



EMI TEST REPORT

Test Report No. : 24GE0134-HO-1

Applicant : Alps Electric Co., Ltd.
Type of Equipment : Passive Entry System
(Hand Unit)
Model No. : TFWB1U619
Test standard : FCC Part 15 Subpart C : 2003
Section 15.231
FCC Part 15 Subpart B : 2003
Section 15.109
FCC ID : CWTWBU619
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.
5. This test report does not constitute an endorsement by NIST/NVLAP or U.S. Government.

Date of test : March 8,9 and June 10, 2004

Tested by : 
Naoki Sakamoto
EMC Service

Approved by : 
Hironobu Shimoji
Group Leader of EMC Service

UL Apex Co., Ltd.

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

MF060b(10.04.03)

CONTENTS	PAGE
SECTION 1: Client information.....	3
SECTION 2: Equipment under test (E.U.T.)	3
SECTION 3: Test specification, procedures & results	4
SECTION 4: Operation of E.U.T. during testing.....	6
SECTION 5: Radiated emission (Fundamental and Spurious Emission)	8
SECTION 6: Automatically deactivate	9
APPENDIX 1: Photographs of test setup.....	10
Radiated emission (Transmitting mode)	10
Radiated emission (Receiving mode)	11
Worst Case Position (Horizontal : Angle A / Vertical: Angle B)	12
APPENDIX 2: Test Instruments.....	13
APPENDIX 3: Data of EMI test	14
Radiated Emission(FCC Part 15 Subpart B).....	14
Radiated Emission(FCC Part 15 Subpart C)	15
Automatically deactivate	18
-20dB Bandwidth.....	19
99% Occupied Bandwidth.....	20
APPENDIX 4: Additional Data of EMI test	21

SECTION 1: Client information

Company Name : Alps Electric Co., Ltd.
Address : 6-3-36 Nakazato, Furukawa-city Miyagi-pref., 989-6181 Japan
Telephone Number : +81-229-23-5111
Facsimile Number : +81-229-22-3755
Contact Person : Tomosuke Takata

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Passive Entry System (Hand Unit)
Model No. : TFWB1U619
Serial No. : 1
Country of Manufacture : Japan
Receipt Date of Sample : March 3, 2004
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Alps Electric Co., Ltd., Model No: TFWB1U619 is the Passive Entry System (Hand Unit).
The hand unit of passive entry system is a transmitter of 315MHz and a receiver of 125kHz. This 125kHz is transmitting from the control unit. For the control unit, see the test report No.24GE0134-HO-2.

(Transmitter Section)

Frequency operation : 315MHz
Type of modulation : FSK modulation
Information antenna : Internal/(P.C.B. Pattern antenna)
Power Supply : DC 3V (Battery)

(Receiver Section)

Equipment Type : Turned Radio frequency Receiver
Frequency operation : 125kHz
Information antenna : Internal/(Loop coil and bar antenna)
Power Supply : DC 3V (Battery)

FCC 15.31 (e)

This test was performed with the New Battery (DC 3V). Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

UL Apex Co., Ltd.

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

MF060b(10.04.03)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C : 2003
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.231 Periodic operation in the band 40.66 - 40.70MHz
and above 70MHz

Test Specification : FCC Part 15 Subpart B : 2003
Section 15.109 Radiated emission limits
Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

1) FCC Part15 Subpart C : 2003

No.	Item	Test Procedure	Specification	Remarks	Worst margin	Result
1	Automatically deactivate	ANSI C63.4:2001	FCC Section 15.231(a)(1)	Radiated	N/A	Complied
2	Electric Field Strength of Fundamental Emission	ANSI C63.4:2001	FCC Section 15.231(b)	Radiated	15.9dB QP 315MHz Horizontal	Complied
3	Electric Field Strength of Spurious Emission	ANSI C63.4:2001	FCC Section 15.205 FCC Section 15.209 FCC Section 15.231(b)	Radiated	2.1dB AV 2204.789MHz Horizontal	Complied
4	-20dB Bandwidth	ANSI C63.4:2001	FCC Section 15.231(c)	Radiated	N/A	Complied
5	Conducted Emission	ANSI C63.4:2001	FCC Section 15.207(a)	AC Mains only*1)	N/A	N/A

Note: UL Apex's EMI Work procedures No. QPM05

*1) This test is not applicable since the EUT does not have AC power port.

*These tests were performed without any deviations from test procedure except for additions or exclusions.

2) FCC Part15 Subpart B : 2003

No.	Item	Test Procedure	Specification	Remarks	Worst margin	Result
1	Radiated emission	ANSI C63.4:2001	FCC Section 15.109(a)	Radiated	10.4 dB QP 36.008MHz Vertical	Complied
2	Conducted Emission	ANSI C63.4:2001	FCC Section 15.107(a)	AC Mains only*1)	N/A	N/A

Note: UL Apex's EMI Work procedures No. QPM05

*1) This test is not applicable since the EUT does not have AC power port.

*These tests were performed without any deviations from test procedure except for additions or exclusions.

UL Apex Co., Ltd.

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

MF060b(10.04.03)

3.3 Addition to standards

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Bandwidth	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003	RSS210(issue 5): 2001 + Amendment:2002 + Amendment2:2003	Radiated	N/A	N/A	N/A

3.4 Confirmation

UL Apex Co., Ltd. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart C : 2003 Section 15.231 and FCC Part 15 Subpart B : 2003 Section 15.109(a).

3.5 Uncertainty

Radiated Emission Test

The measurement uncertainty (with a 95% confidence level) for this test using Loop antenna is $\pm 1.8\text{dB}$.
The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is $\pm 4.5\text{dB}$.
The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is $\pm 5.2\text{dB}$.
The measurement uncertainty (with a 95% confidence level) for this test using Horn Antenna is $\pm 6.6\text{dB}$.
The data listed in this test report meets the limits unless the uncertainty is taken into consideration.

3.6 Test Location

UL Apex Co., Ltd. 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

No.1 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on February 01, 2002. (Registration number: No.1:313583 Industry Canada: No.1: IC4247)

No.2 semi anechoic chamber has been fully described in a report submitted to FCC office, and listed on June 05, 2002. (Registration number: No.2:846015 Industry Canada: No.2: IC4247-2)

*NVLAP Lab. code: 200572-0

Test room	Width x Depth x Height (m)	Size of reference ground plane(m)	Other rooms
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 shielded room	3.1 x 5.0 x 2.7m	N/A	-

3.7 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

UL Apex Co., Ltd.

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

MF060b(10.04.03)

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

The EUT exercise program used during radiated testing was designed to exercise the various system components in a manner similar to typical use.

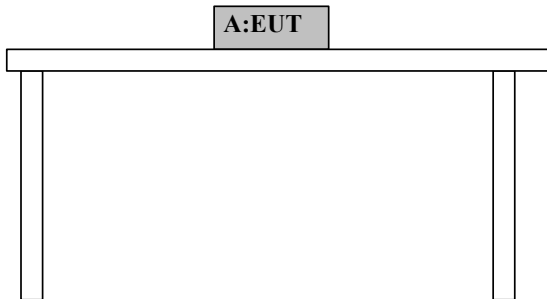
The sequence is used : Continuous transmitting and receiving mode

*Receiving mode: the test was performed under the signal from the transmitter.

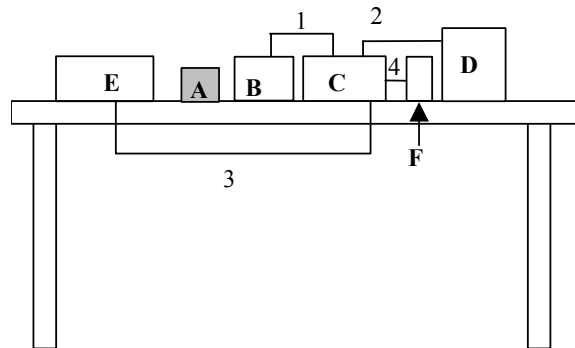
Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

4.2 Configuration and peripherals

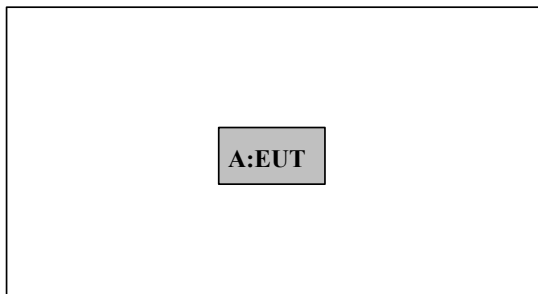
Front View (Hand Unit/Transmitting mode)



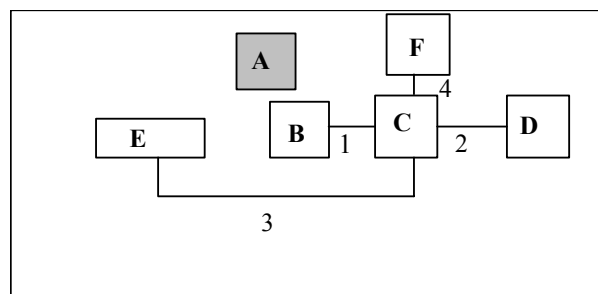
Front View (Hand Unit/Receiving mode)



Top View (Hand Unit/Transmitting mode)



Top View (Hand Unit/Receiving mode)



*Test data was taken under worse case conditions.

UL Apex Co., Ltd.

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

MF060b(10.04.03)

(Hand Unit)

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	FCC ID
A	Hand Unit	TFWB1U619	1	Alps Electric Co., Ltd.	CWTWBU619

(Control Unit)

Description of EUT and Support Equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID
B	Bar antenna	-	-	Alps Electric Co., Ltd.	-
C	Checker Box	N/A	N/A	Alps Electric Co., Ltd.	-
D	Car Battery	50B24L	N/A	YUASA	-
E	Control Unit	TFWD1U626	WD1U626A/402BB18A	Alps Electric Co., Ltd.	CWTWDU626
F	Checker PWB	-	-	Alps Electric Co., Ltd.	-

List of cables used

No.	Name	Length (m)	Shield	Remark
1	Antenna Cable	0.5	N	-
2	DC Power Cable	0.5	N	-
3	Signal & DC Power Cable	1.2	N	-
4	Cable for Checker PWB	0.3	N	-

UL Apex Co., Ltd.

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

MF060b(10.04.03)

SECTION 5: Radiated emission (Fundamental and Spurious Emission)

5.1 Operating environment

The test was carried out in No.2 semi anechoic chamber.

Temperature : See data
Humidity : See data

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane.

The EUT was set on the center of the tabletop.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

A drawing of the set up is shown in the photos of APPENDIX 1.

5.3 Test conditions

Frequency range : Section 15.231: 30MHz - 3200MHz (Transmitting mode)
Section 15.109: 30MHz - 1000MHz (Receiving mode)
Test distance : 3m
EUT position : Tabletop
EUT operation mode : Transmitting and Receiving mode

5.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on No.2 semi anechoic chamber with a ground plane and at a distance of 3m.

Measurements were performed with a QP, PK, and AV detector.

The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detector function of the test receiver.

	Below 1GHz (T/R)	Above 1GHz (S/A)
Detector Type	QP	PK/AV
IF Bandwidth	BW 120kHz	PK: RBW:1MHz/VBW: 1MHz AV: RBW:1MHz/VBW:10Hz

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes A, B and C, and the position that has the maximum noise was determined.

With the position, the noise levels of all the frequencies was measured.

5.5 Results

Summary of the test results: Pass

Date: March 8 and 9, 2004

Tested by: Naoki Sakamoto

UL Apex Co., Ltd.

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

MF060b(10.04.03)

SECTION 6: Automatically deactivate

Limit: A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test data	:	See APPENDIX 3
Test result	:	Pass

APPENDIX 1: Photographs of test setup

Radiated emission (Transmitting mode)

Front

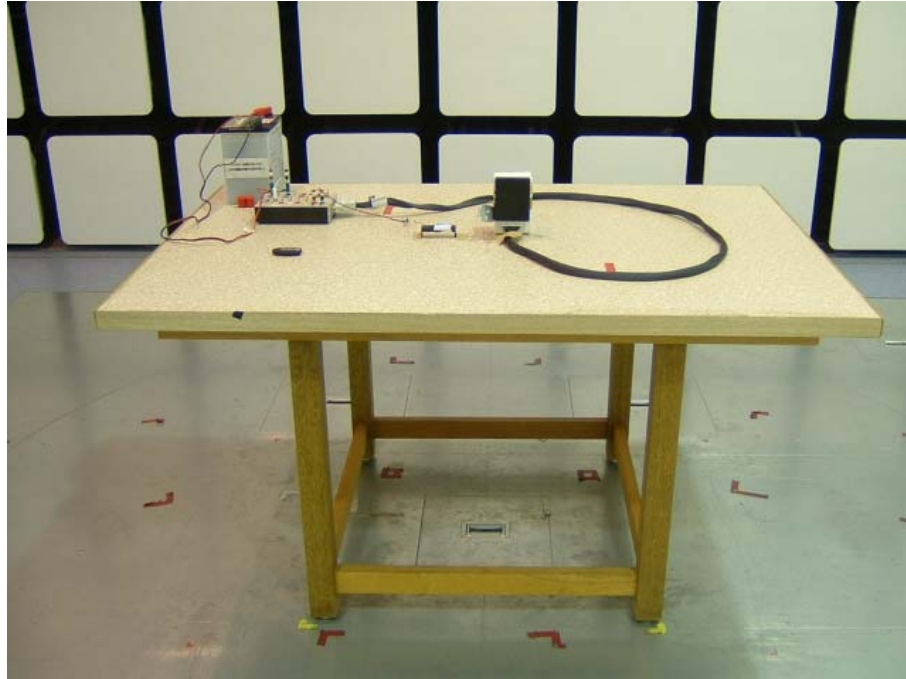


Rear

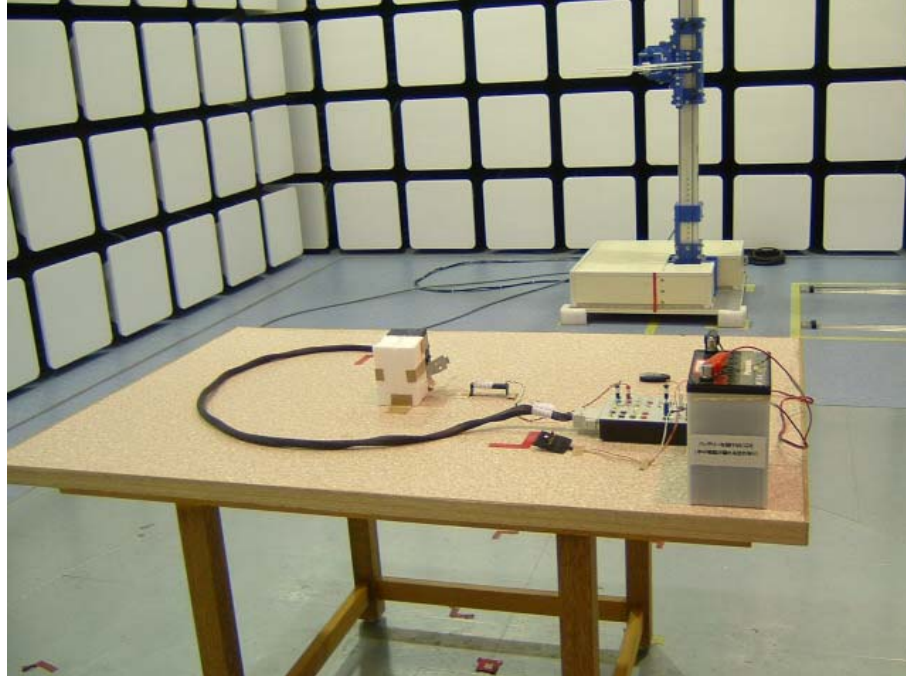


Radiated emission (Receiving mode)

Front



Rear



Worst Case Position (Horizontal : Angle A / Vertical: Angle B)

Angle A



Angle B



Angle C



APPENDIX 2: Test Instruments

EMI Test Instrument

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2004/04/12 * 12
MRENT-06	Spectrum Analyzer	Advantest	R3273	RE	2003/10/31 * 12
MCC-04	Microwave Cable	Storm	421-011	RE	2004/01/06 * 12
MCC-24	Microwave Cable	Storm	-	RE	2003/04/30 * 12
MHA-06	Horn Antenna	Schwarzbeck	BBHA9120D	RE	2004/01/10 * 12
MPA-01	Pre Amplifier	Agilent	8449B	RE	2004/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	RE	2003/04/28 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	RE	2003/04/28 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	RE	2004/02/24 * 12
MTR-02	Test Receiver	Rohde & Schwarz	ESCS30	RE	2004/02/03 * 12
MAEC-02	Anechoic Chamber	TDK	Semi Anechoic Chamber 3m	RE	2003/04/11 * 12
MPA-02	Pre Amplifier	Agilent	87405A	RE	2003/04/17 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	RE	2003/12/27 * 12
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	RE	2003/10/15 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	RE	2003/12/16 * 12
MCC-01	Coaxial Cable	Suhner/storm/Agilent/TSJ	-	RE	2003/12/19 * 12
MPA-04	Pre Amplifier	Agilent	8447D	RE	2004/05/25 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	RE	2003/11/12 * 12

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

RE: Radiated emission

UL Apex Co., Ltd.

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

MF060b(10.04.03)

APPENDIX 3: Data of EMI test

Radiated Emission(FCC Part 15 Subpart B)

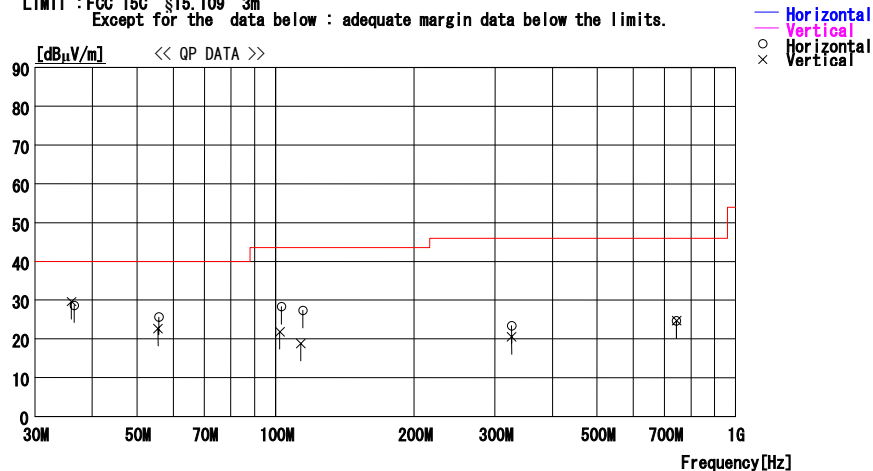
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/08 15:08:03

Applicant : Alps Electric Co.,Ltd. Report No. : 24GE0134-HO
Kind of EUT : Passive Entry System(Hand unit) Power : DC12V
Model No. : TFWB1U619 Temp°C/Humi% : 24 / 30%
Serial No. : 1 Operator : Naoki Sakamoto

Mode / Remarks: Receiving mode (Max: Angle B) 30-1000MHz

LIMIT : FCC 15C §15.109 3m
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
Horizontal										
1	36.511	29.8	16.1	6.5	23.7	28.7	40.0	11.3	253	6
2	55.760	33.0	9.5	6.8	23.7	25.6	40.0	14.4	245	353
3	103.018	35.2	9.1	7.2	23.2	28.3	43.5	15.2	194	184
4	114.517	31.3	12.0	7.3	23.3	27.3	43.5	16.2	295	188
5	325.700	23.1	15.1	8.4	23.2	23.4	46.0	22.6	116	114
6	744.559	16.4	21.0	10.4	23.2	24.6	46.0	21.4	203	309
Vertical										
7	36.008	30.5	16.3	6.5	23.7	29.6	40.0	10.4	112	239
8	55.511	30.0	9.6	6.8	23.7	22.7	40.0	17.3	102	41
9	102.261	28.9	9.0	7.2	23.3	21.8	43.5	21.7	187	128
10	113.508	23.1	11.7	7.3	23.3	18.8	43.5	24.7	231	126
11	325.731	20.2	15.1	8.4	23.2	20.5	46.0	25.5	168	158
12	744.721	16.5	21.0	10.4	23.2	24.7	46.0	21.3	153	128

CHART:WITHOUT FACTOR ANT TYPE: -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

UL Apex Co., Ltd.

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

MF060b(10.04.03)

Radiated Emission(FCC Part 15 Subpart C)

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic
Date : 2004/03/08 19:37:37

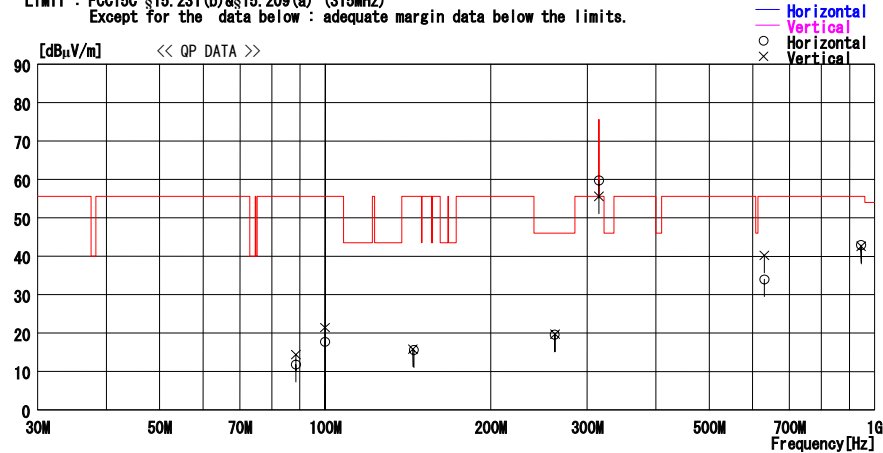
Applicant : Alps Electric CO.,LTD.
Kind of EUT : Passive Entry System (Hand unit)
Model No. : TFWB1U619
Serial No. : 1

Report No. : 24GE0134-HO
Power : DC3V (CR2025)
Temp°C/Humi% : 24 / 30%
Operator : Naoki Sakamoto

Mode / Remarks : Transmitting mode 30-1000MHz

LIMIT : FCC15C §15.231(b)&§15.209(a) (315MHz)

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	[DEG]
Horizontal										
1	88.483	21.7	6.4	7.1	23.4	11.8	55.6	43.8	202	0
2	100.012	25.4	8.4	7.2	23.3	17.7	55.6	37.9	146	156
3	145.042	17.0	14.3	7.5	23.2	15.6	55.6	40.0	192	168
4	261.600	16.8	17.6	8.2	23.0	19.6	46.0	26.4	138	281
5	315.038	59.7	14.8	8.4	23.2	59.7	75.6	15.9	101	278
6	629.959	27.4	19.9	9.9	23.2	34.0	55.6	21.6	222	181
7	944.950	32.4	22.4	11.0	22.9	42.9	55.6	12.7	159	357
Vertical										
8	88.479	24.3	6.4	7.1	23.4	14.4	55.6	41.2	132	360
9	100.010	29.1	8.4	7.2	23.3	21.4	55.6	34.2	285	294
10	144.349	17.1	14.2	7.5	23.0	15.8	55.6	39.8	241	352
11	262.164	16.8	17.7	8.2	23.0	19.7	46.0	26.3	190	154
12	314.980	55.6	14.8	8.4	23.2	55.6	75.6	20.0	183	294
13	629.959	33.6	19.9	9.9	23.2	40.2	55.6	15.4	105	72
14	944.952	32.1	22.4	11.0	22.9	42.6	55.6	13.0	111	5

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page:

UL Apex Co., Ltd.

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

MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/09 22:40:23

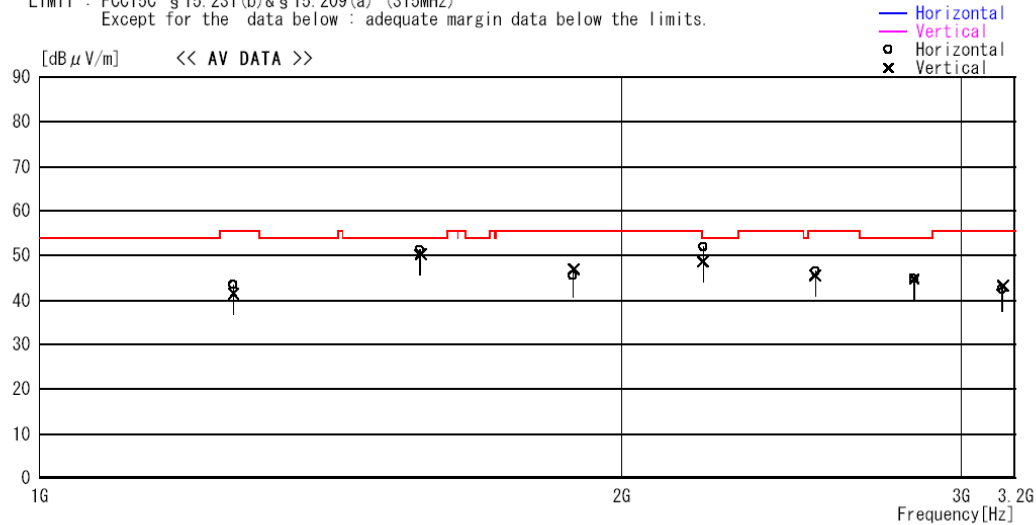
Applicant : Alps Electric CO.,LTD.
Kind of EUT : Passive Entry System
Model No. : TFWB1U619
Serial No. : 1

Report No. : 24GE0134-H0
Power : DC3V (CR2025)
Temp°C/Humi% : 23 / 32%
Operator : Naoki Sakamoto

Mode / Remarks : Transmitting/(Max-Axis)1000-3200MHz

LIMIT : FCC15C § 15.231(b)& § 15.209(a) (315MHz)

Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING AV [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1259.780	52.7	23.2	4.4	36.8	43.5	55.6	12.1	100	0
2	1574.943	57.7	25.0	5.0	36.5	51.2	54.0	2.8	100	242
3	1889.766	47.2	28.9	5.5	36.4	45.2	55.6	10.4	100	286
4	2204.789	51.7	30.5	6.0	36.3	51.9	54.0	2.1	100	220
5	2519.762	45.3	31.1	6.3	36.2	46.5	55.6	9.1	100	264
6	2834.565	42.3	31.9	6.8	36.4	44.6	54.0	9.4	100	121
7	3149.760	39.3	32.0	7.2	36.4	42.1	55.6	13.5	100	77
----- Vertical -----										
8	1259.840	50.6	23.2	4.4	36.8	41.4	55.6	14.2	100	78
9	1574.918	56.7	25.0	5.0	36.5	50.2	54.0	3.8	100	342
10	1889.906	48.9	28.9	5.5	36.4	46.9	55.6	8.7	100	56
11	2204.879	48.5	30.5	6.0	36.3	48.7	54.0	5.3	100	122
12	2519.887	44.3	31.1	6.3	36.2	45.5	55.6	10.1	100	133
13	2834.830	42.3	31.9	6.8	36.4	44.6	54.0	9.4	100	232
14	3149.550	40.4	32.0	7.2	36.4	43.2	55.6	12.4	100	276

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

UL Apex Co., Ltd.

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

MF060b(10.04.03)

DATA OF RADIATED EMISSION TEST

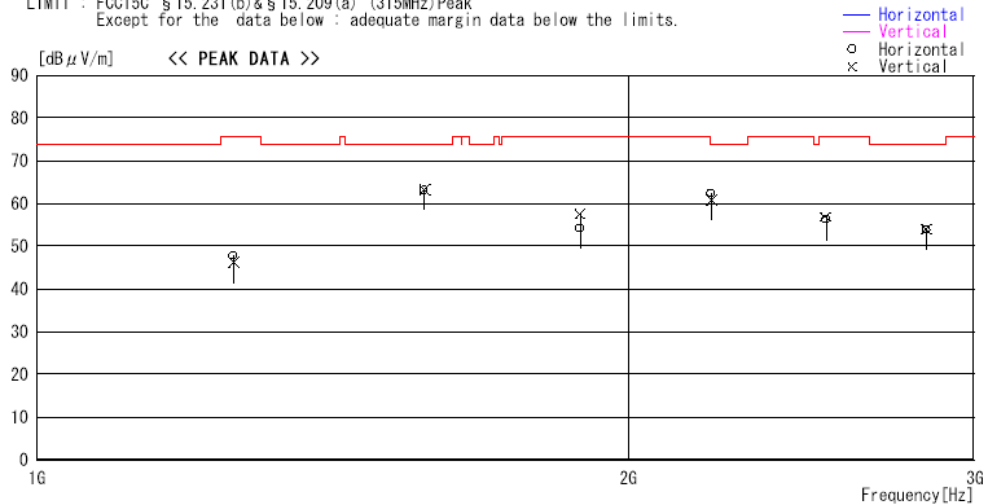
UL Apex Co., Ltd. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2004/03/09 22:40:23

Applicant : Alps Electric CO.,LTD.
Kind of EUT : Passive Entry System
Model No. : TFWB1U619
Serial No. : 1

Report No. : 24GE0134-HO
Power : DC3V (CR2025)
Temp°C/Humi% : 23 / 32%
Operator : Naoki Sakamoto

Mode / Remarks : Transmitting/ (Max-Axis)1000-3200MHz

LIMIT : FCC15C §15.231(b)&§15.209(a) (315MHz)Peak
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING PK [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	1259.780	56.8	23.2	4.4	36.8	47.6	75.6	28.0	100	0
2	1574.943	69.6	25.0	5.0	36.5	63.1	74.0	10.9	100	242
3	1889.766	56.3	28.9	5.5	36.4	54.3	75.6	21.3	100	286
4	2204.879	62.2	30.5	6.0	36.3	62.4	74.0	11.6	100	220
5	2519.762	55.0	31.1	6.3	36.2	56.2	75.6	19.4	100	264
6	2834.565	51.7	31.9	6.8	36.4	54.0	74.0	20.0	100	121
7	3149.760	48.8	32.0	7.2	36.4	51.6	75.6	24.0	100	77
----- Vertical -----										
8	1259.840	55.4	23.2	4.4	36.8	46.2	75.6	29.4	100	78
9	1574.918	69.7	25.0	5.0	36.5	63.2	74.0	10.9	100	342
10	1889.906	59.6	28.9	5.5	36.4	57.6	75.6	18.0	100	56
11	2204.879	60.7	30.5	6.0	36.3	60.9	74.0	13.1	100	122
12	2519.887	55.8	31.1	6.3	36.2	57.0	75.6	18.6	100	133
13	2834.830	51.8	31.9	6.8	36.4	54.1	74.0	19.9	100	232
14	3149.550	48.7	32.0	7.2	36.4	51.5	75.6	24.1	100	276

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP. GAIN

Page:

See APPENDIX 4

UL Apex Co., Ltd.

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

MF060b(10.04.03)

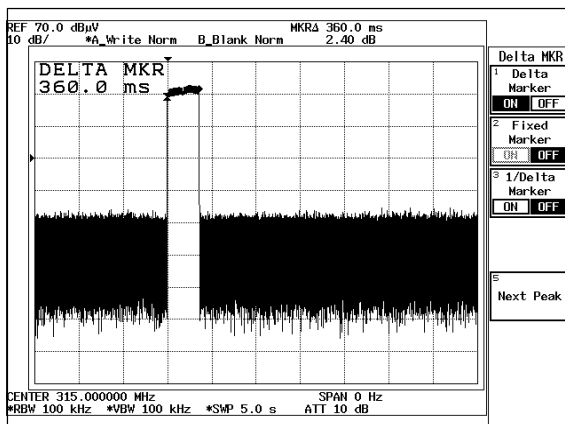
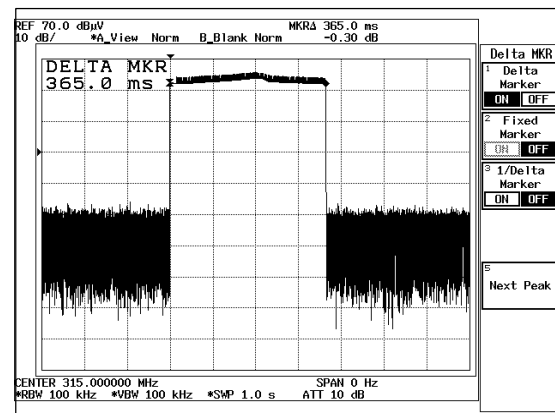
Automatically deactivate

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Alps Electric Co.,Ltd.
EQUIPMENT : Passive Entry System (Hand Unit)
MODEL : TFWB1U619
S/N : 1
FCC ID : CWTWBU619
POWER : DC 3V
Mode : Transmitting

REPORT NO : 24GE0134-HO
REGULATION : FCC Part15 Subpart C 231(a)(1)
DATE : 03/09/2004
TEMPERATURE : 22°C
HUMIDITY : 32%
ENGINEER : Naoki Sakamoto

Time of Transmitting [sec]	Limit [sec]
0.37	5.00



-20dB Bandwidth

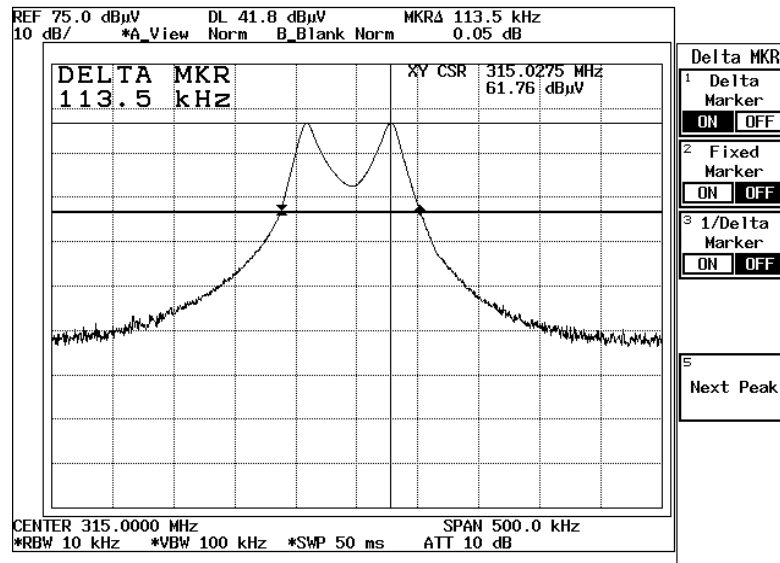
UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Alps Electric Co.,Ltd.
EQUIPMENT : Passive Entry System (Hand Unit)
MODEL : TFWB1U619
S/ N : 1
FCC ID : CWTWBU619
POWER : DC 3V
MODE : Transmitting

REPORT NO. : 24GE0134-HO
REGULATION : RSS210
TEST DISTANCE : 10 m
DATE : 03/08/2004
TEMPERATURE : 22°C
HUMIDITY : 32%
ENGINEER : Naoki Sakamoto

Bandwidth Limit : Fundamental Frequency 315.00MHz X 0.25% = 787.5 kHz

-20dB Bandwidth	Bandwidth Limit	Result
[kHz]	[kHz]	
113.50	787.50	Pass



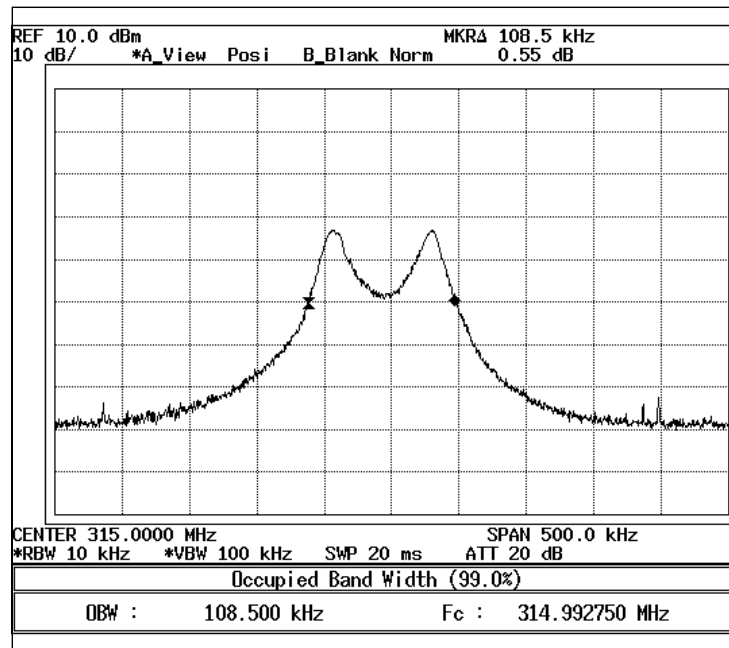
99% Occupied Bandwidth

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : Alps Electric Co.,Ltd.
EQUIPMENT : Passive Entry System (Hand Unit)
MODEL : TFWB1U619
S/N : 1
FCC ID : CWTWBU619
POWER : DC 3V
MODE : Transmitting

REPORT NO. : 24GE0134-HO
REGULATION : RSS210
TEST DISTANCE : 10 m
DATE : 03/08/2004
TEMPERATURE : 22°C
HUMIDITY : 32%
ENGINEER : Naoki Sakamoto

99% Occupied Bandwidth
[kHz]
108.50



APPENDIX 4: Additional Data of EMI test

DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/06/10 17:25:26

Applicant : Alps Electric CO.,LTD. Report No. : 24GE0134-HO
Kind of EUT : Passive Entry System (Hand unit) Power : DC3V (CR2025)
Model No. : TFWB1U619 Temp°C/Humi% : 23deg. C / 65%
Serial No. : 1 Operator : Naoki Sakamoto

Mode / Remarks : Transmitting mode 30-1000MHz / PK (RBW/VBW 1MHz) / Dipole Antenna

LIMIT :
Except for the data below : adequate margin data below the limits.

No.	FREQ [MHz]	READING PK [dB μ V]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dB μ V/m]	LIMIT [dB μ V/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	315.007	53.1	27.6	10.1	27.4	63.4	-----	-----	100	302
----- Vertical -----										
2	315.005	53.0	27.6	10.1	27.4	63.3	-----	-----	190	281

CHART:WITHOUT FACTOR ANT TYPE: -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz Dipole, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN Page: