TEST REPORT

Report Number: HK10051668-1

Application
for
Original Grant
of 47 CFR Part 15 Certification

433MHz ASK Alarm Clock

FCC ID: VNN-CB1000

Prepared and Checked by:	Approved by:
	
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GENERAL INFORMATION

Applicant Name:	Global China Technology Limited
Applicant Address:	Room 308, 3/F., Kwong Sang Hong Centre, 151-153 Hoi Bun Road, Kwun Tong, Hong Kong.
FCC Specification Standard:	FCC Part 15: 2008
FCC ID:	VNN-CB1000
FCC Model(s):	CB1000GNR0, CB1010GHR0, TCL 100, TCL 200
Type of EUT:	Transmitter
Description of EUT:	433MHz ASK Alarm Clock
Serial Number:	N/A
Sample Receipt Date:	May 31, 2010
Date of Test:	July 28-August 17, 2010
Report Date:	November 11, 2010
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

Table of Contents

1.0 **Summary of Test Results**

Test Items	FCC Part 15 Section	Results	Details see section
Antenna Requirement	15.203	Pass	2.1
Radiated Emission Timing Bandwidth	15.231(b) & 15.109 15.231(a) 15.231(c)	Pass Pass Pass	4.2 4.3.2 4.3.1
Radiated Emission in Restricted Bands	15.205	Pass	4.2
AC Power Line Conducted Emission	15.207 & 15.107	Pass	4.4

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

EXHIBIT 2
GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The tested models CB1000GNR0 and CB1010GHR0 are 433MHz ASK alarm clocks. They operate at 433.92MHz. They are powered by an adaptor 100-240VAC 50/60Hz 250mA to 12VDC 670mA, and/or 2 “AAA” size “Ni-MH” rechargeable 1.2V 500mAh backup batteries. They send out control signals to a bed shaker to activate or deactivate its vibration, in the following situations: ① Ringing signal detected from PSTN; ② The alarm is triggered, and ③ The alarm is deactivated by user.

Model CB1000GNR0 is equipped with an analog (mechanical) clock display and controls, and Model CB1010GHR0 is equipped with a digital clock display and controls.

The antenna used in the alarm clock is integral, and the test sample is a prototype.

The Model: TCL 100 is the same as the Model: CB1000GNR0 in electronics/electrical designs, including software & firmware, PCB layout and construction design/physical design/enclosure. The Model: TCL 200 is the same as the Model: CB1010GHR0 in electronics/electrical designs, including software & firmware, PCB layout and construction design/physical design/enclosure. The only differences between these models are trade name, model number, and packing configuration to be sold for marketing purpose.

The circuit description is attached in the Appendix and saved with filename: descri.pdf.

Connection between the device and the telephone network is accomplished through the use of USOC RJ11C in the 2-wire loop calling central office line.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). Preliminary radiated scans and all radiated measurements were performed in Open Area Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data and conducted data are located at Roof Top and 2nd Floor respectively of Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 3
SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to normal mode. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by a 100-240VAC to 12VDC 670mA adaptor and/or fully charged batteries.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the alarm clock attached to peripherals, they were connected and operational to simulate typical use.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 1 MHz for frequencies above 1000 MHz.

Radiated emission measurement for transmitter was performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.109.

3.1 Justification - Cont'd

Detector function for radiated emissions is in peak mode.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) is 2ms. With the resolution bandwidth 100kHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All relevant operation modes have been tested, and the worst case data is included in this report.

The RF modules of CB1000GNR0 and CB1010GHR0 are identical. Therefore, measurement(s) of timing and occupied bandwidth are the same.

3.2 EUT Exercising Software

There was no special software to exercise the device.

3.3 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor and/or a battery (provided with the unit) were used to power the device. Their description are listed below.

(1) Base Unit: An AC adaptor (100-240VAC to 12VDC 670mA, Model: S008CU1200067) (Supplied by Client)

(2) Backup Battery: 2 x "AAA" size "Ni-MH" rechargeable 1.2V 500mAh batteries (Supplied by Client)

Description of Peripherals:

(1) Telephone Line Simulator, Model: TLS-5D-01, S/N: 151101 (Supplied by Intertek)

(2) 3m Telephone Line (Supplied by Intertek)

(3) Bed Shaker, FCC ID: VNN-CB1000SHAKER (Supplied by Client)

(4) Charging Cable, 36.5cm long (Supplied by Client)

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Global China Technology Limited will be incorporated in each production model sold/leased in the United States.

No modifications were installed by Commercial & Electrical Division, Intertek Testing Services Hong Kong Ltd.

EXHIBIT 4
TEST RESULTS

4.0 **Test Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

4.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

FS = RR + LF

where FS = Field Strength in dBμV/m
RR = RA - AG in dBμV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
FS = RR + LF
FS = 23 + 9 = 32 dBμV/m

RR = 23.0 dBμV
LF = 9.0 dB

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

Model: CB1000GNR0 - 3037.440 MHz

Model: CB1010GHR0 - 433.920 MHz

The worst case radiated emission configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1-4 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Model: CB1000GNR0 - Passed by 1.2 dB margin

Model: CB1010GHR0 - Passed by 1.8 dB margin

4.2.3 Transmitter Duty Cycle Calculation

The average factor is not applicable for this device because the peak detector measured data is substituted for the average detector data to show compliance.

Model: CB1000GNR0
Mode: TX (Ringing)

Table 1

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	433.920	70.0	16	25.0	79.0	80.8	-1.8
H	867.840	44.0	16	31.0	59.0	60.8	-1.8
V	***1301.760***	***55.7***	***33***	***26.1***	***48.8***	***54.0***	***-5.2***
V	1735.680	58.5	33	27.2	52.7	60.8	-8.1
V	2169.600	59.1	33	29.4	55.5	60.8	-5.3
V	2603.520	56.0	33	30.4	53.4	60.8	-7.4
V	3037.440	60.7	33	31.9	59.6	60.8	-1.2
V	3471.360	49.9	33	31.9	48.8	60.8	-12.0
V	***3905.280***	***51.7***	***33***	***33.3***	***52.0***	***54.0***	***-2.0***
V	***4339.200***	***49.3***	***33***	***34.8***	***51.1***	***54.0***	***-2.9***

NOTES:
1. Peak detector is used for the emission measurement. The above peak detector measured data is substituted for the average detector data to show compliance.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

Model: CB1000GNR0
Mode: Ringing with Charging

Table 2

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	32.850	38.8	16	10.0	32.8	40.0	-7.2
V	38.410	38.5	16	10.0	32.5	40.0	-7.5
V	43.015	37.6	16	10.0	31.6	40.0	-8.4
V	47.200	36.1	16	11.0	31.1	40.0	-8.9
V	53.015	35.8	16	11.0	30.8	40.0	-9.2
V	58.400	35.0	16	11.0	30.0	40.0	-10.0

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

Model: CB1010GHR0
Mode: TX (Ringing)

Table 3

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	433.920	70.0	16	25.0	79.0	80.8	-1.8
H	867.840	43.5	16	31.0	58.5	60.8	-2.3
H	***1301.760***	***52.9***	***33***	***26.1***	***46.0***	***54.0***	***-8.0***
H	1735.680	56.5	33	27.2	50.7	60.8	-10.1
H	2169.600	61.6	33	29.4	58.0	60.8	-2.8
H	2603.520	47.0	33	30.4	44.4	60.8	-16.4
V	3037.440	53.9	33	31.9	52.8	60.8	-8.0
V	3471.360	50.7	33	31.9	49.6	60.8	-11.2
V	***3905.280***	***49.2***	***33***	***33.3***	***49.5***	***54.0***	***-4.5***
V	***4339.200***	***48.2***	***33***	***34.8***	***50.0***	***54.0***	***-4.0***

NOTES:
1. Peak detector is used for the emission measurement. The above peak detector measured data is substituted for the average detector data to show compliance.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

Model: CB1010GHR0
Mode: Ringing with Charging

Table 4

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	32.830	38.1	16	10.0	32.1	40.0	-7.9
V	35.910	37.7	16	10.0	31.7	40.0	-8.3
V	43.025	38.4	16	10.0	32.4	40.0	-7.6
V	47.210	37.6	16	11.0	32.6	40.0	-7.4
V	53.015	36.8	16	11.0	31.8	40.0	-8.2
V	58.300	35.9	16	11.0	30.9	40.0	-9.1

NOTES: 1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters.

3. Negative value in the margin column shows emission below limit.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

4.3 Transmitter Bandwidth and 5-Second Transmission

4.3.1 Measured Bandwidth

The plot shows the fundamental emission when modulated is attached in the Appendix and saved with filename: bw.pdf. From the plot, the bandwidth is observed to be 469kHz, at 20dBc where the bandwidth limit is 1084.8kHz.

Therefore, the EUT meets the requirement of FCC Part 15 Section 15.231(c).

4.3.2 5-Second Transmission Requirement

[ ] Pursuant to FCC Part 15 Section 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. The EUT meets the requirement. A preliminary copy of the 5-second transmission requirement is attached in the Appendix and saved with filename: 5s.pdf.

[×] Pursuant to FCC Part 15 Section 15.231(a)(2), a transmitter activated automatically shall cease transmitter within 5 seconds after activation. The EUT meets the requirement. A preliminary copy of the 5-seconds transmission requirement is attached in the Appendix and saved with filename: 5s.pdf.

4.4 AC Power Line Conducted Emission

[ ] Not applicable – EUT is only powered by battery for operation.

[×] EUT connects to AC power line. Emission Data is listed in following pages.

[ ] Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

Model: CB1000GNR0 - 1.662 MHz

Model: CB1010GHR0 - 1.694 MHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.4.2 AC Power Line Conducted Emission Data

The conducted emission test result is attached in the Appendix and saved with filename: conduct.pdf

Judgement -

Model: CB1000GNR0 - Passed by 8.46 dB margin compare with quasi-peak limit

Model: CB1010GHR0 - Passed by 6.17 dB margin compare with quasi-peak limit

5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Spectrum Analyzer	EMI Test Receiver	Spectrum Analyzer
Registration No.	EW-2466	EW-2251	EW-2188
Manufacturer	R&S	R&S	AGILENTTECH
Model No.	FSP30	ESCI	E4407B
Calibration Date	Nov. 11, 2009	Oct. 22, 2009	Dec. 25, 2009
Calibration Due Date	Feb. 11, 2011	Oct. 22, 2010	Dec. 31, 2010

Equipment	Digital Multimeter	Biconical Antenna	Log Periodic Antenna	Double Ridged Guide Antenna
Registration No.	EW-1017	EW-0954	EW-0446	EW-0194
Manufacturer	FLUKE	EMCO	EMCO	EMCO
Model No.	87-IV	3104C	3146	3115
Calibration Date	Jun. 07, 2010	Apr. 14, 2010	Apr. 26, 2010	Jul. 06, 2010
Calibration Due Date	Jul. 06, 2011	Apr. 14, 2011	Oct. 26, 2011	Jan. 06, 2012

2) Conducted Emissions Test

Equipment	EMI Test Receiver	LISN	Pulse Limiter
Registration No.	EW-2251	EW-0090	EW-0698
Manufacturer	R&S	R&S	R&S
Model No.	ESCI	ESH3-Z5	ESH3-Z2
Calibration Date	Oct. 22, 2009	Feb. 05, 2010	Mar. 01, 2010
Calibration Due Date	Oct. 22, 2010	Feb. 05, 2011	Mar. 01, 2011

END OF TEST REPORT