

**APPENDIX 2: Data of EMI test**

**Radiated Emission below 30MHz (Fundamental and Spurious Emission)**

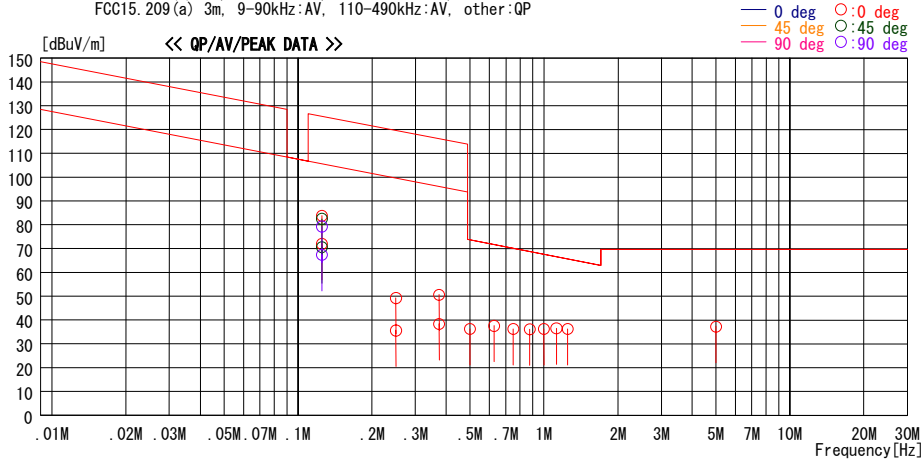
**DATA OF RADIATED EMISSION TEST**

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

Company : OMRON Corporation  
Kind of EUT : Receiver and Antenna Module  
Model No. : G8D-640M-RAM-NU  
Serial No. : 9200  
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]	
0.12510	96.0	PEAK	19.9	0.2	32.3	83.8	125.6	41.8	Odeg	112	PK. BW200Hz
0.12510	84.2	AV	19.9	0.2	32.3	72.0	105.7	33.7	Odeg	112	AV. BW200Hz
0.12510	94.6	PEAK	19.9	0.2	32.3	82.4	125.6	43.2	45deg	72	PK. BW200Hz
0.12510	82.8	AV	19.9	0.2	32.3	70.6	105.7	35.1	45deg	72	AV. BW200Hz
0.12510	91.5	PEAK	19.9	0.2	32.3	79.3	125.6	46.3	90deg	43	PK. BW200Hz
0.12510	79.7	AV	19.9	0.2	32.3	67.5	105.7	38.2	90deg	43	AV. BW200Hz
0.25000	61.6	PEAK	19.8	0.2	32.3	49.3	119.6	70.3	Odeg	114	PK. BW9KHz
0.25000	47.9	AV	19.8	0.2	32.3	35.6	99.6	64.0	Odeg	114	AV. BW9KHz
0.37500	63.0	PEAK	19.7	0.2	32.3	50.6	116.1	65.5	Odeg	115	PK. BW9KHz
0.37500	50.7	AV	19.7	0.2	32.3	38.3	96.1	57.8	Odeg	115	AV. BW9KHz
0.50000	48.7	QP	19.7	0.2	32.3	36.3	73.6	37.3	Odeg	0	QP. BW9KHz
0.62571	49.9	QP	19.7	0.2	32.2	37.6	71.7	34.1	Odeg	114	QP. BW9KHz
0.75000	48.7	QP	19.6	0.2	32.2	36.3	70.1	33.8	Odeg	0	QP. BW9KHz
0.87491	48.5	QP	19.6	0.2	32.2	36.1	68.7	32.6	Odeg	110	QP. BW9KHz
1.00000	48.6	QP	19.6	0.3	32.2	36.3	67.6	31.3	Odeg	0	QP. BW9KHz
1.12580	48.8	QP	19.6	0.3	32.2	36.5	66.5	30.0	Odeg	0	QP. BW9KHz
1.25000	48.6	QP	19.6	0.3	32.2	36.3	65.6	29.3	Odeg	0	QP. BW9KHz
5.00000	49.2	QP	19.8	0.5	32.2	37.3	69.5	32.2	Odeg	0	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)**

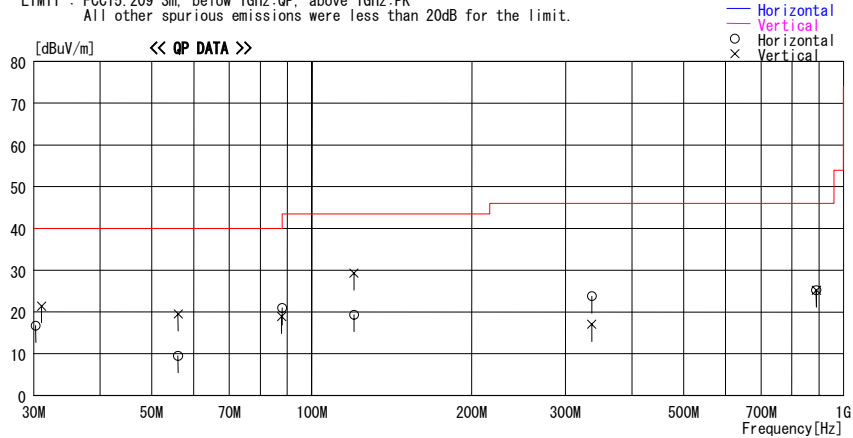
**DATA OF RADIATED EMISSION TEST**

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

Company : OMRON Corporation  
 Kind of EUT : Receiver and Antenna Module  
 Model No. : G8D-640M-RAM-NU  
 Serial No. : 9200  
 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 [dB]
			Factor [dB/m]	Loss&Gain [dB]					[dBuV/m]	[dB]	
30.270	22.5	QP	19.2	-25.0	16.7	359	400	Hori.	40.0	23.3	
31.035	27.6	QP	18.8	-25.0	21.4	131	100	Vert.	40.0	18.6	
56.045	34.6	QP	9.4	-24.5	19.5	136	100	Vert.	40.0	20.5	
56.052	24.6	QP	9.4	-24.5	9.5	352	400	Hori.	40.0	30.5	
87.780	34.7	QP	8.3	-24.1	18.9	278	100	Vert.	40.0	21.1	
88.063	36.7	QP	8.3	-24.1	20.9	178	244	Hori.	43.5	22.6	
120.083	29.9	QP	13.1	-23.7	19.3	238	163	Hori.	43.5	24.2	
120.087	39.9	QP	13.1	-23.7	29.3	293	100	Vert.	43.5	14.2	
336.218	23.5	QP	15.3	-21.8	17.0	251	100	Vert.	46.0	29.0	
336.219	30.3	QP	15.3	-21.8	23.8	359	100	Hori.	46.0	22.2	
888.010	21.5	QP	21.7	-18.0	25.2	111	100	Hori.	46.0	20.8	
889.410	21.5	QP	21.7	-18.0	25.2	12	100	Vert.	46.0	20.8	

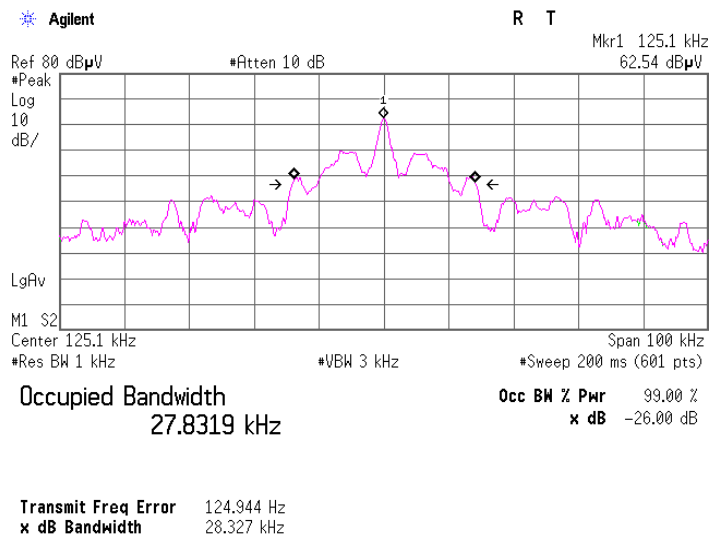
CHART: WITH FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN  
 CALCULATION: RESULT = READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - GAIN (AMP)

## -26dB Bandwidth

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

COMPANY	: OMRON Corporation	REPORT NO	: 27LE0315-HO
EQUIPMENT	: Receiver and Antenna Module	REGULATION	: Reference data
MODEL	: G8D-640M-RAM-NU	TEST DISTANCE	: 3m
S/N	: 9200	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	28.327

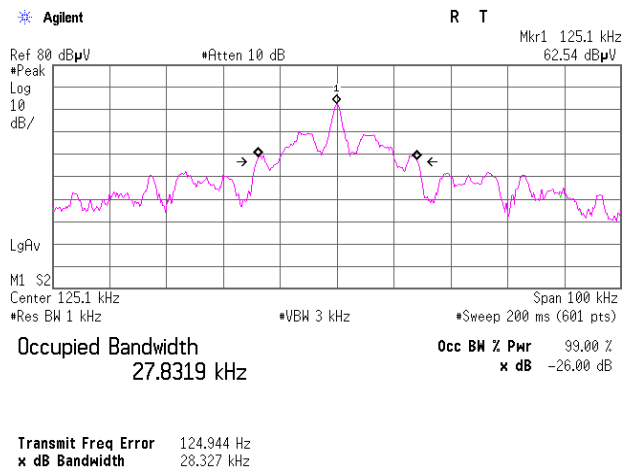


## 99% Occupied Bandwidth

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

COMPANY : OMRON Corporation	REPORT NO : 27LE0315-HO
EQUIPMENT : Receiver and Antenna Module	REGULATION : RSS-Gen 4.6.1
MODEL : G8D-640M-RAM-NU	TEST DISTANCE : 3m
S/N : 9200	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	27.832



### **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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