

# FCC ID TEST REPORT

According to

## FCC Part 15 Subpart C, Intentional Radiators

|                         |  |
|-------------------------|--|
| <b>EUT Type</b>         | : IP CAMERA  |
| <b>Transmitter (TX)</b> | : 1) Model No.: HLC-81I/BW<br>2) FCC ID: UTBHLC-81XW |
| <b>Applicant Name:</b>  | : HUNT ELECTRONIC CO., LTD.                          |
| <b>Address</b>          | : See the General Information for details.           |

Test Date : JUNE 20, 2007      Issued Date : SEP. 03, 2007

Test Engineer : JASON KUNG      NVLAP Signature :

*M. Y. Tsui*  
M. Y. Tsui / Director

The test report shall not be reproduced except in full, without the written approval of the "PEP"

The report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States government.

This report is applicable only for EUT Model which described in page 4 .

The testing result in this report are traceable to national or international standard .

## PEP TESTING LABORATORY

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## 1. General Information

Measurement of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission under FCC Part 2 and 15.

**Applicant Name/Address:** HUNT ELECTRONIC CO., LTD.

6F., NO. 57-59, JIUN HSIEN RD., CHI TU DISTRICT,  
KEELUNG 20653, TAIWAN, R. O. C.

**Contact Person:** HANK WU / ENGINEER

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**Manufacturer Name/Address:** HUNT ELECTRONIC CO., LTD.

6F., NO. 57-59, JIUN HSIEN RD., CHI TU DISTRICT,  
KEELUNG 20653, TAIWAN, R. O. C.

◊ Regulation: FCC Part 2 and 15

◊ Limitation: Part 15, Section 15.249, 15.207 and 15.209

◊ Test Procedure: ANSI C63.4-2003

◊ Place of Test: PEP Testing Laboratory

NO. 9-6, Huzi, Hubei Village, Linkou Shiang, Taipei Hsien,  
Taiwan 244, R. O. C.

TEL : 886-2-26021042      FAX : 886-2-26021045

## 2. Product Information

- a. EUT Type: IP CAMERA
- b. Transmitter Model: HLC-81I/BW
- c. TX FCC ID: UTBHLC-81XW
- d. TX Channel No. : 1-11
- e. TX Working Freq. : 2.412 –2.462 GHz
- f. TX Modulation : CCK, DSSS
- g. TX Crystal / Osc. : 22.1184MHz, 24.576 MHz, 25 MHz, 27MHz, 30 MHz
- h. TX Port(s) : Video out Port \* 1, Audio Output Port \* 1, RJ45 Port \* 1, SD Card Slot \* 1, Power Jack \* 1
- i. TX Transmitting Power : Adapter -----  
Model Number : SW12-120E  
Input : AC 100-240V 50-60Hz 260mA  
Output : DC 12V 1A
- j. Antenna Type: External antenna
- k. TX Case : ABS
- l. EUT Condition : Prototype  Engineering  Production
- m. EUT Received Date : MAY 21, 2007
- n. Date(s) of performance of test: MAY 21, 2007 – JUNE 14, 2007

### **3. EUT Description and Test Methods**

(A) The Equipment under test (EUT) is IP CAMERA model HLC-81I/BW. The EUT serves function of real-time video recording over Internet by wireless or Ethernet network connection. The EUT supports SD card as storage medium for local video recording. The working frequency for wireless connection is 2412-2462MHz. Power adaptor supplies EUT 12Vdc from ac mains. For more detail information about the EUT, please refer to the user's manual.

(B) Test Method: According to the major function designed, the EUT placement on test table was arranged alone to proceed with test. The test was carried out on EUT operational condition of Tx-On mode: continuous transmission state. The worst-case test result of each test mode was recorded and provided in this report.

(C) At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

## 4. Modification(s):

The applicant has been notified and agrees to incorporate the following modification(s) into all production units, please refer to the attached pages in this report.

**(A) C810A110.PCB (Main IC circuit board is including LAN)**

1. Respective connecting 22pF capacitance in parallels from No. 1, 3, 4 and 6 pins of LAN port to GND.
2. Changing RS14 of circuit board to 33-ohm resistance and connecting a bead in series, which its impedance is 70-ohm.
3. Respective connecting 68pF capacitance in parallels to C5, C7 and C8 of circuit board.
4. Connecting 33pF capacitance to C10 in parallels.
5. Connecting a bead to the RS17 of circuit board in series, which its impedance is 80-ohm.
6. Adding conductive shielding gasket to LAN port of circuit board to touch the iron case.

**WL-3002-1A Mini PCI**

1. On the 2.4GHz emission circuit, respective connecting 68pF capacitance in the front and rear of a bead in parallels, which its impedance is 120-ohm.

**C810Z110.PCB (The circuit board is up the main circuit board)**

1. Adding a core on IRIS cable.
2. Connecting 120-ohm bead to No.1 pin of CN3 in series.
3. Respective connecting 22pF capacitance in parallels from No.2 and 3 pin of CN3 to GND.
4. Connecting 0.1uF capacitance in parallels from No. 1 pin of CN1 to GND.
5. Adding a core to the wire circuit, which connects SD Card board.

**C810B110.PCB (Board of POWER and Video out)**

1. Connecting 0.1uF capacitance in parallels from CN3 to GND.
2. Connecting 0.1uF capacitance in parallels from No.1 of J4 to GND.
3. Connecting 1000pF capacitance in parallels from BNC1 to GND.
4. Connecting 1000pF capacitance in parallels from RCA1 to GND.

**C810E110.PCB (SD Card Read Board)**

1. Respective connecting 120-ohm bead in series from No. 3 and 6 pins of J1 to GND.
2. Connecting 68pF capacitance to No.5 pin of J1 in parallels.
3. Changing CB1 of circuit board to 0.1uF capacitance.
4. Changing the L1 to 150-ohm bead.

**(B) Mount one suppression core on adaptor power cord.**

## 5. Test Software Used

Web browser was used to monitor image recorded from EUT.

## 6. Support Equipment Used

|                                |  |
|--------------------------------|--|
| <b>Personal Computer (PC4)</b> | <b>CPU</b> : Intel P4 3GHz<br><b>FCC ID</b> : Declaration of Conformity(DoC)<br><b>Manufacturer</b> : ACER<br><b>Model Number</b> : Aspire T650<br><b>Power Supply</b> : Switching<br><b>Power Cord</b> : Non-Shielded, Detachable, 1.8m<br><b>Data Cable</b> : N/A                    |
| <b>Keyboard (KBS1 PS/2)</b>    | <b>FCC ID</b> : E5XKB5121WTH0110<br><b>Manufacturer</b> : BTC<br><b>Model Number</b> : 5121W<br><b>Power Supply</b> : +5Vdc from PS2 of PC<br><b>Power Cord</b> : N/A<br><b>Data Cable</b> : 1 > Shielded , Non-detachable,1.6m<br>2 > Back Shell : Metal                              |
| <b>LCD (LCD1 15")</b>          | <b>FCC ID</b> : Declaration of Conformity(DoC)<br><b>Manufacturer</b> : SAMSUNG<br><b>Model Number</b> : 740B<br><b>Power Supply</b> : Switching<br><b>Power Cord</b> : Non-Shielded, Detachable, 1.8m<br><b>Data Cable</b> : 1 > Shielded , Detachable,1.2m<br>2 > Back Shell : Metal |
| <b>Printer (PRN1)</b>          | <b>FCC ID</b> : B94C2642X<br><b>Manufacturer</b> : Hewlett-Packard<br><b>Model Number</b> : C2642E<br><b>Power Supply</b> : Linear, 30Vdc O/P<br><b>Power Cable</b> : Non-Shielded , Detachable,1.8m<br><b>Data Cable</b> : 1 > Shielded , Detachable,1.2m<br>2 > Back Shell : Metal   |
| <b>Mouse (MOUS/1 PS/2)</b>     | <b>FCC ID</b> : DZL211106<br><b>Manufacturer</b> : LOGITECH<br><b>Model Number</b> : M-S43<br><b>Power Supply</b> : +5Vdc from PS2 of PC<br><b>Power Cord</b> : N/A<br><b>Data Cable</b> : 1 > Shielded , Non-detachable,1.8m<br>2 > Back Shell : Metal                                |

|                     |   |
|---------------------|---|
| <b>Modem (MOD1)</b> | <b>FCC ID :</b> IFAXDM1414<br><b>Manufacturer :</b> ACEEX<br><b>Model Number :</b> 1414<br><b>Power Supply :</b> Linear, 9Vac O/P<br><b>Power Cable :</b> Non-Shielded , Detachable,1.7m<br><b>Data Cable :</b> 1 > Shielded , Detachable,1m<br>2 > Back Shell : Metal                  |
| <b>TV (TV1)</b>     | <b>FCC ID :</b> Declaration of Conformity(DoC)<br><b>Manufacturer :</b> SONY<br><b>Model Number :</b> PVM-14N6E<br><b>Power Supply :</b> Switching<br><b>Power Cable :</b> Non-Shielded , Detachable,1.8m<br><b>Data Cable :</b> 1 > Shielded , Detachable,1.2m<br>2 > Back Shell : N/A |
| <b>SD Card</b>      |   |

## 7. Description Field Strength of Fundamental and Harmonics Test

### **7.1 Field Strength of Fundamental and Harmonics Test**

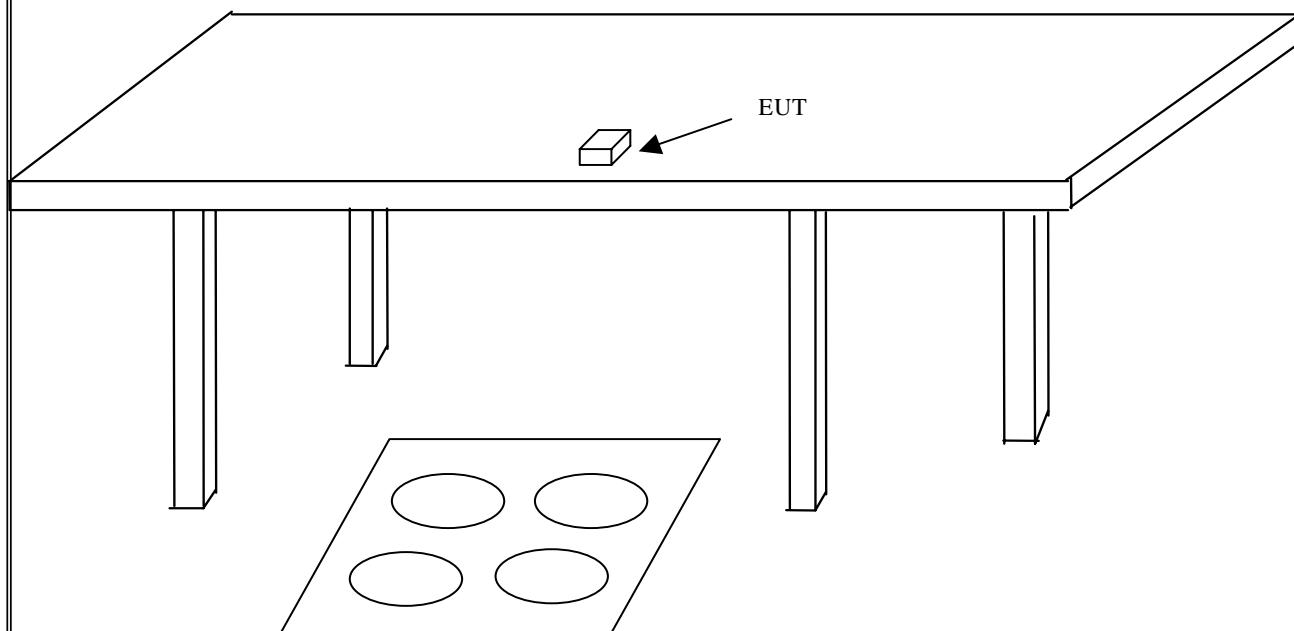
Field Strength of Fundamental and Harmonics Test were made outdoors at 3-meter test range using horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The detector function was set to peak and average value, the bandwidth of the receiver was set to 1000MHz.

The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.

### **7.2 Field Strength of Fundamental and Harmonics Limits**

| Fundamental Frequency | Fundamental ( mV/m ) ( dB $\mu$ V/m ) |     | Harmonics ( $\mu$ V/m ) ( dB $\mu$ V/m ) |    |
|-----------------------|---------------------------------------|-----|--|----|
| 902-928MHz            | 50                                    | 94  | 500                                      | 54 |
| 2400-2483.5MHz        | 50                                    | 94  | 500                                      | 54 |
| 5725-5875MHz          | 50                                    | 94  | 500                                      | 54 |
| 24.0-24.25GHz         | 250                                   | 108 | 2500                                     | 68 |

### **7.3 Test Configuration**



## 8. Description of Conducted Emissions Test

### 8.1 Conducted Emissions

A 1m x1.5m wooden table 80 cm high is placed 40cm away from the vertical wall. Two AMN are bonded to the grounding plane. The EUT is powered from the designated AMN and the support equipment is powered from another designated AMN. Powers to the AMN are filtered by a high-current high insertion loss power line filters. All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2". All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the AMN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30 MHz with 1.5 sec sweep time. The frequency producing the maximum level was re-examined using Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode. The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission.

### 8.2 Conducted Emissions Limits

| Frequency   | Maximum RF Line Voltage dB(uV) |         |            |         |  |
|-------------|--------------------------------|---------|------------|---------|--|
|             | Class A                        |         | Class B    |         |  |
| MHz         | QUASI-PEAK                     | AVERAGE | QUASI-PEAK | AVERAGE |  |
| 0.15 - 0.50 | 79                             | 66      | 66-56      | 56-46   |  |
| 0.50 - 5.0  | 73                             | 60      | 56         | 46      |  |
| 5.0 - 30    | 73                             | 60      | 60         | 50      |  |

Remarks : In the above table, the tighter limit applies at the band edges.

## 9. Description of Radiated Emissions Test

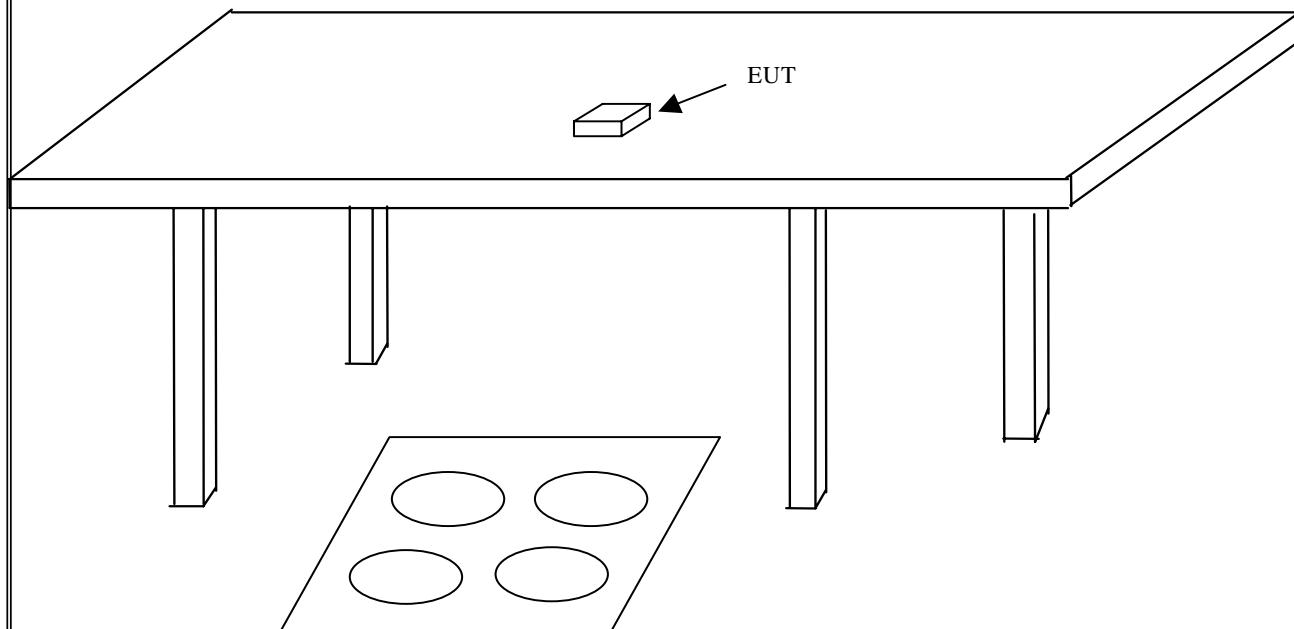
### 9.1 Radiated Emissions

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna was used.

Final measurements were made outdoors at 3-meter test range using logbicon antenna and horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak and Average Adapter. 30MHz-1GHz, the detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz. Above 1GHz, the detector function was set to peak and average value, the bandwidth of the spectrum was set to 1MHz.

The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet , if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in radiated emission test photo.

## **9.2 Test Configuration**



### **9.3 Radiated Emission Limits**

Limits for radiated disturbance of  
Class B ITE or Intentional Radiator  
At a measuring distance of 3 m

| Frequency<br>MHz | Field Strength<br>dB $\mu$ V/m or $\mu$ V/m |     |
|------------------|---|-----|
| 30 to 88         | 40  | 100 |
| 88 to 216        | 43.5  | 150 |
| 216 to 960       | 46  | 200 |
| Above 960        | 56  | 500 |

**NOTES**

- 1 The lower limit shall apply at the transition frequency.
- 2 Additional provisions may be required for cases where interference occurs.

## 10. Field Strength of Fundamental and Harmonics Test Setup Photos

< FRONT VIEW >



## 11. Field Strength of Fundamental and Harmonics Test Data

**Model No.** : HLC-81I/BW

**Temperature** : 24° C      **Humidity** : 55 %

**Memo** : CH LOW MODE (2.412GHz)

**Antenna polarization** : HORIZONTAL ; **Test distance** : 3m ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Limit<br>(dB) | Over             | Limit            | Detector | Remark      |
|----------------|-------------------|---------------|------------------|------------------|----------|-------------|
|                |                   |               | Line<br>(dBuV/m) | Line<br>(dBuV/m) |          |             |
| 2411.950       | 113.49            | - 0.51        | 114              | 114              | Peak     | Fundamental |
| 2412.350       | 68.42             | -25.58        | 94               | 94               | Average  | Fundamental |
| 4824.000       | 60.14             | -13.86        | 74               | 74               | Peak     | Harmonic    |
| 4824.000       | 37.48             | -16.52        | 54               | 54               | Average  | Harmonic    |
| 7235.800       | 46.59             | -27.41        | 74               | 74               | Peak     | Harmonic    |
| 9647.900       | 42.43             | -31.57        | 74               | 74               | Peak     | Harmonic    |
| 9648.000       | ---               |               |                  |                  |          |             |
| 12060.000      | ---               |               |                  |                  |          |             |
| 14472.000      | ---               |               |                  |                  |          |             |
| 16884.000      | ---               |               |                  |                  |          |             |
| 19296.000      | ---               |               |                  |                  |          |             |
| 21708.000      | ---               |               |                  |                  |          |             |
| 24120.000      | ---               |               |                  |                  |          |             |

**Antenna polarization** : VERTICAL ; **Test distance** : 3m ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Limit<br>(dB) | Over             | Limit            | Detector | Remark      |
|----------------|-------------------|---------------|------------------|------------------|----------|-------------|
|                |                   |               | Line<br>(dBuV/m) | Line<br>(dBuV/m) |          |             |
| 2411.750       | 104.95            | - 9.05        | 114              | 114              | Peak     | Fundamental |
| 2411.550       | 67.51             | -26.49        | 94               | 94               | Average  | Fundamental |
| 4823.800       | 54.37             | -19.63        | 74               | 74               | Peak     | Harmonic    |
| 4824.900       | 34.12             | -19.88        | 54               | 54               | Average  | Harmonic    |
| 7236.400       | 40.61             | -33.39        | 74               | 74               | Peak     | Harmonic    |
| 9647.200       | 36.73             | -37.27        | 74               | 74               | Peak     | Harmonic    |
| 9648.000       | ---               |               |                  |                  |          |             |
| 12060.000      | ---               |               |                  |                  |          |             |
| 14472.000      | ---               |               |                  |                  |          |             |
| 16884.000      | ---               |               |                  |                  |          |             |
| 19296.000      | ---               |               |                  |                  |          |             |
| 21708.000      | ---               |               |                  |                  |          |             |
| 24120.000      | ---               |               |                  |                  |          |             |

(1) Over Limit = Level-Limit Line

(2) The above measurement of fundamental and harmonics testing data within the harmonics frequency level shown " --- ", it means that its harmonics frequency level is more than 20dB below the limit or its field strength is too small to be detected.

**Model No.** : **HLC-81I/BW**  
**Temperature** : **24° C**      **Humidity** : **55 %**  
**Memo** : **CH MID MODE (2.437GHz)**

**Antenna** **polarization** : **HORIZONTAL** ; **Test distance** : **3m** ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over          | Limit | Line<br>(dBuV/m) | Detector    | Remark |
|----------------|-------------------|---------------|-------|------------------|-------------|--------|
|                |                   | Limit<br>(dB) | Line  |                  |             |        |
| 2436.900       | 112.20            | - 1.80        | 114   | Peak             | Fundamental |        |
| 2437.150       | 66.77             | -27.23        | 94    | Average          | Fundamental |        |
| 4873.900       | 62.02             | -13.38        | 74    | Peak             | Harmonic    |        |
| 4874.100       | 40.51             | -13.49        | 54    | Average          | Harmonic    |        |
| 7310.900       | 47.64             | -26.36        | 74    | Peak             | Harmonic    |        |
| 9747.900       | 46.02             | -27.98        | 74    | Peak             | Harmonic    |        |
| 9748.000       | ---               |               |       |                  |             |        |
| 12185.000      | ---               |               |       |                  |             |        |
| 14622.000      | ---               |               |       |                  |             |        |
| 17059.000      | ---               |               |       |                  |             |        |
| 19496.000      | ---               |               |       |                  |             |        |
| 21933.000      | ---               |               |       |                  |             |        |
| 24370.000      | ---               |               |       |                  |             |        |

**Antenna** **polarization** : **VERTICAL** ; **Test distance** : **3m** ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over          | Limit | Line<br>(dBuV/m) | Detector    | Remark |
|----------------|-------------------|---------------|-------|------------------|-------------|--------|
|                |                   | Limit<br>(dB) | Line  |                  |             |        |
| 2436.900       | 105.44            | - 8.56        | 114   | Peak             | Fundamental |        |
| 2436.750       | 65.48             | -28.52        | 94    | Average          | Fundamental |        |
| 4873.800       | 55.64             | -18.36        | 74    | Peak             | Harmonic    |        |
| 4874.300       | 36.13             | -17.87        | 54    | Average          | Harmonic    |        |
| 7310.800       | 42.52             | -11.48        | 74    | Peak             | Harmonic    |        |
| 9748.000       | 41.16             | -12.84        | 74    | Peak             | Harmonic    |        |
| 9748.000       | ---               |               |       |                  |             |        |
| 12185.000      | ---               |               |       |                  |             |        |
| 14622.000      | ---               |               |       |                  |             |        |
| 17059.000      | ---               |               |       |                  |             |        |
| 19496.000      | ---               |               |       |                  |             |        |
| 21933.000      | ---               |               |       |                  |             |        |
| 24370.000      | ---               |               |       |                  |             |        |

(1) Over Limit = Level-Limit Line

(2) The above measurement of fundamental and harmonics testing data within the harmonics frequency level shown " --- ", it means that its harmonics frequency level is more than 20dB below the limit or its field strength is too small to be detected.

**Model No.** : HLC-81I/BW  
**Temperature** : 24° C      **Humidity** : 55 %  
**Memo** : CH HIGH MODE (2.462GHz)

**Antenna** polarization : HORIZONTAL ; **Test distance** : 3m ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dBuV/m) | Detector | Remark      |
|----------------|-------------------|-----------------------|---------------------------|----------|-------------|
| 2461.950       | 112.69            | - 1.31                | 114                       | Peak     | Fundamental |
| 2461.700       | 66.61             | -27.39                | 94                        | Average  | Fundamental |
| 4924.000       | 54.48             | -19.52                | 74                        | Peak     | Harmonic    |
| 4923.700       | 36.77             | -17.23                | 54                        | Average  | Harmonic    |
| 7385.900       | 46.98             | -27.02                | 74                        | Peak     | Harmonic    |
| 9847.800       | 47.02             | -26.98                | 74                        | Peak     | Harmonic    |
| 9848.000       | ---               |                       |                           |          |             |
| 12310.000      | ---               |                       |                           |          |             |
| 14772.000      | ---               |                       |                           |          |             |
| 17234.000      | ---               |                       |                           |          |             |
| 19696.000      | ---               |                       |                           |          |             |
| 22158.000      | ---               |                       |                           |          |             |
| 24620.000      | ---               |                       |                           |          |             |

**Antenna** polarization : VERTICAL ; **Test distance** : 3m ;

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dBuV/m) | Detector | Remark      |
|----------------|-------------------|-----------------------|---------------------------|----------|-------------|
| 2461.950       | 106.25            | - 7.75                | 114                       | Peak     | Fundamental |
| 2461.700       | 67.53             | -26.47                | 94                        | Average  | Fundamental |
| 4924.400       | 48.80             | -25.20                | 74                        | Peak     | Harmonic    |
| 7386.100       | 40.12             | -33.88                | 74                        | Peak     | Harmonic    |
| 9847.900       | 39.83             | -34.17                | 74                        | Peak     | Harmonic    |
| 9848.000       | ---               |                       |                           |          |             |
| 12310.000      | ---               |                       |                           |          |             |
| 14772.000      | ---               |                       |                           |          |             |
| 17234.000      | ---               |                       |                           |          |             |
| 19696.000      | ---               |                       |                           |          |             |
| 22158.000      | ---               |                       |                           |          |             |
| 24620.000      | ---               |                       |                           |          |             |

(1) Over Limit = Level-Limit Line

(2) The above measurement of fundamental and harmonics testing data within the harmonics frequency level shown " --- ", it means that its harmonics frequency level is more than 20dB below the limit or its field strength is too small to be detected.

## 12. Conducted Emissions Test Setup Photos

**FRONT VIEW**



## 13. Conducted Emissions Test Data

**Model No.** : HLC-81I/BW  
**Frequency range** : 150KHz to 30MHz  
**Detector** : Quasi-peak Value  
**Temperature** : 27  
**Humidity** : 43 %

**Test Data :** # 196 # 19 < LINE >  
# 197 # 20 <NEUTRAL>

Note 1. Level = Read Level + Cable Loss + Probe (LISN)  
2. Over Limit = Level – Limit = Margin



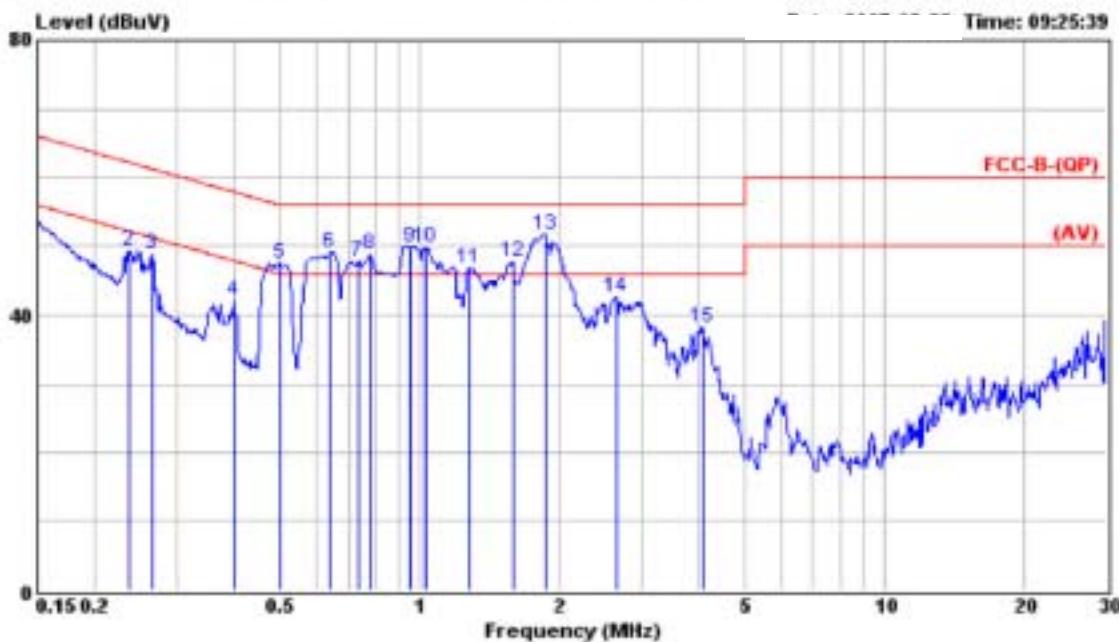
# 暉鑫科技股份有限公司

## PEP Testing Laboratory

Data #: 196

File #: C:\Program Files\le3\96年\My Documents\FCC-B(QP).emi

Time: 09:25:39



Site : Linko: Conduction No.2 (David)  
 Condition : FCC-B-(QP) LISN.L(32A) LINE  
 FORM : E960092

Model :  
 power : AC 120V 60Hz  
 memo : LAN Mode

|    | Freq  | Over Limit | Limit  | Read Line | Probe Level | Cable Factor | Cable Loss | Remark |
|----|-------|------------|--------|-----------|-------------|--------------|------------|--------|
|    | MHz   | dBuV       | dB     | dBuV      | dBuV        | dB           | dB         |        |
| 1  | 0.150 | 53.86      | -12.14 | 66.00     | 53.75       | 0.10         | 0.01       | Peak   |
| 2  | 0.237 | 49.44      | -12.76 | 62.20     | 49.24       | 0.10         | 0.10       | Peak   |
| 3  | 0.264 | 48.84      | -12.46 | 61.30     | 48.61       | 0.10         | 0.13       | Peak   |
| 4  | 0.398 | 42.07      | -15.83 | 57.90     | 41.82       | 0.10         | 0.15       | Peak   |
| 5  | 0.499 | 47.61      | -8.41  | 56.02     | 47.34       | 0.10         | 0.17       | Peak   |
| 6  | 0.641 | 49.14      | -6.86  | 56.00     | 48.84       | 0.10         | 0.20       | Peak   |
| 7  | 0.735 | 47.83      | -8.17  | 56.00     | 47.52       | 0.10         | 0.21       | Peak   |
| 8  | 0.783 | 48.89      | -7.11  | 56.00     | 48.58       | 0.10         | 0.21       | Peak   |
| 9  | 0.953 | 49.99      | -6.01  | 56.00     | 49.66       | 0.10         | 0.23       | Peak   |
| 10 | 1.030 | 49.76      | -6.24  | 56.00     | 49.42       | 0.10         | 0.24       | Peak   |
| 11 | 1.280 | 46.87      | -9.13  | 56.00     | 46.47       | 0.14         | 0.26       | Peak   |
| 12 | 1.590 | 47.80      | -8.20  | 56.00     | 47.34       | 0.17         | 0.29       | Peak   |
| 13 | 1.860 | 51.72      | -4.28  | 56.00     | 51.23       | 0.19         | 0.30       | Peak   |
| 14 | 2.650 | 42.67      | -13.33 | 56.00     | 42.12       | 0.20         | 0.35       | Peak   |
| 15 | 4.050 | 38.09      | -17.91 | 56.00     | 37.49       | 0.20         | 0.40       | Peak   |

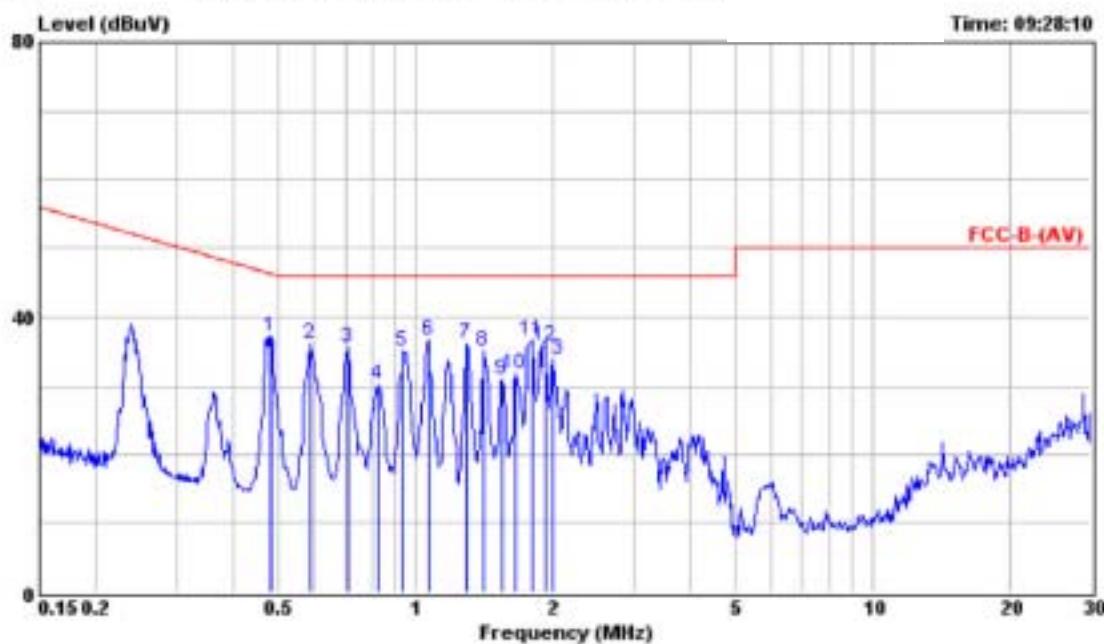


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## PEP Testing Laboratory

Data #: 19

File #: C:\Program Files\le3\96年\My Documents\FCC-B(AV).emi



Site : Linko: Conduction No.2 (David)  
Condition : FCC-B-(AV) LISN.L(32A) LINE  
eut : E960092  
power : AC 120V 60Hz  
memo : Average Value  
: LAN Mode

| Freq | Level | Over  | Limit  | Read  | Probe | Cable | Remark |
|------|-------|-------|--------|-------|-------|-------|--------|
|      |       | MHz   | dBuV   | dB    | dBuV  | dB    |        |
| 1    | 0.481 | 37.25 | -9.07  | 46.32 | 36.98 | 0.10  | 0.17   |
| 2    | 0.585 | 36.21 | -9.79  | 46.00 | 35.91 | 0.10  | 0.20   |
| 3    | 0.712 | 35.56 | -10.44 | 46.00 | 35.25 | 0.10  | 0.21   |
| 4    | 0.826 | 30.19 | -15.81 | 46.00 | 29.88 | 0.10  | 0.21   |
| 5    | 0.938 | 34.96 | -11.04 | 46.00 | 34.63 | 0.10  | 0.23   |
| 6    | 1.070 | 36.61 | -9.39  | 46.00 | 36.25 | 0.11  | 0.25   |
| 7    | 1.290 | 36.11 | -9.89  | 46.00 | 35.70 | 0.14  | 0.27   |
| 8    | 1.410 | 35.16 | -10.84 | 46.00 | 34.74 | 0.15  | 0.27   |
| 9    | 1.540 | 30.95 | -15.05 | 46.00 | 30.51 | 0.16  | 0.28   |
| 10   | 1.650 | 31.69 | -14.31 | 46.00 | 31.23 | 0.17  | 0.29   |
| 11   | 1.790 | 36.63 | -9.37  | 46.00 | 36.15 | 0.18  | 0.30   |
| 12   | 1.920 | 35.86 | -10.14 | 46.00 | 35.36 | 0.19  | 0.31   |
| 13   | 1.990 | 33.78 | -12.22 | 46.00 | 33.27 | 0.20  | 0.31   |



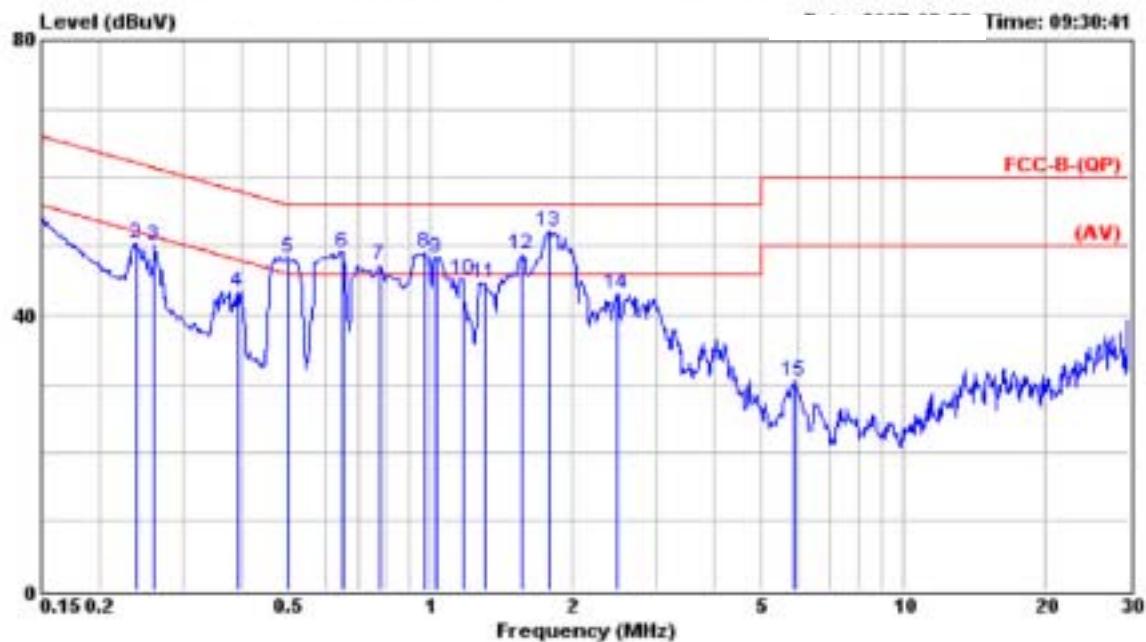
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## PEP Testing Laboratory

Data#: 197

File#: C:\Program Files\le3\96年\My Documents\FCC-B(QP).emi

Time: 09:30:41



Site : Linko: Conduction No.2 (David)  
 Condition : FCC-B-(QP) LISN.N(32A) NEUTRAL  
 FORM : E960092

Model :  
 power : AC 120V 60Hz  
 memo : LAN Mode

|    | Freq  | Level | Over Limit | Limit Line | Read  | Probe | Cable |      |
|----|-------|-------|------------|------------|-------|-------|-------|------|
|    |       |       |            |            |       |       | dBuV  | dB   |
|    | MHz   |       |            |            |       |       |       |      |
| 1  | 0.150 | 54.12 | -11.88     | 66.00      | 54.01 | 0.10  | 0.01  | Peak |
| 2  | 0.239 | 50.45 | -11.68     | 62.13      | 50.24 | 0.10  | 0.11  | Peak |
| 3  | 0.260 | 50.05 | -11.38     | 61.43      | 49.83 | 0.10  | 0.12  | Peak |
| 4  | 0.391 | 43.34 | -14.70     | 58.04      | 43.09 | 0.10  | 0.15  | Peak |
| 5  | 0.499 | 48.36 | -7.66      | 56.02      | 48.09 | 0.10  | 0.17  | Peak |
| 6  | 0.654 | 49.16 | -6.84      | 56.00      | 48.86 | 0.10  | 0.20  | Peak |
| 7  | 0.783 | 47.19 | -8.81      | 56.00      | 46.88 | 0.10  | 0.21  | Peak |
| 8  | 0.968 | 49.06 | -6.94      | 56.00      | 48.72 | 0.10  | 0.24  | Peak |
| 9  | 1.030 | 48.38 | -7.62      | 56.00      | 48.04 | 0.10  | 0.24  | Peak |
| 10 | 1.170 | 45.26 | -10.74     | 56.00      | 44.88 | 0.12  | 0.26  | Peak |
| 11 | 1.300 | 44.72 | -11.28     | 56.00      | 44.31 | 0.14  | 0.27  | Peak |
| 12 | 1.560 | 48.72 | -7.28      | 56.00      | 48.27 | 0.16  | 0.29  | Peak |
| 13 | 1.780 | 52.14 | -3.86      | 56.00      | 51.66 | 0.18  | 0.30  | Peak |
| 14 | 2.470 | 43.06 | -12.94     | 56.00      | 42.52 | 0.20  | 0.34  | Peak |
| 15 | 5.900 | 30.43 | -29.57     | 60.00      | 29.79 | 0.20  | 0.44  | Peak |

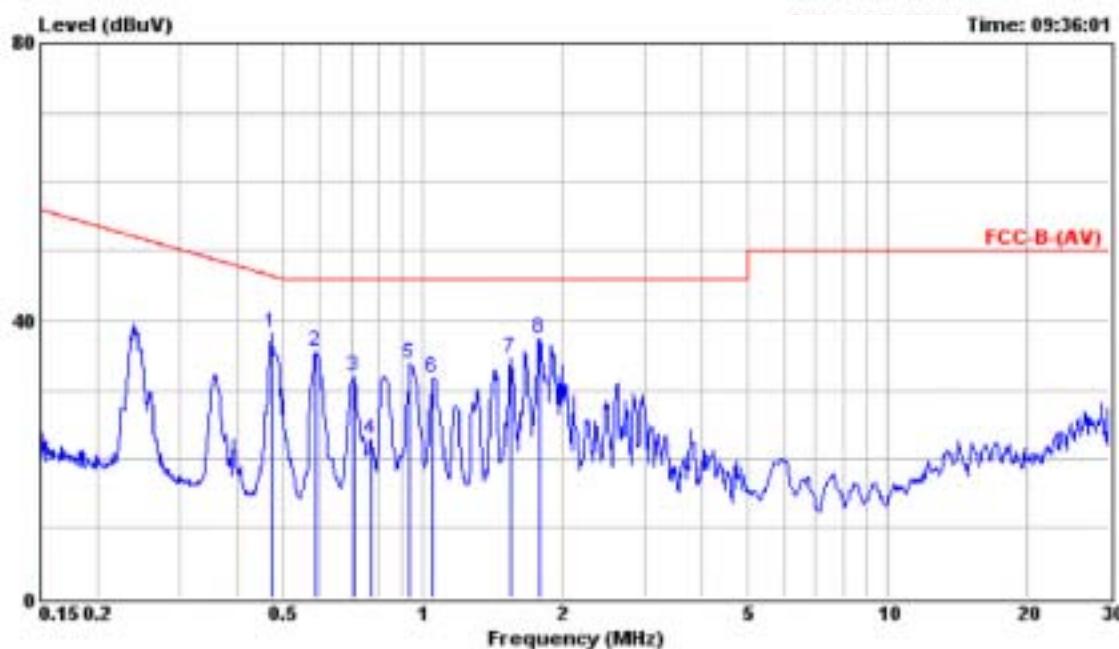


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## PEP Testing Laboratory

Data #: 20

File #: C:\Program Files\le3\96年\My Documents\FCC-B(AV).emi



Site : Linko: Conduction No.2 (David)  
Condition : FCC-B-(AV) LISN.N(32A) NEUTRAL  
eut : E960092  
power : AC 120V 60Hz  
memo : Average Value

| Freq | Level | Over  | Limit  | Read  | Probe  | Cable | Remark |
|------|-------|-------|--------|-------|--------|-------|--------|
|      |       | Limit | Line   | Level | Factor | Loss  |        |
| MHz  | dBuV  | dB    | dBuV   | dBuV  | dB     | dB    |        |
| 1    | 0.471 | 38.10 | -8.40  | 46.50 | 37.84  | 0.10  | 0.16   |
| 2    | 0.585 | 35.65 | -10.35 | 46.00 | 35.35  | 0.10  | 0.20   |
| 3    | 0.712 | 31.95 | -14.05 | 46.00 | 31.64  | 0.10  | 0.21   |
| 4    | 0.771 | 22.86 | -23.14 | 46.00 | 22.55  | 0.10  | 0.21   |
| 5    | 0.938 | 33.74 | -12.26 | 46.00 | 33.41  | 0.10  | 0.23   |
| 6    | 1.050 | 31.81 | -14.19 | 46.00 | 31.46  | 0.11  | 0.24   |
| 7    | 1.540 | 34.43 | -11.57 | 46.00 | 33.99  | 0.16  | 0.28   |
| 8    | 1.780 | 37.45 | -8.55  | 46.00 | 36.97  | 0.18  | 0.30   |

## 14. Radiated Emissions Test Setup Photos

< FRONT VIEW >



< REAR VIEW >



## 15. Radiated Emissions Test Data

|                        |                           |
|------------------------|---------------------------|
| <b>Model No.</b>       | <b>:</b> HLC-81I/BW       |
| <b>Frequency range</b> | <b>:</b> 30MHz to 1GHz    |
| <b>Temperature</b>     | <b>:</b> 28° C            |
| <b>Detector</b>        | <b>:</b> Quasi-Peak Value |
| <b>Humidity</b>        | <b>:</b> 55 %             |

**Antenna polarization : HORIZONTAL ; Test distance : 3m ;**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dBuV/m) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) | Azimuth<br>(°angle) | Antenna<br>High(m) |
|----------------|-------------------|-----------------------|---------------------------|-------------------------|---------------------------|-----------------------|--------------------------|---------------------|--------------------|
| 101.780        | 34.63             | - 6.61                | 41.24                     | 42.83                   | 10.80                     | 0.84                  | 19.84                    | 185.0               | 4.0                |
| 455.830        | 41.51             | -17.69                | 59.20                     | 41.61                   | 16.45                     | 2.95                  | 19.50                    | 175.0               | 4.0                |
| 483.960        | 39.52             | - 1.72                | 41.24                     | 39.26                   | 16.58                     | 3.06                  | 19.38                    | 106.0               | 4.0                |
| 663.410        | 40.10             | - 1.14                | 41.24                     | 35.53                   | 19.75                     | 3.46                  | 18.64                    | 213.0               | 4.0                |
| 774.960        | 38.24             | - 3.00                | 41.24                     | 30.82                   | 21.20                     | 4.06                  | 17.84                    | 196.0               | 4.0                |
| 903.970        | 44.51             | -14.69                | 59.20                     | 35.69                   | 22.62                     | 4.45                  | 18.25                    | 123.0               | 4.0                |

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

# PEP Testing Laboratory

FCC ID: UTBHL-81XW

REPORT NO. :E960092

|                        |          |                         |
|------------------------|----------|-------------------------|
| <b>Model No.</b>       | <b>:</b> | <b>HLC-81I/BW</b>       |
| <b>Frequency range</b> | <b>:</b> | <b>30MHz to 1GHz</b>    |
| <b>Temperature</b>     | <b>:</b> | <b>28° C</b>            |
| <b>Detector</b>        | <b>:</b> | <b>Quasi-Peak Value</b> |
| <b>Humidity</b>        | <b>:</b> | <b>55 %</b>             |

**Antenna polarization : VERTICAL ; Test distance : 3m ;**

| Freq.<br>(MHz) | Level<br>(dBuV/m) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dBuV/m) | Read<br>Level<br>(dBuV) | Antenna<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) | Azimuth<br>(°angle) | Antenna<br>High(m) |
|----------------|-------------------|-----------------------|---------------------------|-------------------------|---------------------------|-----------------------|--------------------------|---------------------|--------------------|
| 94.990         | 39.74             | - 1.50                | 41.24                     | 48.40                   | 10.42                     | 0.98                  | 20.06                    | 115.0               | 1.0                |
| 208.480        | 41.13             | - 0.11                | 41.24                     | 48.72                   | 10.74                     | 1.49                  | 19.82                    | 126.0               | 1.0                |
| 663.410        | 39.50             | - 1.74                | 41.24                     | 34.93                   | 19.75                     | 3.46                  | 18.64                    | 103.0               | 1.0                |
| 750.710        | 40.26             | - 0.98                | 41.24                     | 34.36                   | 20.94                     | 4.41                  | 19.45                    | 180.0               | 1.0                |
| 773.990        | 40.11             | - 1.13                | 41.24                     | 32.75                   | 21.19                     | 4.07                  | 17.90                    | 85.0                | 1.0                |
| 842.860        | 40.53             | - 0.71                | 41.24                     | 33.12                   | 21.86                     | 4.23                  | 18.68                    | 165.0               | 1.0                |

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

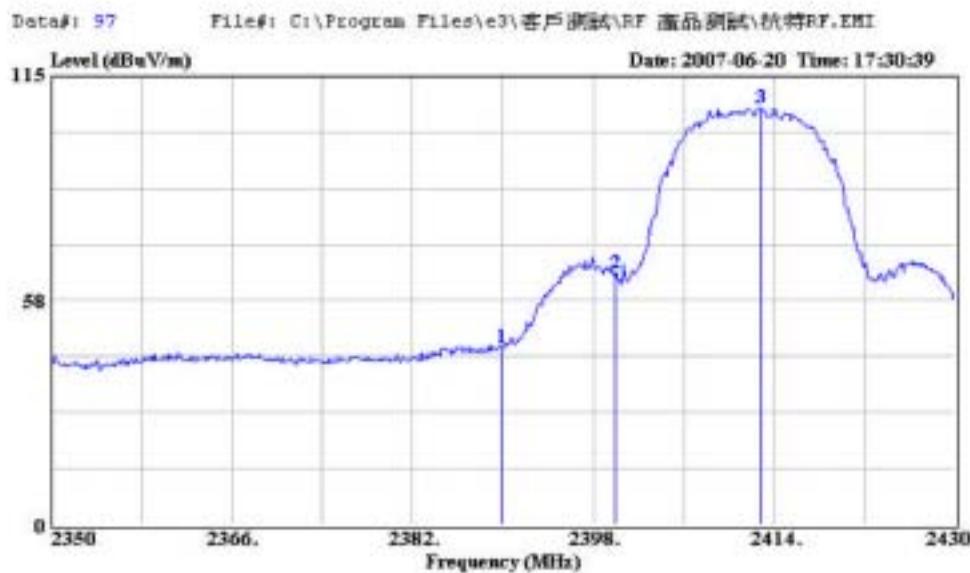
## 16. Band-edges Compliance

Channel : CH LOW

Polarity : Horizontal



PEP TESTING LABORATORY  
暉鑫科技有限公司  
PEP Testing Laboratory



Site : chamber\_3 (JUE)  
Condition : 3m HORN ANTENNA H.3 HORIZONTAL  
EUT : E960092  
Power : AC 120V 60Hz  
Memo : FCC ID  
Memo : Band-edges

|      | Over     | Limit  | Read   | Probe  | Cable  | Preamp     |
|------|----------|--------|--------|--------|--------|------------|
| Freq | Level    | Limit  | Line   | Level  | Factor | Loss       |
| MHz  | dBuV/m   | dB     | dBuV/m | dBuV   | dB     | dB         |
| 1    | 2390.000 | 45.34  | -----  | 44.34  | 28.36  | 5.44 32.80 |
| 2    | 2400.000 | 64.39  | -----  | 63.38  | 28.36  | 5.46 32.81 |
| 3    | 2412.600 | 106.79 | -----  | 105.76 | 28.37  | 5.40 32.62 |

Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

106.79dBuV/m-45.34 dBuV/m =61.45dBuV/m

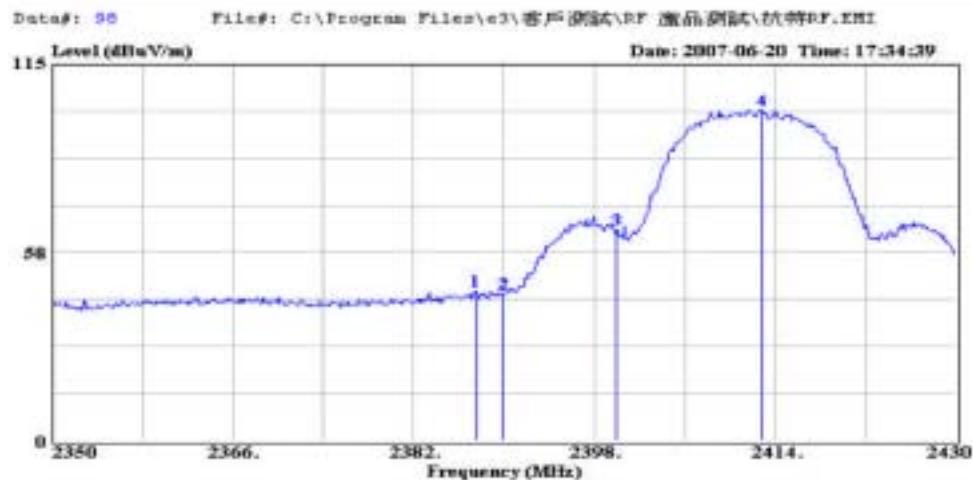
113.49 dBuV/m-61.45 dBuV/m=52.04 dBuV/m

\*52.04dBuV/m<Average Limit (54dBuV/m)

**Channel : CH LOW**  
**Polarity : Vertical**



PEP TESTING LABORATORY  
**暉鑫科技有限公司**  
 PEP Testing Laboratory



Site : chamber\_3 (30E)  
 Condition : 3m HORN ANTENNA V.3 VERTICAL  
 EUT : E960092  
 Power : AC 120V 60Hz  
 Memo : FCC ID  
 Memo : Band-edges

| Freq | Level    | Over Limit |        | Read Line | Probe Factor | Cable Preamp |       | Remark |
|------|----------|------------|--------|-----------|--------------|--------------|-------|--------|
|      |          | MHz        | dBuV/m | dB        | dBuV         | dB           | dB    |        |
| 1    | 2397.600 | 45.64      | -----  | 44.64     | 28.36        | 5.44         | 32.80 |        |
| 2    | 2390.000 | 44.77      | -----  | 43.77     | 28.36        | 5.44         | 32.80 |        |
| 3    | 2400.000 | 64.21      | -----  | 63.20     | 28.36        | 5.46         | 32.81 |        |
| 4    | 2412.800 | 100.90     | -----  | 99.87     | 28.37        | 5.46         | 32.82 |        |

Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

$100.90 \text{ dBuV/m} - 45.64 \text{ dBuV/m} = 55.26 \text{ dBuV/m}$

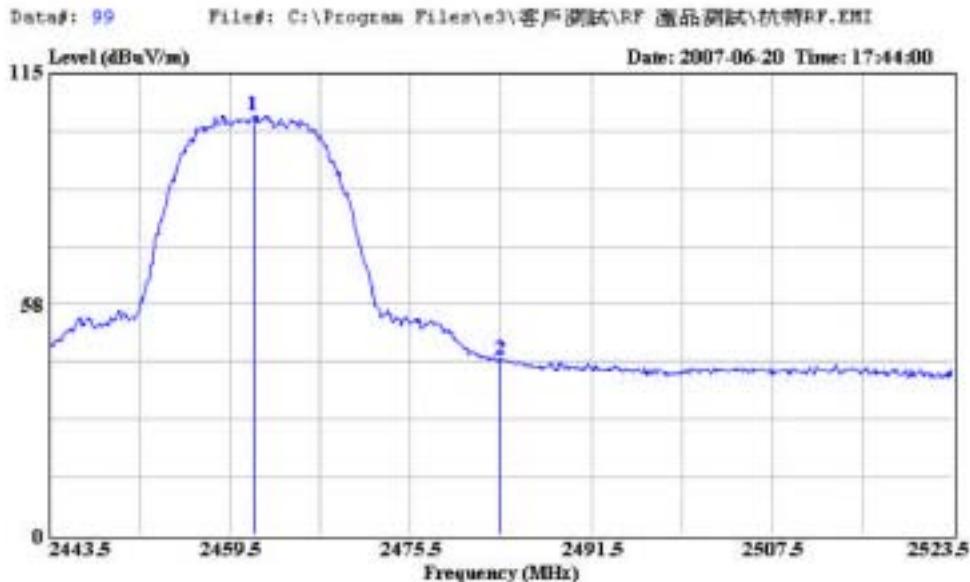
$104.95 \text{ dBuV/m} - 55.26 \text{ dBuV/m} = 49.69 \text{ dBuV/m}$

\*49.69dBuV/m < Average Limit (54dBuV/m)

**Channel : CH HIGH**  
**Polarity : Horizontal**



PEP TESTING LABORATORY  
**暉鑫科技有限公司**  
 PEP Testing Laboratory



Site : chamber\_3 (J0E)  
 Condition : 3m BORN ANTENNA H.3 HORIZONTAL  
 EUT : E960092  
 Power : AC 120V 60Hz  
 Memo : FCC ID  
 Memo : Band-edges

| Freq | Level    | Over Limit |        | Read Line | Probe Factor | Cable Loss | Preamp Factor | Remark |
|------|----------|------------|--------|-----------|--------------|------------|---------------|--------|
|      |          | MHz        | dBuV/m | dB        | dBuV/m       |            |               |        |
| 1    | 2461.580 | 104.50     | -----  | -----     | 103.42       | 28.39      | 5.56          | 32.87  |
| 2    | 2483.500 | 43.75      | -----  | -----     | 42.66        | 28.40      | 5.59          | 32.90  |

Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

104.50dBuV/m-43.75 dBuV/m =60.75dBuV/m

112.69 dBuV/m-60.75 dBuV/m=51.94 dBuV/m

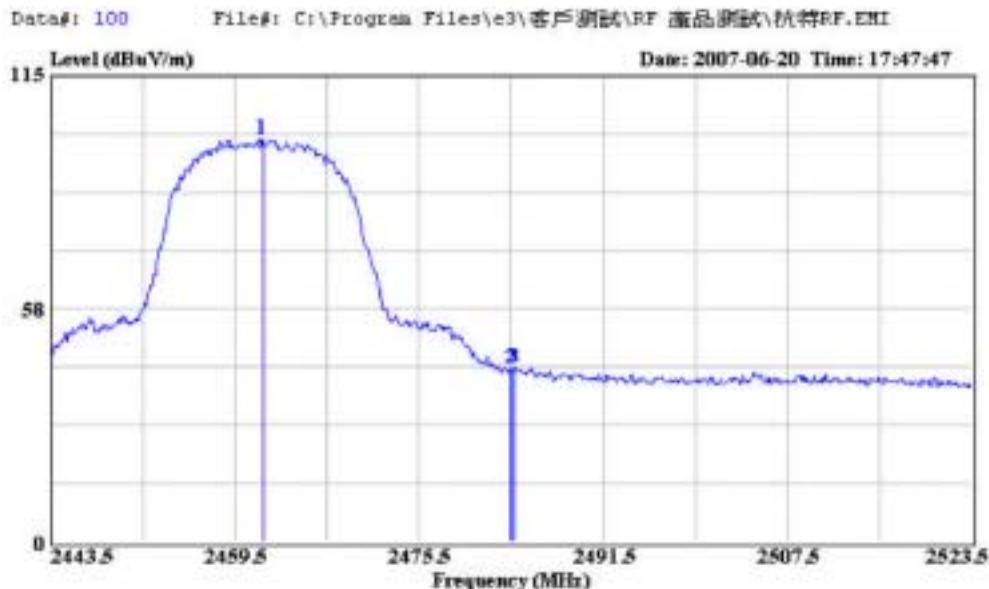
\*51.94dBuV/m<Average Limit (54dBuV/m)

Channel : CH HIGH  
 Polarity : Vertical



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 PEP Testing Laboratory

PEP TESTING LABORATORY



Site : chamber\_3 (JOE)  
 Condition : 3m HORN ANTENNA V.3 VERTICAL  
 EUT : E960092  
 Power : AC 120V 60Hz  
 Memo : FCC ID  
 Memo : Band-edges

|   | Freq     | Over Level | Limit | Read Line | Probe Level | Cable Factor | Preamp | Remark |
|---|----------|------------|-------|-----------|-------------|--------------|--------|--------|
|   | MHz      | dBuV/m     | dB    | dBuV/m    | dBuV        | dB           | dB     |        |
| 1 | 2461.900 | 99.27      | ----- | -----     | 98.19       | 28.39        | 5.56   | 32.87  |
| 2 | 2483.500 | 42.75      | ----- | -----     | 41.66       | 28.40        | 5.59   | 32.90  |
| 3 | 2483.740 | 43.02      | ----- | -----     | 41.93       | 28.40        | 5.59   | 32.90  |

Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

99.27dBuV/m-43.02 dBuV/m =56.25dBuV/m

106.25 dBuV/m-56.25 dBuV/m=50.00 dBuV/m

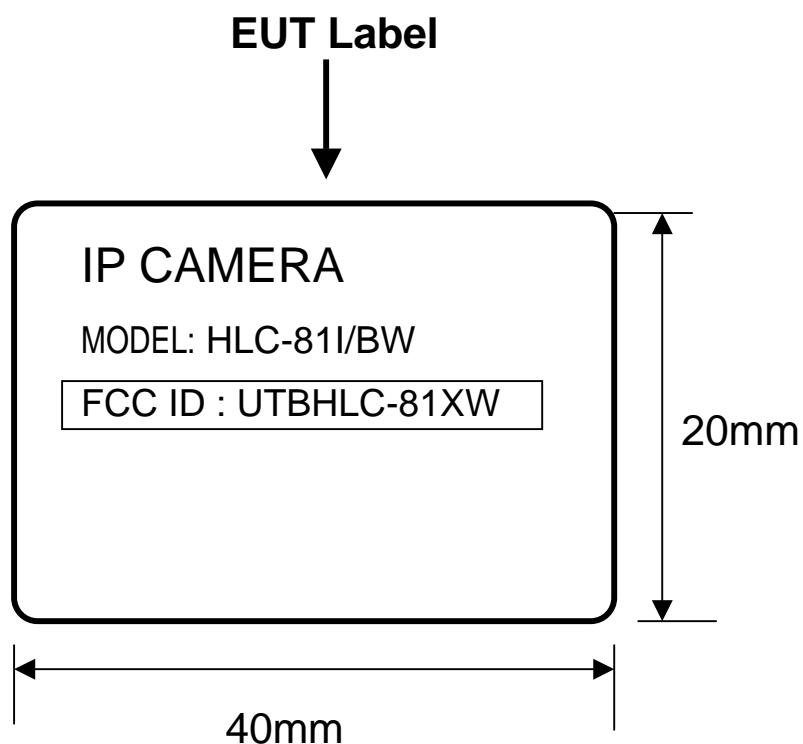
\*50.00dBuV/m<Average Limit (54dBuV/m)

## 17. List of Measured Instruments

| Test Site            | Instrument              | Model No.           | S/N        | Next Cal. Date | Cal. Interval |
|----------------------|-------------------------|---------------------|------------|----------------|---------------|
| Conduction<br>(No.2) | R & S Spectrum          | FSP 3               | 833387/010 | Aug. 21, 2008  | 1 Year        |
|                      | R & S Receiver          | ESHS10              | 830223/008 | Sep. 08, 2008  | 1 Year        |
|                      | R & S LISN(EUT)         | ESH2-Z5             | 831886/004 | Apr. 16, 2008  | 1 Year        |
|                      | Kyoritsu LISN(2nd)      | KNW-242             | 8-837-7    | N/A            | N/A           |
|                      | RF Cable                | No.4                | N/A        | Jan. 02, 2008  | 1 Year        |
| Chamber<br>(No. 3)   | R&S Spectrum Analyzer   | FSP30               | 100157     | Sep. 03, 2007  | 1 Year        |
|                      | Schaffner Pre-Amplifier | CPA-9232            | 1028       | Jan. 02, 2008  | 1 Year        |
|                      | SCHWARZBECK Antenna     | VULB9161            | 4078       | July 21, 2008  | 1 Year        |
|                      | R & S Signal Generator  | SMY02               | 830235/019 | May 01, 2008   | 2 Years       |
|                      | 30MHz~1GHz RF Cable     | NO.3                | N/A        | Jan. 02, 2008  | 1 Year        |
|                      | COM POWER HORN ANTENNA  | AH-118              | 10056      | Oct. 01, 2008  | 2 Years       |
|                      | MITEQ Pre-Amplifier     | JS4-00101800-2 8-5A | 829013     | Sep. 28, 2008  | 2 Years       |
|                      | 1GHz~26.5GHz RF Cable   | N/A                 | N/A        | Sep. 28, 2008  | 2 Years       |
|                      | KSON Humidity Chamber   | THS-COH+-150        | 2019       | Mar. 11, 2008  | 1 Year        |

## 18. FCC ID Label Sample

The sample label shown below shall be permanently affixed at a conspicuous location on the device, instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practicable, only the trade name, model number, and the FCC logo must be displayed on the device per Section §15.19 (b)(2).



## 19. Information To The User

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

### Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver .
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected .
- Consult the dealer or an experienced radio / TV technician for help .

## 20. EUT External Photos

PHOTO. 1. EUT FRONT VIEW



PHOTO. 2. EUT REAR VIEW



## 21. EUT Internal Photos

PHOTO. 3. EUT INSIDE VIEW



PHOTO. 4. EUT COMPONENT VIEW



PHOTO. 5. EUT COMPONENT SIDE VIEW



PHOTO. 6. EUT COMPONENT SIDE VIEW



PHOTO. 7. EUT SOLDERING SIDE VIEW



PHOTO. 8. EUT COMPONENT SIDE VIEW

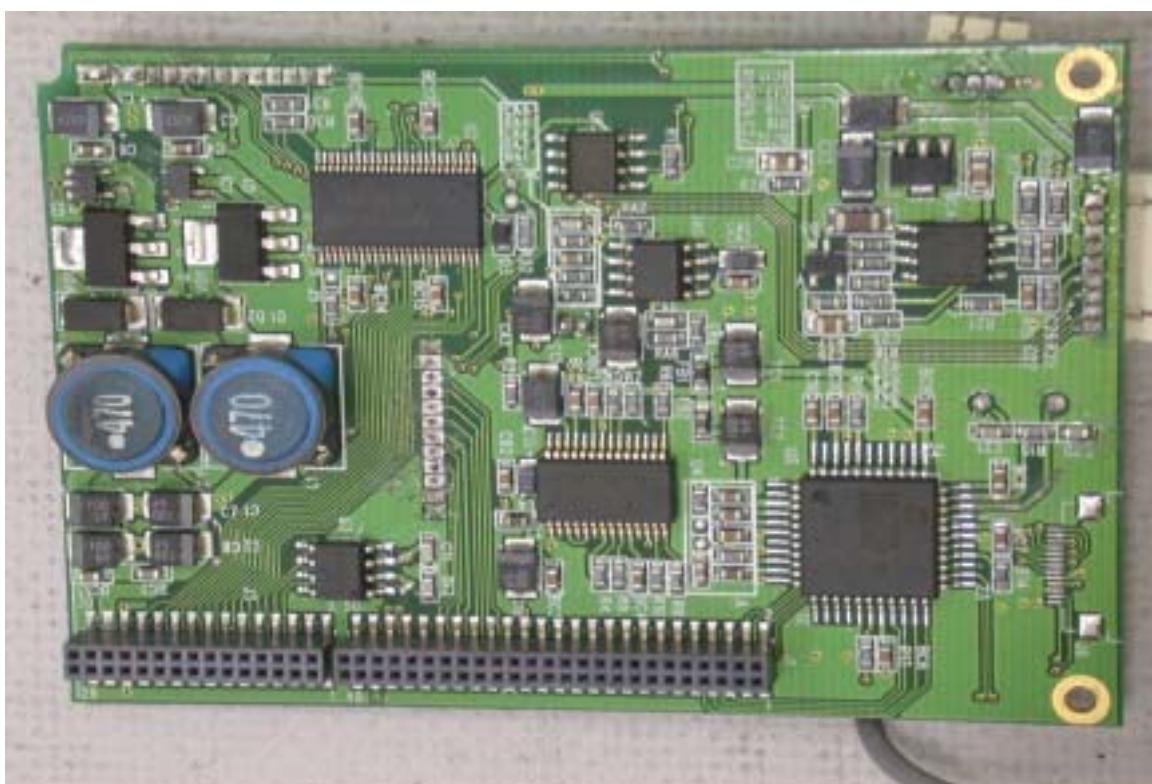


PHOTO. 9. EUT SOLDERING SIDE VIEW



PHOTO. 10. EUT COMPONENT SIDE VIEW



PHOTO. 11 EUT SOLDERING SIDE VIEW

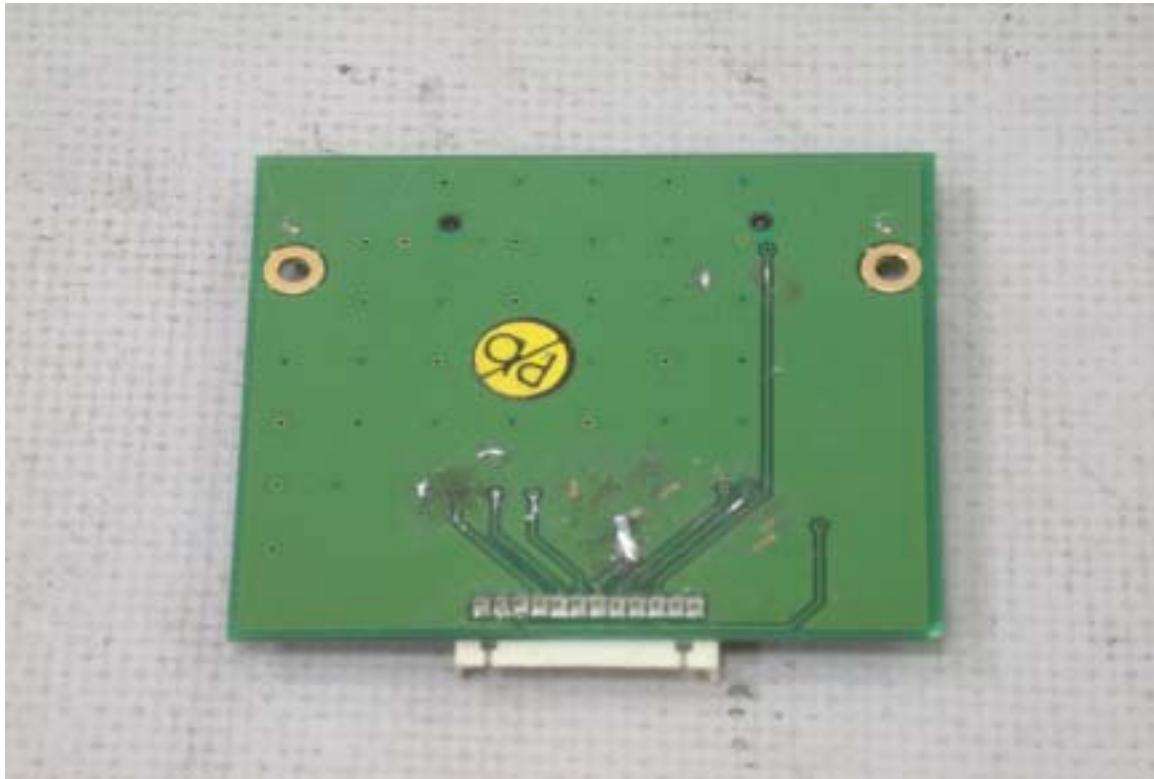


PHOTO. 12 EUT COMPONENT SIDE VIEW

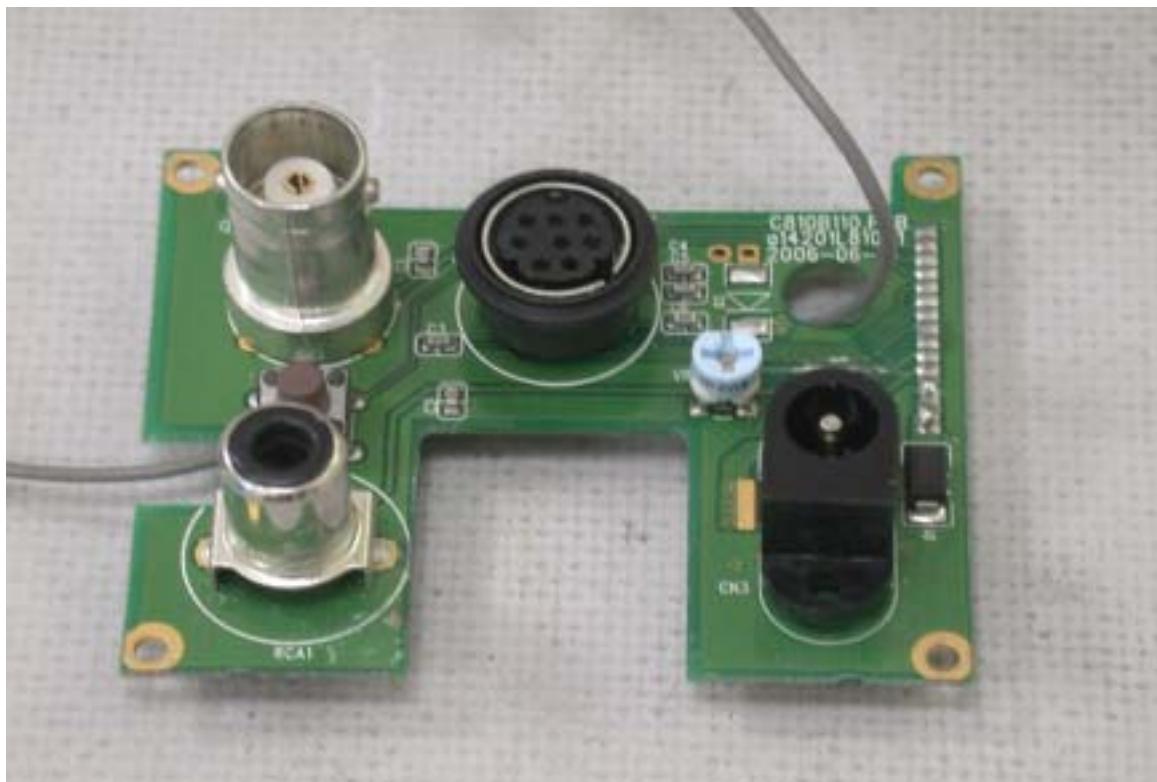


PHOTO. 13 EUT SOLDERING SIDE VIEW

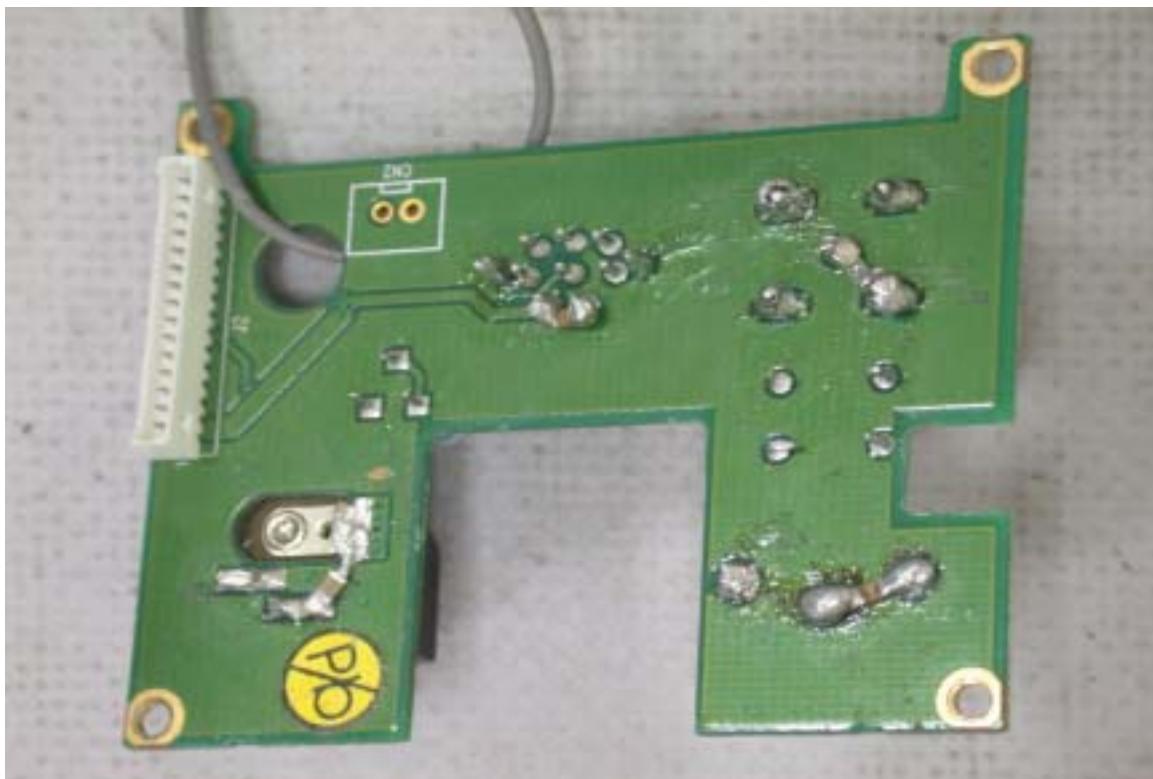


PHOTO. 14 EUT COMPONENT SIDE VIEW



PHOTO. 15 EUT SOLDERING SIDE VIEW



PHOTO. 16 EUT COMPONENT SIDE VIEW



PHOTO. 17 EUT COMPONENT SIDE VIEW



PHOTO. 18 EUT COMPONENT SIDE VIEW



PHOTO. 19      EUT SOLDERING SIDE VIEW

