

APPENDIX 2: Data of EMI test

Conducted emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
 Date : 2007/11/21

Company	: OMRON Corporation	Report No.	: 28CE0226-HO-01
Kind of EUT	: Reader/Writer	Power	: AC120V / 60Hz
Model No.	: V720S-HMU01	Temp./Humi.	: 25deg. C / 28%
Serial No.	: 26X6RB	Operator	: Takahiro Hatakeda

Mode / Remarks : Transmitting with Tag (with Antenna)

LIMIT : FCC15.207 QP
 FCC15.207 AV

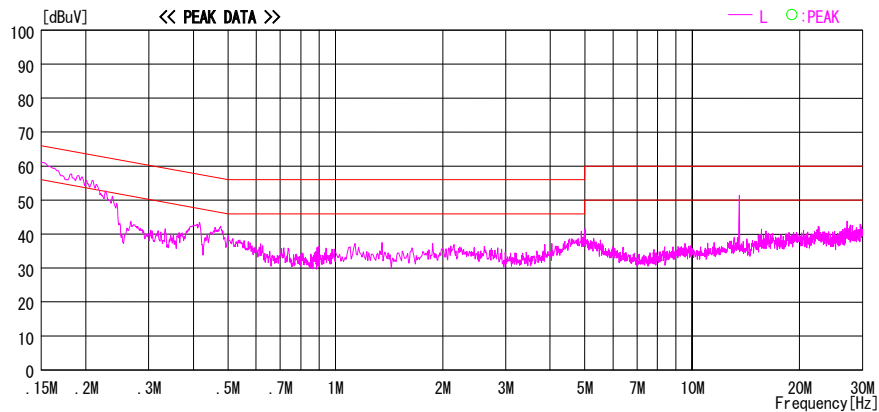
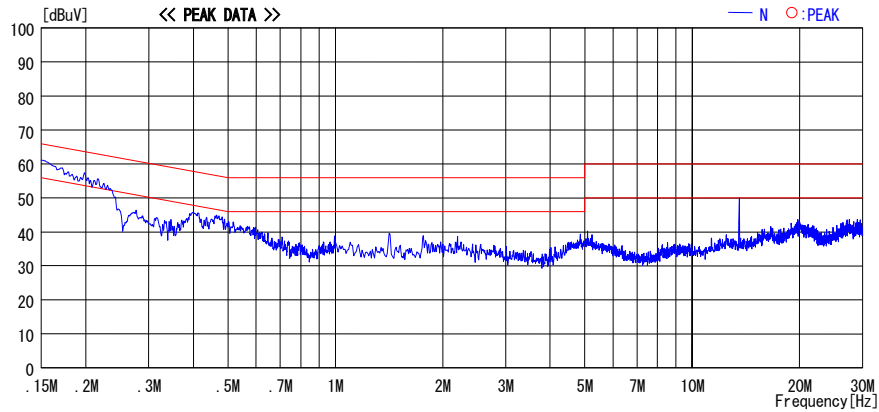


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F.(LISN LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

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Head Office EMC Lab.
 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
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Conducted emission

DATA OF CONDUCTED EMISSION TEST

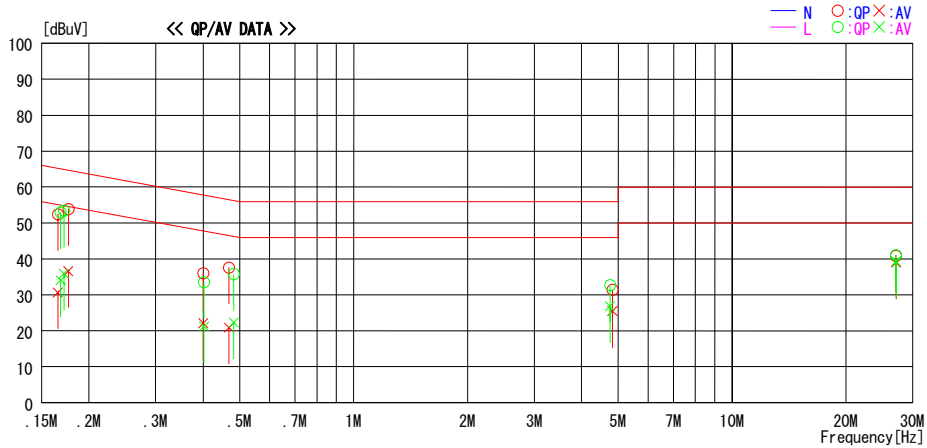
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
 Kind of EUT : Reader/Writer
 Model No. : V720S-HMU01
 Serial No. : 26X6RB

Report No. : 28CE0226-HO-01
 Power : AC120V / 60Hz
 Temp./Humi. : 25deg. C / 28%
 Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting with Tag (with Antenna)

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.16556	52.1	30.4	0.3	52.4	30.7	65.2	55.2	12.8	24.5	N	
0.16834	52.6	33.8	0.3	52.9	34.1	65.0	55.0	12.1	20.9	L	
0.17182	53.1	35.6	0.3	53.4	35.9	64.9	54.9	11.5	19.0	L	
0.17644	53.6	36.3	0.3	53.9	36.6	64.7	54.7	10.8	18.1	N	
0.40078	35.7	21.8	0.3	36.0	22.1	57.8	47.8	21.8	25.7	N	
0.40245	33.2	20.9	0.3	33.5	21.2	57.8	47.8	24.3	26.6	L	
0.46852	37.3	20.6	0.3	37.6	20.9	56.5	46.5	18.9	25.6	N	
0.48241	35.5	22.0	0.3	35.8	22.3	56.3	46.3	20.5	24.0	L	
4.75640	31.9	26.0	0.8	32.7	26.8	56.0	46.0	23.3	19.2	L	
4.83160	30.6	24.7	0.8	31.4	25.5	56.0	46.0	24.6	20.5	N	
27.12000	38.9	37.0	2.0	40.9	39.0	60.0	50.0	19.1	11.0	N	
27.12000	39.0	37.4	2.0	41.0	39.4	60.0	50.0	19.0	10.6	L	

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C. F (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

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
 Kind of EUT : Reader/Writer
 Model No. : V720S-HMU01
 Serial No. : 26X6RB

Report No. : 28CE0226-HO-01
 Power : AC120V / 60Hz
 Temp./Humi. : 25deg. C / 28%
 Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag (with Antenna)

LIMIT : FCC15.207 QP
 FCC15.207 AV

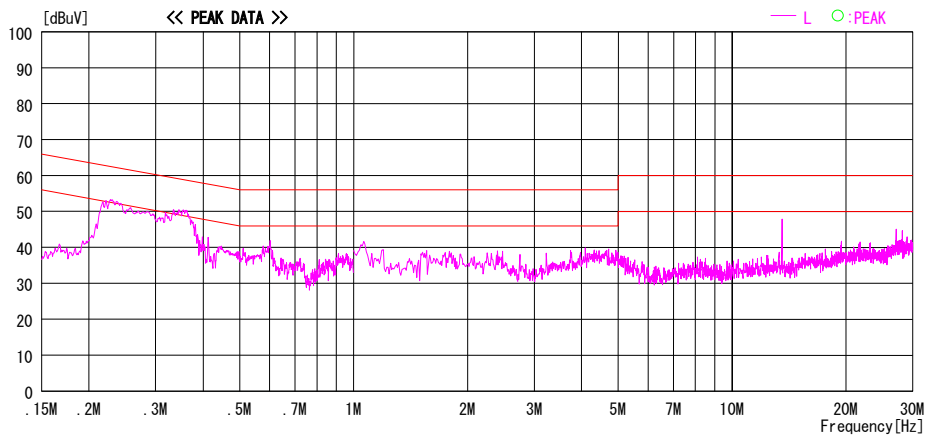
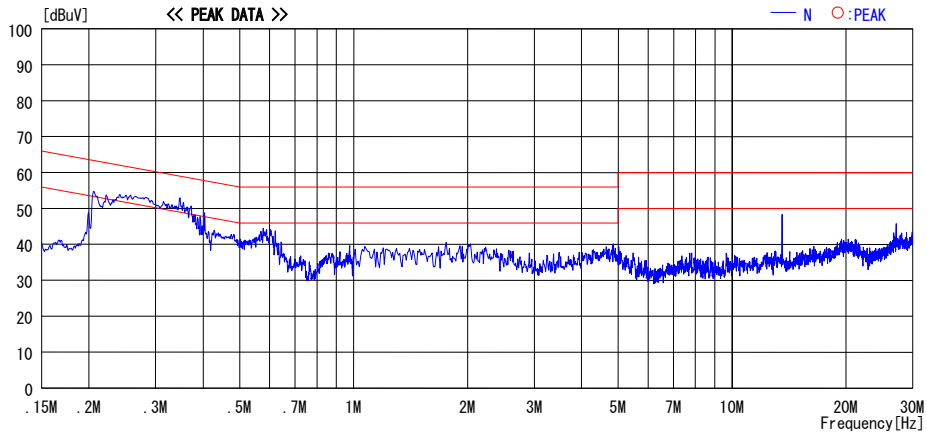


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C. F (LISN LOSS+CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted emission

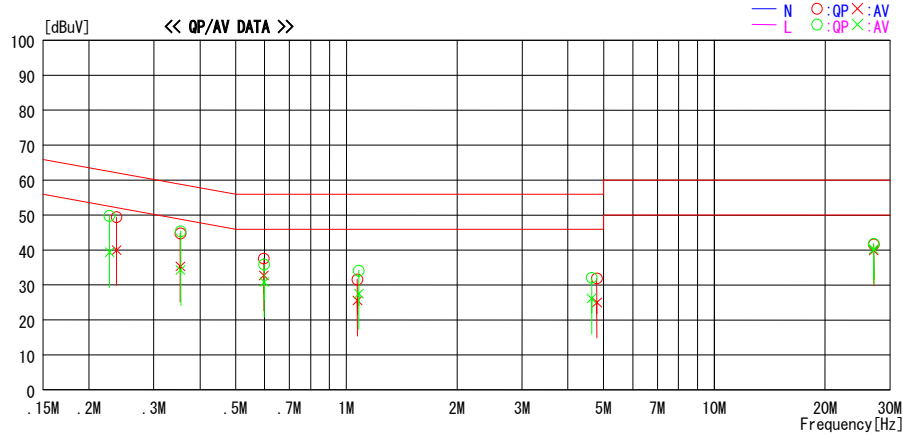
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : AC120V / 60Hz
Temp./Humi. : 25deg.C / 28%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag (with Antenna)

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.22728	49.5	39.1	0.3	49.8	39.4	62.5	52.5	12.7	13.1	L	
0.23748	49.1	39.7	0.3	49.4	40.0	62.2	52.2	12.8	12.2	N	
0.35410	44.5	35.0	0.3	44.8	35.3	58.9	48.9	14.1	13.6	N	
0.35426	45.1	34.0	0.3	45.4	34.3	58.9	48.9	13.5	14.6	L	
0.59747	37.3	32.4	0.3	37.6	32.7	56.0	46.0	18.4	13.3	N	
0.59881	35.6	30.6	0.3	35.9	30.9	56.0	46.0	20.1	15.1	L	
1.07134	31.2	25.1	0.4	31.6	25.5	56.0	46.0	24.4	20.5	N	
1.08088	33.8	27.1	0.4	34.2	27.5	56.0	46.0	21.8	18.5	L	
4.64699	31.4	25.4	0.7	32.1	26.1	56.0	46.0	23.9	19.9	L	
4.79450	31.1	24.2	0.8	31.9	25.0	56.0	46.0	24.1	21.0	N	
27.12000	39.6	37.9	2.0	41.6	39.9	60.0	50.0	18.4	10.1	N	
27.12000	39.8	38.3	2.0	41.8	40.3	60.0	50.0	18.2	9.7	L	

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (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

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation	Report No. : 28CE0226-HO-01
Kind of EUT : Reader/Writer	Power : AC120V / 60Hz
Model No. : V720S-HMU01	Temp./Humi. : 25deg. C / 28%
Serial No. : 26X6RB	Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag (Antenna: 50 ohm terminated)

LIMIT : FCC15.207 QP
FCC15.207 AV

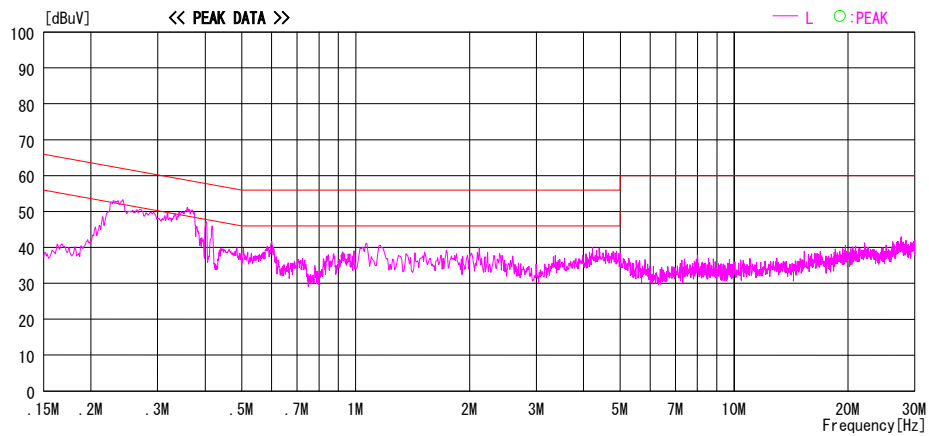
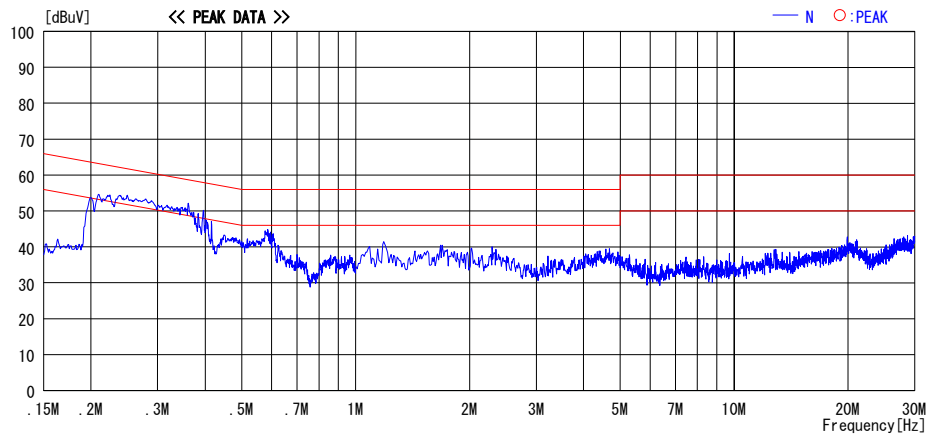


CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

Conducted emission

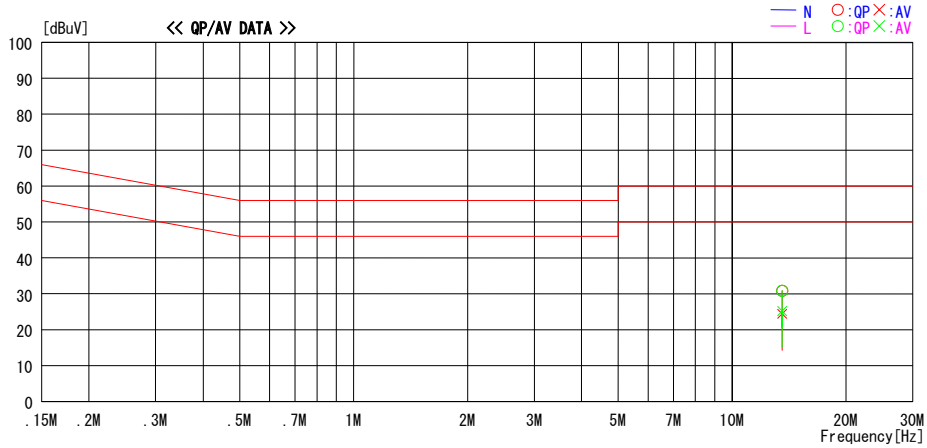
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : AC120V / 60Hz
Temp./Humi. : 25deg. C / 28%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag (Antenna: 50 ohm terminated)

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
13.56000	29.4	23.0	1.4	30.8	24.4	60.0	50.0	29.2	25.6	N	
13.56000	29.4	23.8	1.4	30.8	25.2	60.0	50.0	29.2	24.8	L	

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

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Conducted emission

DATA OF CONDUCTED EMISSION TEST

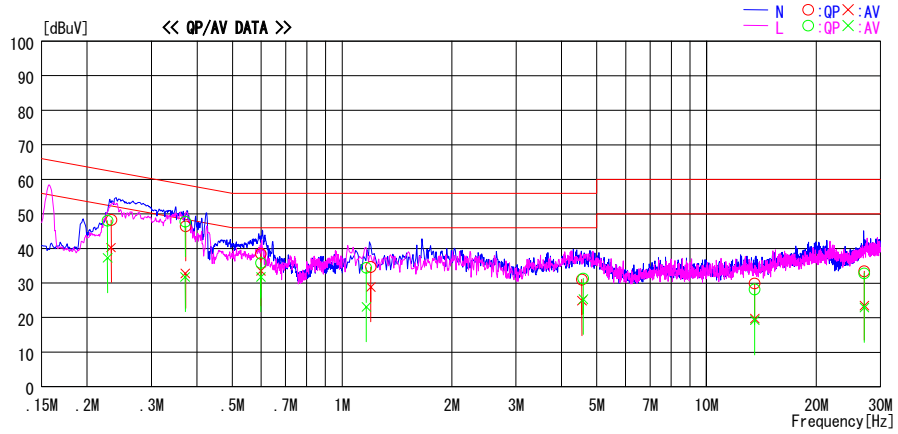
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
 Date : 2007/11/21

Company : OMRON Corporation
 Kind of EUT : Reader/Writer
 Model No. : V720S-HMU01
 Serial No. : 26X6RB

Report No. : 28CE0226-HO-01
 Power : AC120V / 60Hz
 Temp./Humi. : 25deg. C / 28%
 Operator : Takahiro Hatakeda

Mode / Remarks : Standby (with Antenna)

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.22709	47.8	37.0	0.3	48.1	37.3	62.6	52.6	14.5	15.3	L	
0.23258	48.0	40.0	0.3	48.3	40.3	62.4	52.4	14.1	12.1	N	
0.37106	47.5	31.5	0.3	47.8	31.8	58.5	48.5	10.7	16.7	L	
0.37222	46.2	32.5	0.3	46.5	32.8	58.5	48.5	12.0	15.7	N	
0.59880	35.6	31.5	0.3	35.9	31.8	56.0	46.0	20.1	14.2	L	
0.59855	38.2	33.2	0.3	38.5	33.5	56.0	46.0	17.5	12.5	N	
1.16521	34.1	22.7	0.4	34.5	23.1	56.0	46.0	21.5	22.9	L	
1.19992	34.3	28.5	0.4	34.7	28.9	56.0	46.0	21.3	17.1	N	
4.54995	30.3	24.2	0.7	31.0	24.9	56.0	46.0	25.0	21.1	N	
4.58959	30.6	24.6	0.7	31.3	25.3	56.0	46.0	24.7	20.7	L	
13.56000	26.8	17.9	1.4	28.2	19.3	60.0	50.0	31.8	30.7	L	
13.56000	28.5	18.4	1.4	29.9	19.8	60.0	50.0	30.1	30.2	N	
27.12000	31.5	21.5	2.0	33.5	23.5	60.0	50.0	26.5	26.5	N	
27.12000	30.8	20.9	2.0	32.8	22.9	60.0	50.0	27.2	27.1	L	

CHART: WITH FACTOR, Peak hold data. Data is uncorrected. CALCULATION: RESULT=READING+C.F (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)

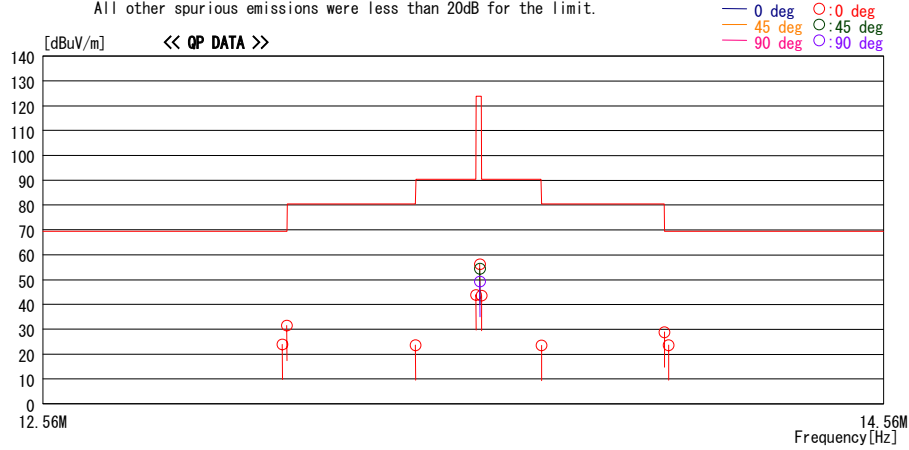
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/20

Applicant : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : DC 5.0V
Temp. / Humi. : 25deg. C / 33%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting with Tag, Worst-Axis:Y, Worst-angle:0deg.

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
All other spurious emissions were less than 20dB for the limit.



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	35.1	QP	20.1	0.8	32.1	23.9	69.5	45.6	0deg	174	
13.11000	42.8	QP	20.1	0.8	32.1	31.6	69.5	37.9	0deg	174	
13.41000	34.8	QP	20.1	0.8	32.1	23.6	80.5	56.9	0deg	174	
13.55300	55.0	QP	20.1	0.8	32.1	43.8	90.4	46.6	0deg	174	
13.56270	60.5	QP	20.1	0.8	32.1	49.3	123.9	74.6	90deg	122	
13.56270	67.4	QP	20.1	0.8	32.1	56.2	123.9	67.7	0deg	174	Worst angle
13.56270	65.7	QP	20.1	0.8	32.1	54.5	123.9	69.4	45deg	157	
13.56700	54.8	QP	20.1	0.8	32.1	43.6	90.4	46.8	0deg	174	
13.71000	34.7	QP	20.1	0.8	32.1	23.5	80.5	57.0	0deg	174	
14.01000	40.0	QP	20.1	0.8	32.1	28.8	69.5	40.7	0deg	174	
14.02000	34.9	QP	20.1	0.8	32.1	23.7	69.5	45.8	0deg	174	

CHART : WITH FACTOR . ANT TYPE : LOOP . Except for the data below : adequate margin data below the limits.
CALCULATION : READING + ANT FACTOR + LOSS (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)

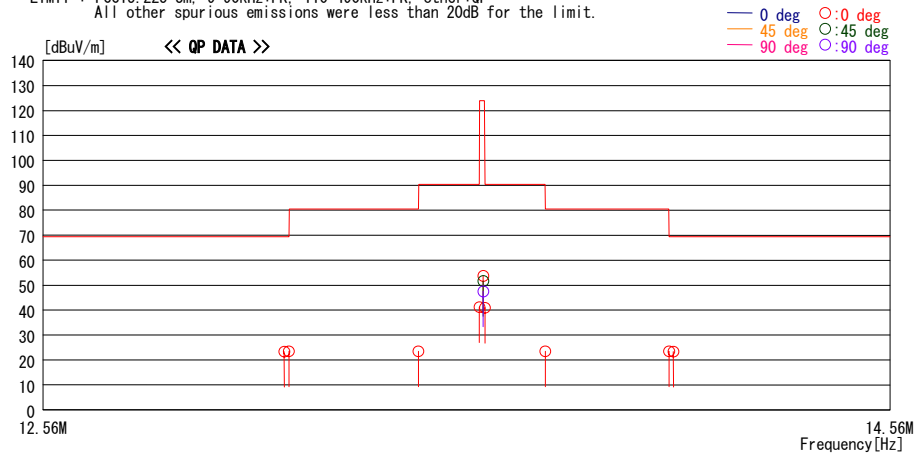
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/20

Applicant : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : DC 5.0V
Temp. / Humi. : 25deg.C / 33%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag, Worst-Axis:Y, Worst-angle:0deg.

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
All other spurious emissions were less than 20dB for the limit.



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	34.6	QP	20.1	0.8	32.1	23.4	69.5	46.1	0deg	180	
13.11000	34.7	QP	20.1	0.8	32.1	23.5	69.5	46.0	0deg	180	
13.41000	34.7	QP	20.1	0.8	32.1	23.5	80.5	57.0	0deg	180	
13.55300	52.3	QP	20.1	0.8	32.1	41.1	90.4	49.3	0deg	180	
13.56270	58.8	QP	20.1	0.8	32.1	47.6	123.9	76.3	90deg	230	
13.56270	64.9	QP	20.1	0.8	32.1	53.7	123.9	70.2	0deg	180	Worst angle
13.56270	62.8	QP	20.1	0.8	32.1	51.6	123.9	72.3	45deg	158	
13.56700	52.1	QP	20.1	0.8	32.1	40.9	90.4	49.5	0deg	180	
13.71000	34.7	QP	20.1	0.8	32.1	23.5	80.5	57.0	0deg	180	
14.01000	34.7	QP	20.1	0.8	32.1	23.5	69.5	46.0	0deg	180	
14.02000	34.6	QP	20.1	0.8	32.1	23.4	69.5	46.1	0deg	180	

CHART : WITH FACTOR, ANT TYPE : LOOP, Except for the data below : adequate margin data below the limits.
CALCULATION : READING + ANT FACTOR + LOSS(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)

DATA OF RADIATED EMISSION TEST

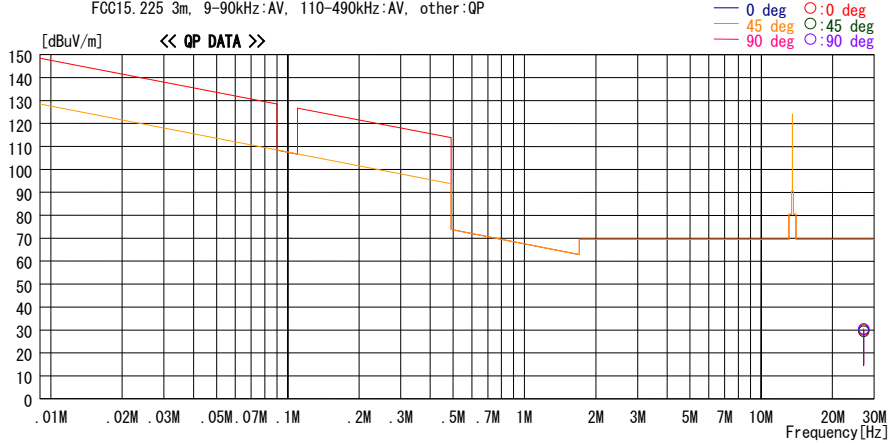
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Applicant : OMRON Corporation
 Kind of EUT : Reader/Writer
 Model No. : V720S-HMU01
 Serial No. : 26X6RB

Report No. : 28CE0226-HO-01
 Power : DC 5.0V
 Temp. / Humi. : 25deg. C / 33%
 Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting with Tag, Worst-Axis:Y, Worst-angle:0deg.

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	Comment
27.12000	40.4	QP	20.5	1.2	32.1	30.0	69.5	39.5	0deg	164	
27.12000	40.0	QP	20.5	1.2	32.1	29.6	69.5	39.9	45deg	279	
27.12000	40.9	QP	20.5	1.2	32.1	30.5	69.5	39.0	90deg	201	

CHART : WITH FACTOR , ANT TYPE : LOOP , Except for the data below : adequate margin data below the limits.
 CALCULATION : READING + ANT FACTOR + LOSS (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)

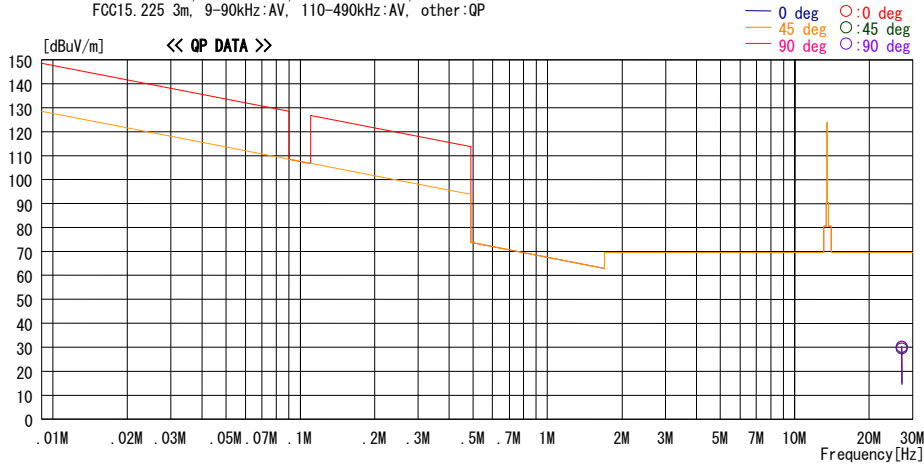
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Applicant : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : DC 5.0V
Temp. / Humi. : 25deg. C / 33%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag, Worst-Axis:Y, Worst-angle:0deg.

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]	
27.12000	40.5	QP	20.5	1.2	32.1	30.1	69.5	39.4	0deg	156	
27.12000	40.0	QP	20.5	1.2	32.1	29.6	69.5	39.9	45deg	242	
27.12000	40.7	QP	20.5	1.2	32.1	30.3	69.5	39.2	90deg	223	

CHART : WITH FACTOR , ANT TYPE : LOOP , Except for the data below : adequate margin data below the limits.
CALCULATION : READING + ANT FACTOR + LOSS (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)

DATA OF RADIATED EMISSION TEST

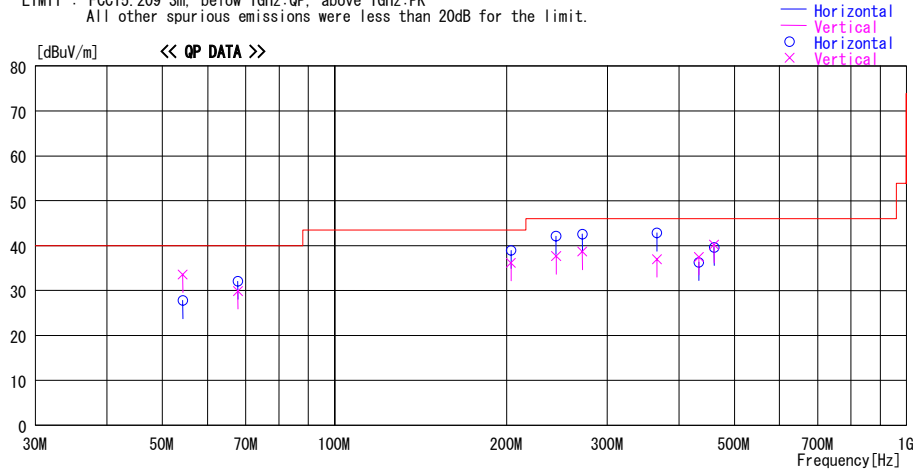
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB

Report No. : 28CE0226-HO-01
Power : DC 5.0V
Temp./Humi. : 25deg.C. / 33%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting with Tag, Worst-Axis:Y

LIMIT : FCC15.209 3m. below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain [dB]					
54.238	48.2	QP	9.9	-24.5	33.6	Vert.	40.0	6.4	
54.239	42.4	QP	9.9	-24.5	27.8	Hori.	40.0	12.2	
67.794	46.7	QP	7.5	-24.3	29.9	Vert.	40.0	10.1	
67.793	48.9	QP	7.5	-24.3	32.1	Hori.	40.0	7.9	
203.403	45.1	QP	16.7	-22.8	39.0	Hori.	43.5	4.5	
203.394	42.3	QP	16.7	-22.8	36.2	Vert.	43.5	7.3	
244.078	47.5	QP	17.1	-22.5	42.1	Hori.	46.0	3.9	
244.084	43.1	QP	17.1	-22.5	37.7	Vert.	46.0	8.3	
271.203	46.5	QP	18.4	-22.3	42.6	Hori.	46.0	3.4	
271.199	42.6	QP	18.4	-22.3	38.7	Vert.	46.0	7.3	
366.114	47.3	QP	17.1	-21.6	42.8	Hori.	46.0	3.2	
366.115	41.5	QP	17.1	-21.6	37.0	Vert.	46.0	9.0	
433.919	39.2	QP	18.3	-21.2	36.3	Hori.	46.0	9.7	
433.924	40.4	QP	18.3	-21.2	37.5	Vert.	46.0	8.5	
461.037	41.8	QP	18.8	-21.0	39.6	Hori.	46.0	6.4	
461.048	42.4	QP	18.8	-21.0	40.2	Vert.	46.0	5.8	

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

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

Radiated emission (Spurious emission: above 30MHz)

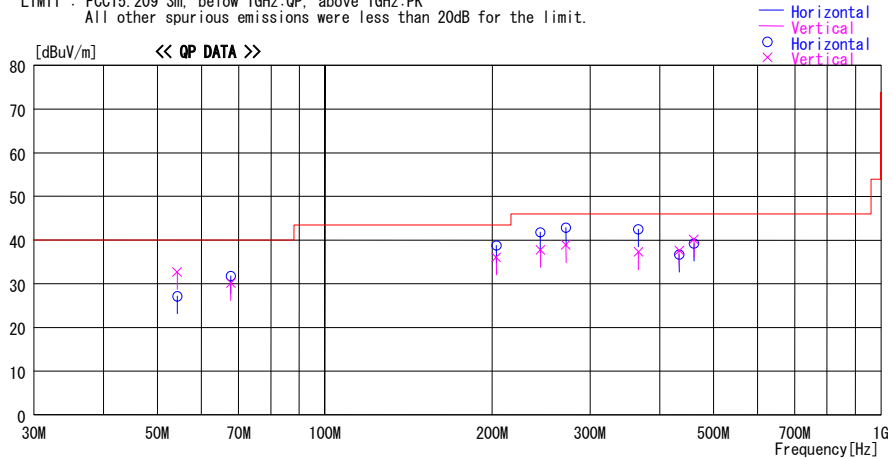
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/11/21

Company : OMRON Corporation
Kind of EUT : Reader/Writer
Model No. : V720S-HMU01
Serial No. : 26X6RB
Report No. : 28CE0226-HO-01
Power : DC 5.0V
Temp./Humi. : 25deg. C. / 33%
Operator : Takahiro Hatakeda

Mode / Remarks : Transmitting without Tag, Worst-Axis:Y

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]					
54.243	47.3	QP	9.9	-24.5	32.7	Vert.	40.0	7.3	
54.237	41.8	QP	9.9	-24.5	27.2	Hori.	40.0	12.8	
67.799	47.0	QP	7.5	-24.3	30.2	Vert.	40.0	9.8	
67.795	48.6	QP	7.5	-24.3	31.8	Hori.	40.0	8.2	
203.410	44.9	QP	16.7	-22.8	38.8	Hori.	43.5	4.7	
203.391	42.2	QP	16.7	-22.8	36.1	Vert.	43.5	7.4	
244.081	47.2	QP	17.1	-22.5	41.8	Hori.	46.0	4.2	
244.090	43.2	QP	17.1	-22.5	37.8	Vert.	46.0	8.2	
271.205	46.7	QP	18.4	-22.3	42.8	Hori.	46.0	3.2	
271.205	42.8	QP	18.4	-22.3	38.9	Vert.	46.0	7.1	
366.117	47.0	QP	17.1	-21.6	42.5	Hori.	46.0	3.5	
366.110	41.8	QP	17.1	-21.6	37.3	Vert.	46.0	8.7	
433.917	39.6	QP	18.3	-21.2	36.7	Hori.	46.0	9.3	
433.929	40.5	QP	18.3	-21.2	37.6	Vert.	46.0	8.4	
461.039	41.4	QP	18.8	-21.0	39.2	Hori.	46.0	6.8	
461.051	42.3	QP	18.8	-21.0	40.1	Vert.	46.0	5.9	

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.

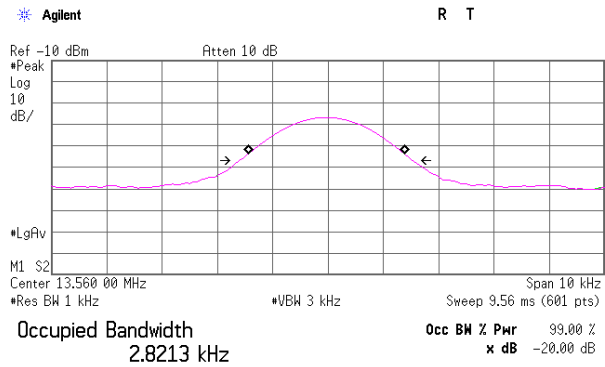
20dB Bandwidth

UL Japan, Inc.
Head Office EMC Lab. No.4 Semi Anechoic Chamber

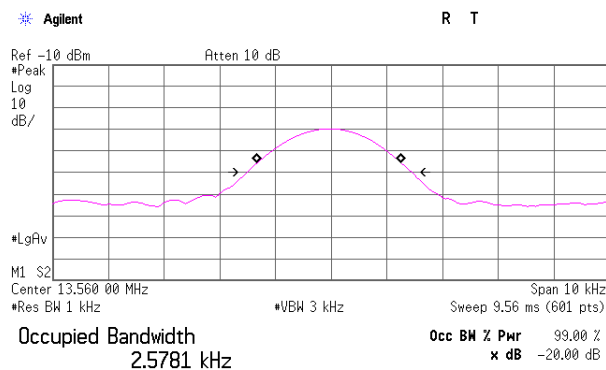
COMPANY : OMRON Corporation
EQUIPMENT : Reader/Writer
MODEL : V720S-HMU01
S/N : 26X6RB
POWER : DC5.0V
MODE : Transmitting

REPORT NO : 28CE0226-HO-01
REGULATION : FCC 15.225/-
TEST DISTANCE : -
DATE : 11/20/2007
TEMPERATURE : 25 deg.C.
HUMIDITY : 33 %
ENGINEER : Takahiro Hatakeda

FREQ [MHz]	20dB Bandwidth [kHz]	
13.56	3.12	with Tag
	2.94	without Tag



with Tag
Transmit Freq Error -28.526 Hz
x dB Bandwidth 3.116 kHz



without Tag
Transmit Freq Error -38.661 Hz
x dB Bandwidth 2.943 kHz

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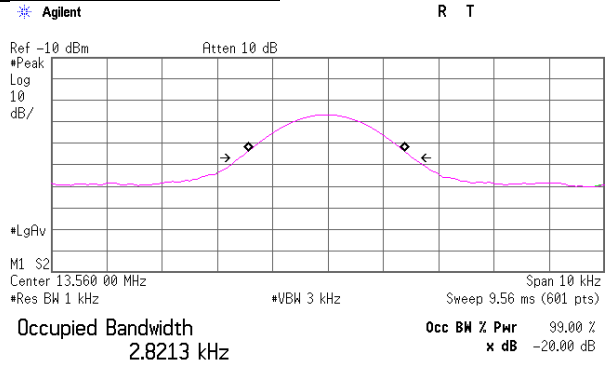
99% Occupied Bandwidth

UL Japan, Inc.
 Head Office EMC Lab. No.4 Semi Anechoic Chamber

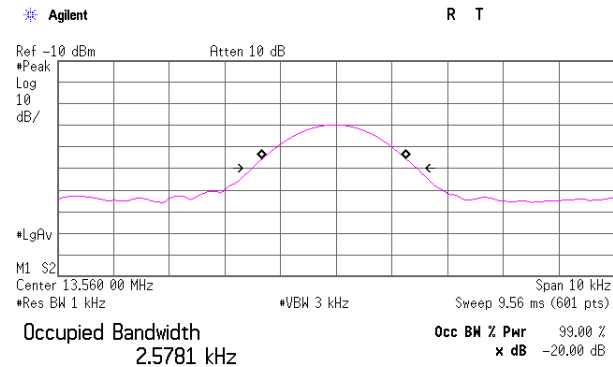
COMPANY : OMRON Corporation
 EQUIPMENT : Reader/Writer
 MODEL : V720S-HMU01
 S/ N : 26X6RB
 POWER : DC5.0V
 MODE : Transmitting

REPORT NO : 28CE0226-HO-01
 REGULATION : RSS-Gen 4.6.1
 TEST DISTANCE : -
 DATE : 11/20/2007
 TEMPERATURE : 25 deg.C.
 HUMIDITY : 33 %
 ENGINEER : Takahiro Hatakeda

FREQ [MHz]	99% Occupied Bandwidth [kHz]	
13.56	2.82	with Tag
	2.58	without Tag



with Tag
 Transmit Freq Error -28.526 Hz
 x dB Bandwidth 3.116 kHz



without Tag
 Transmit Freq Error -38.661 Hz
 x dB Bandwidth 2.943 kHz

Frequency Tolerance

Company OMRON Corporation
Equipment Reader/Writer
Model V720S-HMU01
S/N 26X6RB
Power DC 5.0V (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 11/21/2007
Temperature 25 deg.C.
Humidity 32 %
Engineer Takahiro Hatakeda

Test Condition	Test Timing	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.01%) [+/- ppm]	Margin [ppm]
T nom 20deg.C Vmax AC138V (115%)	Power on	13.560025	0.000025	1.84	100.00	98.16
	on 2min.	13.560016	0.000016	1.18	100.00	98.82
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.560025	0.000025	1.84	100.00	98.16
T nom 20deg.C Vnom AC120V (100%)	Power on	13.560016	0.000016	1.18	100.00	98.82
	on 2min.	13.560008	0.000008	0.59	100.00	99.41
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.559991	-0.000009	-0.66	100.00	99.34
T nom 20deg.C Vmin AC102V (85%)	Power on	13.560016	0.000016	1.18	100.00	98.82
	on 2min.	13.560016	0.000016	1.18	100.00	98.82
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.560016	0.000016	1.18	100.00	98.82
T max 50deg.C. Vnom AC120V (100%)	Power on	13.559966	-0.000034	-2.51	100.00	97.49
	on 2min.	13.559975	-0.000025	-1.84	100.00	98.16
	on 5min.	13.559958	-0.000042	-3.10	100.00	96.90
	on 10min.	13.559983	-0.000017	-1.25	100.00	98.75
40deg.C. Vnom AC120V (100%)	Power on	13.559991	-0.000009	-0.66	100.00	99.34
	on 2min.	13.559975	-0.000025	-1.84	100.00	98.16
	on 5min.	13.559983	-0.000017	-1.25	100.00	98.75
	on 10min.	13.559958	-0.000042	-3.10	100.00	96.90
30deg.C. Vnom AC120V (100%)	Power on	13.559991	-0.000009	-0.66	100.00	99.34
	on 2min.	13.559991	-0.000009	-0.66	100.00	99.34
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.559991	-0.000009	-0.66	100.00	99.34
20deg.C. Vnom AC120V (100%)	Power on	13.560016	0.000016	1.18	100.00	98.82
	on 2min.	13.560008	0.000008	0.59	100.00	99.41
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.559991	-0.000009	-0.66	100.00	99.34
10deg.C. Vnom AC120V (100%)	Power on	13.560041	0.000041	3.02	100.00	96.98
	on 2min.	13.560033	0.000033	2.43	100.00	97.57
	on 5min.	13.560033	0.000033	2.43	100.00	97.57
	on 10min.	13.560016	0.000016	1.18	100.00	98.82
0deg.C. Vnom AC120V (100%)	Power on	13.560025	0.000025	1.84	100.00	98.16
	on 2min.	13.560016	0.000016	1.18	100.00	98.82
	on 5min.	13.560041	0.000041	3.02	100.00	96.98
	on 10min.	13.560033	0.000033	2.43	100.00	97.57
-10deg.C. Vnom AC120V (100%)	Power on	13.560041	0.000041	3.02	100.00	96.98
	on 2min.	13.560008	0.000008	0.59	100.00	99.41
	on 5min.	13.560025	0.000025	1.84	100.00	98.16
	on 10min.	13.560025	0.000025	1.84	100.00	98.16
-20deg.C Vnom AC120V (100%)	Power on	13.559975	-0.000025	-1.84	100.00	98.16
	on 2min.	13.559991	-0.000009	-0.66	100.00	99.34
	on 5min.	13.560008	0.000008	0.59	100.00	99.41
	on 10min.	13.559991	-0.000009	-0.66	100.00	99.34
*T min -30deg.C Vnom AC120V (100%)	Power on	13.559816	-0.000184	-13.57	100.00	86.43
	on 2min.	13.559841	-0.000159	-11.73	100.00	88.27
	on 5min.	13.559858	-0.000142	-10.47	100.00	89.53
	on 10min.	13.559841	-0.000159	-11.73	100.00	88.27

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

* Temperature -30deg.C.: Reference data

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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 / ME /CE	2007/03/06 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	RE / ME	2007/03/12 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	RE / ME /CE	2007/09/14 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	RE / ME /CE	2007/06/01 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	ME	2007/06/20 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	ME	2006/12/19 * 12
MCC-31	Coaxial cable	UL Japan	-	ME	2007/06/04 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE / ME /CE	-
MOS-15	Thermo-Hygrometer	Custom	CTH-180	RE / ME /CE	2006/01/19 * 24
MJM-07	Measure	PROMART	SEN1955	RE / ME /CE	-
MSA-06	Spectrum Analyzer	Agilent	E4407B	RE	2007/04/10 * 12
MCH-04	Temperature and Humidity Chamber	Espec	PL-2KP	RE	2007/08/30 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	CE (EUT)	2007/02/22 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: CE: Conducted Emission

ME: Radiated Emission (below 30MHz)

RE: Radiated Emission (above 30MHz)

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