

APPENDIX 2: Data of EMI test

**Radiated Emission
ANT1: Built in Antenna**

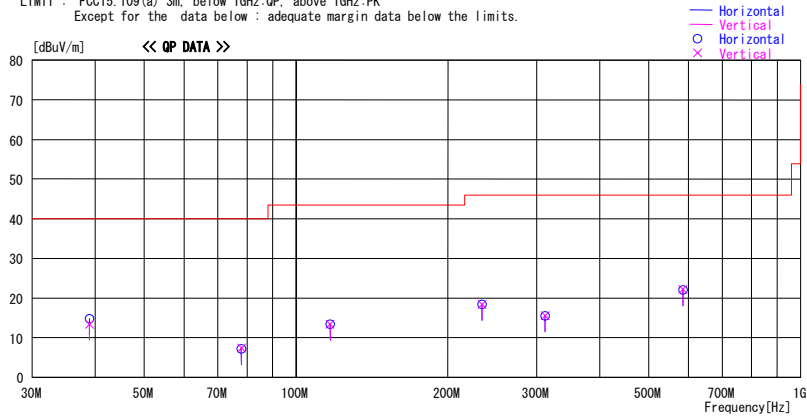
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2008/11/12

Company : TOYOTA MOTOR CORPORATION Report No. : 29CE0195-HO-01
Kind of EUT : Remote Keyless Entry System (Receiver) Power : DC 5.0V
Model No. : TMRF-002 Temp./Humi. : 21deg. C / 43%
Serial No. : 1 Engineer : Norihisa Hashimoto

Mode / Remarks : Receiving 314.35MHz Worst-axis(Hor:X Ver:X) /ANT1 (Built in Antenna)

LIMIT : FCC15.109(a) 3m, below 1GHz:OP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Loss & Gain [dB]						
38.981	20.9	OP	14.4	-21.9	13.4	4	100	Vert.	40.0	26.6
38.981	22.3	OP	14.4	-21.9	14.8	351	316	Hori.	40.0	25.2
77.963	22.0	OP	6.6	-21.4	7.2	10	277	Hori.	40.0	32.8
77.963	22.2	OP	6.6	-21.4	7.4	349	251	Vert.	40.0	32.6
116.944	21.6	OP	12.6	-20.8	13.4	345	295	Hori.	43.5	30.1
116.944	21.6	OP	12.6	-20.8	13.4	2	100	Vert.	43.5	30.1
233.888	20.9	OP	17.0	-19.5	18.4	328	300	Hori.	46.0	27.6
233.888	20.9	OP	17.0	-19.5	18.4	6	100	Vert.	46.0	27.6
311.850	20.9	OP	13.5	-18.9	15.5	7	100	Hori.	46.0	30.5
311.850	21.0	OP	13.5	-18.9	15.6	355	100	Vert.	46.0	30.4
584.719	21.8	OP	19.1	-18.8	22.1	345	100	Hori.	46.0	23.9
584.719	21.9	OP	19.1	-18.8	22.2	2	100	Vert.	46.0	23.8

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 limit is rounded down to one decimal place.
- *The test result is rounded off to one or two decimal places, so some differences might be observed.
- *Second and third harmonics at local oscillator were not detected

Radiated Emission
ANT2 : Glass Antenna

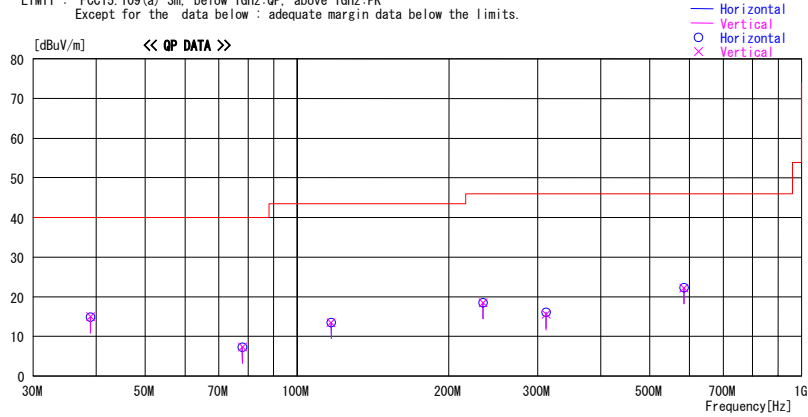
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LIMIT : FCC15, 109(a) 3m, below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss &	Level [dBuV/m]	Angle [Deg.]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]
			Factor [dB/m]	Gain [dB]						
38.981	22.4	QP	14.4	-21.9	14.9	355	374	Hori.	40.0	25.1
38.981	22.5	QP	14.4	-21.9	15.0	5	100	Vert.	40.0	25.0
77.963	22.1	QP	6.6	-21.4	7.3	6	268	Hori.	40.0	32.7
77.963	22.1	QP	6.6	-21.4	7.3	355	100	Vert.	40.0	32.7
116.944	21.7	QP	12.6	-20.8	13.5	12	100	Vert.	43.5	30.0
116.944	21.7	QP	12.6	-20.8	13.5	350	315	Hori.	43.5	30.0
233.888	21.0	QP	17.0	-19.5	18.5	345	100	Vert.	46.0	27.5
233.888	21.0	QP	17.0	-19.5	18.5	1	264	Hori.	46.0	27.5
311.850	21.5	QP	13.5	-18.9	16.1	319	100	Hori.	46.0	29.9
311.850	21.0	QP	13.5	-18.9	15.6	343	223	Vert.	46.0	30.4
584.719	22.0	QP	19.1	-18.8	22.3	353	271	Hori.	46.0	23.7
584.719	21.9	QP	19.1	-18.8	22.2	11	100	Vert.	46.0	23.8

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 limit is rounded down to one decimal place.
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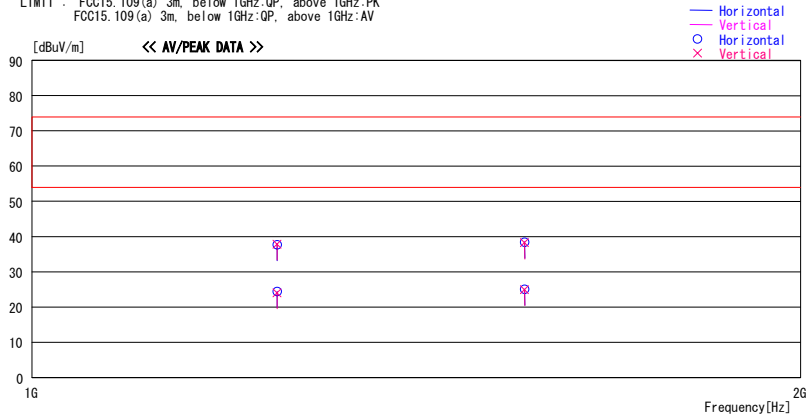
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LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss & Gain [dB]							
1247.400	44.6	PK	24.8	-31.7	37.7	359	100	Hori.	73.9	36.2	
1247.400	44.8	PK	24.8	-31.7	37.9	359	100	Vert.	73.9	36.0	
1247.400	31.4	AV	24.8	-31.7	24.5	359	100	Hori.	53.9	29.4	
1247.400	31.0	AV	24.8	-31.7	24.1	359	100	Vert.	53.9	29.8	
1559.250	44.4	PK	25.2	-31.1	38.5	359	100	Hori.	73.9	35.4	
1559.250	44.1	PK	25.2	-31.1	38.2	359	100	Vert.	73.9	35.7	
1559.250	31.0	AV	25.2	-31.1	25.1	359	100	Hori.	53.9	28.8	
1559.250	30.9	AV	25.2	-31.1	25.0	359	100	Vert.	53.9	28.9	

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)

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Radiated Emission
ANT2: Glass Antenna

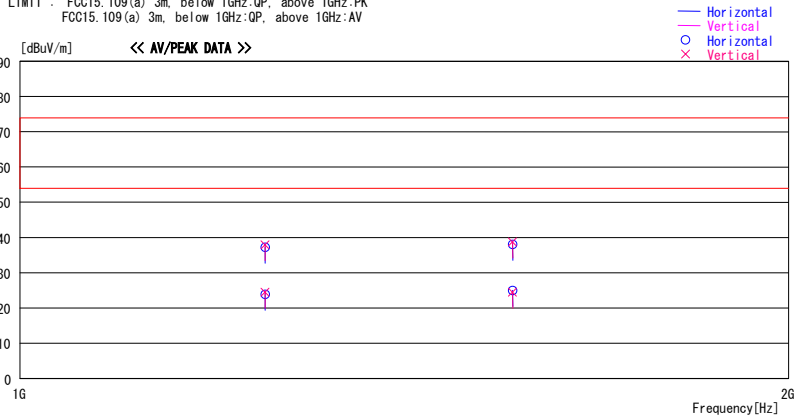
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LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss & Gain [dB]							
1247.400	44.2	PK	24.6	-31.7	37.3	359	100	Hori.	73.9	36.6	
1247.400	44.9	PK	24.6	-31.7	38.0	359	100	Vert.	73.9	35.9	
1247.400	30.6	AV	24.6	-31.7	23.9	359	100	Hori.	53.9	30.0	
1247.400	31.4	AV	24.6	-31.7	24.5	359	100	Vert.	53.9	29.4	
1559.250	44.0	PK	25.2	-31.1	38.1	359	100	Hori.	73.9	35.8	
1559.250	44.6	PK	25.2	-31.1	38.7	359	100	Vert.	73.9	35.2	
1559.250	30.9	AV	25.2	-31.1	25.0	359	100	Hori.	53.9	28.9	
1559.250	30.4	AV	25.2	-31.1	24.5	359	100	Vert.	53.9	29.4	

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

APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2008/04/17 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2007/12/27 * 12
MJM-05	Measure	PROMART	SEN1955	-	RE	-
MSTW-14	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-62	Spectrum Analyzer	Agilent	E4448A	MY46180653	RE	2007/11/27 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2008/04/02 * 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	2008/02/15 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2007/11/13 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2008/09/04 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2008/01/19 * 12
MCC-47	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	284646(5m) / 287573(1m)	RE	2008/05/12 * 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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