. No.3 Semi Anechoinc Chamber

Company	OMRON Corporation	Regulation	RSS-Gen 4.6.1
Equipment	RFID System (ReaderWriter)	Test Distance	3m
Model	V680-HAM81	Date	12/21/2007
S/N	SP-001	Temperature	20 deg.C.
Power	DC 24.0V (DC power supply: AC120V / 60Hz)	Humidity	31 %
Mode	Tx 13.56MHz	Engineer	Kazufumi Nakai

FREQ [MHz]	99% Occupied Bandwidth [kHz]
13.56	6.5702



Frequency Tolerance

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

Company	OMRON Corporation	Regulation	FCC15.225 (e) / RSS-210 A2.6
Equipment	RFID System (ReaderWriter)	Test Distance	-
Model	V680-HAM81	Date	12/27/2007
S/N	SP-001	Temperature	23 deg.C.
Power	DC 24.0V (DC power supply: AC120V / 60Hz)	Humidity	38 %
Mode	Continuous Transmitting (No Modulation)	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	13.55985674	-0.00014327	-10.57	100.00	89.43
	on 2min.	13.55985588	-0.00014413	-10.63	100.00	89.37
	on 5min.	13.55985449	-0.00014551	-10.73	100.00	89.27
	on 10min.	13.55985327	-0.00014674	-10.82	100.00	89.18
T nom 20deg.C Vnom DC24V (100%)	Power on	13.55985810	-0.00014190	-10.46	100.00	89.54
	on 2min.	13.55985677	-0.00014323	-10.56	100.00	89.44
	on 5min.	13.55985500	-0.00014500	-10.69	100.00	89.31
	on 10min.	13.55985355	-0.00014645	-10.80	100.00	89.20
T nom 20deg.C Vmin DC20.4V (85%)	Power on	13.55985506	-0.00014494	-10.69	100.00	89.31
	on 2min.	13.55985406	-0.00014594	-10.76	100.00	89.24
	on 5min.	13.55985335	-0.00014665	-10.82	100.00	89.18
	on 10min.	13.55985243	-0.00014757	-10.88	100.00	89.12
T max 50deg.C. Vnom DC24V (100%)	Power on	13.55982510	-0.00017490	-12.90	100.00	87.10
	on 2min.	13.55982739	-0.00017261	-12.73	100.00	87.27
	on 5min.	13.55982299	-0.00017701	-13.05	100.00	86.95
	on 10min.	13.55982425	-0.00017575	-12.96	100.00	87.04
40deg.C. Vnom DC24V (100%)	Power on	13.55982838	-0.00017162	-12.66	100.00	87.34
	on 2min.	13.55982756	-0.00017244	-12.72	100.00	87.28
	on 5min.	13.55982660	-0.00017340	-12.79	100.00	87.21
	on 10min.	13.55982624	-0.00017376	-12.81	100.00	87.19
30deg.C. Vnom DC24V (100%)	Power on	13.55984585	-0.00015415	-11.37	100.00	88.63
	on 2min.	13.55984464	-0.00015536	-11.46	100.00	88.54
	on 5min.	13.55983986	-0.00016014	-11.81	100.00	88.19
	on 10min.	13.55983656	-0.00016344	-12.05	100.00	87.95
20deg.C. Vnom DC24V (100%)	Power on	13.55985810	-0.00014190	-10.46	100.00	89.54
	on 2min.	13.55985677	-0.00014323	-10.56	100.00	89.44
	on 5min.	13.55985500	-0.00014500	-10.69	100.00	89.31
	on 10min.	13.55985355	-0.00014645	-10.80	100.00	89.20
10deg.C. Vnom DC24V (100%)	Power on	13.55988668	-0.00011332	-8.36	100.00	91.64
	on 2min.	13.55987259	-0.00012741	-9.40	100.00	90.60
	on 5min.	13.55986962	-0.00013038	-9.61	100.00	90.39
	on 10min.	13.55986954	-0.00013046	-9.62	100.00	90.38
0deg.C. Vnom DC24V (100%)	Power on	13.55989501	-0.00010499	-7.74	100.00	92.26
	on 2min.	13.55990510	-0.00009490	-7.00	100.00	93.00
	on 5min.	13.55990751	-0.00009249	-6.82	100.00	93.18
	on 10min.	13.55990684	-0.00009316	-6.87	100.00	93.13
-10deg.C. Vnom DC24V (100%)	Power on	13.55989750	-0.00010250	-7.56	100.00	92.44
	on 2min.	13.55989488	-0.00010512	-7.75	100.00	92.25
	on 5min.	13.55989322	-0.00010678	-7.87	100.00	92.13
	on 10min.	13.55989307	-0.00010693	-7.89	100.00	92.11
-20deg.C Vnom DC24V (100%)	Power on	13.55988251	-0.00011749	-8.66	100.00	91.34
	on 2min.	13.55988835	-0.00011165	-8.23	100.00	91.77
	on 5min.	13.55989197	-0.00010803	-7.97	100.00	92.03
	on 10min.	13.55989319	-0.00010681	-7.88	100.00	92.12
*T min -30deg.C Vnom DC24V (100%)	Power on	13.55976969	-0.00023031	-16.98	100.00	83.02
	on 2min.	13.55982156	-0.00017845	-13.16	100.00	86.84
	on 5min.	13.55984411	-0.00015590	-11.50	100.00	88.50
	on 10min.	13.55986075	-0.00013925	-10.27	100.00	89.73

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

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* for IC application (RSS-Gen 4.7 requirement)

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APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-04	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE/ME/CE	2007/03/03 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/01/19 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	RE	2007/01/19 * 12
MAT-31	Attenuator(6dB)	TME	UFA-01	RE	2007/03/05 * 12
MCC-50	Coaxial cable	UL Japan	-	RE/CE/ME	2007/03/06 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	RE/ME	2007/03/12 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	RE/ME/CE	2007/06/01 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	RE/ME/CE	2007/09/14 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	RE/ME/CE	2006/01/19 * 24
MJM-07	Measure	PROMART	SEN1955	RE/ME/CE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE/ME/CE	
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2007/12/12 * 12
MCC-31	Coaxial cable	UL Japan	-	ME	2007/06/04 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	CE(EUT)	2007/06/29 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	CE(AE)	2007/06/29 * 12
MTA-06	Terminator	MCL	BTRM-50	CE	2007/02/01 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	FT	2007/07/04 * 12
MCC-66	Microwave Cable 1G-40GHz	Schner	SUCOFLEX102	FT	2007/04/03 * 12
MAT-25	Attenuator(10dB) (above1GHz)	Agilent	8493C	FT	2007/06/28 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-180	FT	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