

**DIGITAL EMC CO., LTD.**

683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

Tel: +82-31-321-2664 Fax: +82-31-321-1664

<http://www.digitalemcc.com>**CERTIFICATION OF COMPLIANCE****LG Electronics USA.**1000 Sylvan Avenue Englewood Cliffs, New Jersey,  
United States

Dates of Tests: October 19 ~ 23, 2009

Test Report S/N: DR50110911Z

Test Site : DIGITAL EMC CO., LTD.

FCC ID

**BEJLAFP10-R**

APPLICANT

**LG Electronics USA.**

|                                  |          |                                                           |
|----------------------------------|----------|-----------------------------------------------------------|
| <b>Purpose</b>                   | <b>:</b> | <b>Original Grant</b>                                     |
| <b>FCC Equipment Class</b>       | <b>:</b> | <b>Part 15 Low Power Transmitter Below 1705 kHz (DCD)</b> |
| <b>Device name</b>               | <b>:</b> | <b>Fingerprint Identification System</b>                  |
| <b>Manufacturer</b>              | <b>:</b> | <b>LG Electronics Inc</b>                                 |
| <b>FCC ID</b>                    | <b>:</b> | <b>BEJLAFP10-R</b>                                        |
| <b>Model name</b>                | <b>:</b> | <b>LAFP10-R</b>                                           |
| <b>Test Device Serial number</b> | <b>:</b> | <b>Identical prototype</b>                                |
| <b>FCC Rule Part(s)</b>          | <b>:</b> | <b>FCC Part 15.209 Subpart C</b>                          |
|                                  |          | <b>ANSI C63.4-2003</b>                                    |
| <b>Data of issue</b>             | <b>:</b> | <b>November 25, 2009</b>                                  |

***The Test results relate only to the tested sample. It is not allowed to copy this report even partly without the allowance of DIGITAL EMC CO., LTD.***

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## 1. General information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.

Address: 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

<http://www.digitalemc.com> E-mail: [Harveysung@digitalemc.com](mailto:Harveysung@digitalemc.com)

Tel: +82-31-321-2664 Fax: +82-31-321-1664

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".

**Tested by: Engineer**

November 25, 2009

B.G. HAN

Date

Name

Signature

**Reviewed by: Manager**

November 25, 2009

W.J. LEE

Date

Name

Signature

### **Applicant:**

Company name : LG Electronics USA.

Address : 1000 Sylvan Avenue Englewood Cliffs, New Jersey, United States

Date of order : September 11, 2009

## 2. Equipment information

### BEJLAFP10-R

#### 2.1 Equipment description

|                      |                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------|
| Equipment model no.  | LAFP10-R                                                                                                   |
| Equipment serial no. | Identical prototype                                                                                        |
| Type of equipment    | Fingerprint Identification System                                                                          |
| Frequency band       | 125 kHz                                                                                                    |
| Type of Modulation   | ASK                                                                                                        |
| Power                | DC 12.0V                                                                                                   |
| Type of antenna      | <input checked="" type="checkbox"/> Internal Type: Loop Antenna<br><input type="checkbox"/> External Type: |



#### 2.2 Ancillary equipment

| Equipment     | Model No.       | Serial No.     | Manufacturer      | Note |
|---------------|-----------------|----------------|-------------------|------|
| AC/DC Adapter | JPW128KA1200F03 | 82-31-299-1234 | BridgePower Corp. | -    |
| -             | -               | -              | -                 | -    |

### 3. Information about test items

#### BEJLAFP10-R

#### 3.1 Tested frequency

| Frequency                   | TX      | RX      |
|-----------------------------|---------|---------|
| Frequency band of operation | 125 kHz | 125 kHz |

#### 3.2 Tested environment

|                           |   |              |
|---------------------------|---|--------------|
| Temperature               | : | 15 ~ 35 (°C) |
| Relative humidity content | : | 20 ~ 75 %    |
| Air pressure              | : | 86 ~ 103 kPa |
| Details of power supply   | : | AC 120V 60Hz |

#### 3.3 Test mode

|           |                              |
|-----------|------------------------------|
| Test mode | Continuous Transmission Mode |
|-----------|------------------------------|

#### 3.4 Auxiliary equipment

| Equipment | Model No. | Serial No. | Manufacturer | Note |
|-----------|-----------|------------|--------------|------|
| -         | -         | -          | -            | -    |
| -         | -         | -          | -            | -    |

#### 3.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing

→ None

## 4. Test Report

### 4.1 Summary of tests

| FCC Part<br>Section(s)                                                                                                                                                                                               | Parameter              | Test Condition    | Status<br>Note 1 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|------------------|
| <b>I. Test Items</b>                                                                                                                                                                                                 |                        |                   |                  |
| 2.1049                                                                                                                                                                                                               | 20 dB Bandwidth        | Radiated          | <b>C</b>         |
| 15.209<br>15.205                                                                                                                                                                                                     | Radiated Emission      |                   | <b>C</b>         |
| 15.207                                                                                                                                                                                                               | AC Conducted Emissions | AC Line Conducted | <b>C</b>         |
| 15.203                                                                                                                                                                                                               | Antenna Requirements   | -                 | <b>C</b>         |
| <p>Note 1: <b>C</b>=Comply    <b>NC</b>=Not Comply    <b>NT</b>=Not Tested    <b>NA</b>=Not Applicable</p> <p>Note 2: The JBP(Computing device peripheral) portion was tested and approved by FCC DoC procedure.</p> |                        |                   |                  |

The sample was tested according to the following specification:

ANSI C-63.4-2003

## 4.2 Transmitter requirements

### 4.2.1 20 dB Bandwidth

#### - Procedure:

The 20dB Bandwidth is measured with a spectrum analyzer connected via a receive antenna placed near the EUT while the EUT is operating in transmission mode.

The spectrum analyzer is set to:

Span = approximately 2 or 3 times of the 20 dB bandwidth

RBW = 1% of the span 20 dB bandwidth or more

Sweep = auto

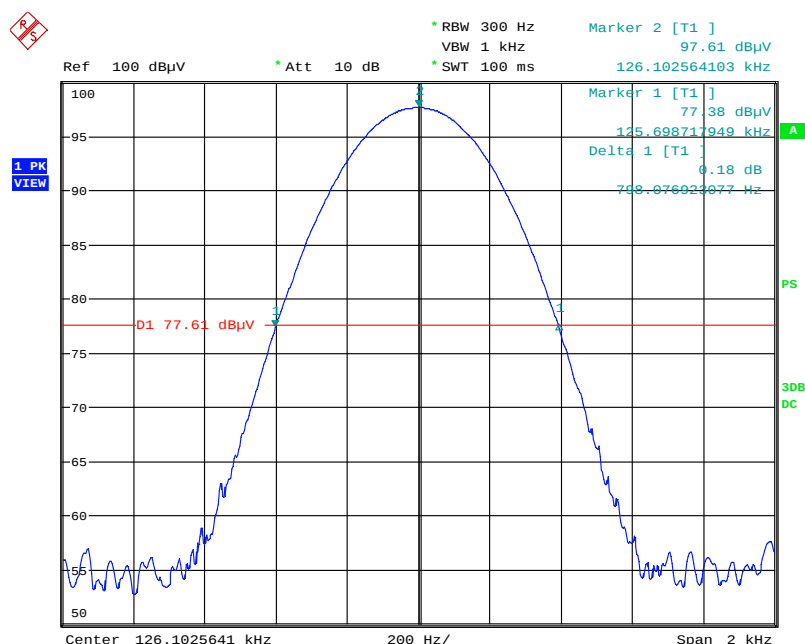
VBW =  $\geq$  RBW

Detector function = peak

Trace = max hold

#### - Measurement Data: **Comply**

| Tested Frequency(kHz) | Test Result(kHz) |
|-----------------------|------------------|
| 125                   | 0.798            |



Date: 21.OCT.2009 01:22:30

#### - Minimum Standard:

None

## 4.2.2 Field Strength of Fundamental

### - Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Tested frequency = Fundamental Frequency

RBW and VBW = RBW: 200 Hz & VBW:  $\geq$  RBW

Detector function = Average mode Sweep = auto

Trace = max hold

### - Measurement Data: **Comply**

| Frequency [MHz] | Reading [dBuV] | Detect Mode | Ant Pol. | T.F [dB/m] | Field Strength @ 3m [dBuV/m] | Field Strength @ 300m [dBuV/m] | Limit [dBuV/m] | Margin [dB] |
|-----------------|----------------|-------------|----------|------------|------------------------------|--------------------------------|----------------|-------------|
| 0.125           | 97.60          | AV          | V        | -10.69     | 86.91                        | 6.91                           | 25.67          | 18.76       |

Note 1. This test item was performed at 3m and the data were extrapolated to the specified measurement distance of 300m using the square of an inverse linear distance extrapolation factor (80 dB/decade).

▪ Extrapolation Factor =  $20 \log_{10}(300/3)^2 = 80\text{dB}$

Note 2. 300m Limit(dBuV/m) =  $20\log(2400/F_{\text{(kHz)}})$   
 $= 20\log(2400/125)$   
 $= 25.67$

Note 3. Sample Calculation.

Margin = Limit – Field Strength @ 300m / Field Strength @ 300m = Field Strength @ 3m – 80

Field Strength @ 3m = Reading + T.F / T.F = AF + CL – AG

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

### - Minimum Standard: FCC Part 15.209

| Frequency (MHz) | Limit (uV/m)  | Measurement Distance(m) |
|-----------------|---------------|-------------------------|
| 0.009 ~ 0.490   | 2400 / F(kHz) | 300                     |

### 4.2.3 Radiated Spurious Emissions

#### - Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Tested frequency = 125KHz

RBW and VBW = 1. Frequency range: 9kHz ~ 150 kHz  
RBW = 200 Hz / VBW =  $\geq$  RBW  
2. Frequency range: 150kHz ~ 30MHz  
RBW = 9 kHz / VBW =  $\geq$  RBW  
3. Frequency range: 30M ~ 1GHz  
RBW = 120 kHz / VBW =  $\geq$  RBW

- Measurement Data: **Comply** (Refer to the next pages)

#### - Minimum Standard:

##### ▪ FCC Part 15.209(a) and (b)

| Frequency (MHz) | Limit (uV/m)   | Measurement Distance(m) |
|-----------------|----------------|-------------------------|
| 0.009 ~ 0.490   | 2400 / F(kHz)  | 300                     |
| 0.490 ~ 1.705   | 24000 / F(kHz) | 30                      |
| 1.705 ~ 30.0    | 30             | 30                      |
| 30 ~ 88         | 100 **         | 3                       |
| 88 ~ 216        | 150 **         | 3                       |
| 216 ~ 960       | 200 **         | 3                       |
| Above 960       | 500            | 3                       |

\*\* Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

##### ▪ FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

| MHz               | MHz                 | MHz                   | MHz             | GHz            | GHz           |
|-------------------|---------------------|-----------------------|-----------------|----------------|---------------|
| 0.009 ~ 0.110     | 8.37625 ~ 8.38675   | 73 ~ 74.6             | 399.90 ~ 410    | 2.655 ~ 2.900  | 10.6 ~ 12.7   |
| 0.495 ~ 0.505     | 8.41425 ~ 8.41475   | 74.8 ~ 75.2           | 608 ~ 614       | 3.260 ~ 3.267  | 13.25 ~ 13.4  |
| 2.1735 ~ 2.1905   | 12.29 ~ 12.293      | 108 ~ 121.94          | 960 ~ 1240      | 3.332 ~ 3.339  | 14.47 ~ 14.5  |
| 4.125 ~ 4.128     | 12.51975 ~ 12.52025 | 123 ~ 138             | 1300 ~ 1427     | 3.3458 ~ 3.358 | 15.35 ~ 16.2  |
| 4.17725 ~ 4.17775 | 12.57675 ~ 12.57725 | 149.9 ~ 150.05        | 1435 ~ 1626.5   | 3.6 ~ 4.4      | 17.7 ~ 21.4   |
| 4.20725 ~ 4.20775 | 13.36 ~ 13.41       | 156.52475 ~ 156.52525 | 1645.5 ~ 1646.5 | 4.5 ~ 5.15     | 22.01 ~ 23.12 |
| 6.215 ~ 6.218     | 16.42 ~ 16.423      | 156.7 ~ 156.9         | 1660 ~ 1710     | 5.35 ~ 5.46    | 23.6 ~ 24.0   |
| 6.26775 ~ 6.26825 | 16.69475 ~ 16.69525 | 162.0125 ~ 167.17     | 1718.8 ~ 1722.2 | 7.25 ~ 7.75    | 31.2 ~ 31.8   |
| 6.31175 ~ 6.31225 | 16.80425 ~ 16.80475 | 167.72 ~ 173.2        | 2200 ~ 2300     | 8.025 ~ 8.5    | 36.43 ~ 36.5  |
| 8.291 ~ 8.294     | 25.5 ~ 25.67        | 240 ~ 285             | 2310 ~ 2390     | 9.0 ~ 9.2      | Above 38.6    |
| 8.362 ~ 8.366     | 37.5 ~ 38.25        | 322 ~ 335.4           | 2483.5 ~ 2500   | 9.3 ~ 9.5      |               |

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

**- Measurement Data:**

Tested Frequency : 125 kHz  
 Measurement Distance : 3 Meters

| Frequency [MHz] | Reading [dBuV] | Detect Mode | ANT Pol. | T.F [dB/m] | Field Strength @3m [dBuV/m] | Distance Factor [dB] | Field Strength @30m [dBuV/m] | Field Strength @300m [dBuV/m] | Limit [dBuV/m] | Margin [dB] |
|-----------------|----------------|-------------|----------|------------|-----------------------------|----------------------|------------------------------|-------------------------------|----------------|-------------|
| 0.195           | 59.44          | AV          | V        | -10.84     | 48.60                       | 80.00                | -                            | -31.40                        | 123.08         | 154.48      |
| 0.378           | 61.10          | AV          | V        | -11.21     | 49.89                       | 80.00                | -                            | -30.11                        | 63.49          | 93.60       |
|                 |                |             |          |            |                             |                      |                              |                               |                |             |
|                 |                |             |          |            |                             |                      |                              |                               |                |             |

Note 1. All measurements were recorded using a spectrum analyzer employing a Quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz.

Therefore three bands are based on measurements employing an average detector.

Note 2. Both Vertical and Horizontal polarities of the receiver antenna were evaluated with the worst case emissions being reported.

Note 3. Sample Calculation.

Margin = Limit – Field Strength / T.F = AF + CL – AG

Distance factor =  $20\log(\text{Measurement distance} / \text{The measured distance})^2$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

## 4.2.4 AC Line Conducted Emissions

### - Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak and average detector mode with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

### - Measurement Data: **Comply**

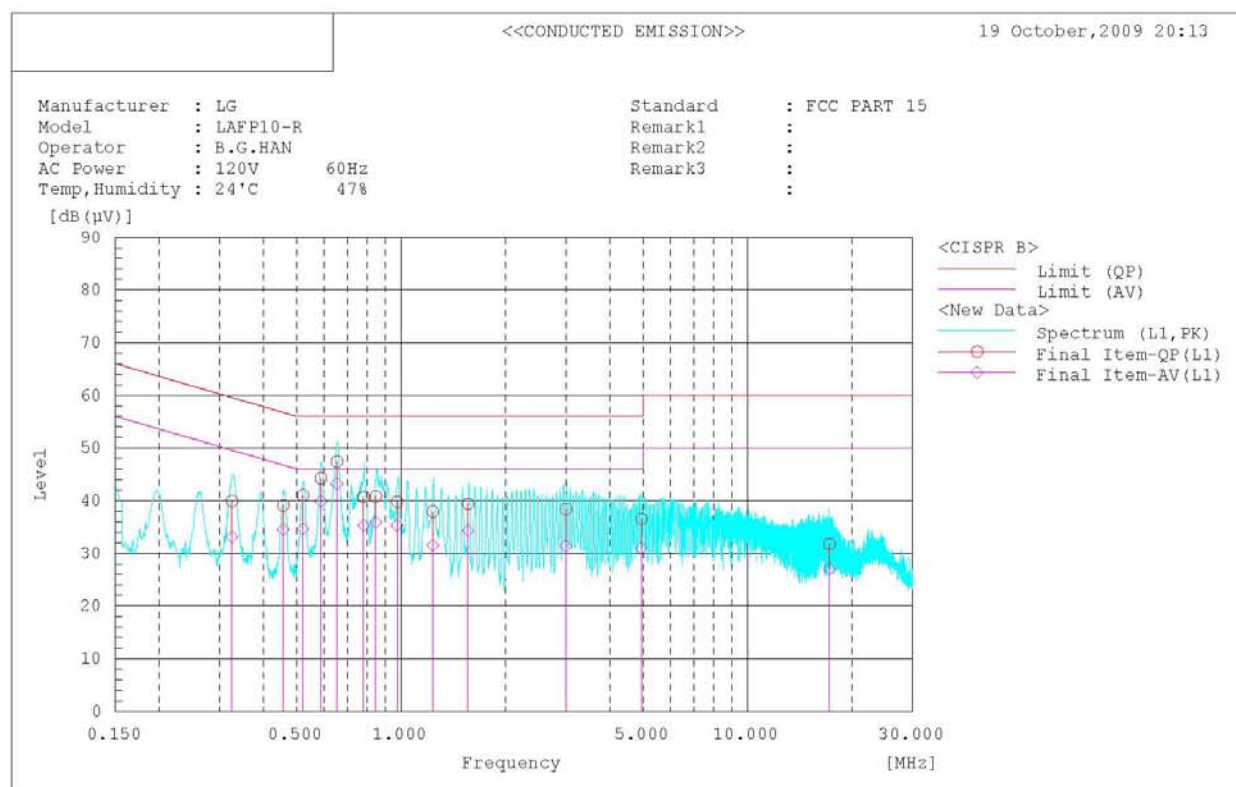
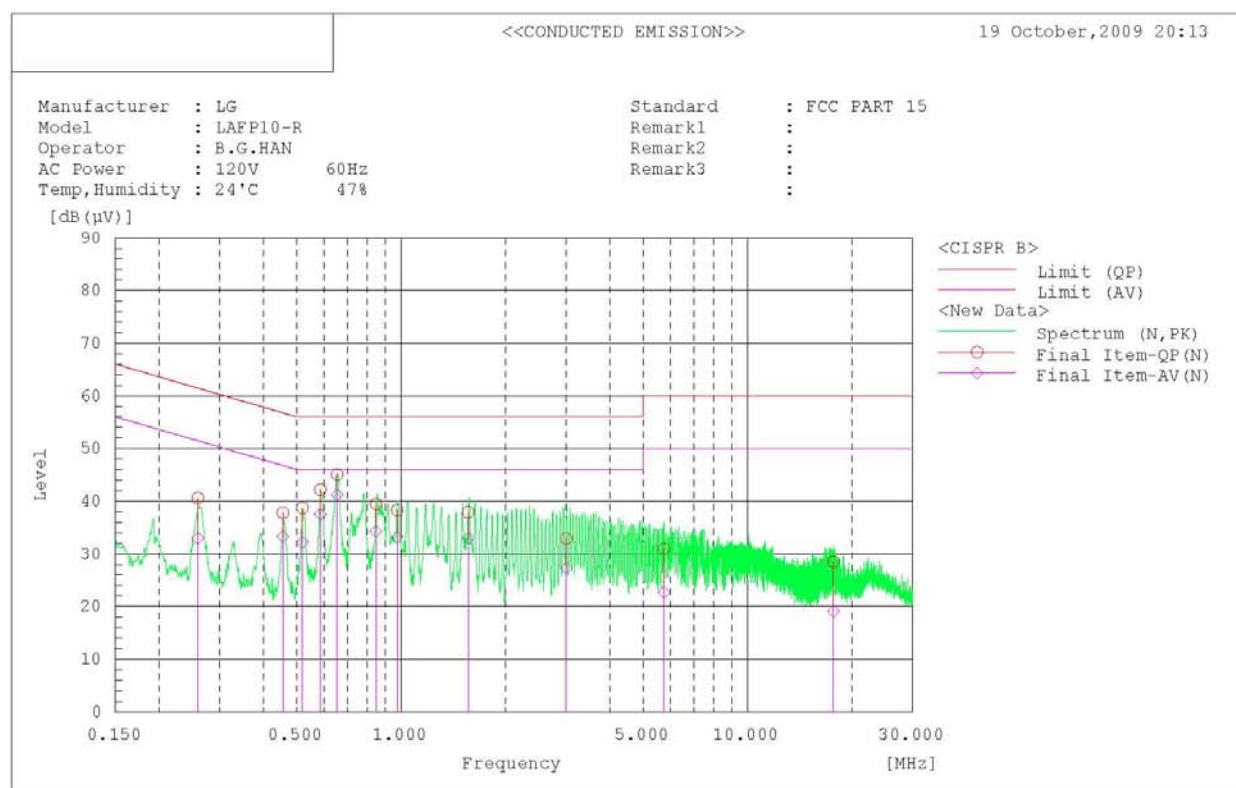
### - Minimum Standard: FCC Part 15.207(a)/EN 55022

| Frequency Range<br>(MHz) | Conducted Limit (dBuV) |            |
|--------------------------|------------------------|------------|
|                          | Quasi-Peak             | Average    |
| 0.15 ~ 0.5               | 66 to 56 *             | 56 to 46 * |
| 0.5 ~ 5                  | 56                     | 46         |
| 5 ~ 30                   | 60                     | 50         |

\* Decreases with the logarithm of the frequency

# AC Line Conducted Emissions

## Graph



## AC Line Conducted Emissions

## Data List

<<CONDUCTED EMISSION>>

19 October, 2009 20:13

Standard : FCC PART 15

Manufacturer : LG

Model : LAFP10-R

Operator : B.G.HAN

AC Power : 120V 60Hz

Temp, Humidity : 24°C 47%

Remark1 :

Remark2 :

Remark3 :

Final Result

--- N Phase ---

| No. | Frequency | Reading<br>QP | Reading<br>AV | c.f  | Result<br>QP | Result<br>AV | Limit<br>QP | Limit<br>AV | Margin<br>QP | Margin<br>AV | Remark |
|-----|-----------|---------------|---------------|------|--------------|--------------|-------------|-------------|--------------|--------------|--------|
|     | [MHz]     | [dB(μV)]      | [dB(μV)]      | [dB] | [dB(μV)]     | [dB(μV)]     | [dB(μV)]    | [dB(μV)]    | [dB]         | [dB]         |        |
| 1   | 0.259     | 40.5          | 32.9          | 0.1  | 40.6         | 33.0         | 61.5        | 51.5        | 20.9         | 18.5         |        |
| 2   | 0.456     | 37.6          | 33.1          | 0.2  | 37.8         | 33.3         | 56.8        | 46.8        | 19.0         | 13.5         |        |
| 3   | 0.519     | 38.6          | 32.1          | 0.1  | 38.7         | 32.2         | 56.0        | 46.0        | 17.3         | 13.8         |        |
| 4   | 0.585     | 42.1          | 37.4          | 0.1  | 42.2         | 37.5         | 56.0        | 46.0        | 13.8         | 8.5          |        |
| 5   | 0.654     | 45.0          | 41.1          | 0.1  | 45.1         | 41.2         | 56.0        | 46.0        | 10.9         | 4.8          |        |
| 6   | 0.847     | 39.4          | 34.2          | 0.1  | 39.5         | 34.3         | 56.0        | 46.0        | 16.5         | 11.7         |        |
| 7   | 1.562     | 37.7          | 32.8          | 0.2  | 37.9         | 33.0         | 56.0        | 46.0        | 18.1         | 13.0         |        |
| 8   | 0.975     | 38.2          | 33.1          | 0.1  | 38.3         | 33.2         | 56.0        | 46.0        | 17.7         | 12.8         |        |
| 9   | 2.999     | 32.7          | 27.1          | 0.2  | 32.9         | 27.3         | 56.0        | 46.0        | 23.1         | 18.7         |        |
| 10  | 5.738     | 30.6          | 22.4          | 0.3  | 30.9         | 22.7         | 60.0        | 50.0        | 29.1         | 27.3         |        |
| 11  | 17.698    | 27.4          | 18.0          | 1.1  | 28.5         | 19.1         | 60.0        | 50.0        | 31.5         | 30.9         |        |

--- L1 Phase ---

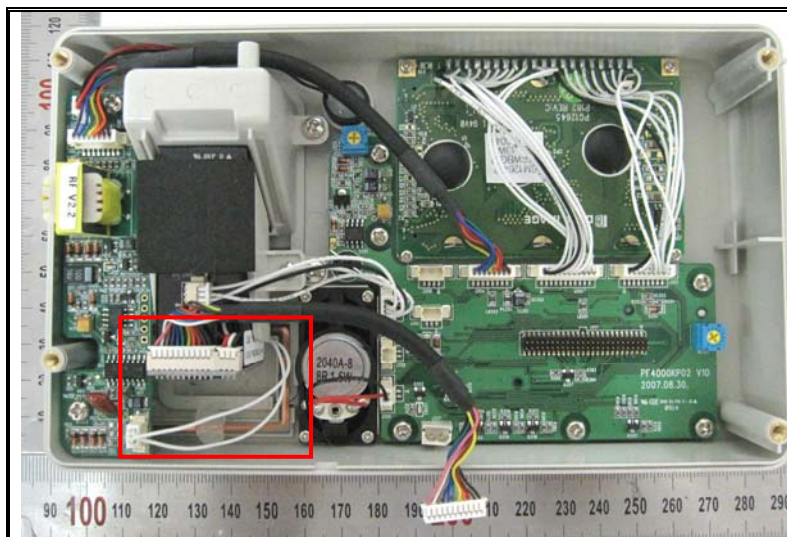
| No. | Frequency | Reading<br>QP | Reading<br>AV | c.f  | Result<br>QP | Result<br>AV | Limit<br>QP | Limit<br>AV | Margin<br>QP | Margin<br>AV | Remark |
|-----|-----------|---------------|---------------|------|--------------|--------------|-------------|-------------|--------------|--------------|--------|
|     | [MHz]     | [dB(μV)]      | [dB(μV)]      | [dB] | [dB(μV)]     | [dB(μV)]     | [dB(μV)]    | [dB(μV)]    | [dB]         | [dB]         |        |
| 1   | 0.325     | 39.5          | 32.7          | 0.4  | 39.9         | 33.1         | 59.6        | 49.6        | 19.7         | 16.5         |        |
| 2   | 0.457     | 38.7          | 34.1          | 0.4  | 39.1         | 34.5         | 56.7        | 46.7        | 17.6         | 12.2         |        |
| 3   | 0.521     | 40.5          | 34.2          | 0.5  | 41.0         | 34.7         | 56.0        | 46.0        | 15.0         | 11.3         |        |
| 4   | 0.587     | 43.7          | 39.4          | 0.5  | 44.2         | 39.9         | 56.0        | 46.0        | 11.8         | 6.1          |        |
| 5   | 0.653     | 46.9          | 42.7          | 0.5  | 47.4         | 43.2         | 56.0        | 46.0        | 8.6          | 2.8          |        |
| 6   | 0.780     | 40.2          | 34.8          | 0.5  | 40.7         | 35.3         | 56.0        | 46.0        | 15.3         | 10.7         |        |
| 7   | 0.845     | 40.3          | 35.4          | 0.5  | 40.8         | 35.9         | 56.0        | 46.0        | 15.2         | 10.1         |        |
| 8   | 0.975     | 39.3          | 34.8          | 0.5  | 39.8         | 35.3         | 56.0        | 46.0        | 16.2         | 10.7         |        |
| 9   | 1.236     | 37.4          | 31.0          | 0.5  | 37.9         | 31.5         | 56.0        | 46.0        | 18.1         | 14.5         |        |
| 10  | 1.561     | 38.9          | 33.8          | 0.5  | 39.4         | 34.3         | 56.0        | 46.0        | 16.6         | 11.7         |        |
| 11  | 2.993     | 37.8          | 30.8          | 0.6  | 38.4         | 31.4         | 56.0        | 46.0        | 17.6         | 14.6         |        |
| 12  | 4.945     | 35.8          | 30.3          | 0.7  | 36.5         | 31.0         | 56.0        | 46.0        | 19.5         | 15.0         |        |
| 13  | 17.241    | 30.4          | 25.7          | 1.4  | 31.8         | 27.1         | 60.0        | 50.0        | 28.2         | 22.9         |        |

## 4.2.5 Antenna Requirements

### - Procedure:

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

### - Conclusion: **Comply**



### - Minimum Standard:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

# APPENDIX

## TEST EQUIPMENT FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

|                                     | Type                                    | Manufacturer       | Model                           | Cal.Due.Date<br>(dd/mm/yy) | Next.Due.Date<br>(dd/mm/yy) | S/N                    |
|-------------------------------------|-----------------------------------------|--------------------|---------------------------------|----------------------------|-----------------------------|------------------------|
| <input type="checkbox"/>            | Spectrum Analyzer                       | Agilent            | E4440A                          | 25/09/09                   | 25/09/10                    | MY45304199             |
| <input type="checkbox"/>            | Spectrum Analyzer                       | Rohde Schwarz      | FSQ26                           | 05/06/09                   | 05/06/10                    | 200445                 |
| <input type="checkbox"/>            | Spectrum Analyzer(RE)                   | H.P                | 8563E                           | 13/10/09                   | 13/10/10                    | 3551A04634             |
| <input type="checkbox"/>            | Power Meter                             | H.P                | EMP-442A                        | 02/07/09                   | 02/07/10                    | GB37170413             |
| <input type="checkbox"/>            | Power Sensor                            | H.P                | 8481A                           | 02/07/09                   | 02/07/10                    | 3318A96332             |
| <input type="checkbox"/>            | Power Divider                           | Agilent            | 11636B                          | 13/10/09                   | 13/10/10                    | 56471                  |
| <input type="checkbox"/>            | Power Splitter                          | Anritsu            | K241B                           | 13/10/09                   | 13/10/10                    | 20611                  |
| <input type="checkbox"/>            | Power Splitter                          | Anritsu            | K241B                           | 02/07/09                   | 02/07/10                    | 017060                 |
| <input type="checkbox"/>            | Frequency Counter                       | H.P                | 5342A                           | 13/07/09                   | 13/07/10                    | 2119A04450             |
| <input type="checkbox"/>            | TEMP & HUMIDITY Chamber                 | JISCO              | KR-100/J-RHC2                   | 10/10/09                   | 10/10/10                    | 30604493/021031        |
| <input checked="" type="checkbox"/> | Digital Multimeter                      | H.P                | 34401A                          | 13/03/09                   | 13/03/10                    | 3146A13475, US36122178 |
| <input type="checkbox"/>            | Multifunction Synthesizer               | HP                 | 8904A                           | 06/10/09                   | 06/10/10                    | 3633A08404             |
| <input type="checkbox"/>            | Signal Generator                        | Rohde Schwarz      | SMR20                           | 13/03/09                   | 13/03/10                    | 101251                 |
| <input type="checkbox"/>            | Signal Generator                        | H.P                | ESG-3000A                       | 02/07/09                   | 02/07/10                    | US37230529             |
| <input type="checkbox"/>            | Vector Signal Generator                 | Rohde Schwarz      | SMJ100A                         | 02/02/09                   | 02/02/10                    | 100148                 |
| <input type="checkbox"/>            | Audio Analyzer                          | H.P                | 8903B                           | 02/07/09                   | 02/07/10                    | 3011A09448             |
| <input type="checkbox"/>            | Modulation Analyzer                     | H.P                | 8901B                           | 02/07/09                   | 02/07/10                    | 3028A03029             |
| <input type="checkbox"/>            | 8960 Series 10 Wireless Comms. Test Set | Agilent            | E5515C                          | 02/07/09                   | 02/07/10                    | GB43461134             |
| <input type="checkbox"/>            | Universal Radio communication Tester    | Rohde Schwarz      | CMU 200                         | 19/05/09                   | 19/05/10                    | 106760                 |
| <input type="checkbox"/>            | Bluetooth Tester                        | TESCOM             | TC-3000B                        | 02/07/09                   | 02/07/10                    | 3000B000268            |
| <input type="checkbox"/>            | Thermo hygrometer                       | BODYCOM            | BJ5478                          | 06/02/09                   | 06/02/10                    | 090205-3               |
| <input checked="" type="checkbox"/> | Thermo hygrometer                       | BODYCOM            | BJ5478                          | 06/02/09                   | 06/02/10                    | 090205-2               |
| <input type="checkbox"/>            | Thermo hygrometer                       | BODYCOM            | BJ5478                          | 06/02/09                   | 06/02/10                    | 090205-4               |
| <input type="checkbox"/>            | AC Power supply                         | DAEKWANG           | 5KVA                            | 13/03/09                   | 13/03/10                    | 20060321-1             |
| <input type="checkbox"/>            | DC Power Supply                         | HP                 | 6622A                           | 13/03/09                   | 13/03/10                    | 3448A03760             |
| <input type="checkbox"/>            | DC Power Supply                         | HP                 | 6633A                           | 13/03/09                   | 13/03/10                    | 3524A06634             |
| <input type="checkbox"/>            | BAND Reject Filter                      | Microwave Circuits | N0308372                        | 06/10/09                   | 06/10/10                    | 3125-01DC0352          |
| <input type="checkbox"/>            | BAND Reject Filter                      | Wainwright         | WRCG1750                        | 06/10/09                   | 06/10/10                    | 2                      |
| <input type="checkbox"/>            | High-Pass Filter                        | ANRITSU            | MP526D                          | 06/10/09                   | 06/10/10                    | M27756                 |
| <input type="checkbox"/>            | High-pass filter                        | Wainwright         | WHKX2.1                         | N/A                        | N/A                         | 1                      |
| <input type="checkbox"/>            | High-Pass Filter                        | Wainwright         | WHKX3.0                         | N/A                        | N/A                         | 9                      |
| <input type="checkbox"/>            | Tunable Notch Filter                    | Wainwright         | WRCT800.0 /960.0-0.2/40-8SSK    | N/A                        | N/A                         | 10                     |
| <input type="checkbox"/>            | Tunable Notch Filter                    | Wainwright         | WRCD1700.0 /2000.0-0.2/40-10SSK | N/A                        | N/A                         | 27                     |
| <input type="checkbox"/>            | Tunable Notch Filter                    | Wainwright         | WRCT1900.0 /2200.0-5/40-10SSK   | N/A                        | N/A                         | 7                      |
| <input type="checkbox"/>            | HORN ANT                                | ETS                | 3115                            | 17/06/09                   | 17/06/10                    | 6419                   |
| <input type="checkbox"/>            | HORN ANT                                | ETS                | 3115                            | 23/09/09                   | 23/09/10                    | 21097                  |
| <input type="checkbox"/>            | HORN ANT                                | A.H.Systems        | SAS-574                         | 10/06/09                   | 10/06/10                    | 154                    |
| <input type="checkbox"/>            | HORN ANT                                | A.H.Systems        | SAS-574                         | 10/06/09                   | 10/06/10                    | 155                    |

|                                     | Type                         | Manufacturer   | Model            | Cal.Due.Date<br>(dd/mm/yy) | Next.Due.Date<br>(dd/mm/yy) | S/N           |
|-------------------------------------|------------------------------|----------------|------------------|----------------------------|-----------------------------|---------------|
| <input type="checkbox"/>            | Dipole Antenna               | Schwarzbeck    | VHA9103          | 06/10/09                   | 06/10/10                    | 2116          |
| <input type="checkbox"/>            | Dipole Antenna               | Schwarzbeck    | VHA9103          | 06/10/09                   | 06/10/10                    | 2117          |
| <input type="checkbox"/>            | Dipole Antenna               | Schwarzbeck    | UHA9105          | 05/10/09                   | 05/10/10                    | 2261          |
| <input type="checkbox"/>            | Dipole Antenna               | Schwarzbeck    | UHA9105          | 05/10/09                   | 05/10/10                    | 2262          |
| <input checked="" type="checkbox"/> | LOOP Antenna                 | ETS            | 6502             | 14/09/09                   | 14/09/10                    | 3471          |
| <input type="checkbox"/>            | Coaxial Fixed Attenuators    | Agilent        | 8491B            | 02/07/09                   | 02/07/10                    | MY39260700    |
| <input type="checkbox"/>            | Coaxial Fixed Attenuators    | Agilent        | 8491B            | 02/07/09                   | 02/07/10                    | MY39260699    |
| <input type="checkbox"/>            | Attenuator (10dB)            | WEINSCHTEL     | 23-10-34         | 01/10/09                   | 01/10/10                    | BP4386        |
| <input type="checkbox"/>            | Attenuator (10dB)            | WEINSCHTEL     | 23-10-34         | 19/01/09                   | 19/01/10                    | BP4387        |
| <input type="checkbox"/>            | Attenuator (20dB)            | WEINSCHTEL     | 86-20-11         | 06/10/09                   | 06/10/10                    | 432           |
| <input type="checkbox"/>            | Attenuator (10dB)            | WEINSCHTEL     | 31696            | 06/10/09                   | 06/10/10                    | 446           |
| <input type="checkbox"/>            | Attenuator (10dB)            | WEINSCHTEL     | 31696            | 06/10/09                   | 06/10/10                    | 408           |
| <input type="checkbox"/>            | Attenuator (40dB)            | WEINSCHTEL     | 57-40-33         | 01/10/09                   | 01/10/10                    | NN837         |
| <input type="checkbox"/>            | Attenuator (30dB)            | JFW            | 50FH-030-300     | 13/03/09                   | 13/03/10                    | 060320-1      |
| <input type="checkbox"/>            | Type N<br>Coaxial CIRCULATOR | NOVA MICROWAVE | 0088CAN          | 02/07/09                   | 02/07/10                    | 788           |
| <input type="checkbox"/>            | Type N<br>Coaxial CIRCULATOR | NOVA MICROWAVE | 0185CAN          | 02/07/09                   | 02/07/10                    | 790           |
| <input type="checkbox"/>            | Type N<br>Coaxial CIRCULATOR | NOVA MICROWAVE | 0215CAN          | 02/07/09                   | 02/07/10                    | 112           |
| <input type="checkbox"/>            | Amplifier (30dB)             | Agilent        | 8449B            | 10/10/09                   | 10/10/10                    | 3008A01590    |
| <input type="checkbox"/>            | Amplifier                    | EMPOWER        | BBS3Q7ELU        | 02/02/09                   | 02/02/10                    | 1020          |
| <input type="checkbox"/>            | RF Power Amplifier           | OPHIRRF        | 5069F            | 02/07/09                   | 02/07/10                    | 1006          |
| <input checked="" type="checkbox"/> | EMI TEST RECEIVER            | R&S            | ESU              | 02/02/09                   | 02/02/10                    | 100014        |
| <input checked="" type="checkbox"/> | BILOG ANTENNA                | SCHAFFNER      | CBL6112B         | 02/06/09                   | 02/06/10                    | 2737          |
| <input checked="" type="checkbox"/> | Amplifier (22dB)             | H.P            | 8447E            | 05/02/09                   | 05/02/10                    | 2945A02865    |
| <input type="checkbox"/>            | EMI TEST RECEIVER            | R&S            | ESCI             | 12/05/09                   | 12/05/10                    | 100364        |
| <input type="checkbox"/>            | LOG-PERIODIC ANT.            | Schwarzbeck    | UHALP9108A       | 30/05/09                   | 30/05/10                    | 590           |
| <input type="checkbox"/>            | BICONICAL ANT.               | Schwarzbeck    | VHA 9103         | 02/06/09                   | 02/06/10                    | 2233          |
| <input type="checkbox"/>            | LOG-PERIODIC ANT.            | Schwarzbeck    | UHALP9108A1      | 07/10/09                   | 07/10/10                    | 1098          |
| <input type="checkbox"/>            | BICONICAL ANT.               | Schwarzbeck    | VHA 9103         | 06/10/09                   | 06/10/10                    | 91031946      |
| <input type="checkbox"/>            | Low Noise Pre Amplifier      | TSJ            | MLA-100K01-B01-2 | 13/03/09                   | 13/03/10                    | 1252741       |
| <input type="checkbox"/>            | Amplifier (25dB)             | Agilent        | 8447D            | 12/05/09                   | 12/05/10                    | 2944A10144    |
| <input type="checkbox"/>            | Amplifier (25dB)             | Agilent        | 8447D            | 03/07/09                   | 03/07/10                    | 2648A04922    |
| <input checked="" type="checkbox"/> | Spectrum Analyzer(CE)        | H.P            | 8591E            | 26/04/09                   | 26/04/10                    | 3649A05889    |
| <input type="checkbox"/>            | LISN                         | Kyoritsu       | KNW-407          | 03/07/09                   | 03/07/10                    | 8-317-8       |
| <input checked="" type="checkbox"/> | LISN                         | Kyoritsu       | KNW-242          | 13/10/09                   | 13/10/10                    | 8-654-15      |
| <input checked="" type="checkbox"/> | CVCF                         | NF Electronic  | 4420             | 13/03/09                   | 13/03/10                    | 304935/337980 |
| <input checked="" type="checkbox"/> | DC BLOCK                     | Hyuplip        | KEL-007          | N/A                        | N/A                         | 7-1581-5      |
| <input type="checkbox"/>            | 50 ohm Terminator            | HME            | CT-01            | 22/01/09                   | 22/01/10                    | N/A           |
| <input checked="" type="checkbox"/> | RFI/FIELD Intensity<br>Meter | Kyoritsu       | KNM-2402         | 03/07/09                   | 03/07/10                    | 4N-170-3      |