



STC Test Report

Date : 2007-05-10

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No. : HM157802

Applicant:

Lung Fat Industries (HK) Co., Ltd.
Flat 7, 8/F, New City Centre, 2 Lei Yue Mun Road,
Kwun Tong, Kowloon, Hong Kong.

Description of Samples:

Model name: VAC-U-STORE V2
Model no.: Vac-U-Store V2
Brand name: Vac-U-Store
FCC ID: UZAVUSV2

Date Samples Received: 2006-11-27, 2006-12-12, 2006-12-18, 2007-01-03,
2007-01-15, 2007-04-10

Date Tested: 2006-11-27 to 2007-04-19

Investigation Requested: FCC Part 15 Subpart C

Conclusions:

The submitted product was deemed to have COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

LEE Kam Chuen, EMD
For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

10 Dai Wang Street, Tai Po Industrial Estate, N.T., Hong Kong

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

Lung Fat Industries (HK) Co., Ltd.
Flat 7, 8/F, New City Centre, 2 Lei Yue Mun Road,
Kwun Tong, Kowloon, Hong Kong.

HKSTC Code Number for Applicant

Manufacturer

Lung Fat Industries (HK) Co., Ltd.
Flat 7, 8/F, New City Centre, 2 Lei Yue Mun Road,
Kwun Tong, Kowloon, Hong Kong.

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1.3 Equipment Under Test [EUT]

Description of Sample

Product: VAC-U-STORE V2
Manufacturer: Lung Fat Industries (HK) Co., Ltd.
Brand Name: Vac-U-Store
Model Number: Vac-U-Store V2
Rating: 12Vd.c. ("H23A" size battery x 1)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is an Lung Fat Industries (HK) Co., Ltd. VAC-U-STORE V2. The transmitter is a 1 button transmitter. The EUT is to transmit while button is being pressed. It is pulse transmitter, Modulation by IC; and type is pulse modulation.

1.4 Date of Order

2006-11-27, 2006-12-12, 2006-12-18, 2007-01-03, 2007-01-15, 2007-04-10

1.5 Submitted Sample(s):

11 Samples

1.6 Test Duration

2006-11-27 to 2007-04-19

1.7 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 2006 and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231a	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

Test Requirement: FCC 47CFR 15.231a

Test Method: ANSI C63.4:2003

Test Date: 2007-04-19

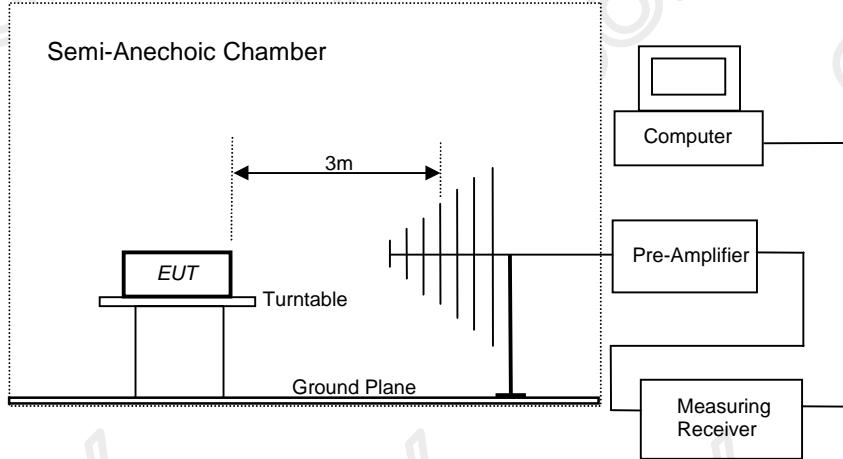
Mode of Operation: Tx mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: Semi-anechoic chamber located on the G/F of HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231a]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μ V/m]	Field Strength of Spurious Emission [Average] [μ V/m]
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12,500 *	375 to 1,250 *
Above 470	12,500	1,250

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, μ V/m at 3 meters = $56.81818(F)-6136.3636$; for the band 260-470 MHz, μ V/m at 3 meters = $41.6667(F)-7083.3333$. The maximum permissible unwanted emission level is 20dB below the maximum permitted fundamental level.

Results:

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
433.96	68.1	18.4	86.5	21134.9	109,983.5	Horizontal
867.92	18.0	25.7	43.7	153.109	10,998.3	Horizontal

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
+ 1301.88	< 1.0	26.7	< 27.7	< 24.3	5,000.0	Vertical
1735.84	< 1.0	32.2	< 33.2	< 45.7	10,998.3	Vertical
2169.80	< 1.0	38.8	< 39.8	< 97.7	10,998.3	Vertical
2603.76	< 1.0	17.4	< 18.4	< 8.3	10,998.3	Vertical
3037.72	< 1.0	17.2	< 18.2	< 8.1	10,998.3	Vertical
3471.68	< 1.0	18.8	< 19.8	< 9.8	10,998.3	Vertical
+ 3905.64	< 1.0	19.7	< 20.7	< 10.8	5,000.0	Vertical
+ 4339.60	< 1.0	20.6	< 21.6	< 12.0	5,000.0	Vertical

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Results:

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V *	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
433.96	57.5	18.4	75.9	6237.3	10,998.3	Horizontal
867.92	7.4	25.7	33.1	45.19	10,998.3	Horizontal

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
+ 1301.88	< 1.0	26.7	< 27.7	< 24.3	500.0	Vertical
1735.84	< 1.0	32.2	< 33.2	< 45.7	1,099.8	Vertical
2169.80	< 1.0	38.8	< 39.8	< 97.7	1,099.8	Vertical
2603.76	< 1.0	17.4	< 18.4	< 8.3	1,099.8	Vertical
3037.72	< 1.0	17.2	< 18.2	< 8.1	1,099.8	Vertical
3471.68	< 1.0	18.8	< 19.8	< 9.8	1,099.8	Vertical
+ 3905.64	< 1.0	19.7	< 20.7	< 10.8	500.0	Vertical
+ 4339.60	< 1.0	20.6	< 21.6	< 12.0	500.0	Vertical

Remarks:

*: Adjusted by Duty Cycle = -10.6dB

FCC Limit for Average Measurement = $41.6667(433.96\text{MHz})-7083.3333=10,998.34783\mu\text{V/m}$

+: Denotes restricted band of operation.
Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz $\pm 5.2\text{dB}$

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results :

Radiated Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz ± 5.2 dB

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3.1.1 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	N/A
Mode of Operation:	N/A

Results: N/A

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.231a
Test Method: ANSI C63.4:2003 (Section 13.1.7)
Test Date: 2007-04-19
Mode of Operation: On mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



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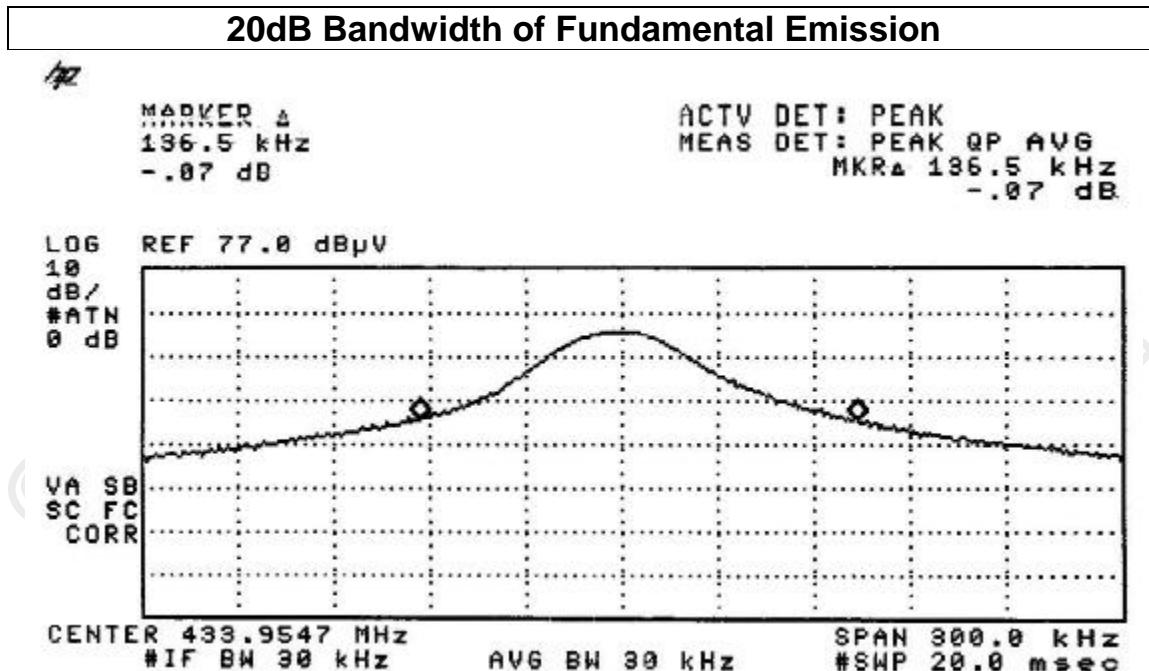
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Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits * [KHz]
433.96	136.5	1084.9

*: FCC Limit for Bandwidth measurement
=(0.25%)(Center Frequency)
=(0.0025)(433.96)
=1084.9KHz



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262
EM020	HORN ANTENNA	ETS-Linggren	3115	4032
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662
EM215	MULTIDEVICE CONTROLLER	ETS-Linggren	2090	00024676
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A
EM233	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	100314
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A
EM197	LISN	ETS-Linggren	4825/2	1193

Remarks:-

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined

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Appendix B

Duty Cycle Correction During 100msec

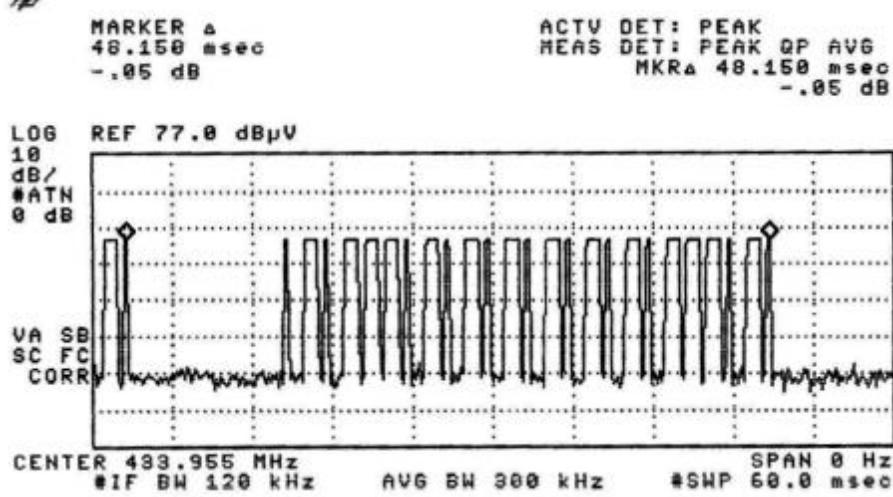
Each function key sends a different series of characters, but each packet period (48.15msec) never exceeds a series of 14 long (900 μ sec) and 11 short (150 μ sec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $14 \times 900\mu\text{sec} + 11 \times 150\mu\text{sec}$ per 48.15msec = 29.5% duty cycle. Figure A through C show the characteristics of the pulses train for one of these functions.

Remarks:

Duty Cycle Correction = $20\log(0.295) = -10.6\text{dB}$

The following figures [Figure A to Figure C] showed the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]



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Figure B [Long Pulse]

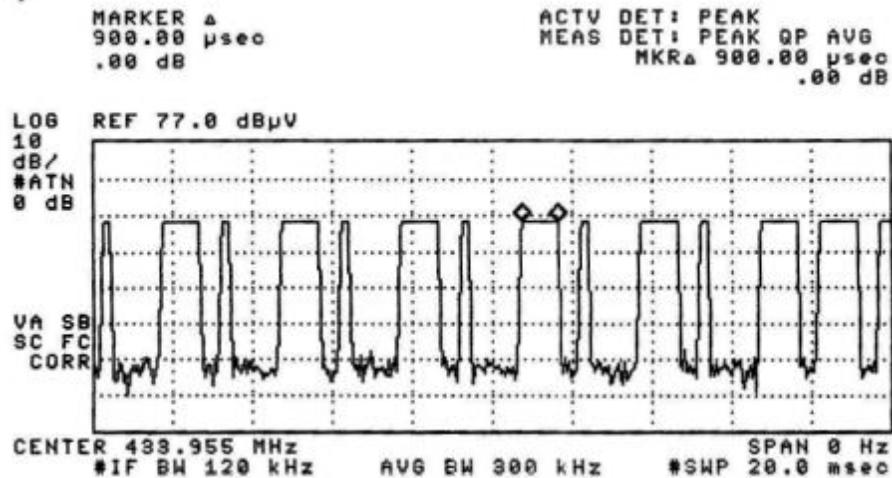
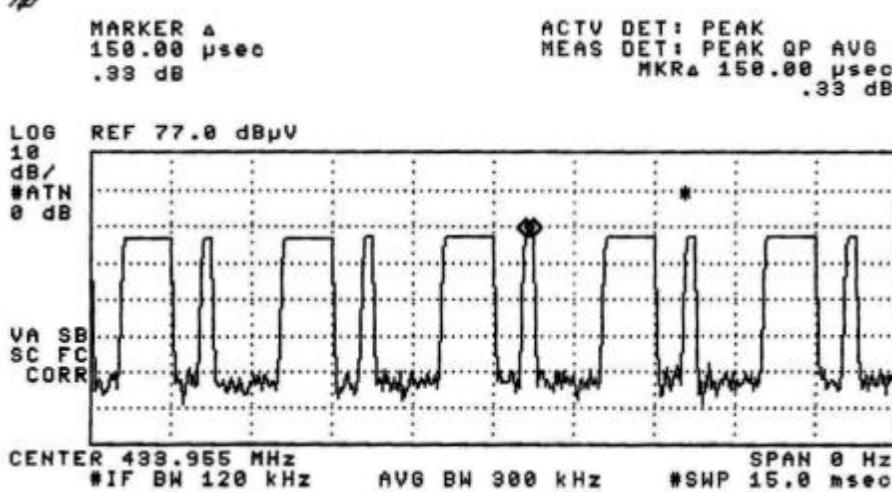


Figure C [Short Pulse]



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Appendix C

Periodic Operation [FCC 47CFR 15.231(a2)]

According to FCC 47CFR15.231 (a2). A transmitter automatically activated must automatically deactivate within not more than 5 seconds of being released. The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length.

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Appendix D

Photographs of EUT

Front View of the product



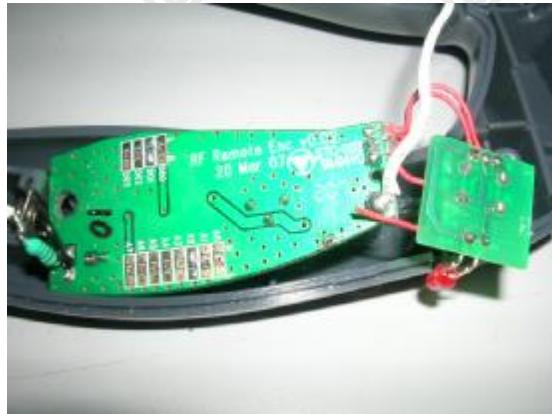
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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