

## FCC EVALUATION REPORT FOR CERTIFICATION

*Korea Standard Technology*

*Test report No.: KST-FCC0304*

**Manufacturer's Name :** Techsan I&C Co., Ltd.  
**Manufacturer's Address :** 436, Mogok-Dong, Pyeong Taek-City, Kyungki-Do, Korea

**EUT's:**

**FCC ID :** RJ5LTSW1700U  
**Product Name :** LCD TV & Monitor  
**Model Number(s) :** LTSW1700U & 70009 & 71009  
**Product Options :** With Analog RGB (D-sub) & Request for enter a multi list of model name by manufacturer  
**Category :** FCC Part 15 sub. part B TV interface devices /  
Class B computing digital devise

### 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:** 2003.07.26 - 27

**Issue Date :** 2003. 8. 8

**Tested by:**



Jeong, Seok-Jin

**Approved by:**



Lee, Weon-woo

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## 1. Description of Device

- |                               |                                                                                                           |
|-------------------------------|-----------------------------------------------------------------------------------------------------------|
| 1) Kind of equipment:         | LCD TV                                                                                                    |
| 2) FCC ID:                    | RJ5LTSW1700U                                                                                              |
| 3) Model Name:                | LTSW1700U & 70009 & 71009                                                                                 |
| 4) Serial No.:                | None                                                                                                      |
| 5) Type of Sample Tested:     | Pre-production                                                                                            |
| 6) High Frequency Used:       | 20.250MHz , 18.432MHz<br>14.318MHz , 10.000MHz                                                            |
| 7) Adapter                    | Model name: 0217B1250<br>Manufacturer:LISHIN INTERNATIONAL<br>ENTERPRISE CORP.<br>Serial no: A20317090101 |
| 8) Power Rating:              | 1phase AC100-250V, 10A, 50/60Hz<br>Output: DC 12V, 5A                                                     |
| 9) Tested Power supply:       | 1phase AC120V, 60Hz                                                                                       |
| 10) Date of Manufacture:      | June, 2003                                                                                                |
| 11) Manufacture:              | Techsan I & C Co.,Ltd.                                                                                    |
| 12) Description of Operating: | TV tuner mode and "H" pattern scrol                                                                       |
| 13) Dates of Test:            | July 26 ~ 27 , 2003                                                                                       |
| 14) Place of Tests:           | Korea Standard Technology EMC site                                                                        |
| 15) Test Report No:           | KST-FCC0304                                                                                               |

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## 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:

302 City Bild, 1600-3 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**

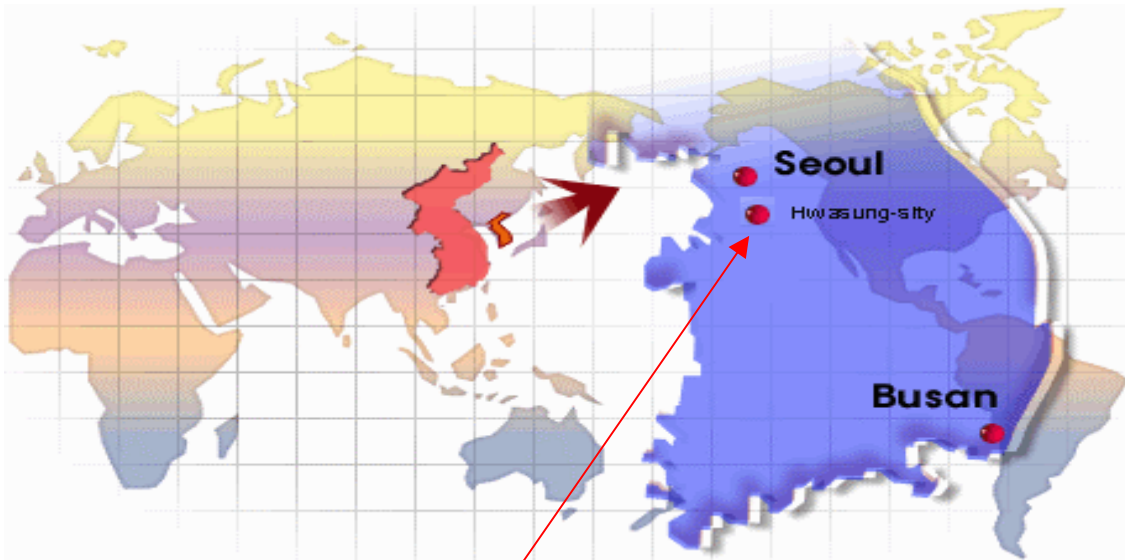
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## 3. Route Map of Measurement Facility

Korea



Hwasung-shi (open area test site)



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## 4. Operation Environment

| Ambient            | <u>Temperature</u><br>( ° C ) | <u>Humidity</u><br>( % ) | <u>Pressure</u> ( hPa ) |
|--------------------|-------------------------------|--------------------------|-------------------------|
| 10m Open Area site | 29.4                          | 45                       | 1014                    |
| Shielded room:     | 24.5                          | 48                       | 1012                    |

### 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

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

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

### Product Description

|                  |                                                      |
|------------------|------------------------------------------------------|
| Manufactured By: | Techsan I & C Co.,Ltd.                               |
| Address:         | 436, Mogok-Dong, Pyoung Taek-City, Kyungki-Do, Korea |
| Model:           | LTSW1700U & 70009 & 71009                            |
| Serial Number:   | None                                                 |

### Configuration of EUT

| Description       | Manufacturer           | Model / Part # | Serial Number |
|-------------------|------------------------|----------------|---------------|
| AD Board          | Techsan I & C Co.,Ltd. | 62010-2003     | None          |
| LCD Panel         | Samsung                | LTM170W1-L01   | 4D3F18609D    |
| Tuner             | Techsan I & C Co.,Ltd. | FI1236MK2      | None          |
| Inverter          | D & D Corp.            | 17W4P0         | None          |
| OSD               | Techsan I & C Co.,Ltd. | DTV17000       | None          |
| AC/DC Adapter     | LISHIN                 | 0217B1250      | A20317090101  |
| Remote controller | Techsan I & C Co.,Ltd. | None           | None          |

### EUT Used cables

| Cable Type | Shield | Length (m) | Ferrite | Connector | Connection Point 1 | Connection Point 2 |
|------------|--------|------------|---------|-----------|--------------------|--------------------|
| Power Line | Y      | 1.2        | -       | DC INLET  | AC/DC Adapter      | EUT                |
| VGA        | Y      | 1.5        | Y       | D-sub     | EUT                | PC                 |
| RCA        | Y      | 1.5        | -       | Jack      | EUT                | -                  |
| Sound Out  | Y      | 1.5        | -       | Jack      | EUT                | Headset            |

### Operating conditions

The operating mode/system were as follows in details:

Operating: After connected from analog RGB port of E.U.T. to VGA port of PC by RGB cable(D-sub). And connected from E.U.T. to Headset by RCA cable(Jack). And then use to data transmission and continuously "H" pattern scroll displayed on the EUT. And TV tuner mode.

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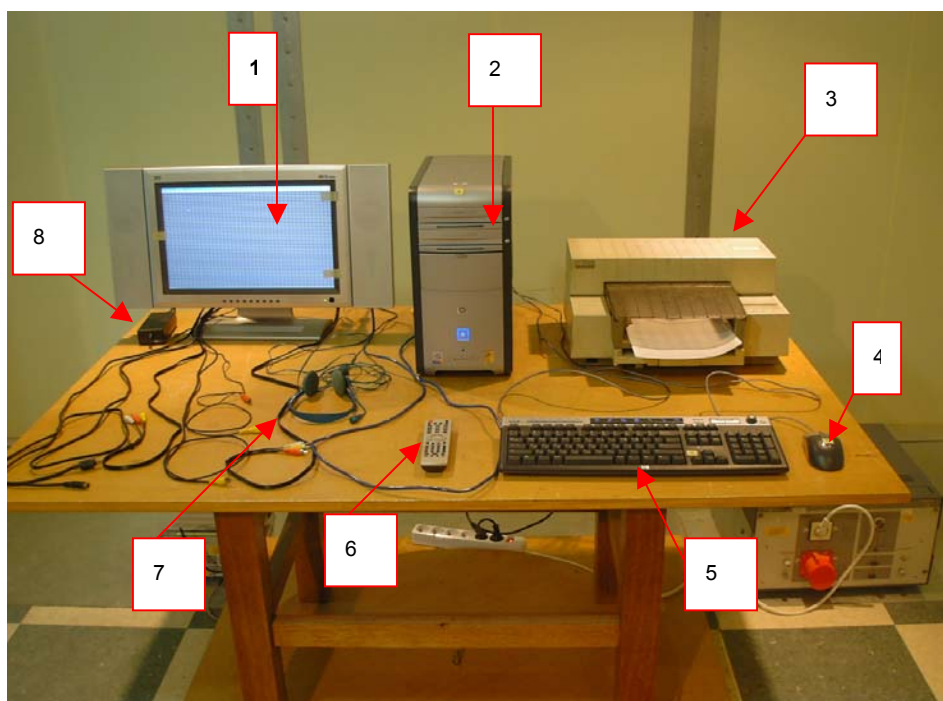


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## Configuration of Peripherals

| No | Description    | Manufacturer                          | Model / Part #   | Serial Number |
|----|----------------|---------------------------------------|------------------|---------------|
| 1  | EUT            | Techsan I & C Co.,Ltd.                | LTSW1700U        | None          |
| 2  | PC             | HP                                    | HP Pabilion t212 | KRJ32101BH    |
| 3  | Printer        | HP                                    | C2605A           | SG42R1C05B    |
| 4  | Mouse          | HP                                    | M042K0           | 30205141      |
| 5  | Keyboard       | HP                                    | 5219             | BN31719954    |
| 6  | Remote Control | Techsan I & C Co.,Ltd                 | None             | None          |
| 7  | Headset        | None                                  | None             | None          |
| 8  | AC/DC Adaptor  | LI SHIN International Enterprise Corp | 0217B1250        | A20317090101  |

## E.U.T Test Configuration (Example)



## 6. Summary of test results

Modification to the E.U.T.

- None

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## 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    | 2004.03.11    | ●    |
| L.I.S.N.      | ESH2-Z5   | 100044     | R&S    | 2004.04.25    | ●    |
|               | ESH2-Z5   | 100147     | R&S    | 2004.04.25    | ●    |

Measurement uncertainty

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

Test Data : Without Ground

| 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    |
| 0.182          | 46.46             | 41.54 | L           | 0.08         | 66.00             | 56.00 | 19.46              | 14.38 |
| 0.238          | 40.50             | 37.99 | L           | 0.29         | 66.00             | 56.00 | 25.21              | 17.72 |
| 0.422          | 32.62             | 30.55 | N           | 0.29         | 66.00             | 56.00 | 33.09              | 25.16 |
| 4.959          | 42.40             | 31.87 | L           | 0.68         | 56.00             | 46.00 | 12.92              | 13.45 |
| 5.674          | 38.81             | 23.37 | L           | 0.75         | 60.00             | 50.00 | 20.44              | 25.88 |
| 6.826          | 37.06             | 27.33 | N           | 0.97         | 60.00             | 50.00 | 21.97              | 21.70 |
| 10.494         | 22.39             | 15.07 | N           | 1.33         | 60.00             | 50.00 | 36.28              | 33.60 |

\* Level = test receiver reading value

\* Loss = LISN insertion Loss + Cable Loss

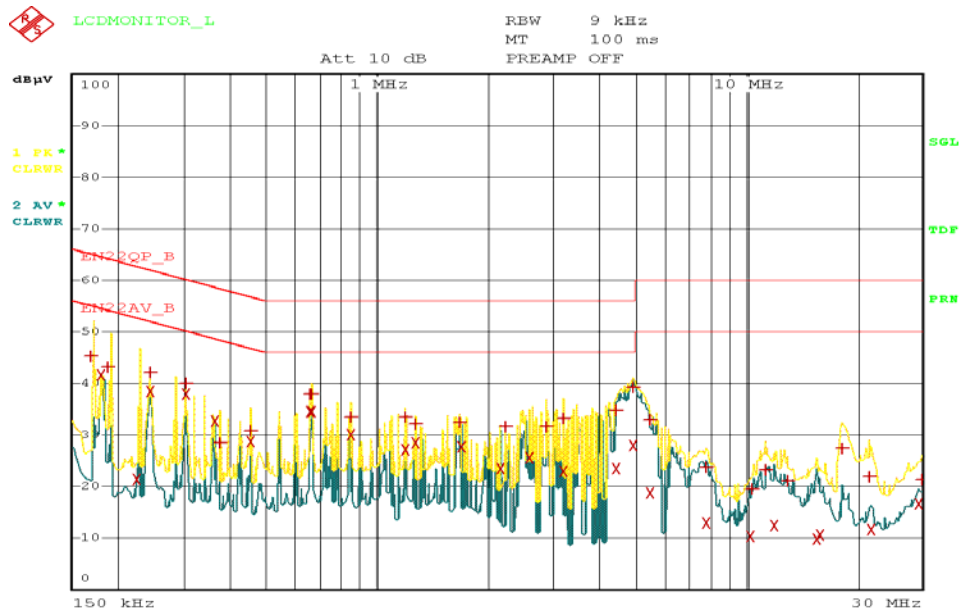
# EMC TEST REPORT



Report No: KST-FCC0304

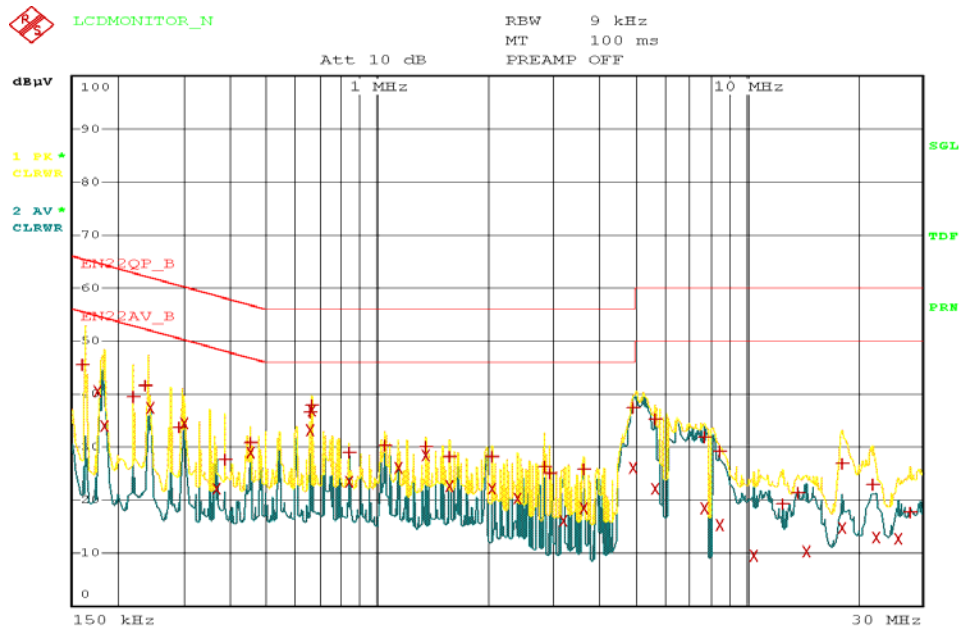
## Conducted emission test graph

Without Ground  
Line. Live



Date: 28.JUL.2003 14:33:19

Line. Neutral



Date: 28.JUL.2003 14:28:20

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Test Data : With Ground

| 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    |
| 0.158          | 45.15             | 40.39 | L           | 0.08         | 66.00             | 56.00 | 20.77              | 15.53 |
| 0.194          | 41.90             | 33.94 | N           | 0.08         | 66.00             | 56.00 | 24.02              | 21.98 |
| 0.302          | 40.04             | 37.72 | L           | 0.29         | 66.00             | 56.00 | 25.67              | 17.99 |
| 0.662          | 39.36             | 38.64 | L           | 0.90         | 56.00             | 46.00 | 15.74              | 6.46  |
| 4.862          | 42.32             | 30.01 | L           | 0.68         | 56.00             | 46.00 | 13.00              | 15.31 |
| 5.662          | 38.84             | 27.80 | N           | 0.75         | 60.00             | 50.00 | 20.41              | 21.45 |
| 12.734         | 32.55             | 18.24 | N           | 1.52         | 60.00             | 50.00 | 25.93              | 30.24 |

\* Level = test receiver reading value

\* Loss = LISN insertion Loss + Cable Loss

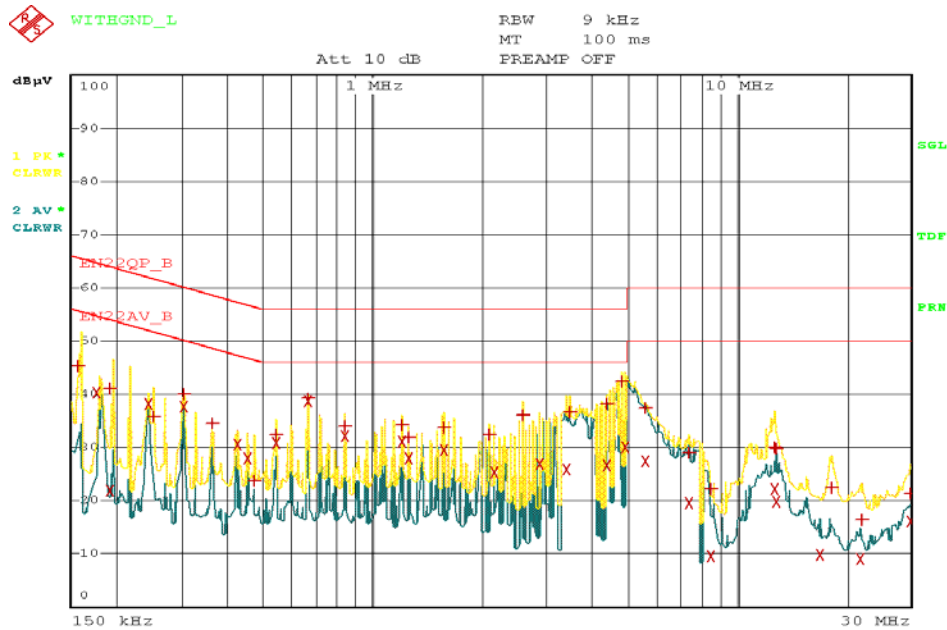
# EMC TEST REPORT



Report No: KST-FCC0304

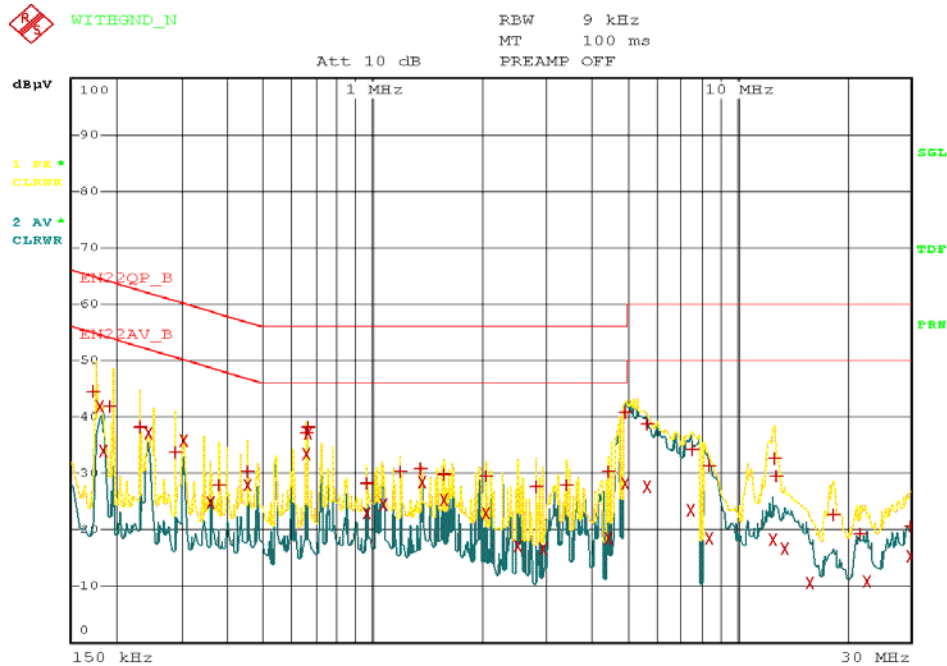
## Conducted emission test graph

With Ground  
Line. Live



Date: 28.JUL.2003 13:55:15

Line. Neutral



Date: 28.JUL.2003 14:00:57

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## 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        | 2004.03.17    |
| Ultra broadband antenna | HL562     | 100075     | R&S        | 2004.03.18    |
| 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 : Other Frequency ( "H" pattern scroll )

| Freq (MHz) | Reading (dBuV/m) | P (H/V) | H (m) | A (°) | Antenna (dB) | Cable Loss (dB) | Result (dBuV/m) | Limit (dB) | Margin (dB) |
|------------|------------------|---------|-------|-------|--------------|-----------------|-----------------|------------|-------------|
| 79.97      | 21.78            | H       | 3.80  | 45    | 8.10         | 3.32            | 33.20           | 39.0       | 5.80        |
| 109.71     | 13.94            | H       | 3.70  | 210   | 9.16         | 3.80            | 26.90           | 43.5       | 16.60       |
| 197.05     | 21.08            | H       | 3.50  | 90    | 7.24         | 4.98            | 33.30           | 43.5       | 10.20       |
| 256.57     | 20.92            | V       | 2.00  | 110   | 9.64         | 5.94            | 36.50           | 43.5       | 7.00        |
| 305.65     | 18.20            | H       | 3.00  | 90    | 11.15        | 6.55            | 35.90           | 46.4       | 10.50       |
| 562.25     | 14.50            | V       | 2.30  | 270   | 16.44        | 9.16            | 40.10           | 46.4       | 6.30        |
| 590.56     | 13.73            | H       | 2.80  | 270   | 16.90        | 9.27            | 39.90           | 46.4       | 6.50        |

Reading = Test receiver reading / P= antenna Polarization / H=antenna Height

A=turn table Angle / Antenna = antenna factor / Cable loss = used cable loss

Result = reading + antenna + loss / Margin = Limit - result

\* Receiving Antenna Mode: Horizontal, Vertical / \* Test site: 10m Open area site

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Disturbance radiation due to local oscillator ( TV tuner mode )

| Channel           | Frequency (MHz) | Reading (dBuV) | Pol (H/V) | Total Loss (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) |
|-------------------|-----------------|----------------|-----------|-----------------|---------------|--------------|-------------|
| 2<br>(55.25MHz)   | 101.0           |                |           | 12.8            |               | 43.5         |             |
|                   | 202.0           |                |           | 12.5            |               | 43.5         |             |
|                   | 303.0           |                |           | 17.6            |               | 46.0         |             |
|                   | 404.0           |                |           | 21.0            |               | 46.0         |             |
|                   | 505.0           |                |           | 23.4            |               | 46.0         |             |
|                   | 606.0           |                |           | 26.4            |               | 46.0         |             |
|                   | 707.0           |                |           | 28.5            |               | 46.0         |             |
|                   | 808.0           |                |           | 30.5            |               | 46.0         |             |
|                   | 909.0           |                |           | 32.7            |               | 46.0         |             |
| 4<br>(67.25MHz)   | 108.5           |                |           | 12.9            |               | 43.5         |             |
|                   | 217.0           | 18.7           | H         | 13.0            | 31.7          | 46.0         | 14.3        |
|                   | 325.5           |                |           | 18.5            |               | 46.0         |             |
|                   | 434.0           | 21.4           | H         | 22.0            | 43.4          | 46.0         | 2.6         |
|                   | 542.5           |                |           | 25.0            |               | 46.0         |             |
|                   | 651.0           |                |           | 27.5            |               | 46.0         |             |
|                   | 759.5           |                |           | 29.8            |               | 46.0         |             |
|                   | 868.0           |                |           | 31.5            |               | 46.0         |             |
|                   | 976.5           |                |           | 33.7            |               | 54.0         |             |
| 6<br>(83.25MHz)   | 129.0           | 22.3           | H         | 12.9            | 35.2          | 43.5         | 8.3         |
|                   | 258.0           | 17.8           | H         | 15.7            | 33.5          | 46.0         | 12.5        |
|                   | 387.0           |                |           | 20.5            |               | 46.0         |             |
|                   | 516.0           |                |           | 24.0            |               | 46.0         |             |
|                   | 645.0           |                |           | 27.2            |               | 46.0         |             |
|                   | 774.0           | 13.2           | H         | 30.0            | 43.2          | 46.0         | 2.8         |
|                   | 903.0           |                |           | 32.6            |               | 46.0         |             |
| 7<br>(175.25MHz)  | 221.0           | 22.9           | H         | 13.2            | 36.1          | 46.0         | 9.9         |
|                   | 442.0           |                |           | 22.3            |               | 46.0         |             |
|                   | 663.0           |                |           | 27.9            |               | 46.0         |             |
|                   | 884.0           |                |           | 32              |               | 46.0         |             |
| 10<br>(193.25MHz) | 239.0           | 22.8           | H         | 14.3            | 37.1          | 46.0         | 8.9         |
|                   | 478.0           |                |           | 22.9            |               | 46.0         |             |
|                   | 717.0           |                |           | 28.9            |               | 46.0         |             |
|                   | 956.0           |                |           | 33.4            |               | 46.0         |             |
| 13<br>(211.25MHz) | 257.0           | 21.0           | H         | 15.7            | 36.7          | 46.0         | 9.3         |
|                   | 514.0           |                |           | 23.9            |               | 46.0         |             |
|                   | 771.0           |                |           | 29.9            |               | 46.0         |             |
| 14                | 517.0           | 18.4           | V         | 24.1            | 42.5          | 46.0         | 3.5         |
| 19                | 547.0           | 17.3           | H         | 25.2            | 42.5          | 46.0         | 3.5         |
| 28                | 601.0           | 15.9           | V         | 26.3            | 42.2          | 46.0         | 3.8         |
| 36                | 649.0           | 16.3           | V         | 27.4            | 43.7          | 46.0         | 2.3         |
| 44                | 697.0           | 14.8           | V         | 28.3            | 43.1          | 46.0         | 2.9         |
| 53                | 751.0           | 12.8           | V         | 29.8            | 42.6          | 46.0         | 3.4         |
| 61                | 799.0           | 11.9           | H         | 30.4            | 42.3          | 46.0         | 3.7         |
| 69                | 847.0           | 11.8           | H         | 31.1            | 42.9          | 46.0         | 3.1         |

Total loss = Antenna factor + cable loss