



FCC CLASS B COMPLIANCE REPORT (DoC)

for

Electromagnetic Emissions

of

Receiver

Trade Name : N/A
Model Number : 91672-07
Serial Number : N/A
Report Number : SZ070523B06-EF
Date : May 25, 2007

Prepared for :

KENWO INDUSTRIES LIMITED
UNIT 1-2, 7/F., BLK A, HI-TECH IND CENTRE, 5 PAKTINPAR ST.,
TSUEN WAN, HONG KONG.

Prepared by :

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TEST RESULT CERTIFICATION

Equipment Under Test: Receiver

Trade Name: N/A

Model Number: 91672-07

Serial Number: N/A

Applicant: KENWO INDUSTRIES LIMITED
UNIT 1-2, 7/F., BLK A, HI-TECH IND CENTRE, 5 PAKTINPAR ST.,
TSUEN WAN, HONG KONG.

Manufacturer: KENWO INDUSTRIES LIMITED
UNIT 1-2, 7/F., BLK A, HI-TECH IND CENTRE, 5 PAKTINPAR ST.,
TSUEN WAN, HONG KONG.

Type of Test: FCC Part 15 Subpart B Class B (DoC)

Measurement Procedure: ANSI C63.4: 2003

Report Number: SZ070523B06-EF

Date of test: May 23~25, 2007

Deviation: None

Condition of Test Sample: Normal

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Approved By:

Clinton Kao / Manager
COMPLIANCE CERTIFICATION
SERVICES INC.

Tested By: Maya You

Reviewed By:

Eric Wong/ Assistant manager
COMPLIANCE CERTIFICATION
SERVICES INC.



SYSTEM DESCRIPTION

EUT Test Program:

1. Set up EUT with the relative support equipments and Power on.
2. Make sure the EUT works normally during the test.



PRODUCT INFORMATION

Housing Type: Plastic

EUT Power Rating: DC4.5 V supplied by the lithium battery;
DC4.5V supplied by the adapter

Power during Test: DC4.5 V supplied by the lithium battery;
DC4.5V supplied by the adapter

Adapter Manufacturer/ Model No.: FOREEN INDUSTRIES LTD./ 28-D04-050
(DC output Cable: Unshielded, 1.80m)

I/O Port of EUT:

I/O Port Type	Q'TY	Tested with
DC Input Port	1	1

Difference between model numbers as below:

	Model Number	Trade Name
1.	N/A	N/A



SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	Trade Name	Data Cable	Power Cord	FCC ID
1.	N/A						

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.



SECTION 1 FCC (LINE CONDUCTED AND RADIATED EMISSION)

MEASUREMENT PROCEDURE (PRELIMINARY LINE CONDUCTED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC4.5V power from the adapter, and the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5) All support equipments received power from a second LISN supplying power of AC120V/60Hz, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

Preliminary Conducted Emission Test			
Frequency Range Investigated		150KHz TO 30 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
Normal	2007-05-24	91672-07_0(L,N)	<input checked="" type="checkbox"/>

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.



MEASUREMENT PROCEDURE (FINAL LINE CONDUCTED EMISSION TEST)

- 1) EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using an Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. MHz	Peak Raw dBuV	Q.P. Raw dBuV	Average Raw dBuV	Q.P. Limit dBuV	Average Limit dBuV	Q.P. Margin dB	Average Margin dB	Note
xx.xx	43.95	---	---	56.00	46.00	---	-2.05	L 1

Freq.

= Emission frequency in MHz

Raw dBuV

= Uncorrected Analyzer/Receiver reading

Limit dBuV

= Limit stated in standard

Margin dB

= Reading in reference to limit

Note

= Current carrying line of reading

“---”

= The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.



LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	AVERAGE(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

Note: The lower limit shall apply at the transition frequency.



MEASUREMENT PROCEDURE (PRELIMINARY RADIATED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received DC4.5V power from the adapter, and the adapter received AC120V/60Hz power from the outlet socket under the turntable. All support equipment received AC120V/60Hz power from socket under the turntable, if any.
- 5) The antenna was placed at 3 meter away from the EUT as stated in CISPR 22. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The following test mode(s) were scanned during the preliminary test:

Preliminary Radiated Emission Test			
Frequency Range Investigated		30 MHz TO 1000 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
Normal	2007-05-24	91672-07_0(H,V)	<input checked="" type="checkbox"/>

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for final testing.



MEASUREMENT PROCEDURE (FINAL RADIATED EMISSION TEST)

- 1) EUT and support equipment were set up on the turntable as per step 7 of the preliminary test.
- 2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Peak/ Q.P. reading is presented. Above 1GHz, if EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using an Average detector.
- 4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)	Reading Type P/Q
xx.xxx	23.15	9.29	32.44	40.00	-7.56	P

Freq.

= Emission frequency in MHz

Raw Data (dBuV/m)

= Uncorrected Analyzer / Receiver reading

Corr. Factor (dB)

= Correction factors of antenna factor and cable loss

Emiss. Level

= Raw reading converted to dBuV/m and CF added

Limit dBuV/m

= Limit stated in standard

Margin dB

= Reading in reference to limit

P

=Peak Reading

Q

=Quasi-peak



RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30-88	3	40.00
88-216	3	43.50
216-960	3	46.00
960-1000	3	54.00

****Note:** The lower limit shall apply at the transition frequency.



SUMMARY DATA (LINE CONDUCTED TEST)

Model Number: 91672-07**Location:** Site G**Tested by:** Maya**Test Mode:** Normal**Test Results:** Passed**Temperature:** 25°C**Humidity:** 55%RH

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	Avg Limit dBuV	Q.P. Margin dB	Avg Margin dB	NOTE
0.257	39.81	---	---	62.93	52.93	---	-13.12	L1
0.313	34.87	---	---	61.34	51.34	---	-16.47	L1
0.713	25.45	---	---	56.00	46.00	---	-20.55	L1
15.458	31.53	---	---	60.00	50.00	---	-18.47	L1
17.783	31.58	---	---	60.00	50.00	---	-18.42	L1
27.482	35.82	---	---	60.00	50.00	---	-14.18	L1
0.346	42.26	---	---	63.25	53.25	---	-10.99	L2
0.279	41.96	---	---	62.29	52.29	---	-10.33	L2
0.717	25.45	---	---	56.00	46.00	---	-20.55	L2
2.296	17.44	---	---	56.00	46.00	---	-28.56	L2
7.715	22.30	---	---	60.00	50.00	---	-27.70	L2
26.969	40.13	---	---	60.00	50.00	---	-9.87	L2

(The chart below shows the highest readings taken from the final data)

*L1 = Line One (Hot side) / L2 = Line Two (Neutral side)****NOTE: “---” denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.*



SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: 91672-07**Location:** Site G**Test Mode:** Normal**Polar:** Vertical / Horizontal**Test Results:** Passed**Test Distance:** 3m**Temperature:** 25°C**Humidity:** 55%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated (30 MHz TO 1000 MHz)							
Freq (MHz)	Meter Reading (dBuV/m)	CF (dBuV/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q	Pol. H/V
46.875	36.63	-1.91	34.72	40.00	-5.28	P	V
49.575	38.75	-3.96	34.79	40.00	-5.21	P	V
53.625	37.35	-3.62	33.73	40.00	-6.27	P	V
94.125	42.96	-5.92	37.04	43.50	-6.46	P	V
660.500	34.86	4.42	39.28	46.00	-6.72	P	V
802.250	35.31	6.72	42.03	46.00	-3.97	P	V
423.220	40.87	2.22	43.09	46.00	-2.91	P	V
846.440	23.95	7.07	31.02	46.00	-14.98	P	V
49.575	35.12	-0.21	34.91	40.00	-5.09	P	H
202.800	42.56	-4.18	38.38	43.50	-5.12	P	H
290.550	42.71	-2.19	40.52	46.00	-5.48	P	H
398.000	38.61	0.21	38.82	46.00	-7.18	P	H
594.000	35.98	2.83	38.81	46.00	-7.19	P	H
847.750	36.36	3.44	39.80	46.00	-6.20	P	H
423.220	41.76	0.61	42.37	46.00	-3.63	P	H
846.440	32.41	3.62	36.03	46.00	-9.97	P	H

C.F.(Correction Factor)=Antenna Factor + Cable Loss - Amplifier Gain (+ Attenuator 6dB)

Corrected Reading = Metering Reading + C.F.

Margin=Corrected Reading - Limits

P=Peak Reading

H=Horizontal Polarization/Antenna

Q=Quasi-peak

V=Vertical Polarization/Antenna

Comments: N/A



TEST FACILITY

Location: No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township
Taoyuan County, Taiwan

Description: There is one 3/10m open area test sites and one line conducted labs for final test.
The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

Site Filing: A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Site Accreditation: This accredited organization maintains A2LA accreditation to ISO/IEC 17025 for the specific test listed in A2LA Certificate #0824-01.
Accredited by TAF (Testing Laboratory code: 0363) for EMC.

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.

Measurement Uncertainty: Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	9kHz~30MHz		± 3.5863
Radiated emissions	Horizontal	30MHz ~ 200MHz	± 4.7685
		200MHz ~1000MHz	± 4.9330
	Vertical	30MHz ~ 200MHz	± 5.0411
		200MHz ~1000MHz	± 4.9262

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Ground Plane: Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.



TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at Compliance Certification Services Inc. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 1.0GHz or above.

Equipment used during the tests:

Open Area Test Site: G

Open Area Test Site G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100145	02/06/2007	02/05/2008
Pre Amplifier	H.P.	8447D	2944A06833	09/01/2006	09/01/2007
Bi-log Antenna	SCHAFFNER	CBL6143	5082	06/10/2006	06/09/2007
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/10/2006	06/09/2007
System-Controller	CT	SC100	N/A	N/A	N/A
Turn Table	EMCO	2081-1.21	N/A	N/A	N/A
Antenna Tower	CT	N/A	N/A	N/A	N/A

Conducted Emission Test Site: G

Conducted Emission Test Site G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100088	02/06/2007	02/05/2008
LISN	EMCO	3825/2	1371	02/06/2007	02/05/2008
LISN	EMCO	3825/2	8901-1459	02/06/2007	02/05/2008

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

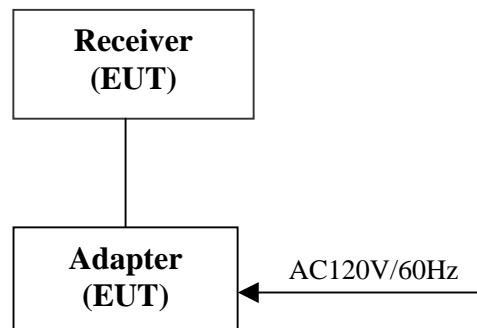
BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

EUT: Receiver

Trade Name: N/A

Model Number: 91672-07





APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST

RADIATED EMISSION TEST