

**APPENDIX 2: Data of EMI test**

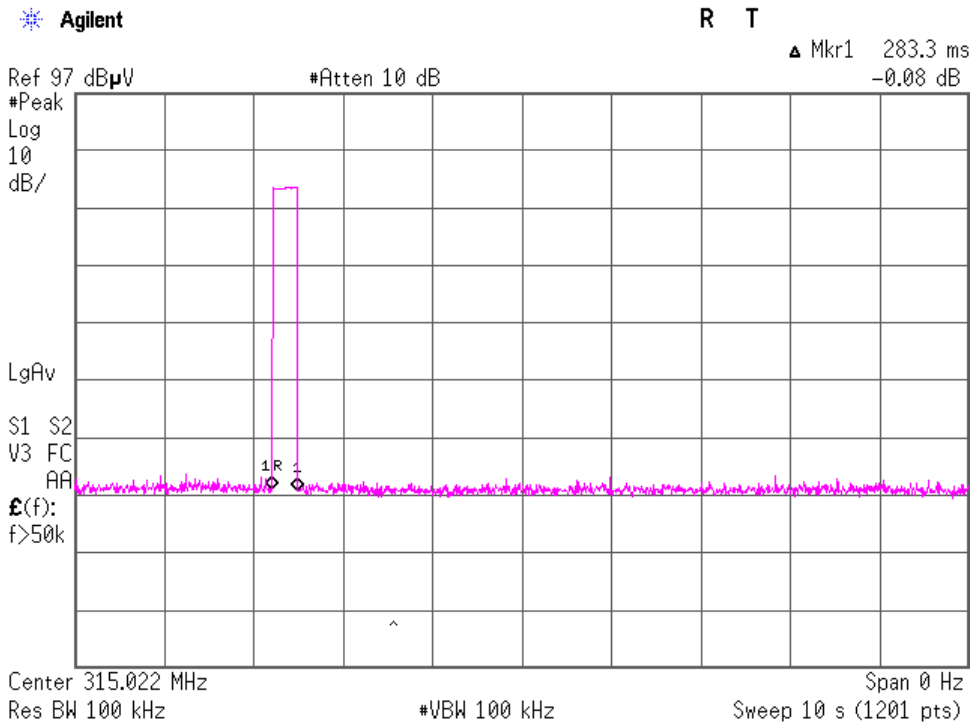
**Automatically deactivate**

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

COMPANY : Mitsubishi Electric Corporation Himeji Works  
 EQUIPMENT : NORMAL KEYLESS SYSTEM (Transmitter)  
 MODEL : SKE125-01  
 S/N : 20090527-02  
 POWER : DC3.0V  
 Mode : Normal Transmitting mode

REGULATION : Fcc Part15 Subpart C 15.231(a)(1)(2)  
 / RSS-210 A.1.1.1(a)(b)  
 TEST DISTANCE : -  
 DATE : 05/28/2009  
 TEMPERATURE : 24deg.C.  
 HUMIDITY : 48%  
 ENGINEER : Motoya Imura

Time of Transmitting [sec]	Limit [sec]	Result
0.28	5.00	Pass



## Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)

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

COMPANY : Mitsubishi Electric Corporation Himeji Works  
EQUIPMENT : NORMAL KEYLESS SYSTEM (Transmitter)  
MODEL : SKE125-01  
S/N : 20090527-01  
POWER : DC 3.0V  
Mode : Continuous Transmitting mode  
Axis : Hor.: X-axis, Ver.: Y-axis

REGULATION : Fcc Part 15.231(b) / 15.205 / 15.209 / RSS-210 A.1.1.2  
TEST DISTANCE : 3m  
DATE : 06/03/2009  
TEMPERATURE : 23deg.C.  
HUMIDITY : 58%  
ENGINEER : Tomohisa Nakagawa

**Peak with Duty factor**

No.	FREQ [MHz]	TR READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
1	315.00	71.5	67.0	13.6	27.7	8.8	-5.8	60.4	55.9	75.6	15.2	19.7
2	630.00	40.4	40.1	19.4	28.9	10.2	-5.8	35.3	35.0	55.6	20.3	20.6
3	945.00	37.8	35.6	22.4	27.9	11.4	-5.8	37.9	35.7	55.6	17.7	19.9

**PK DETECT**

(RBW: 1MHz, VBW: 1MHz)

(Inside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
5	1575.00	46.4	50.2	25.7	33.3	2.2	-	41.0	44.8	73.9	32.9	29.1
7	2205.00	42.9	42.2	26.7	32.6	2.5	-	39.5	38.8	73.9	34.4	35.1
9	2835.00	42.3	42.1	28.1	32.2	2.9	-	41.1	40.9	73.9	32.8	33.0

**Peak with Duty factor**

Result = Reading (RBW: 1MHz, VBW: 1MHz) + Duty Factor

(Inside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
5	1575.00	46.4	50.2	25.7	33.3	2.2	-5.8	35.2	39.0	53.9	18.7	14.9
7	2205.00	42.9	42.2	26.7	32.6	2.5	-5.8	33.7	33.0	53.9	20.2	20.9
9	2835.00	42.3	42.1	28.1	32.2	2.9	-5.8	35.3	35.1	53.9	18.6	18.8

**PK DETECT**

Result = Reading (RBW: 1MHz, VBW: 1MHz)

(Outside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
4	1260.00	46.1	51.5	25.1	33.7	2.0	-	39.5	44.9	75.6	36.1	30.7
6	1890.00	44.3	44.5	26.1	32.9	2.4	-	39.9	40.1	75.6	35.7	35.5
8	2520.00	41.3	41.5	27.4	32.3	2.7	-	39.1	39.3	75.6	36.5	36.3
10	3150.00	41.7	41.0	28.5	32.1	3.1	-	41.2	40.5	75.6	34.4	35.1

**Peak with Duty factor**

Result = Reading (RBW: 1MHz, VBW: 1MHz) + Duty Factor

(Outside Restricted bands)

No.	FREQ [MHz]	S/A READING		ANT Factor [dB/m]	AMP GAIN [dB]	LOSS [dB]	Duty Factor [dB]	RESULT		Limit [dBuV/m]	MARGIN	
		HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
4	1260.00	46.1	51.5	25.1	33.7	2.0	-5.8	33.7	39.1	55.6	21.9	16.5
6	1890.00	44.3	44.5	26.1	32.9	2.4	-5.8	34.1	34.3	55.6	21.5	21.3
8	2520.00	41.3	41.5	27.4	32.3	2.7	-5.8	33.3	33.5	55.6	22.3	22.1
10	3150.00	41.7	41.0	28.5	32.1	3.1	-5.8	35.4	34.7	55.6	20.2	20.9

REMARKS ANTENNA TYPE:30-300MHz Biconical / 300-1000MHz Logperodic / 1-4GHz Horn

CALCULATION RESULT=Reading + ANT Factor - Amp Gain + LOSS (Cable+ ATTEN.)+Duty factor

Duty cycle Factor Measurement : -5.8 dB \*See data of "Duty Cycle"

- \* The test below and above 1GHz was performed with PK DETECT. Average emission measurements were calculated with PK DETECT and Duty cycle factor.
- \* Duty Factor was calculated with the assumption of the worst condition in 100msec.
- \* All the measured noise was pulse emission.
- \* The result is rounded off to the second decimal place, so some differences might be observed.
- \*The limit was converted from V to dBuV, and it is rounded off to the second decimal place.
- \*Except for the above table : All other spurious emissions were less than 20dB for the limit.

**-20dB Bandwidth and 99% Occupied Bandwidth**

UL Japan, Inc.  
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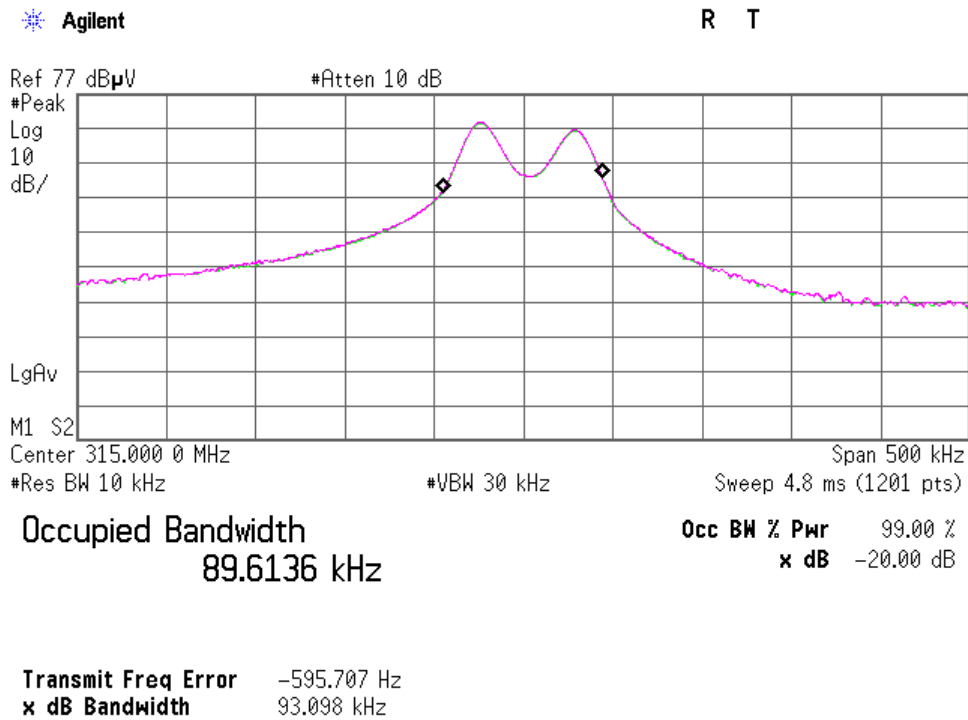
COMPANY : Mitsubishi Electric Corporation Himeji Works  
EQUIPMENT : NORMAL KEYLESS SYSTEM (Transmitter)  
MODEL : SKE125-01  
S/N : 20090527-02  
POWER : DC3.0V  
Mode : Normal Transmitting mode

REGULATION : Fcc Part15 Subpart C 15.231(c)  
TEST DISTANCE : -  
DATE : 05/28/2009  
TEMPERATURE : 24deg.C.  
HUMIDITY : 48%  
ENGINEER : Motoya Imura

Bandwidth Limit : Fundamental Frequency      **315 MHz X 0.25% =**      787.50      kHz

-20dB Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
93.10	787.50	Pass

99% Occupied Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
89.61	787.50	Pass



### Duty Cycle (Fundamental)

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

COMPANY : Mitsubishi Electric Corporation Himeji Works  
EQUIPMENT : NORMAL KEYLESS SYSTEM (Transmitter)  
MODEL : SKE125-01  
S/N : 20090527-02  
POWER : DC 3.0V  
Mode : Normal Transmitting mode

REGULATION : Fcc Part15 Subpart C 15.231(b) / 15.35 (c)  
TEST DISTANCE : -  
DATE : 05/28/2009  
TEMPERATURE : 24deg.C.  
HUMIDITY : 48%  
ENGINEER : Motoya Imura

Times(in 10ms)	ON time(One pulse) [ms]	ON time(in 100ms) [ms]
17	0.300	51

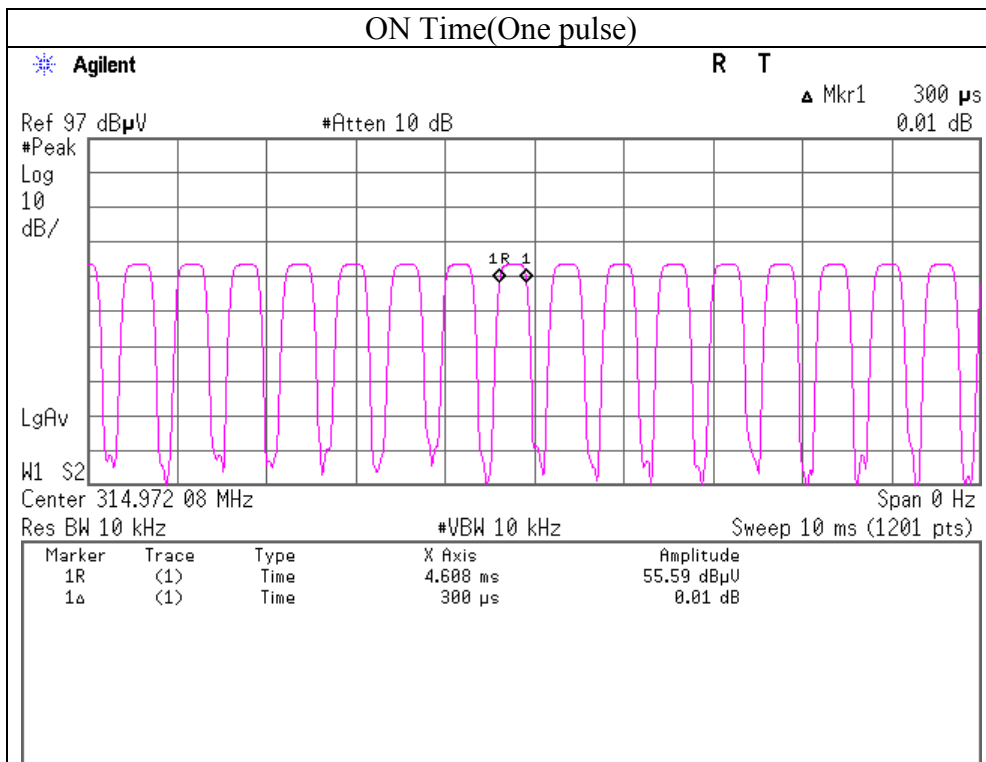
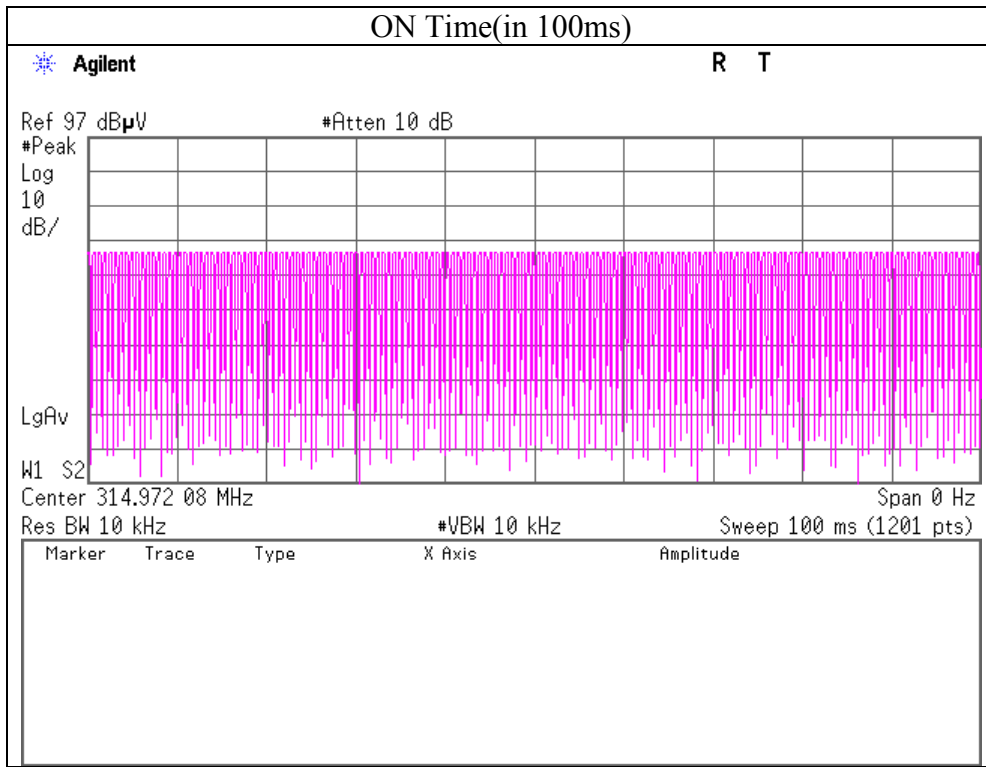
\*1)The train of pulses was exceeding 100msec, and that sampled 100msec was the worst case against the pulse train.

**(Total)**

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
51.00	100.00	0.51	-5.8

\*2)Duty = 20log10(ON time/Cycle)

### Duty Cycle (Fundamental)



### **APPENDIX 3:Test Instruments**

#### **EMI test equipment**

<b>Control No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Serial No</b>	<b>Test Item</b>	<b>Calibration Date * Interval(month)</b>
MAEC-02	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2009/06/01 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2009/02/05 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	MY46180856	RE	2008/11/25 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2009/04/14 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2008/10/18 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2008/10/18 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2009/02/16 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2008/11/14 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2008/09/04 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2009/01/31 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	295123(5m) / 287573(1m)	RE	2008/11/27 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2008/09/17 * 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:**

**RE: Radiated emission**

**UL Japan, Inc.**

**Head Office EMC Lab.**

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