

APPENDIX 2: Data of EMI test

Radiated Emission

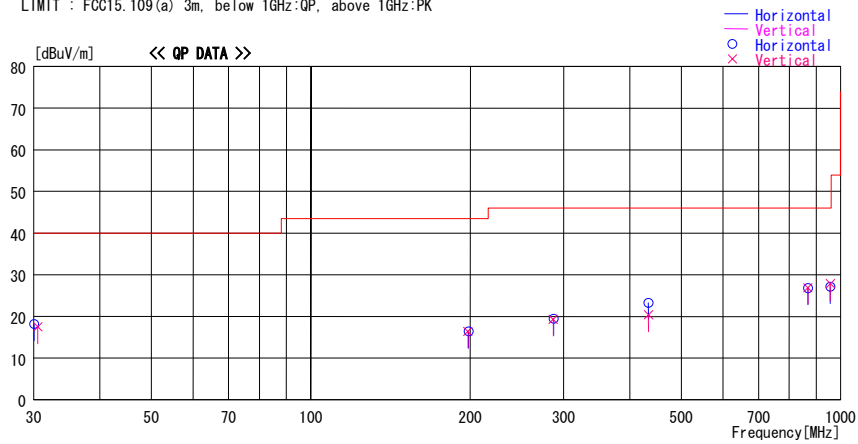
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2009/07/17

Company : Alps Electric Co., Ltd. Report No. : 29KE0211-HO-04
Kind of EUT : Passive Entry System(Tuner) Power : DC 12.0V
Model No. : TWC1G154 Temp./Humi. : 24deg. C. / 52%
Serial No. : 09070801 Engineer : Tomotaka Sasagawa

Mode / Remarks : Receiving mode / EUT Worst-axis(H:X/V:X)

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



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss	Level	Angle [Deg]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
30.043	25.4	QP	17.9	-25.1	18.2	6	100	Hori.	40.0	21.8	
30.540	24.9	QP	17.7	-25.1	17.5	356	100	Vert.	40.0	22.5	
197.940	22.8	QP	16.6	-23.0	16.4	1	100	Vert.	43.5	27.1	
198.480	22.8	QP	16.6	-23.0	16.4	243	100	Hori.	43.5	27.1	
286.770	22.7	QP	18.8	-22.2	19.3	360	100	Vert.	46.0	26.7	
287.040	22.9	QP	18.8	-22.2	19.5	11	100	Hori.	46.0	26.5	
433.691	26.8	QP	17.7	-21.2	23.3	142	111	Hori.	46.0	22.7	
433.711	23.9	QP	17.7	-21.2	20.4	148	100	Vert.	46.0	25.6	
867.400	22.8	QP	21.9	-17.9	26.8	10	100	Hori.	46.0	19.2	
867.400	22.9	QP	21.9	-17.9	26.9	0	100	Vert.	46.0	19.1	
955.211	21.4	QP	23.0	-17.2	27.2	1	100	Hori.	46.0	18.8	
955.911	21.9	QP	23.1	-17.2	27.8	0	100	Vert.	46.0	18.2	

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

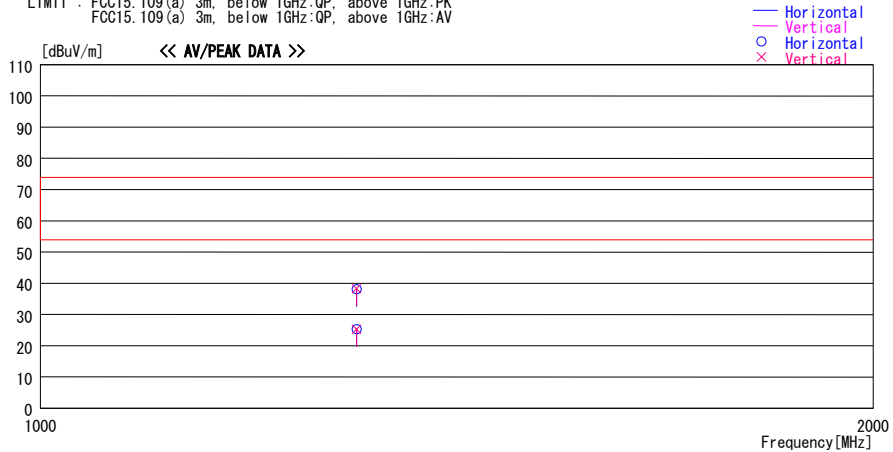
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Mode / Remarks : Receiving mode / EUT Worst-axis(H:X/V:X)

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	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain							
			[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]	
1301.100	44.9	PK	25.1	-31.9	38.1	0	100	Hori.	73.9	35.8	
1301.100	45.1	PK	25.1	-31.9	38.3	0	100	Vert.	73.9	35.6	
1301.100	32.1	AV	25.1	-31.9	25.3	0	100	Hori.	53.9	28.6	
1301.100	32.1	AV	25.1	-31.9	25.3	0	100	Vert.	53.9	28.6	

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)

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APPENDIX 3: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2009/02/02 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2009/02/06 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-09	Spectrum Analyzer	Advantest	R3273	95090115	RE	2008/12/24 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2009/06/30 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2009/01/19 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2009/01/10 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2009/07/02 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2008/11/14 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2009/03/18 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2009/04/30 * 12
MCC-56	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	174410(1m) / 284655(5m)	RE	2009/01/07 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	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

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