

FCC PART 15 Subpart C
EMI MEASUREMENT AND TEST REPORT

For

COBY MANUFACTURING CO., LTD

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Kowloon, Hongkong

FCC ID: RMVCT-P7250

2004-01-30

This Report Concerns: ☒ Original Report	Equipment Type: 2.4GHz & 5.8 GHz Cordless Phone – Handset
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Report No.: R0401061(HS)	
Test Date: 2004-01-21	
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The COBY MANUFACTURING CO., LTD's product, model name: CT-P7250 or the "EUT" as referred to in this report is the handset unit of a 2.4GHz & 5.8GHz cordless telephone, which measures approximately 6.1"L x 5.6" W x 3.1"H.

** The test data gathered are from production sample, serial number: 01A, provided by the manufacturer.*

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2001.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.205, 15.207, and 15.249, 15.203, 15.209 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 - 2001, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22:1997 and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to ANSI C63.4-2001.

Handset being tested: The Handset unit was placed on the wooden table and tested in three orthogonal axis. The handset was connected to the headset via its headset port. The Low, middle, and high channels were tested. The handset was transmitting to and receiving from the Base unit. The EUT was investigated for emissions while off hook. The radiated data was taken in this mode of operation. All initial and final investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously.

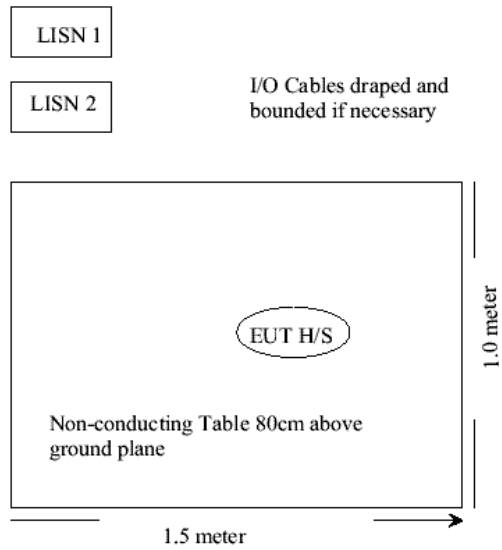
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test System



Handset

Test Setup Block Diagram

SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.207 (a)	Conducted Emission	N/A
§15.209 (a)	Radiated Emission	Compliant
§15.249 (c)	Band Edge Testing	Compliant
§15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§15.214	Cordless Telephone	Compliant

§15.209(a), §15.205 & §15.249 - RADIATED EMISSION DATA

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2001. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle as required.

Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2003-06-13
HP	Spectrum Analyzer Display	85662A	3026A20081	2003-06-13
HP	Quasi-Peak Adapter	85650A	3019A05393	2003-09-30
Agilent	Amplifier	8447D	2944A10187	2003-09-23
Electro-Metrics	Biconical Antenna	EM-6912	585	2003-04-17
Electro-Metrics	Logperiodic Antenna	EM-6950	788	2003-04-15
HP	Spectrum Analyzer	8565EC	3946A00131	2003-06-30

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	13 ° C
Relative Humidity:	50%
ATM Pressure:	1027bar

Test Procedure

For the radiated emissions test, the power cord of the host system and all support equipment were connected to the AC floor outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "Qp" in the data table.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for applicable limits. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Applicable Limit}$$

Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209, and 15.249 after tested to 10th harmonics as required by FCC and had the worst margin of:

Handset, 30MHz - 25GHz, 3 Meters

- 7.4 dB at 4936.00MHz in the Vertical polarization at Low Frequency
- 7.2 dB at 4948.00 MHz in the Vertical polarization at Mid Frequency
- 7.5 dB at 4959.40MHz in the Vertical polarization at High Frequency
- 5.3 dB at 824.67MHz in the Vertical polarization at Unintentional Emission

Radiated Emissions Test Result Data

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 Subpart C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel											
4936.00	42.2	Ave	30	1.8	v	32.5	4.9	33.0	46.6	54	-7.4
4936.00	41.8	Ave	110	1.5	h	32.5	4.9	33.0	46.2	54	-7.8
2468.00	78.2	Fund/Ave	90	1.2	v	28.1	3.4	35.2	74.5	94	-19.6
2468.00	77.6	Fund/Ave	0	1.5	h	28.1	3.4	35.2	73.9	94	-20.2
1162.75	37.1	RxLo /Ave	60	1.5	v	23.7	4.2	32.1	32.9	54	-21.1
1162.75	36.5	RxLo /Ave	90	1.5	h	23.7	4.2	32.1	32.3	54	-21.7
4936.00	43.4	Peak	30	1.8	v	32.5	4.9	33.0	47.8	74	-26.2
4936.00	43.1	Peak	110	1.5	h	32.5	4.9	33.0	47.5	74	-26.5
1162.75	47.7	RxLo /Peak	60	1.5	v	23.7	4.2	32.1	43.5	74	-30.5
1162.75	46.3	RxLo /Peak	90	1.5	h	23.7	4.2	32.1	42.1	74	-31.9
2468.00	80.3	Fund/Peak	90	1.2	v	28.1	3.4	35.2	76.6	114	-37.5
2468.00	79.5	Fund/Peak	0	1.5	h	28.1	3.4	35.2	75.8	114	-38.3
Mid Channel											
4948.00	42.4	Ave	90	1.5	v	32.5	4.9	33.0	46.8	54	-7.2
4948.00	42.1	Ave	15	1.2	h	32.5	4.9	33.0	46.5	54	-7.5
2474.00	78.3	Fund/Ave	0	1.5	v	28.1	3.4	35.2	74.6	94	-19.5
2474.00	77.9	Fund/Ave	230	1.2	h	28.1	3.4	35.2	74.2	94	-19.9
1164.08	37.3	RxLo /Ave	270	1.6	v	23.7	4.2	32.1	33.1	54	-20.9
1164.08	36.8	RxLo /Ave	310	1.5	h	23.7	4.2	32.1	32.6	54	-21.4
4948.00	43.5	Peak	90	1.5	v	32.5	4.9	33.0	47.9	74	-26.1
4948.00	43.3	Peak	15	1.2	h	32.5	4.9	33.0	47.7	74	-26.3
1164.08	47.9	RxLo /Peak	270	1.6	v	23.7	4.2	32.1	43.7	74	-30.3
1164.08	46.5	RxLo /Peak	310	1.5	h	23.7	4.2	32.1	42.3	74	-31.7
2474.00	80.5	Fund/Peak	0	1.5	v	28.1	3.4	35.2	76.8	114	-37.3
2474.00	79.7	Fund/Peak	230	1.2	h	28.1	3.4	35.2	76.0	114	-38.1

High Channel											
4959.40	42.1	Ave	60	1.0	v	32.5	4.9	33.0	46.5	54	-7.5
4959.40	41.7	Ave	30	1.5	h	32.5	4.9	33.0	46.1	54	-7.9
2479.70	79.9	Fund/Ave	210	1.2	h	28.1	3.4	35.2	76.2	94	-17.9
2479.70	78.2	Fund/Ave	290	1.5	v	28.1	3.4	35.2	74.5	94	-19.6
1165.35	36.9	RxLo /Ave	120	1.2	v	23.7	4.2	32.1	32.7	54	-21.3
1165.35	36.4	RxLo /Ave	230	1.0	h	23.7	4.2	32.1	32.2	54	-21.8
4959.40	43.2	Peak	60	1.0	v	32.5	4.9	33.0	47.6	74	-26.4
4959.40	42.9	Peak	30	1.5	h	32.5	4.9	33.0	47.3	74	-26.7
1165.35	47.5	RxLo /Peak	120	1.2	v	23.7	4.2	32.1	43.3	74	-30.7
1165.35	46.1	RxLo /Peak	230	1.0	h	23.7	4.2	32.1	41.9	74	-32.1
2479.70	80.1	Fund/Peak	290	1.5	v	28.1	3.4	35.2	76.4	114	-37.7
2479.70	79.5	Fund/Peak	210	1.2	h	28.1	3.4	35.2	75.8	114	-38.3
Unintentional Emission, 30MHz to 1000MHz											
824.67	43.3	TxLo	15	1.6	v	22.3	3.7	28.6	40.7	46	-5.3
824.67	37.8	TxLo	290	1.5	h	22.3	3.7	28.6	35.2	46	-10.8
196.25	33.9	/	110	1.5	v	14.2	2.1	28.5	21.7	43.5	-21.8
226.41	34.2	/	0	1.5	v	11.8	2.2	28.2	20.0	46	-26.0
128.87	31.7	/	60	1.6	h	11.9	1.6	28.5	16.6	43.5	-26.9
209.60	30.5	/	230	1.2	h	11.5	2.2	28.2	16.0	43.5	-27.5

§15.249(c) - BAND EDGES TESTING

Standard Applicable

Requirements: FCC 15.249 (c), the emission power at the START and STOP frequencies shall be at least 50 dB below the level of the fundamental or to the general radiated emission limits in FCC 15.209, whichever is the lesser attenuation.

Test Procedure

With the EUT's antenna attached, the EUT's radiated emission power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8565EC	3946A00131	2003-06-30

* **Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Environmental Conditions

Temperature:	13 ° C
Relative Humidity:	50%
ATM Pressure:	1027bar

Test Results

Refer to the attached plots.

