

## FCC EVALUATION REPORT FOR CERTIFICATION

*KOREA Standard Technology*

*Test report No.: KST-FCC0411*

**Manufacturer's Name** : Ind Tek Co.,Ltd.

**Manufacturer's Address** : 23<sup>rd</sup> Bloc 5<sup>th</sup> Lot, Inui-Jigu, Inui-dong, Kumi-city,  
Kyongsangbuk-Do, Korea

**EUT's:**

**FCC ID** : R7DLC-30IU20

**Product Name** : LCD Monitor

**Model Number(s)** : LC-30IU20

**Product Options** : N/A

**Category** : FCC Part 15 subpart B

**Class B Computing Digital Device**

### Supplementary Information

The device bearing the brand name and FCC ID specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with measurement procedures specified in ANSI C63.4-1992.

I attest to the accuracy of data and all measurements reported herein were performed by or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

**Test Date : May 19, 2004.**

**Issued Date : May 22 , 2004**

**Tested by:**



**Kim, Ha-Hyung**

**Approved by:**



**Lee, Weon-Woo**

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## 1. Description of Device

|                               |                                                                            |
|-------------------------------|----------------------------------------------------------------------------|
| 1) Kind of equipment:         | LCD Monitor                                                                |
| 2) FCC ID:                    | R7DLC-30IU20                                                               |
| 3) Model Name:                | LC-30IU20                                                                  |
| 4) Serial No.:                | None                                                                       |
| 5) Type of Sample Tested:     | Pre-production                                                             |
| 6) High Frequency Used:       | 8.000 / 12.000 / 13.500 MHz<br>18.432 / 20.250 / 25.000 MHz                |
| 7) Adapter                    | N/A                                                                        |
| 8) Power Rating:              | 1phase AC100-240V, 50/60Hz, 280W<br>Output: -                              |
| 9) Tested Power supply:       | 1phase AC110V, 60Hz                                                        |
| 10) Date of Manufacture:      | May , 2004                                                                 |
| 11) Manufacture:              | Ind Tek co.,Ltd.                                                           |
| 12) Description of Operating: | Scroll All "H" Character<br>Resolution 1024*768 , Vertical Frequency: 75Hz |
| 13) Dates of Test:            | May 19, 2004                                                               |
| 14) Place of Tests:           | Korea Standard Technology EMC site                                         |
| 15) Test Report No:           | KST-FCC0411                                                                |

## 2. Test Facility

The open field test site and conducted measurement facility are used for these testing, where are located following address and drawing. This site was fully described in a report dated November 14, 2002, that was submitted to the FCC.

Korea Standard Technology ( KOSTEC Co., Ltd)

Head office:

4F, 1503-2, Kwanyang-dong, Dongan-gu, Anyang-shi, Kyunggi-do, Korea

Telephone No : 82-31-388-2051

Facsimile No: 82-31-388-2052

Test Lab

:180-254, Annyung-Ri, Taeon-Yup, Hwasung-shi, Kyunggi-do, Korea

Telephone No : 82-31-222-4251

Facsimile No: 82-31-222-4252

**MIC**(Ministry of Information and Communication) No: **KR0042**

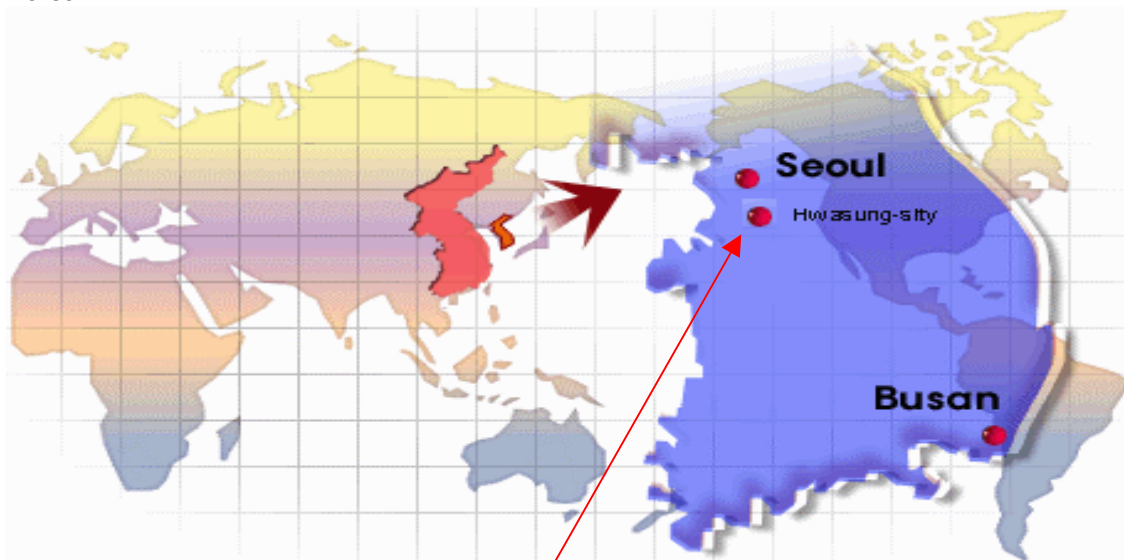
**FCC** Filing No. : **525762**

**VCCI** Membership Number : **2005**

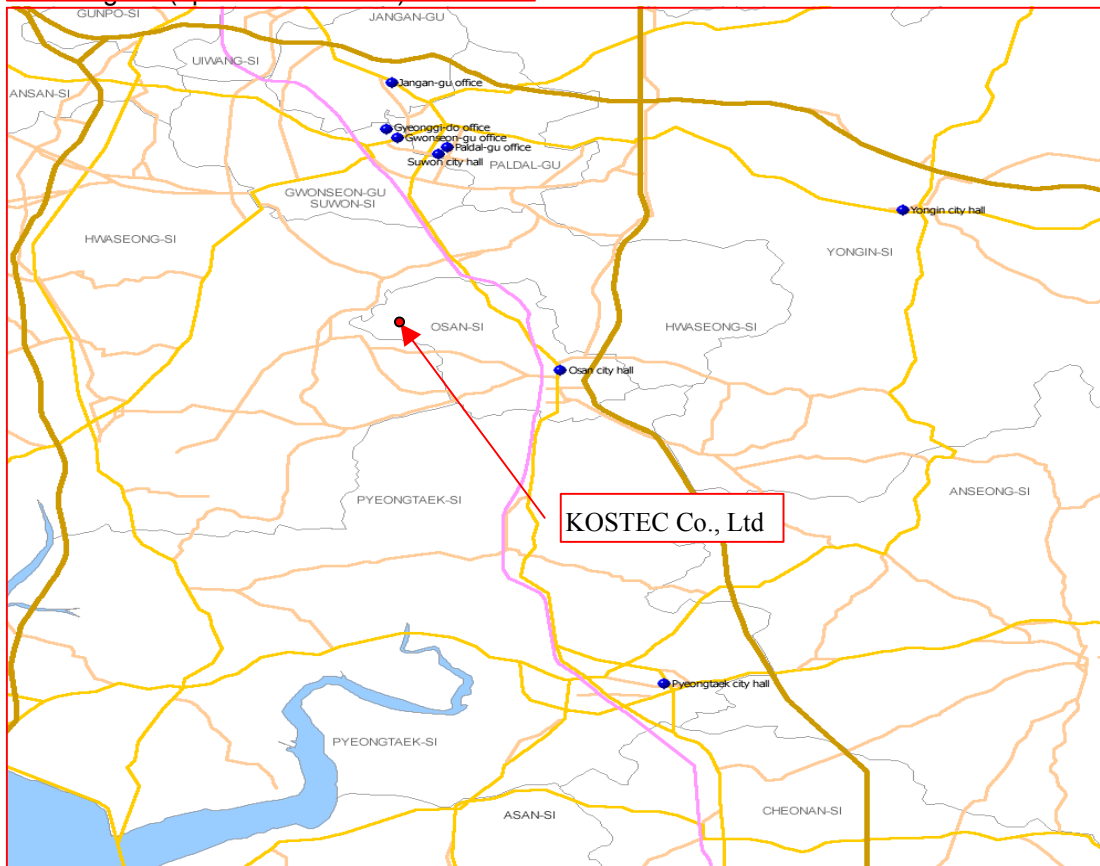
**VCCI** Registration Number : **R-1657 / C-1763**

## 3. MAP

Korea



Hwasung-shi (open area test site)



## 4. Test System Configuration

### Operation Environment

| Ambient            | <u>Temperature</u><br>( ° C ) | <u>Humidity</u><br>( % ) | <u>Pressure</u> ( hPa ) |
|--------------------|-------------------------------|--------------------------|-------------------------|
| 10m Open Area site | 20.3                          | 38                       | 1012                    |
| Shielded room:     | 19.1                          | 39                       | 1011                    |

### Test site

These testing were performed following locations ;

Shielded room : Conducted Emission,

10m Open Area Site: Radiated Emission

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.

The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, its imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

### sample calculation

#### Conducted emission

The field strength is calculated by adding the LISN factor, cable loss from the measured reading.

The sample calculation is as follows:

$$FS = MR + LF + CL$$

MR = Meter Reading

LF = LISN Factor

CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB

The result (MR) is

$$30 + 1 + 1 = 32\text{dBuV}$$

## 5. Description of E.U.T.

### Product Description

|                  |                                                                                                    |
|------------------|----------------------------------------------------------------------------------------------------|
| Manufactured By: | Ind Tek Co.,Ltd.                                                                                   |
| Address:         | 23 <sup>rd</sup> Bloc 5 <sup>th</sup> Lot, Inui-Jigu, Inui-dong, Kumi-city, Kyongsangbuk-Do, Korea |
| Model:           | LC-30IU20                                                                                          |
| Serial Number:   | None                                                                                               |

### Configuration of EUT

| Description     | Manufacturer            | Model / Part # | Serial Number   |
|-----------------|-------------------------|----------------|-----------------|
| Main controller | Ind Tek Co.,Ltd.        | LC-23IE20      | -               |
| Tuner board     | Ind Tek Co.,Ltd.        | A/V LC-23IE20  | -               |
| Tuner           | LG Innotek Co.,Ltd.     | TAFH-H001P     | 401E0902        |
| Power supply    | H & E Co.,Ltd.          | A1T4L30PN00    | 040408          |
| OSD             | Ind Tek Co.,Ltd.        | 23"KEYB/D      | -               |
| LCD Panel       | CHI MEI Optoelectronics | V296W1-L11     | 26C131143H20132 |
| Remote Control  | Ind Tek Co.,Ltd.        | None           | None            |

### EUT Used cables

| Cable Type | Shield | Length (m) | Ferrite | Connector | Connection Point 1 | Connection Point 2 |
|------------|--------|------------|---------|-----------|--------------------|--------------------|
| POWER      | Y      | 1.5        | -       | AC INLET  | Main power source  | EUT                |
| VGA In     | Y      | 1.5        | yes     | D-sub     | EUT                | PC                 |
| S-Video    | Y      | 1.0        | -       | Din       | EUT                | -                  |
| DVI        | Y      | 1.0        | Yes     | D-sub     | EUT                | -                  |
| Audio      | Y      | 1.5        | -       | Jack      | EUT                | Speaker            |
| Antenna    | -      | -          | -       | NTSC      | EUT Ant            | 75Ω terminated     |

### Operating conditions

The operating mode/system were as follows in details:

Operating: After Connected from personal comput to E.U.T by RGB cable(D-sub 15 pin).  
And then use to "H" pattern program for data transmission and continuously 'H' pattern displayed on the LCD Monitor.

## 7. TEST RESULTS

### 7.1 Conducted emission

#### Measurement procedure

##### Mains

The measurements were performed in a shielded room. EUT was placed on a non-metallic table height of 0.4m above the reference ground plane. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

#### Used equipment

| Equipment     | Model no. | Serial no. | Makers | Next cal date | Used |
|---------------|-----------|------------|--------|---------------|------|
| Test receiver | ESPI3     | 100109     | R&S    | 2005.3.15     | x    |
| L.I.S.N.      | ESH2-Z5   | 100044     | R&S    | 2005.4.23     | x    |
|               | ESH2-Z5   | 100147     | R&S    | 2005.4.23     | x    |

#### Measurement uncertainty

Conducted Emission measurement :  $\pm 2.4$  (K=2)

#### Test data

| FREQ.<br>(MHz) | LEVEL(dB $\mu V$ ) |       | LINE<br>Pol | Loss<br>(dB) | LIMIT(dB $\mu V$ ) |       | MARGIN(dB $\mu V$ ) |       |
|----------------|--------------------|-------|-------------|--------------|--------------------|-------|---------------------|-------|
|                | QP                 | AV    |             |              | QP                 | AV    | QP                  | AV    |
| 0.166          | 60.43              | 37.47 | N           | 0.29         | 65.57              | 55.57 | 5.43                | 18.39 |
| 0.214          | 54.68              | 43.79 | N           | 0.29         | 61.89              | 51.89 | 7.50                | 8.39  |
| 0.306          | 43.29              | 42.05 | N           | 0.29         | 59.66              | 49.66 | 16.66               | 7.90  |
| 0.466          | 25.19              | 19.90 | L           | 0.29         | 56.00              | 46.00 | 31.10               | 26.39 |
| 0.922          | 21.12              | 15.89 | N           | 0.43         | 56.00              | 46.00 | 35.31               | 30.54 |
| 17.182         | 24.23              | 20.76 | N           | 1.77         | 60.00              | 50.00 | 37.54               | 31.01 |
| 21.342         | 20.42              | 19.81 | N           | 1.83         | 60.00              | 50.00 | 41.41               | 32.02 |

\* Level = test receiver reading value

\* Loss = LISN insertion Loss + Cable Loss

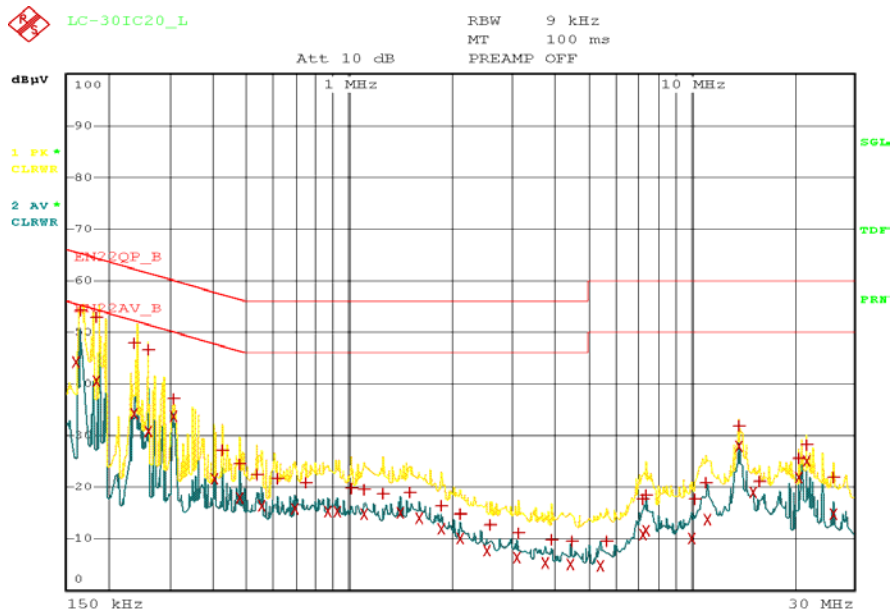
# EMI TEST REPORT



Report reference No: KST-FCC0411

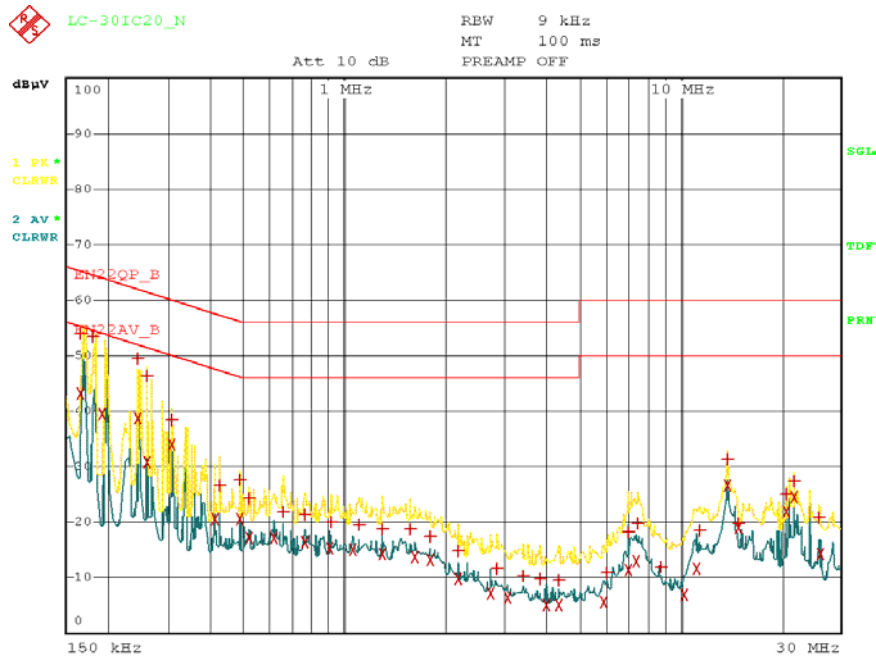
## Conducted emission test graph

Line. Live



Date: 19.MAY.2004 20:47:51

Line. Neutral



Date: 19.MAY.2004 20:50:39

# EMI TEST REPORT



Report reference No: KST-FCC0411

## 7.2 Radiated Emission

### Measurement procedure

A pretest was performed at 3m distances in a semi-anechoic chamber for searching correct frequency. The final test was done at a 10m open area test site with a quasi-peak detector. EUT was placed on a non-metallic table height of 0.8m above the reference ground plane. Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

### Used equipment

| Equipment               | Model no. | Serial no.  | Makers     | Next cal date |
|-------------------------|-----------|-------------|------------|---------------|
| Test receiver           | ESCS30    | 100111      | R&S        | 2005.3.17     |
| Ultra broadband antenna | HL562     | 100075      | R&S        | 2005.3.16     |
| Matching network        | RAM       | 358.5414.02 | R&S        | -             |
| Antenna Mast            | AT14      | none        | Daeil EMC  | -             |
| Turn Table              | TT15      | none        | Daeil EMC  | -             |
| 10m Open area site      | none      | none        | KOSTEC Lab | -             |
| chamber(3m)             | none      | none        | FRANCONIA  | -             |

### Measurement uncertainty

Radiated Emission measurement :  
30-300MHz +3.96dB / -4.04dB  
300-1000MHz +3.04dB / -3.00dB

Test data : ( "H" pattern scroll ) – PC Mode

| Freq<br>(MHz) | Reading<br>(dBuV) | P<br>(H/V) | H<br>(m) | A<br>(. ) | Antenna<br>(dB/m) | Cable Loss<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|---------------|-------------------|------------|----------|-----------|-------------------|--------------------|--------------------|-------------------|----------------|
| 80.19         | 20.90             | H          | 3.00     | 70        | 8.20              | 3.40               | 32.50              | 40.0              | 7.50           |
| 183.16        | 22.11             | H          | 3.00     | 90        | 7.66              | 4.63               | 34.40              | 43.5              | 9.10           |
| 200.74        | 23.30             | H          | 2.90     | 250       | 7.30              | 5.10               | 35.70              | 43.5              | 7.80           |
| 243.88        | 21.73             | V          | 1.80     | 270       | 9.22              | 5.35               | 36.30              | 46.0              | 9.70           |
| 388.72        | 18.38             | H          | 2.60     | 70        | 13.24             | 7.28               | 38.90              | 46.0              | 7.10           |
| 406.47        | 19.62             | H          | 2.20     | 135       | 13.62             | 7.46               | 40.70              | 46.0              | 5.30           |
| 731.66        | 12.48             | V          | 1.50     | 90        | 18.90             | 10.42              | 41.80              | 46.0              | 4.20           |
| 870.85        | 8.70              | H          | 1.90     | 250       | 20.20             | 11.30              | 40.20              | 46.0              | 5.80           |

Reading = Test receiver reading / P= antenna Polarization / H=antenna Height  
/ A=turntable Angle / Antenna = antenna factor / Cable loss = used cable loss  
/ Result = reading + antenna + loss / Margin = Limit – result / \* Receiving Antenna Mode:  
Horizontal, Vertical