

APPENDIX 2: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious Emission)

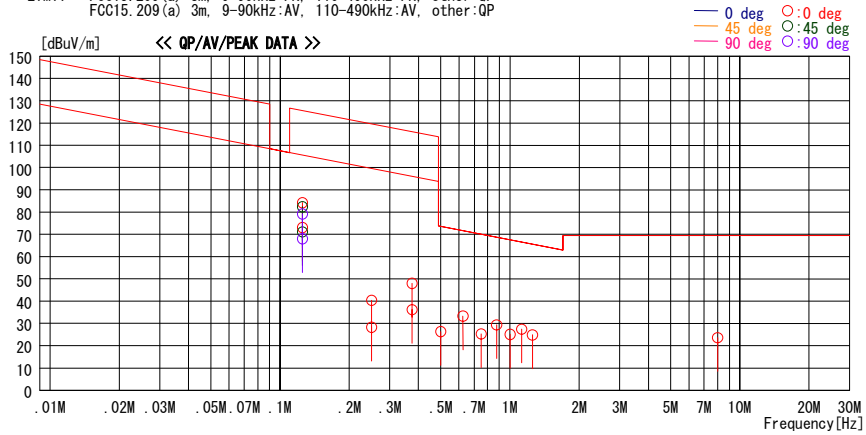
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2007/08/08

Company : OMRON Corporation
 Kind of EUT : Wireless Control Module
 Model No. : G8D-645M
 Serial No. : 9000
 Report No. : 27LE0315-HO
 Power : DC 12V
 Temp. / Humi. : 25deg.C / 61%
 Operator : Takahiro Hatakeda

Mode / Remarks : Transceiver 125kHz X-axis

LIMIT : FCC15.209(a) 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15.209(a) 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]	
0.12507	91.5	PEAK	19.9	0.2	32.3	79.3	125.6	46.3	90deg	128	PK, BW200Hz
0.12507	94.6	PEAK	19.9	0.2	32.3	82.4	125.6	43.2	45deg	175	PK, BW200Hz
0.12507	96.4	PEAK	19.9	0.2	32.3	84.2	125.6	41.4	0deg	207	PK, BW200Hz Worst
0.12507	80.2	AV	19.9	0.2	32.3	68.0	105.7	37.7	90deg	128	AV, BW200Hz
0.12507	83.5	AV	19.9	0.2	32.3	71.3	105.7	34.4	45deg	175	AV, BW200Hz
0.12507	85.3	AV	19.9	0.2	32.3	73.1	105.7	32.6	0deg	207	AV, BW200Hz Worst
0.25011	52.7	PEAK	19.8	0.2	32.3	40.4	119.6	79.2	0deg	206	PK, BW9kHz
0.25011	40.7	AV	19.8	0.2	32.3	28.4	99.6	71.2	0deg	206	AV, BW9kHz
0.37516	60.4	PEAK	19.7	0.2	32.3	48.0	116.1	68.1	0deg	200	PK, BW9kHz
0.37516	48.7	AV	19.7	0.2	32.3	36.3	96.1	59.8	0deg	200	AV, BW9kHz
0.50020	38.7	QP	19.7	0.2	32.2	26.4	73.6	47.2	0deg	203	QP, BW9kHz
0.62530	45.7	QP	19.7	0.2	32.2	33.4	71.7	38.3	0deg	210	QP, BW9kHz
0.75029	37.7	QP	19.6	0.2	32.2	25.3	70.1	44.8	0deg	208	QP, BW9kHz
0.87535	41.8	QP	19.6	0.2	32.2	29.4	68.7	39.3	0deg	194	QP, BW9kHz
1.00044	37.5	QP	19.6	0.3	32.2	25.2	67.6	42.4	0deg	200	QP, BW9kHz
1.12545	39.7	QP	19.6	0.3	32.2	27.4	66.5	39.1	0deg	220	QP, BW9kHz
1.25074	37.1	QP	19.6	0.3	32.2	24.8	65.6	40.8	0deg	207	QP, BW9kHz
8.00000	35.4	QP	19.9	0.6	32.2	23.7	69.5	45.8	0deg	359	QP, BW9kHz

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.)

Radiated Emission above 30MHz (Spurious Emission)

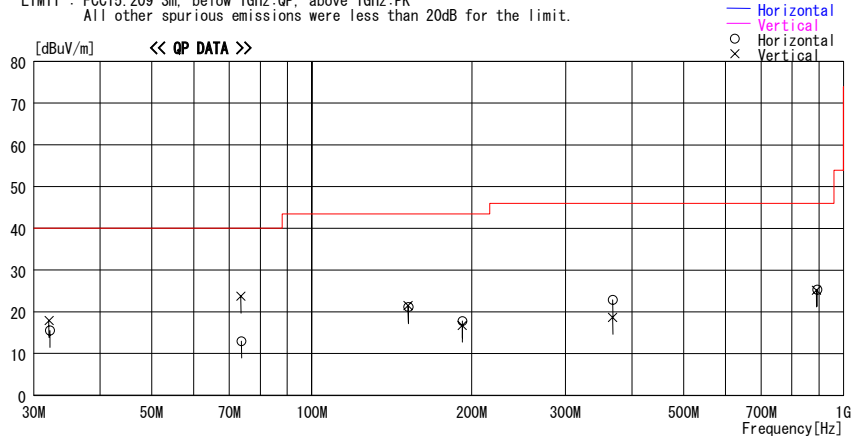
DATA OF RADIATED EMISSION TEST

UL Japan Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2007/08/09

Company : OMRON Corporation
 Kind of EUT : Wireless Control Module
 Model No. : G8D-645M
 Serial No. : 9000
 Report No. : 27LE0315-HO
 Power : DC 12V
 Temp./Humi. : 25deg.C / 61%
 Operator : Takahiro Hatakeda

Mode / Remarks : Transceiver 125kHz X-axis

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]	Angle [Deg]	Height [cm]	Polar.	Limit		Margin
			Factor [dB/m]	Loss&Gain [dB]					[dBuV/m]	[dB]	
32.032	24.5	QP	18.4	-25.0	17.9	241	100	Vert.	40.0	22.1	
32.160	22.2	QP	18.3	-25.0	15.5	359	400	Hori.	40.0	24.5	
73.545	40.8	QP	7.1	-24.2	23.7	195	100	Vert.	40.0	16.3	
73.795	30.0	QP	7.1	-24.2	12.9	359	400	Hori.	40.0	27.1	
151.939	29.7	QP	15.2	-23.4	21.5	288	100	Vert.	43.5	22.0	
151.955	29.4	QP	15.2	-23.4	21.2	295	271	Hori.	43.5	22.3	
191.894	23.0	QP	16.6	-22.9	16.7	205	100	Vert.	43.5	26.8	
191.957	24.1	QP	16.6	-22.9	17.8	355	188	Hori.	43.5	25.7	
368.042	28.1	QP	16.4	-21.6	22.9	185	100	Hori.	46.0	23.1	
368.044	23.8	QP	16.4	-21.6	18.6	257	100	Vert.	46.0	27.4	
890.110	21.5	QP	21.7	-18.0	25.2	321	100	Vert.	46.0	20.8	
892.210	21.5	QP	21.7	-17.9	25.3	349	100	Hori.	46.0	20.7	

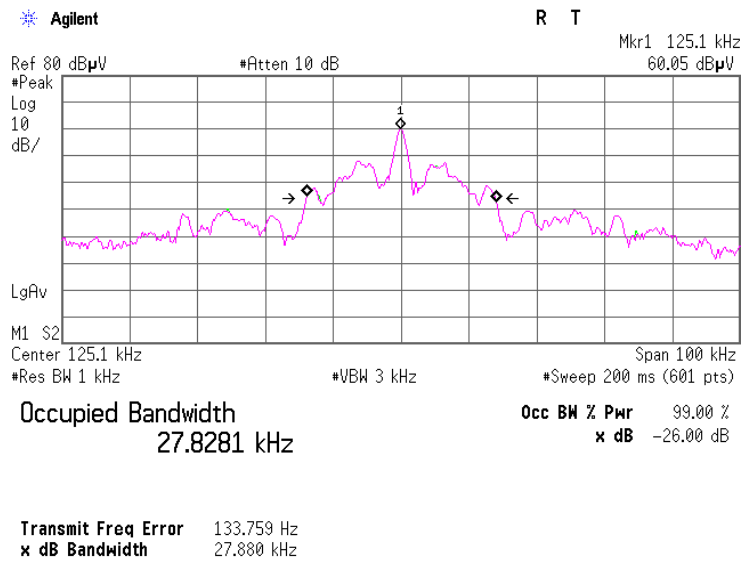
CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
 CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

-26dB Bandwidth

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

COMPANY	: OMRON Corporation	REPORT NO	: 27LE0315-HO
EQUIPMENT	: Wireless Control Module	REGULATION	: Reference data
MODEL	: G8D-645M	TEST DISTANCE	: 3m
S/N	: 9000	DATE	: 08/22/2007
POWER	: DC 12V	TEMPERATURE	: 25 deg.C
MODE	: Transceiver 125kHz	HUMIDITY	: 50 %
		Engineer	: Takahiro Hatakeda

	FREQ	-26dB Bandwidth
	[kHz]	[kHz]
	125.1	27.880

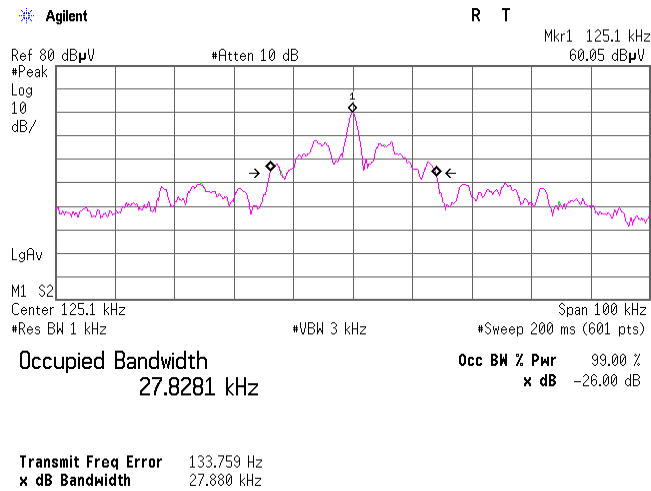


99% Occupied Bandwidth

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

COMPANY : OMRON Corporation	REPORT NO : 27LE0315-HO
EQUIPMENT : Wireless Control Module	REGULATION : RSS-Gen 4.6.1
MODEL : G8D-645M	TEST DISTANCE : 3m
S/N : 9000	DATE : 08/22/2007
POWER : DC 12V	TEMPERATURE : 25 deg.C
MODE : Transceiver 125kHz	HUMIDITY : 50 %
	Engineer : Takahiro Hatakeda

	FREQ	99% Occupied Bandwidth
	[kHz]	[kHz]
	125.1	27.828



APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-03	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	ME/RE	2007/03/05 * 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
MCC-51	Coaxial cable	UL Japan	-	ME/RE	2007/07/26 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	ME/RE	2007/03/16 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	ME/RE	2007/02/03 * 12
MSA-09	Spectrum Analyzer	Advantest	R3273	ME/RE	2006/12/08 * 12
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	ME/RE	-
MOS-12	Thermo-Hygrometer	Custom	CTH-180	ME/RE	2006/01/19 * 24
MBM-07	Barometer	SATO	Aneroid(7610-20)	ME	2006/06/02 * 36
MJM-06	Measure	PROMART	SEN1955	ME/RE	-
MMM-02	Digital Tester	Hioki	3255	ME	2007/03/23 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2007/01/19 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2007/01/19 * 12
MAT-30	Attenuator(6dB)	TME	UFA-01	RE	2007/03/05 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	ME	2007/04/02 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	ME	2007/06/20 * 12
MCC-13	Coaxial Cable	Fujikura/Agilent	-	ME	2007/02/27 * 12
MOS-02	Digital Humidity Indicator	N.T	NT-1800	ME	2006/11/27 * 12
MJM-05	Measure	PROMART	SEN1955	ME	-

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

Test Item:

ME: Spurious emission (9kHz-30MHz)

RE: Spurious emission (30MHz-1GHz)

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