

## 1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do,  
443-742 Republic of Korea
- Date of Receipt : 2015-01-15



## 2. Manufacturer

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do,  
443-742 Republic of Korea

## 3. Use of Report : For FCC certification

## 4. Test Sample / Model: Digital Set Top Box / SMT-H3462, SMT-H3462S and SMT-H3462M

## 5. Date of Test : 2015-01-19 to 2015-01-22

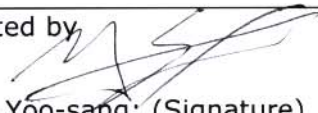
## 6. Test Standard(method) used : FCC Part 15 Subpart B

## 7. Testing Environment: refer to 11 pages to 21 pages

## 8. Test Results : refer to 12 pages to 21 pages

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

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|             |                                                                                                                                                    |                                                                                                                                                           |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Affirmation | Tested by<br><br>Yoo Yoo-sang: (Signature)<br>EMC Test Engineer | Approved by<br><br>Park Young-joon: (Signature)<br>Technical Manager |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|

The above testing certificate is the accredited test result by Korea Laboratory Accreditation Scheme, which signed the ILAC-MRA.

2015-01-27

Accredited by KOLAS, Republic of KOREA **CTK Co., Ltd.**



**CTK Co., Ltd.**  
(Ho-dong), 113, Yejik-ro, Cheoin-gu,  
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Certificate No.:  
CTK-K-2015-00020  
Page (2) / (33) Pages



## REPORT REVISION HISTORY

| Date       | Revision                  | Page No |
|------------|---------------------------|---------|
| 2015-01-27 | Issued (CTK-K-2015-00020) | All     |
|            |                           |         |
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## 1.0 General Product Description

| No. | ITEM                                 |                       | APPLICATION                                                       |
|-----|--------------------------------------|-----------------------|-------------------------------------------------------------------|
| 1   | Type of receiver                     |                       | Digital Set Top Box                                               |
| 2   | Model name                           |                       | SMT-H3462, SMT-H3462S and SMT-H3462M                              |
| 3   | STB                                  |                       | Cable                                                             |
| 4   | SMPS (Revision : Date)               |                       | S3012_EPN                                                         |
| 5   | Dimensions (W x L x H)               |                       | 290 x 200x 55 mm                                                  |
| 6   | Weight                               |                       | 1.3 kg                                                            |
| 7   | RF Tuner                             | Type                  | J.83B (6 MHz Band-width)                                          |
|     |                                      | Input Connector Type  | F type                                                            |
|     |                                      | Output connector type | -                                                                 |
|     |                                      | Frequency range       | 5 to 1002 MHz                                                     |
|     |                                      | Input signal level    | -15 dBmV ~ + 15 dBmV                                              |
|     |                                      | IF frequency          | 43.75 MHz                                                         |
| 8   | Ethernet Port                        |                       | 1 x RJ-45(8P8C) Female                                            |
| 9   | HDMI                                 |                       | HDMI type A Female, HDMI                                          |
| 10  | AUDIO L/R                            |                       | L/R RCA connector Female, IEC 60268-11                            |
| 11  | SPDIF                                |                       | N/A                                                               |
| 12  | USB                                  |                       | 1 X USB2.0 on rear panel                                          |
| 13  | Clock and other Frequencies utilized |                       | Host CPU: 1 300 MHz<br>DDR3 Memory : 800 MHz<br>CM DDR3 : 533 MHz |
| 14  | Test Voltage & Frequency             | Voltage:              | AC 120 V                                                          |
|     |                                      | Frequency:            | 60 Hz                                                             |
| 15  | Electrical Ratings                   | Input:                | AC 120 V, 60 Hz, 1.5 A                                            |
|     |                                      | Output:               | -                                                                 |

|                                                                                                                                                                       |                                                                                                                                                          |                                                                        |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## 1.1 Model Differences

SMT-H3462, SMT-H3462S and SMT-H3462M are no technical difference from each model only except for Model name because of marketing purposes.

## 1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable

### 1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

| Device    | Model No.  | Serial No.      | Manufacturer                  |
|-----------|------------|-----------------|-------------------------------|
| LED TV    | UN22ES5003 | ZV8R33FD301120F | Samsung Electronics Co., Ltd. |
| USB Drive | SLC        | -               | ZALMAN                        |

☒ Cable Description

| No. | From   |           | To                                                |           | Type of Cable |                        |                    |
|-----|--------|-----------|---------------------------------------------------|-----------|---------------|------------------------|--------------------|
|     | Device | I/O Port  | Device                                            | I/O Port  | Length (m)    | Shielded or Unshielded | Ferrite Core [Y/N] |
| 1   | EUT    | USB       | USB Drive                                         | -         | -             | -                      | -                  |
| 2   |        | HDMI OUT  | LED TV                                            | HDMI      | 1.8           | S                      | Y                  |
| 3   |        | VIDEO OUT | LED TV                                            | VIDEO IN  | 1.8           | U                      | N                  |
| 4   |        | AUDIO OUT | LED TV                                            | AUDIO IN  | 1.8           | U                      | N                  |
| 5   |        | IR input  | CABLE                                             | -         | 1.5           | U                      | Y                  |
| 6   |        | LAN       | CABLE                                             | -         | 2.5           | S                      | N                  |
| 7   |        | CABLE IN  | Digital signal transmitter (Outside of test site) | CABLE OUT | 10.0          | S                      | N                  |
| 8   |        | AC POWER  | AC MAIN                                           | -         | 1.8           | U                      | N                  |
| 9   | LED TV | AC POWER  | AC MAIN                                           | -         | 1.8           | U                      | Y                  |

\* Shielded or Unshielded : Unshielded=U, Shielded=S

### 1.4 Test Software

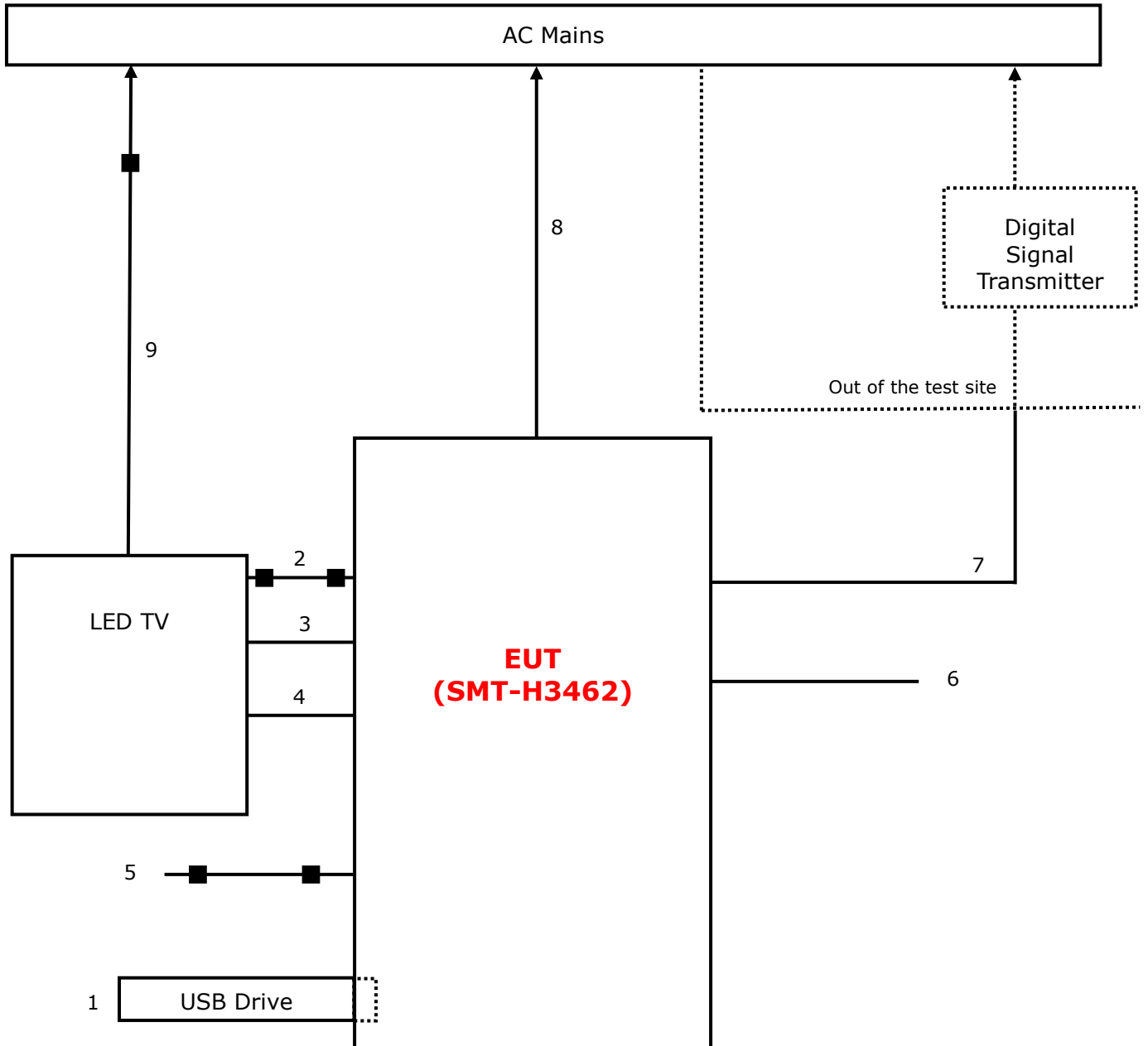
- ☐ EMC Test V 1.0  
☐ Display Test Patterns - V1.5  
☐ Ping.exe  
☒ Not applicable

### 1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☒ Digital signal receiving mode

## 1.6 Configuration



|                                                                                                                                                                       |                                                                                                                                                          |                                                                        |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## 1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.8 Test Facility

The measurement facility is located at (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.9 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed Semi-Anechoic Chamber or anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Semi-Anechoic Chamber. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

\* Measurement procedures was In accordance with ANSI C63.4-2009 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2

Note #1: Comparing this test result and FCC Part 18 limits, the emission of this product can also meet the FCC Part 18.305 Field Strength Limits and 18.307 Conduction Limits.

Note #2: These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

|                                                                                                                                                           |                                                                                                                                               |                                                               |                                                                                     |
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------|

## 1.10 Laboratory Accreditations and Listings

| Country       | Agency | Scope of Accreditation                                                                           | Registration Number                | Logo                                                                                  |
|---------------|--------|--------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------|
| USA           | FCC    | FCC Part 15 & 18<br>EMI (Electromagnetic Interference / Emission)                                | 805871                             |    |
| JAPAN         | VCCI   | VCCI V-3<br>EMI (Electromagnetic Interference / Emission)                                        | C-986<br>T-1843<br>R-3627<br>G-387 |    |
| KOREA         | MSIP   | EMI (Electromagnetic Interference / Emission)<br>EMS (Electromagnetic Susceptibility / Immunity) | KR0025                             |   |
| International | KOLAS  | EMI (Electromagnetic Interference / Emission)<br>EMS (Electromagnetic Susceptibility / Immunity) | TESTING<br>NO. 119                 |  |

## 1.11 Measurement Uncertainty

Compliance of the product is based on the measured value.

However, the measurement uncertainty is included for information purposes.

The measurement uncertainties given below are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| Measurement Type   | Frequency Range    | Expanded Uncertainty                 |
|--------------------|--------------------|--------------------------------------|
| Conducted Emission | 9 kHz to 150 kHz   | 2.78 dB (C.L.: Approx. 95 %, $k=2$ ) |
| Conducted Emission | 150 kHz to 30 MHz  | 2.70 dB (C.L.: Approx. 95 %, $k=2$ ) |
| Disturbance Power  | 30 MHz to 300 MHz  | 3.74 dB (C.L.: Approx. 95 %, $k=2$ ) |
| Radiated Emission  | 30 MHz to 1000 MHz | 3.66 dB (C.L.: Approx. 95 %, $k=2$ ) |
| Radiated Emission  | 1 GHz Above        | 4.16 dB (C.L.: Approx. 95 %, $k=2$ ) |

## 2.0 EMC Test Regulations/Standards

The tests were performed according to following regulations:

| Applied standard                                                                                      | Title                               | Applied                             | Test Result                                                              |
|-------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------------------------|
| FCC Part 15 Subpart B<br><input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B | Conducted Voltage Emissions         | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> MET <input type="checkbox"/> NOT MET |
|                                                                                                       | Radiated Electric Field Emissions   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> MET <input type="checkbox"/> NOT MET |
|                                                                                                       | Antenna Power Conducted Emission    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> MET <input type="checkbox"/> NOT MET |
|                                                                                                       | Output and Spurious Conducted Level | <input type="checkbox"/>            | <input type="checkbox"/> MET <input type="checkbox"/> NOT MET            |
|                                                                                                       | Antenna Transfer Switch             | <input type="checkbox"/>            | <input type="checkbox"/> MET <input type="checkbox"/> NOT MET            |

## 3.0 Results of Individual Test

### 3.1 Conducted Voltage Emissions of Mains ports

#### Test Date

2015-01-19

#### Test Location

Shielded Room

#### Test Equipment

| Name of Equipment           | Model No. | Manufacturer    | Serial No. | Due Date   | Applied                             |
|-----------------------------|-----------|-----------------|------------|------------|-------------------------------------|
| EMI Test Receiver           | ESCI7     | Rohde & Schwarz | 100816     | 2015-02-04 | <input type="checkbox"/>            |
| LISN                        | ENV216    | Rohde & Schwarz | 101235     | 2015-07-30 | <input type="checkbox"/>            |
| LISN                        | ENV216    | Rohde & Schwarz | 101236     | 2015-07-30 | <input type="checkbox"/>            |
| EMI Test Receiver           | ESR7      | Rohde & Schwarz | 101088     | 2015-07-29 | <input type="checkbox"/>            |
| LISN                        | ENV216    | Rohde & Schwarz | 101151     | 2015-11-07 | <input type="checkbox"/>            |
| LISN                        | ESH3-Z5   | Rohde & Schwarz | 100207     | 2015-11-07 | <input type="checkbox"/>            |
| EMI Test Receiver           | ESCI7     | Rohde & Schwarz | 100816     | 2015-12-05 | <input checked="" type="checkbox"/> |
| LISN                        | ENV216    | Rohde & Schwarz | 101760     | 2015-02-03 | <input checked="" type="checkbox"/> |
| LISN                        | ENV4200   | Rohde & Schwarz | 100042     | 2015-02-05 | <input type="checkbox"/>            |
| LISN                        | ENV216    | Rohde & Schwarz | 101150     | 2015-02-04 | <input checked="" type="checkbox"/> |
| Signal Generator            | 8648A     | HP              | 3847U02547 | 2015-05-13 | <input type="checkbox"/>            |
| Matching Pad                | RAM       | Rohde & Schwarz | 100618     | 2015-05-15 | <input type="checkbox"/>            |
| Matching Pad                | 75Z-3G    | JFW             | 1311       | 2015-02-21 | <input type="checkbox"/>            |
| TV-Test Transmitter         | SFQ       | Rohde & Schwarz | 100547     | 2015-05-13 | <input checked="" type="checkbox"/> |
| MPEG2 Measurement Generator | DVG       | Rohde & Schwarz | 100366     | N/A        | <input checked="" type="checkbox"/> |

#### Test Software

ESCI7, ESCI3 : EMC32 Ver. 8.50.0

ESR7 : EMC32 Ver. 8.53.0

#### Frequency Range of Measurement

150 kHz to 30 MHz

#### Instrument Setting

IF Band Width: 9 kHz

#### Climate Condition

Temperature: (24 ± 1) °C

Relative Humidity: (37 ± 1) %

Atmospheric Pressure: 99 kPa

### Test Result

The requirements are: ☒ MET ☐ NOT MET

| Frequency<br>(MHz) | Measured Data<br>(dBμV) | Margin<br>(dB) | Remark   |
|--------------------|-------------------------|----------------|----------|
| 0.199 500          | 47.4                    | 6.2            | CAverage |

The Result is calculated by using the following formula;

- \* Result = Limit – Margin (Result included the correction factor)
- \* Correction factor = Cable Loss + Insertion loss of LISN

## Test Data

[Line: L1]

Test

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## Test Report

### Common Information

Test Model Name: SMT-H3462  
Test Mode: Digital signal receiving mode  
Manufacturer: Samsung Electronics Co., Ltd.  
Tester: Yoo Yoo-sang

### Hardware Setup: EMI conducted Voltage with ENV216\_FO(101760) - [EMI conducted]

Subrange 1

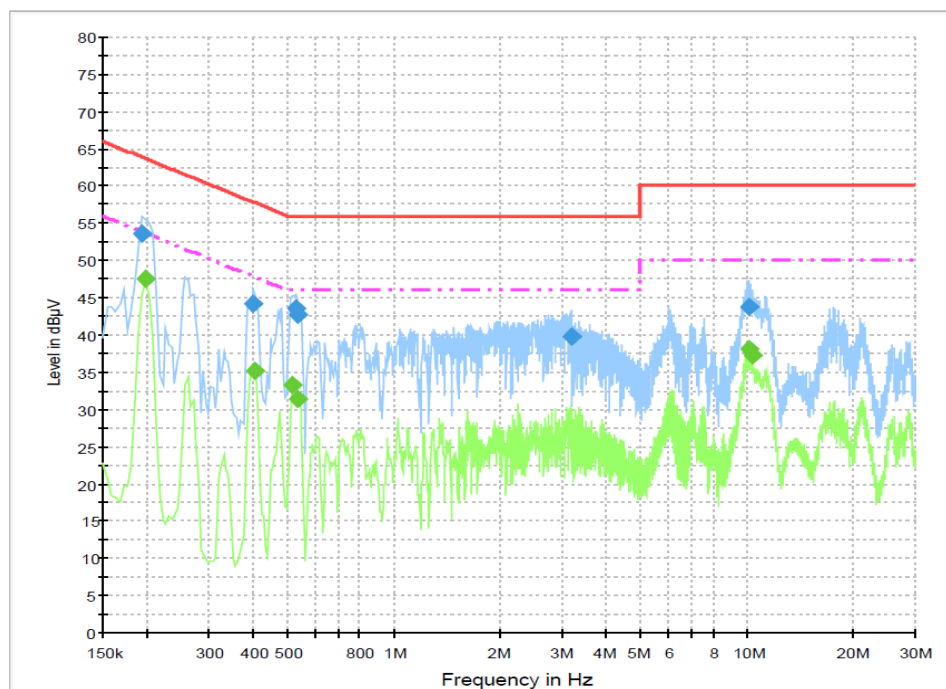
Frequency Range: 150 kHz - 30 MHz

Receiver: ESCI 7 [ESCI 7]  
@ GPIB0 (ADR 20), SN 100816/007, FW 4.42

Signal Path: ESCI 7-ENV216 FO(101760)  
Correction Table: 3-2 CE Cable Loss

LISN: ENV216 FO(101760)  
Correction Table (Line 0): ENV216\_FO\_N(101760)  
Correction Table (Line 1): ENV216\_FO\_L1(101760)

CISPR 22 Class B\_L1



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Test

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### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.195000        | 53.5             | 1000.0          | 9.000           | On     | L1   | 9.9        | 10.3        | 63.8         |
| 0.402000        | 44.2             | 1000.0          | 9.000           | On     | L1   | 10.1       | 13.7        | 57.8         |
| 0.528000        | 43.6             | 1000.0          | 9.000           | On     | L1   | 10.2       | 12.4        | 56.0         |
| 0.537000        | 42.7             | 1000.0          | 9.000           | On     | L1   | 10.2       | 13.3        | 56.0         |
| 3.205500        | 39.8             | 1000.0          | 9.000           | On     | L1   | 9.8        | 16.2        | 56.0         |
| 10.086000       | 43.7             | 1000.0          | 9.000           | On     | L1   | 9.9        | 16.3        | 60.0         |

### Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.199500        | 47.4            | 1000.0          | 9.000           | On     | L1   | 9.9        | 6.2         | 53.6         |
| 0.406500        | 35.2            | 1000.0          | 9.000           | On     | L1   | 10.1       | 12.5        | 47.7         |
| 0.519000        | 33.2            | 1000.0          | 9.000           | On     | L1   | 10.2       | 12.8        | 46.0         |
| 0.537000        | 31.4            | 1000.0          | 9.000           | On     | L1   | 10.2       | 14.6        | 46.0         |
| 10.086000       | 38.1            | 1000.0          | 9.000           | On     | L1   | 9.9        | 11.9        | 50.0         |
| 10.419000       | 37.3            | 1000.0          | 9.000           | On     | L1   | 9.9        | 12.7        | 50.0         |

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[Line : Neutral]

Test

1 / 2

## Test Report

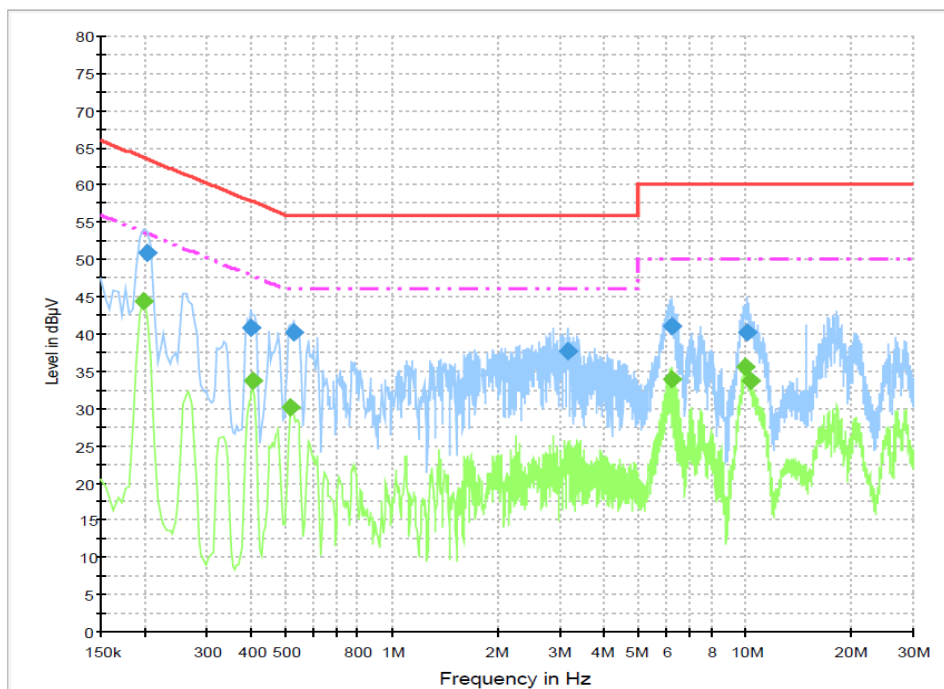
### Common Information

Test Model Name: SMT-H3462  
Test Mode: Digital signal receiving mode  
Manufacturer: Samsung Electronics Co., Ltd.  
Tester: Yoo Yoo-sang

### Hardware Setup: EMI conducted Voltage with ENV216\_FO(101760) - [EMI conducted]

Subrange 1  
Frequency Range: 150 kHz - 30 MHz  
Receiver: ESCI 7 [ESCI 7]  
@ GPIB0 (ADR 20), SN 100816/007, FW 4.42  
Signal Path: ESCI 7-ENV216 FO(101760)  
Correction Table: 3-2 CE Cable Loss  
LISN: ENV216 FO(101760)  
Correction Table (Line 0): ENV216\_FO\_N(101760)  
Correction Table (Line 1): ENV216\_FO\_L1(101760)

CISPR 22 Class B\_N



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Test

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### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.204000        | 50.8             | 1000.0          | 9.000           | On     | N    | 10.0       | 12.6        | 63.4         |
| 0.397500        | 40.9             | 1000.0          | 9.000           | On     | N    | 10.1       | 17.0        | 57.9         |
| 0.528000        | 40.3             | 1000.0          | 9.000           | On     | N    | 10.2       | 15.8        | 56.0         |
| 3.138000        | 37.8             | 1000.0          | 9.000           | On     | N    | 9.9        | 18.2        | 56.0         |
| 6.193500        | 41.0             | 1000.0          | 9.000           | On     | N    | 9.9        | 19.0        | 60.0         |
| 10.117500       | 40.3             | 1000.0          | 9.000           | On     | N    | 10.0       | 19.7        | 60.0         |

### Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Meas. Time (ms) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.199500        | 44.5            | 1000.0          | 9.000           | On     | N    | 10.0       | 9.2         | 53.6         |
| 0.406500        | 33.7            | 1000.0          | 9.000           | On     | N    | 10.1       | 14.1        | 47.7         |
| 0.519000        | 30.3            | 1000.0          | 9.000           | On     | N    | 10.2       | 15.7        | 46.0         |
| 6.207000        | 34.0            | 1000.0          | 9.000           | On     | N    | 9.9        | 16.0        | 50.0         |
| 10.032000       | 35.6            | 1000.0          | 9.000           | On     | N    | 10.0       | 14.4        | 50.0         |
| 10.423500       | 33.7            | 1000.0          | 9.000           | On     | N    | 10.0       | 16.3        | 50.0         |

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## 3.2 Radiated Electric Field Emissions

### Test Date

2015-01-19 - 2015-01-22

### Test Location

☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)  
☒ 3 m SAC

### Test Equipment

| Name of Equipment           | Model No. | Manufacturer          | Serial No.    | Due Date   | Applied                             |
|-----------------------------|-----------|-----------------------|---------------|------------|-------------------------------------|
| EMI Test Receiver           | ESC17     | Rohde & Schwarz       | 100814        | 2015-12-05 | <input checked="" type="checkbox"/> |
| Bilog Antenna               | CBL6111C  | Schaffner             | 2551          | 2016-05-08 | <input checked="" type="checkbox"/> |
| 6dB Attenuator              | DNF       | Rohde & Schwarz       | 272.4110.50-2 | 2015-11-07 | <input checked="" type="checkbox"/> |
| Amplifier                   | 310       | Sonoma Instrument Co. | 291721        | 2015-02-06 | <input checked="" type="checkbox"/> |
| EMI Test Receiver           | ESC17     | Rohde & Schwarz       | 100816        | 2015-12-05 | <input checked="" type="checkbox"/> |
| Double Ridged Guide Antenna | 3117      | ETS-Lindgren          | 154525        | 2015-07-03 | <input checked="" type="checkbox"/> |
| Preamplifier                | 8449B     | Agilent Technologies  | 3008A02307    | 2015-12-26 | <input checked="" type="checkbox"/> |
| Signal Generator            | 8648A     | HP                    | 3847U02547    | 2015-05-13 | <input type="checkbox"/>            |
| Matching Pad                | RAM       | Rohde & Schwarz       | 100618        | 2015-05-15 | <input type="checkbox"/>            |
| Matching Pad                | 75Z-3G    | JFW                   | 1311          | 2015-02-21 | <input type="checkbox"/>            |
| TV-Test Transmitter         | SFQ       | Rohde & Schwarz       | 100547        | 2015-05-13 | <input checked="" type="checkbox"/> |
| MPEG2 Measurement Generator | DVG       | Rohde & Schwarz       | 100366        | N/A        | <input checked="" type="checkbox"/> |

### Test Software

TOYO EMI software Ver. 5.1.0

### Frequency Range of Measurement

☒ 30 MHz to 1 GHz  
☒ 1 GHz to 7 GHz

### Instrument Setting

☒ IF Band Width: 120 kHz (30 MHz to 1 GHz)  
☒ IF Band Width: 1 MHz (1 GHz to 7 GHz)

### Climate Condition

[Below 1 GHz]

Temperature: (24 ± 2) °C  
 Relative Humidity: (45 ± 1) %  
 Atmospheric Pressure: 99 kPa

[Above 1 GHz]

Temperature: (23 ± 2) °C  
 Relative Humidity: (42 ± 1) %  
 Atmospheric Pressure: 99 kPa

### Test Result

The requirements are: ☒ MET ☐ NOT MET

[Below 1 GHz]

| Frequency<br>(MHz) | Measured Data<br>(dBμV/m) | Margin<br>(dB) | Remark     |
|--------------------|---------------------------|----------------|------------|
| 593.999            | 40.4                      | 5.6            | Quasi-peak |

The Result is calculated by using the following formula;

- \* Result = Reading + Correction factor
- \* Correction factor = Antenna Factor + Cable Loss + 6 dB attenuator – Amp Gain

[Above 1 GHz]

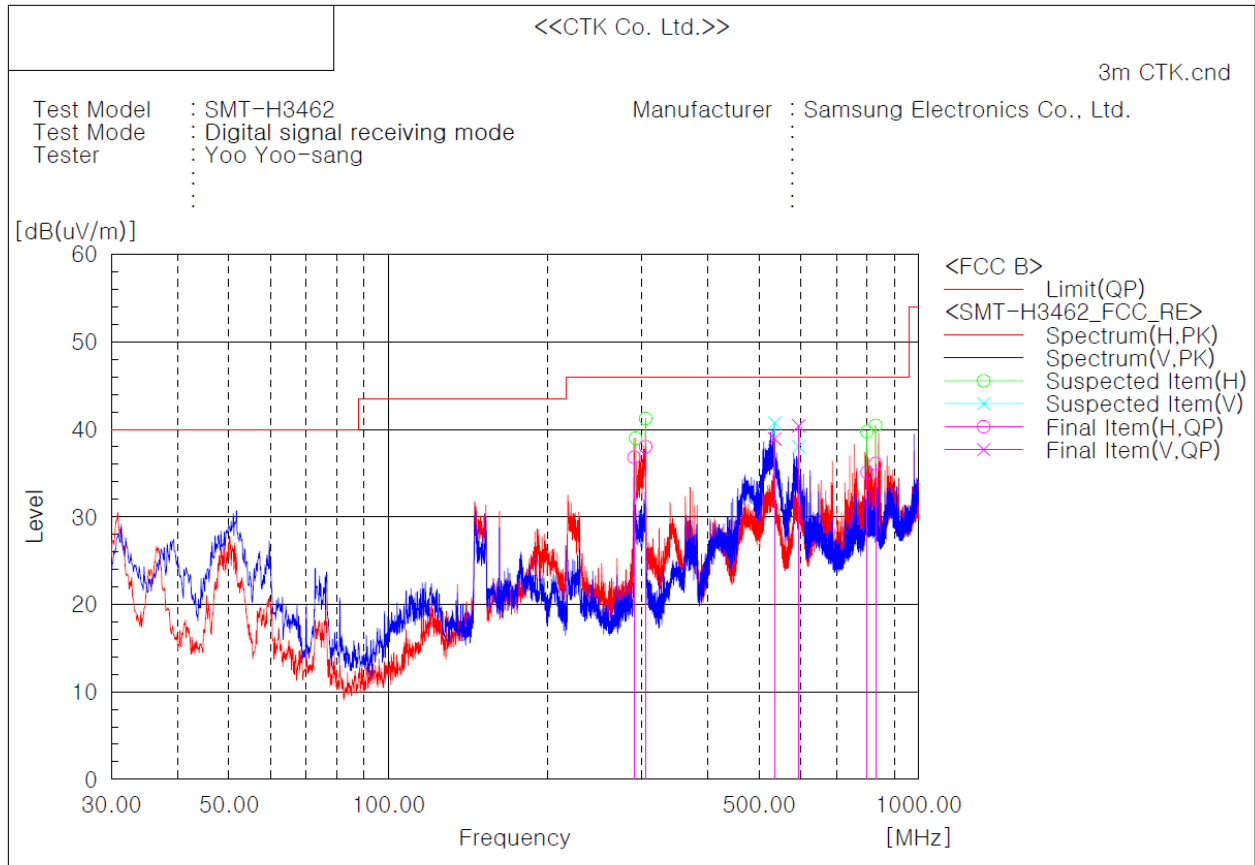
| Frequency<br>(MHz) | Measured Data<br>(dBμV/m) | Margin<br>(dB) | Remark     |
|--------------------|---------------------------|----------------|------------|
| 1 134.948          | 62.3                      | 11.7           | Quasi-peak |

The Result is calculated by using the following formula;

- \* Result = Reading + Correction factor
- \* Correction factor = Antenna Factor + Cable Loss– Amp Gain

## Test Data

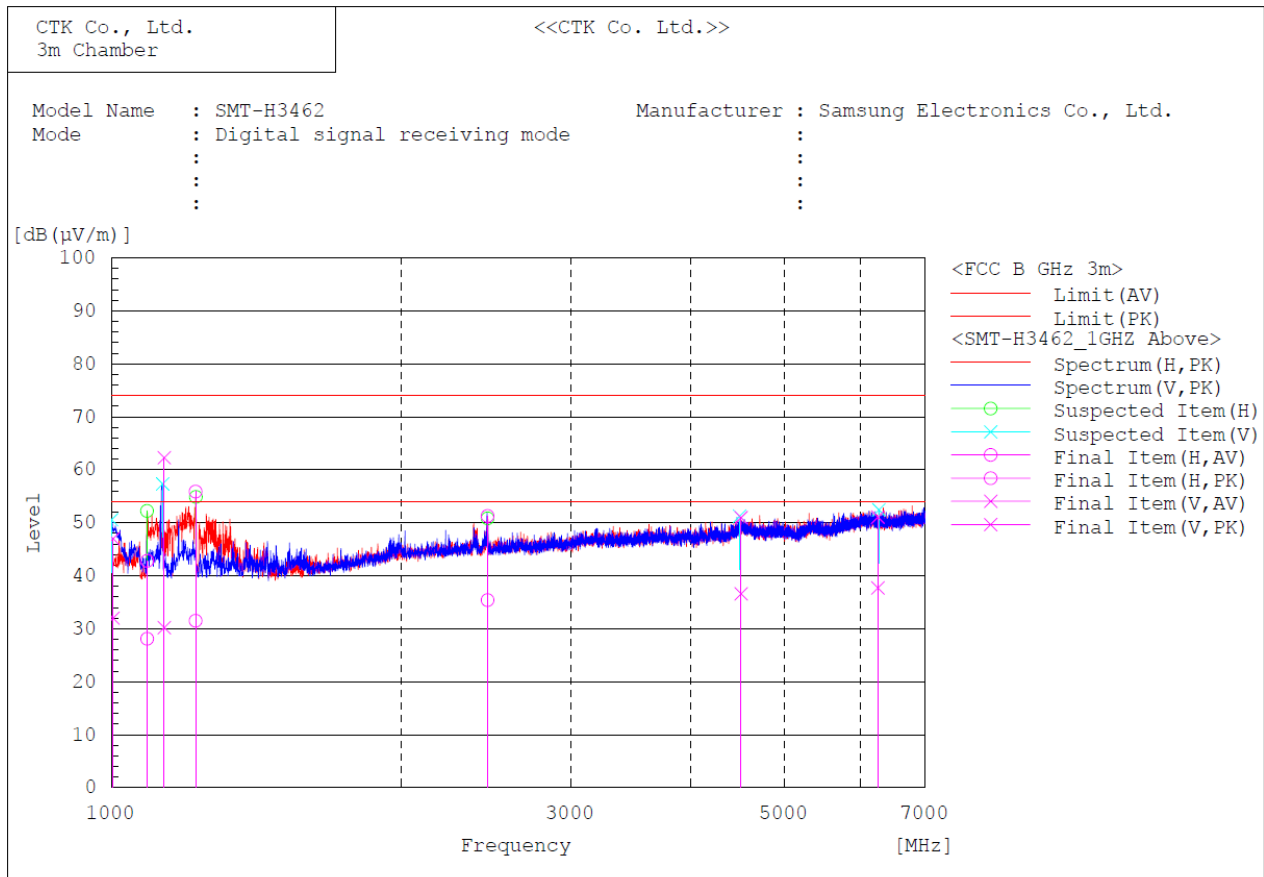
[Below 1 GHz]



### Final Result

| No. | Frequency [MHz] | (P) | Reading QP [dB(uV)] | c.f [dB(1/m)] | Result QP [dB(uV/m)] | Limit QP [dB(uV/m)] | Margin QP [dB] | Height [cm] | Angle [deg] |
|-----|-----------------|-----|---------------------|---------------|----------------------|---------------------|----------------|-------------|-------------|
| 1   | 290.651         | H   | 46.1                | -9.3          | 36.8                 | 46.0                | 9.2            | 100.0       | 201.0       |
| 2   | 305.653         | H   | 46.8                | -8.8          | 38.0                 | 46.0                | 8.0            | 100.0       | 201.0       |
| 3   | 535.079         | V   | 41.2                | -2.3          | 38.9                 | 46.0                | 7.1            | 100.0       | 158.0       |
| 4   | 593.999         | V   | 41.4                | -1.0          | 40.4                 | 46.0                | 5.6            | 100.0       | 121.0       |
| 5   | 799.801         | H   | 32.6                | 2.5           | 35.1                 | 46.0                | 10.9           | 100.0       | 164.0       |
| 6   | 829.886         | H   | 32.9                | 3.2           | 36.1                 | 46.0                | 9.9            | 100.0       | 51.0        |

[Above 1 GHz]



Final Result

| No. | Frequency [MHz] | (F) | Reading AV [dB(μV)] | Reading PK [dB(μV)] | c.f [dB(1/m)] | Result AV [dB(μV/m)] | Result PK [dB(μV/m)] | Limit AV [dB(μV/m)] | Limit PK [dB(μV/m)] | Margin AV [dB] | Margin PK [dB] | Height [cm] | Angle [°] |
|-----|-----------------|-----|---------------------|---------------------|---------------|----------------------|----------------------|---------------------|---------------------|----------------|----------------|-------------|-----------|
| 1   | 1004.171        | V   | 33.8                | 48.8                | -1.8          | 32.0                 | 47.0                 | 54.0                | 74.0                | 22.0           | 27.0           | 100.0       | 178.0     |
| 2   | 1089.610        | H   | 29.4                | 44.1                | -1.3          | 28.1                 | 42.8                 | 54.0                | 74.0                | 25.9           | 31.2           | 100.0       | 201.0     |
| 3   | 1134.948        | V   | 31.3                | 63.4                | -1.1          | 30.2                 | 62.3                 | 54.0                | 74.0                | 23.8           | 11.7           | 100.0       | 196.0     |
| 4   | 1223.350        | H   | 32.1                | 56.5                | -0.6          | 31.5                 | 55.9                 | 54.0                | 74.0                | 22.5           | 18.1           | 100.0       | 183.0     |
| 5   | 2459.515        | H   | 28.1                | 44.0                | 7.3           | 35.4                 | 51.3                 | 54.0                | 74.0                | 18.6           | 22.7           | 100.0       | 257.0     |
| 6   | 4508.748        | V   | 22.9                | 37.3                | 13.7          | 36.6                 | 51.0                 | 54.0                | 74.0                | 17.4           | 23.0           | 100.0       | 103.0     |
| 7   | 6253.300        | V   | 20.6                | 34.0                | 17.1          | 37.7                 | 51.1                 | 54.0                | 74.0                | 16.3           | 22.9           | 100.0       | 66.0      |

### 3.3 Antenna Power Conducted Emission

#### Test Date

2015-01-19

#### Test Location

Shield room

#### Test Equipment

| Name of Equipment           | Model No. | Manufacturer    | Serial No. | Due Date   | Applied                             |
|-----------------------------|-----------|-----------------|------------|------------|-------------------------------------|
| EMI Test Receiver           | ESU40     | Rohde & Schwarz | 100336     | 2015-05-15 | <input checked="" type="checkbox"/> |
| Siganl Generator            | 8648A     | HP              | 3847U02547 | 2015-05-13 | <input type="checkbox"/>            |
| Matching Pad                | RAM       | Rohde & Schwarz | 100618     | 2015-05-15 | <input checked="" type="checkbox"/> |
| Matching Pad                | 75Z-3G    | JFW             | 1311       | 2015-02-21 | <input type="checkbox"/>            |
| TV-Test Transmitter         | SFQ       | Rohde & Schwarz | 100547     | 2015-05-13 | <input checked="" type="checkbox"/> |
| MPEG2 Measurement Generator | DVG       | Rohde & Schwarz | 100366     | N/A        | <input checked="" type="checkbox"/> |
| POWER SPLITTER              | RVZ       | Rohde & Schwarz | 100251     | 2015-05-15 | <input checked="" type="checkbox"/> |

#### Frequency Range of Measurement

30 MHz to 7 GHz

#### Instrument Setting

IF Band Width: 120 kHz (30 MHz – 1 GHz)

IF Band Width: 1 MHz (1 GHz – 7 GHz)

#### Climate Condition

Temperature: (23 ± 1) °C

Relative Humidity: (41 ± 1) %

Atmospheric Pressure: 99 kPa

#### Test Result

The requirements are: ☒ MET ☐ NOT MET

## Test Data

| System                   | Test Frequency [MHz] | Local Oscillator Frequency [MHz] | Limits [dBμV] | Total Loss [dB] | Reading [dBμV] | Result [dBμV] | Margin [dB] |
|--------------------------|----------------------|----------------------------------|---------------|-----------------|----------------|---------------|-------------|
| Local Oscillator (J83.B) | 453                  | Fundamental                      | 496.75        | 51.8            | 13.5           | 13.7          | 24.6        |
|                          |                      | Harmonics                        | 993.50        | 51.8            | 14.0           | 16.8          | 21.0        |
|                          |                      |                                  | 1490.25       | 51.8            | 14.1           | 16.0          | 21.7        |
|                          |                      |                                  | 1987.00       | 51.8            | 14.4           | 17.2          | 20.2        |
|                          |                      |                                  | 2483.75       | 51.8            | 14.4           | 15.8          | 21.6        |
|                          |                      |                                  | 2980.50       | 51.8            | 14.4           | 19.5          | 17.9        |
|                          |                      |                                  | 3477.25       | 51.8            | 14.1           | 21.1          | 16.6        |
|                          |                      |                                  | 3974.00       | 51.8            | 14.7           | 23.0          | 14.1        |
|                          |                      |                                  | 4470.75       | 51.8            | 15.0           | 21.7          | 15.1        |
|                          |                      |                                  | 4967.50       | 51.8            | 15.6           | 21.8          | 14.4        |
|                          |                      |                                  | 5464.25       | 51.8            | 15.9           | 21.1          | 14.8        |
|                          |                      |                                  | 5961.00       | 51.8            | 16.0           | 22.3          | 13.5        |
|                          |                      |                                  | 6457.75       | 51.8            | 16.4           | 21.7          | 13.7        |
|                          |                      |                                  | 6954.50       | 51.8            | 18.7           | 21.6          | 11.5        |

\* Total loss = Matching Pad Loss + Cable Loss + Power Splitter loss

### 3.4 Output and Spurious Conducted Level

#### Test Date

Not applicable

#### Test Location

Shielded Room

#### Test Equipment

| Name of Equipment | Model No. | Manufacturer    | Serial No. | Due Date   | Applied                  |
|-------------------|-----------|-----------------|------------|------------|--------------------------|
| EMI Test Receiver | ESU40     | Rohde & Schwarz | 100336     | 2015-05-15 | <input type="checkbox"/> |

#### Frequency Range of Measurement

30 MHz to 1 GHz

#### Instrument Settings

IF Band Width: 120 kHz

#### Climate Condition

Temperature:

Relative Humidity:

Atmospheric Pressure:

#### Test Procedures

The Output signal level is the maximum voltage level present at the output terminals of the EUT on a particular frequency during normal use of the device.

Measurements were made by direct connection to the spectrum analyzer and EUT with proper impedance matching.

The Cable was supported between the EUT and the measuring instrument in a straight horizontal line so it had at least 75 cm clearance from any conducting surface.

The EUT was provided with a typical signal consistent with normal operation. For each channel on which the device operates and in each mode in which the device operates, the video carrier level, audio carrier level and the spurious emissions over the frequency range was measured and recorded.

#### Test Result

The requirements are: ☐ MET ☐ NOT MET

#### Test Data

### 3.5 Antenna Transfer Switch

**Test Date**

**Not Applicable**

**Test Location**

Shielded Room

**Test Equipment**

| Name of Equipment | Model No. | Manufacturer    | Serial No. | Due Date   | Applied                  |
|-------------------|-----------|-----------------|------------|------------|--------------------------|
| EMI Test Receiver | ESU40     | Rohde & Schwarz | 100336     | 2015-05-15 | <input type="checkbox"/> |

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Climate Condition**

Temperature:

Relative Humidity:

Atmospheric Pressure:

**Test Procedures**

The isolation of a cable TV antenna transfer switch shall be measured on the following frequencies: 54, 100, 150, 200, 250, 300, 350, 400, 450, 500 and 550 MHz.

If the device or switch is equipped with more than two antenna input ports or terminals, repeat the following procedure until isolation for each pair of input ports has been measured.

The cable TV antenna transfer switch isolation, expressed in decibels, is the difference between the level of a signal going into the port that is used for cable TV input to the switch and the level of the same signal coming out of an antenna input port of the transfer switch.

Be sure to compare emission levels of the same frequency.

The signal levels are expressed in decibel units.

**Test Result**

The requirements are: ☐ MET ☐ NOT MET

**Test Data**

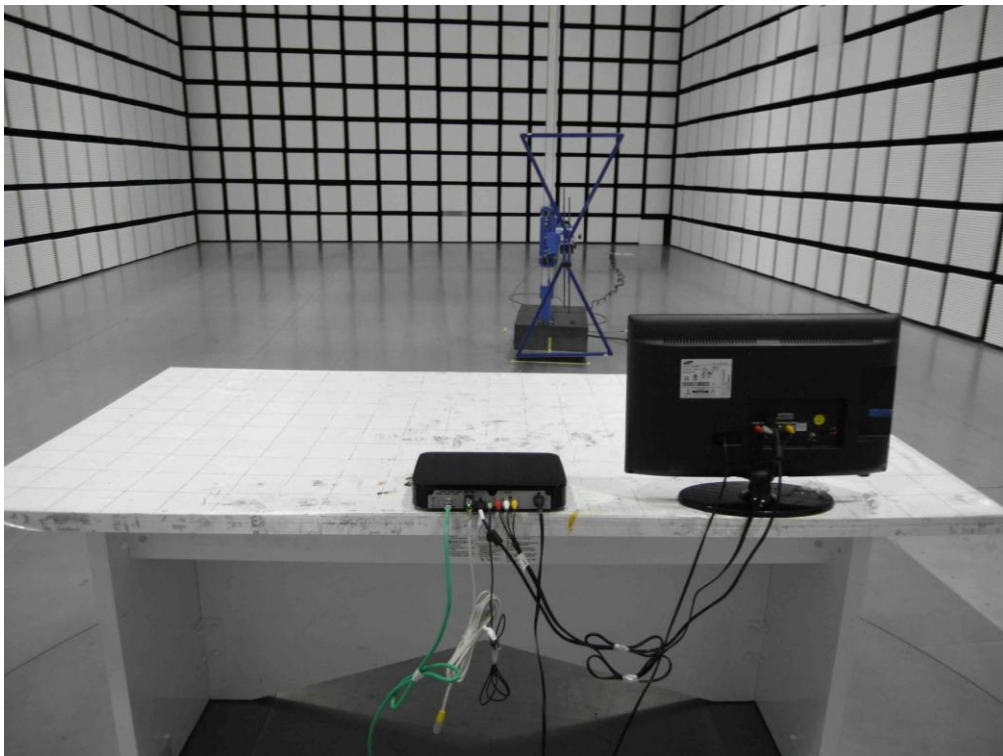
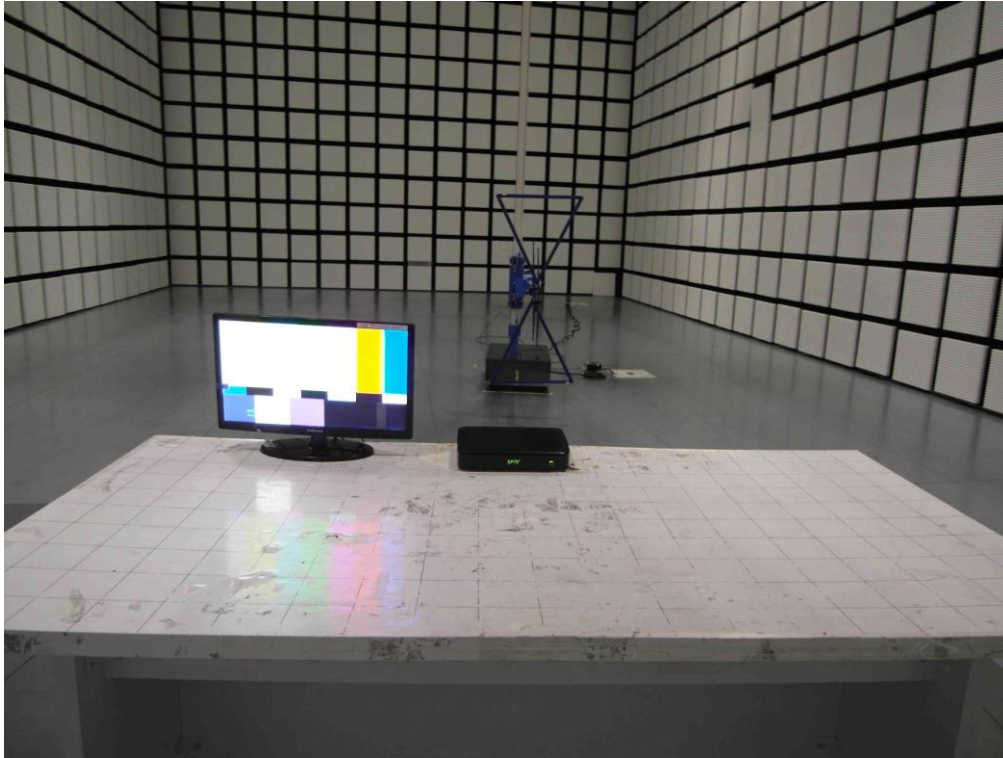
|                                                                                                                                                                       |                                                                                                                                                          |                                                                         |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  <p><b>CTK Co., Ltd.</b><br/>The Prime Leader of Global Regulatory Certification</p> | <p><b>CTK Co., Ltd.</b><br/>(Ho-dong), 113, Yejik-ro, Cheoin-gu,<br/>Yongin-si, Gyeonggi-do, Korea<br/>Tel: +82-31-339-9970<br/>Fax: +82-31-624-9501</p> | <p>Certificate No.:<br/>CTK-K-2015-00020<br/>Page (25) / (33) Pages</p> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## APPENDIX A - Test Setup Photos and Configuration

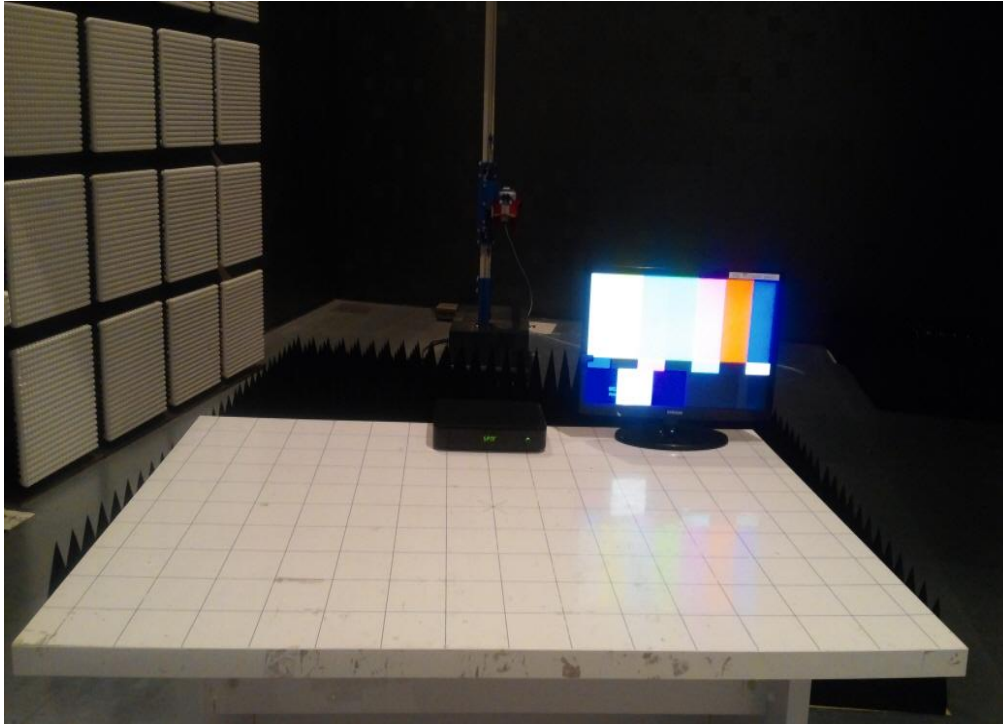
## Conducted Voltage Emissions of Mains Ports



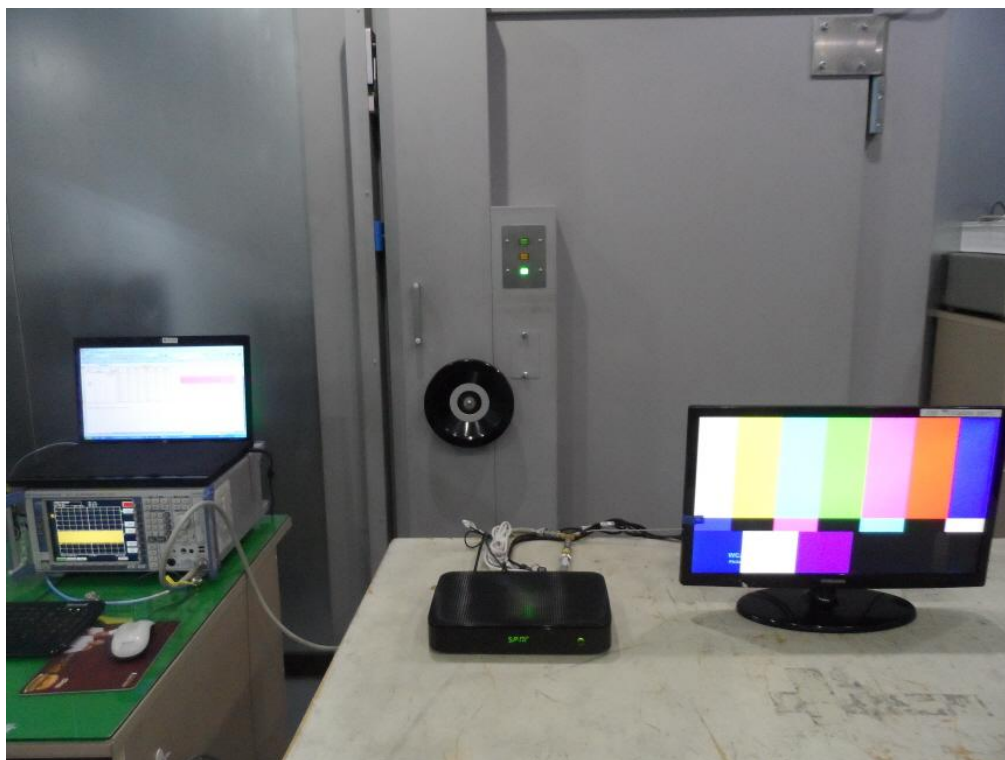
## Radiated Electric Field Emissions (Below 1 GHz)



## Radiated Electric Field Emissions (Above 1 GHz)



## Antenna Power Conducted Emission



|                                                                                                                                                                       |                                                                                                                                                          |                                                                         |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## Output and Spurious Conducted Level

*Not Applicable*

|                                                                                                                                                                       |                                                                                                                                                          |                                                                         |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

## Antenna Transfer Switch

*Not Applicable*

|                                                                                                                                                                       |                                                                                                                                                          |                                                                         |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
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## APPENDIX B – EUT Photographs

## EUT External Photographs

