

APPENDIX 2: Data of EMI test

Radiated Emission below 30MHz (Fundamental and Spurious Emission)

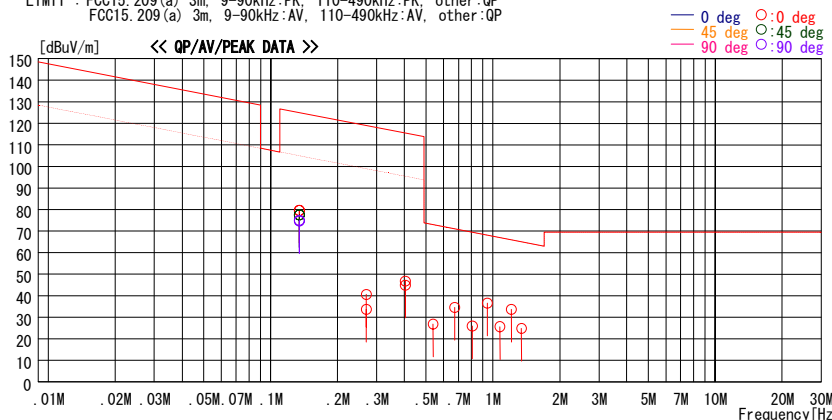
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/07/30

Company : Mitsubishi Electric Corp., Himeji Works Report No. : 27JE0286-HO
Kind of EUT : Immobilizer System Power : DC 12V
Model No. : IMB111-04 Temp./ Humi. : 26deg.C / 57%
Serial No. : 20070727-01 Operator : Shinya Watanabe

Mode / Remarks : Continuous Transmitting mode

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
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]		[deg]
0.13464	91.6	PEAK	19.9	0.2	32.1	79.6	125.0	45.4	0deg	1
0.13464	89.6	PEAK	19.9	0.2	32.1	77.6	125.0	47.4	45deg	337
0.13464	87.0	PEAK	19.9	0.2	32.1	75.0	125.0	50.0	90deg	88
0.13464	91.6	AV	19.9	0.2	32.1	79.6	105.0	25.4	0deg	1
0.13464	89.4	AV	19.9	0.2	32.1	77.4	105.0	27.6	45deg	337
0.13464	86.7	AV	19.9	0.2	32.1	74.7	105.0	30.3	90deg	88
0.26928	52.7	PEAK	19.8	0.2	32.1	40.6	119.0	78.4	0deg	1
0.26928	45.8	AV	19.8	0.2	32.1	33.7	99.0	65.3	0deg	1
0.40392	59.1	PEAK	19.7	0.2	32.1	46.9	115.5	68.6	0deg	1
0.40392	57.0	AV	19.7	0.2	32.1	44.8	95.5	50.7	0deg	1
0.53856	39.0	QP	19.7	0.2	32.1	26.8	73.0	46.2	0deg	1
0.67320	46.8	QP	19.7	0.2	32.1	34.6	71.0	36.4	0deg	1
0.80784	38.4	QP	19.6	0.2	32.2	26.0	69.4	43.4	0deg	1
0.94248	48.8	QP	19.6	0.3	32.2	36.5	68.1	31.6	0deg	1
1.07712	38.0	QP	19.6	0.3	32.2	25.7	66.9	41.2	0deg	1
1.21176	45.9	QP	19.6	0.3	32.2	33.6	65.9	32.3	0deg	1
1.34640	37.2	QP	19.6	0.3	32.2	24.9	65.0	40.1	0deg	1

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 result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

Radiated Emission above 30MHz (Spurious Emission)

DATA OF RADIATED EMISSION TEST

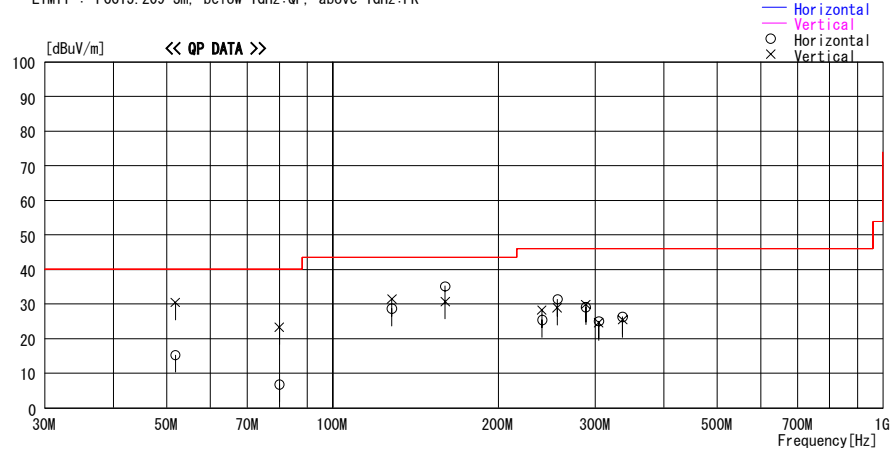
UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2007/07/30

Applicant : Mitsubishi Electric Corp., Himeji Works
Kind of EUT : Immobilizer System
Model No. : IMB111-04
Serial No. : 20070727-01

Report No. : 27JE0286-HO
Power : DC 12V
Temp./Humi. : 26deg. C / 57%
Operator : Shinya Watanabe

Mode / Remarks : Continuous Transmitting mode

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Loss& Gain [dB]				
51.821	29.6	QP	10.3	-24.6	15.3	Hori.	40.0	24.7
51.821	44.8	QP	10.3	-24.6	30.5	Vert.	40.0	9.5
80.088	24.0	QP	7.0	-24.2	6.8	Hori.	40.0	33.2
80.088	40.5	QP	7.0	-24.2	23.3	Vert.	40.0	16.7
128.118	38.5	QP	13.8	-23.6	28.7	Hori.	43.5	14.8
128.118	41.2	QP	13.8	-23.6	31.4	Vert.	43.5	12.1
160.172	42.9	QP	15.6	-23.3	35.2	Hori.	43.5	8.3
160.172	38.4	QP	15.6	-23.3	30.7	Vert.	43.5	12.8
240.262	30.9	QP	17.1	-22.5	25.5	Hori.	46.0	20.5
240.262	33.6	QP	17.1	-22.5	28.2	Vert.	46.0	17.8
256.161	36.2	QP	17.6	-22.4	31.4	Hori.	46.0	14.6
256.161	33.7	QP	17.6	-22.4	28.9	Vert.	46.0	17.1
288.329	31.9	QP	19.3	-22.1	29.1	Hori.	46.0	16.9
288.329	32.7	QP	19.3	-22.1	29.9	Vert.	46.0	16.1
304.316	31.0	QP	16.1	-22.0	25.1	Hori.	46.0	20.9
304.316	30.5	QP	16.1	-22.0	24.6	Vert.	46.0	21.4
336.354	31.6	QP	16.6	-21.8	26.4	Hori.	46.0	19.6
336.354	30.6	QP	16.6	-21.8	25.4	Vert.	46.0	20.6

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 result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

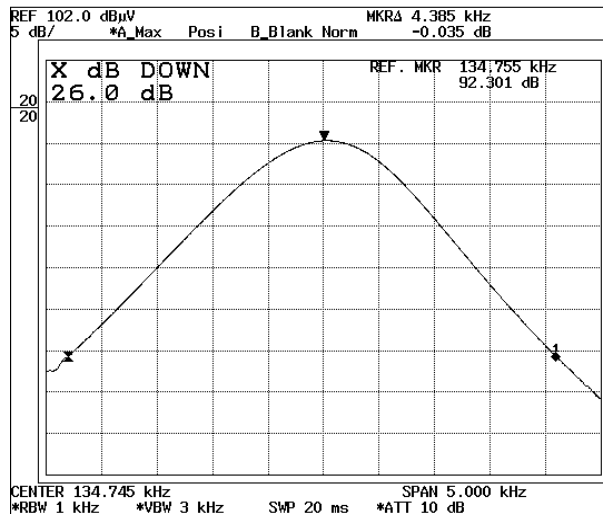
-26dB Bandwidth

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

COMPANY : Mitsubishi Electric Corp., Himeji Works
EQUIPMENT : Immobilizer System
MODEL : IMB111-04
S/N : 20070727-01
POWER : DC 12V
MODE : Continuous Transmitting mode
Ant-Max

REPORT NO : 27JE0286-HO
REGULATION : Reference data
TEST DISTANCE : 3m
DATE : 7/30/2007
TEMPERATURE : 26 deg.C
HUMIDITY : 57 %
Engineer : Shinya Watanabe

FREQ	-26dB Bandwidth
[kHz]	[kHz]
134.8	4.385



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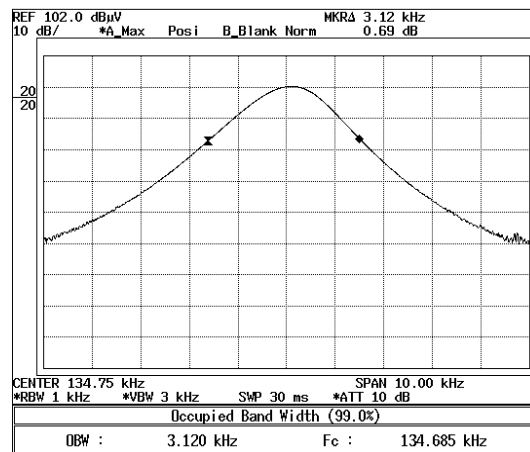
Facsimile : +81 596 24 8124

99% Occupied Bandwidth

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

COMPANY	: Mitsubishi Electric Corp., Himeji Works	REPORT NO	: 27JE0286-HO
EQUIPMENT	: Immobilizer System	REGULATION	: Reference data
MODEL	: IMB111-04	TEST DISTANCE	: 3m
S/ N	: 20070727-01	DATE	: 7/30/2007
POWER	: DC 12V	TEMPERATURE	: 26 deg.C
MODE	: Continuous Transmitting mode	HUMIDITY	: 57 %
	: Ant-Max	Engineer	: Shinya Watanabe

FREQ	99% Occupied Bandwidth
[kHz]	[kHz]
134.8	3.120



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	2007/03/03 * 12
MLPA-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	RE	2006/12/19 * 12
MCC-50	Coaxial cable	UL Japan	-	RE	2007/03/06 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	RE	2007/03/12 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	RE	2007/06/01 * 12
MTR-06	Test Receiver	Rohde & Schwarz	ESCS30	RE	2006/09/12 * 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
MOS-15	Thermo-Hygrometer	Custom	CTH-180	RE	2006/01/19 * 24
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	RE	-
MJM-07	Measure	PROMART	SEN1955	RE	-

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.

Test Item:

RE: Spurious emission

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