

APPENDIX 2: Data of EMI test

Radiated Emission

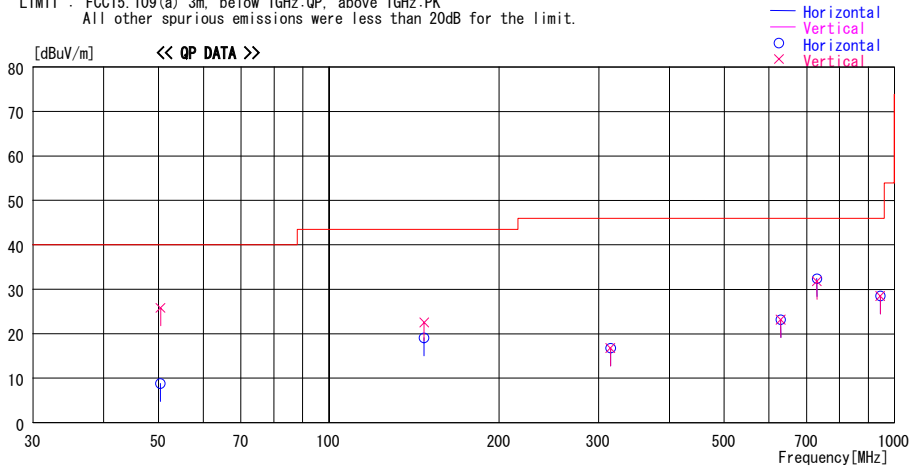
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
Date : 2009/06/16

Company : Alps Electric Co., Ltd. Report No. : 29JE0067-HO-01
Kind of EUT : TPMS Tuner Power : DC 12V
Model No. : TWC1U290 Temp./Humi. : 23 deg.C. / 65 %
Serial No. : 2009061501 Engineer : Kazufumi Nakai

Mode / Remarks : Rx 314.975MHz, X-axis

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
50.410	22.8	QP	10.5	-24.5	8.8	5	300	Hori.	40.0	31.2	
50.415	39.8	QP	10.5	-24.5	25.8	121	100	Vert.	40.0	14.2	
147.455	28.1	QP	14.3	-23.3	19.1	114	242	Hori.	43.5	24.4	
147.459	31.5	QP	14.3	-23.3	22.5	298	100	Vert.	43.5	21.0	
314.755	22.1	QP	16.6	-21.9	16.8	63	100	Hori.	46.0	29.2	
314.755	22.1	QP	16.6	-21.9	16.8	245	100	Vert.	46.0	29.2	
629.510	22.3	QP	21.0	-20.1	23.2	0	100	Hori.	46.0	22.8	
629.510	22.3	QP	21.0	-20.1	23.2	0	100	Vert.	46.0	22.8	
728.988	29.2	QP	22.7	-19.5	32.4	285	114	Hori.	46.0	13.6	
729.108	28.6	QP	22.7	-19.5	31.8	213	100	Vert.	46.0	14.2	
944.265	21.6	QP	24.5	-17.6	28.5	0	100	Hori.	46.0	17.5	
944.265	21.6	QP	24.5	-17.6	28.5	0	100	Vert.	46.0	17.5	

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.

Radiated Emission

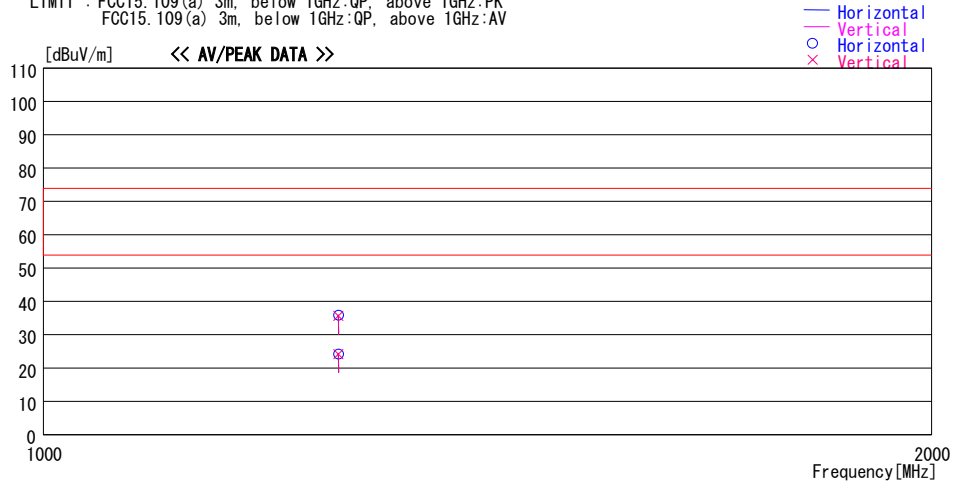
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2009/06/16

Company : Alps Electric Co., Ltd.	Report No. : 29JE0067-HO-01
Kind of EUT : TPMS Tuner	Power : DC 12V
Model No. : TWC1U290	Temp./Humi. : 23 deg. C. / 65 %
Serial No. : 2009061501	Engineer : Kazufumi Nakai

Mode / Remarks: Rx 314.975MHz, X-axis

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]							
1259.020	43.4	PK	25.0	-32.5	35.9	0	100	Hori.	73.9	38.0	
1259.020	43.1	PK	25.0	-32.5	35.6	0	100	Vert.	73.9	38.3	
1259.020	31.7	AV	25.0	-32.5	24.2	0	100	Hori.	53.9	29.7	
1259.020	31.7	AV	25.0	-32.5	24.2	0	100	Vert.	53.9	29.7	

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)

*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-04	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2009/02/03 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2009/02/06 * 12
MJM-07	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2008/06/25 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2008/10/03 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2009/01/10 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2009/01/10 * 12
MCC-50	Coaxial cable	UL Japan	-	-	RE	2009/03/18 * 12
MAT-31	Attenuator(6dB)	TME	UFA-01	-	RE	2009/03/03 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2009/03/18 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2008/08/11 * 12
MCC-57	Microwave Cable 1G-26.5GHz 6m	Suhner	SUCOFLEX104	246769(1m) / 292411(5m)	RE	2008/11/05 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2009/03/19 * 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.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124