



**CE MARKING**

**ELECTROMAGNETIC COMPATIBILITY  
ELECTRICAL SAFETY  
LASER SPECTROSCOPY  
ENVIRONMENTAL PHYSICS**

**G.S.D. S.r.l.**  
Certified in accordance with  
**UNI EN ISO 9001:2008**  
by  
**TÜV Rheinland Italia S.r.l.**  
**Certificate N. 39 00 1850509**

|                                    |                                                                                           |         |
|------------------------------------|-------------------------------------------------------------------------------------------|---------|
| <b>G.S.D. Srl<br/>PISA - Italy</b> | <b>Test Report n. FCC-16795B</b>                                                          | Rev. 00 |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |
| <b>Manufacturer</b>                | <b>TERTIUM Technology S.r.l.</b>                                                          |         |
| Address                            | Via G. B. Picotti, 8<br>56124 Pisa<br>Italy                                               |         |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |
| <b>Test Family Name</b>            | <b>NFC SCANNER</b>                                                                        |         |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |
| <b>Testing Laboratory Name</b>     | <b>G.S.D. S.r.l.</b>                                                                      |         |
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|                                    | FCC Listed: Registration Number: 424037                                                   |         |
|                                    |                                                                                           |         |
| <b>Location and Date of Issue</b>  | <b>Pisa, 2016 December 30</b>                                                             |         |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |
|                                    |                                                                                           |         |

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### Report Revision History

#### *Revision details*

| <i>Date</i>      | <i>Page No.(s)</i> | <i>Details</i>           |
|------------------|--------------------|--------------------------|
| 2016 December 30 | 15                 | Rev. 00<br>Initial issue |
|                  |                    |                          |
|                  |                    |                          |
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**1. MANUFACTURER AND EUT IDENTIFICATION<sup>1</sup>**

|                         |                                                                      |
|-------------------------|----------------------------------------------------------------------|
| <b>Manufacturer</b>     | <b>TERTIUM Technology S.r.l..</b>                                    |
| Address                 | Via G. B. Picotti, 8<br>56124 Pisa<br>Italy                          |
|                         |                                                                      |
|                         |                                                                      |
| <b>Test Family Name</b> | <b>NFC SCANNER</b>                                                   |
|                         |                                                                      |
|                         |                                                                      |
| Date of reception       | <b>2016 November 03</b>                                              |
|                         |                                                                      |
| Sampling                | <b>Laboratory sample for certification</b>                           |
|                         |                                                                      |
| Test Item Description   | <b>RFID Device</b>                                                   |
|                         |                                                                      |
| Nominal Input Voltage   | <b>3,7 Vdc Li-ion Batteries rechargeable batteries via micro USB</b> |
|                         |                                                                      |
| FCC ID                  | <b>Y6D-NFCLE-RW050</b>                                               |
|                         |                                                                      |

<sup>1</sup>A detailed documentation is preserved in the internal fascicle.

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*Fig. 1.1  
Equipment Photo*

**2. REFERENCE STANDARDS**

Tests and measurements are performed accordingly to the reference standards given in the table below:

| <i>TEST</i>                           | <i>STANDARD</i>                                                                                                                                                                                                                                   |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emissions: Radiated – Section 15.109  | FCC Rules ad Regulations, Title 47 Part 15 – Sub part C<br><br>ANSI C63.4 2014 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz |
| Emissions: Conducted – Section 15.107 | FCC Rules ad Regulations, Title 47 Part 15 – Sub part C<br><br>ANSI C63.4 2014 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz |

### 3. TEST GENERALITY, RESULT, CONDITION, MEASUREMENT UNCERTAINTY

#### Sub-part 2.1033(b)

##### Test And Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts: 15.109; Unintentional Radiators

##### Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing: In accordance with ANSI C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures.

All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

##### Summary of Test Results

| <i>TEST</i>                                    | <i>RESULT</i> |
|------------------------------------------------|---------------|
| <i>Emissions: conducted<br/>Section 15.107</i> | <i>Pass</i>   |
| <i>Emissions: radiated<br/>Section 15.109</i>  | <i>Pass</i>   |

##### Measurement uncertainty

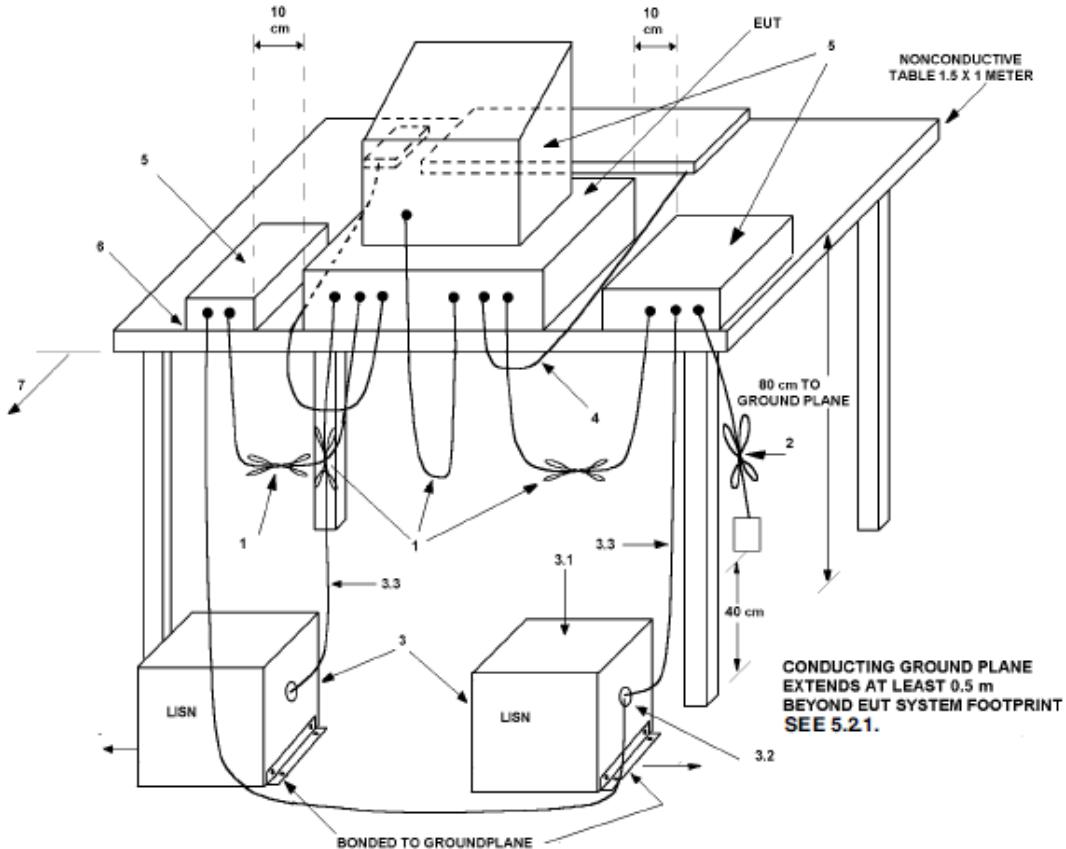
| <i>TEST</i>                                               | <i>EXPANDED UNCERTAINTY</i> |
|-----------------------------------------------------------|-----------------------------|
| Conducted Emission – 50Ω/50µH (150 kHz - 30 MHz)          | ± 3.5 dB                    |
| Radiated Emission – (Semianechoic Room) (30 MHz - 18 GHz) | ± 4.7 dB                    |

##### Climatic Conditions

| <i>PARAMETER</i>  | <i>VALUE</i> |
|-------------------|--------------|
| Temperature       | (293 ± 3) K  |
| Relative humidity | (50 ± 5) %   |

##### Extensions

The results refer only to the sampled EUT and under the specified conditions.



Conducted and Radiated EUT Test Set-up example (ANSI C63.4 2014)

TT\_RFID\_Configurator.

#### 4. RADIATED EMISSIONS

In the following table you can find the limits established by the reference standard:

| FREQUENCY RANGE<br>(MHz) | Field Strength<br>QUASI-PEAK LIMITS<br>[dB ( $\mu$ V/m)] |
|--------------------------|----------------------------------------------------------|
| 30 ÷ 88                  | 40                                                       |
| 88 ÷ 216                 | 43,5                                                     |
| 216 ÷ 960                | 46                                                       |
| Above 960                | 54                                                       |

#### Test Equipment

| EQUIPMENT                   | MANUFACTURER | MODEL    | CAL. DUE |
|-----------------------------|--------------|----------|----------|
| EMI Receiver                | HP           | HP8546A  | 01/2017  |
| EMI Receiver Filter Section | HP           | HP85460A | 01/2017  |
| Anechoic Chamber            | Comtest      | CSA01    | 01/2017  |
| Bilog Antenna               | Schaffner    | CBL6112B | 01/2017  |
| Horn Antenna                | EMCO         | 3115     | 01/2017  |
| Controller                  | Deisel       | HD100    | 01/2017  |
| Turn Table                  | Deisel       | MA240    | 01/2017  |
| LISN                        | GSD          | NTW06    | 01/2017  |

#### Test procedure: RE22R02

#### Notes

Azimuth position EUT-Antenna corresponding to 0° identifies the rotating table orientation (TT) in which the instrument to be tested shows the front part turned towards the antenna. Positive grades individuate clockwise rotations of TT when this one is observed from the top. For negative degrees, TT rotation is anticlockwise.

Antenna height respect to the mass plane is conventionally individuated with: MA=XXX where XXX indicates the height (always positive for e>100) expressed in cm.

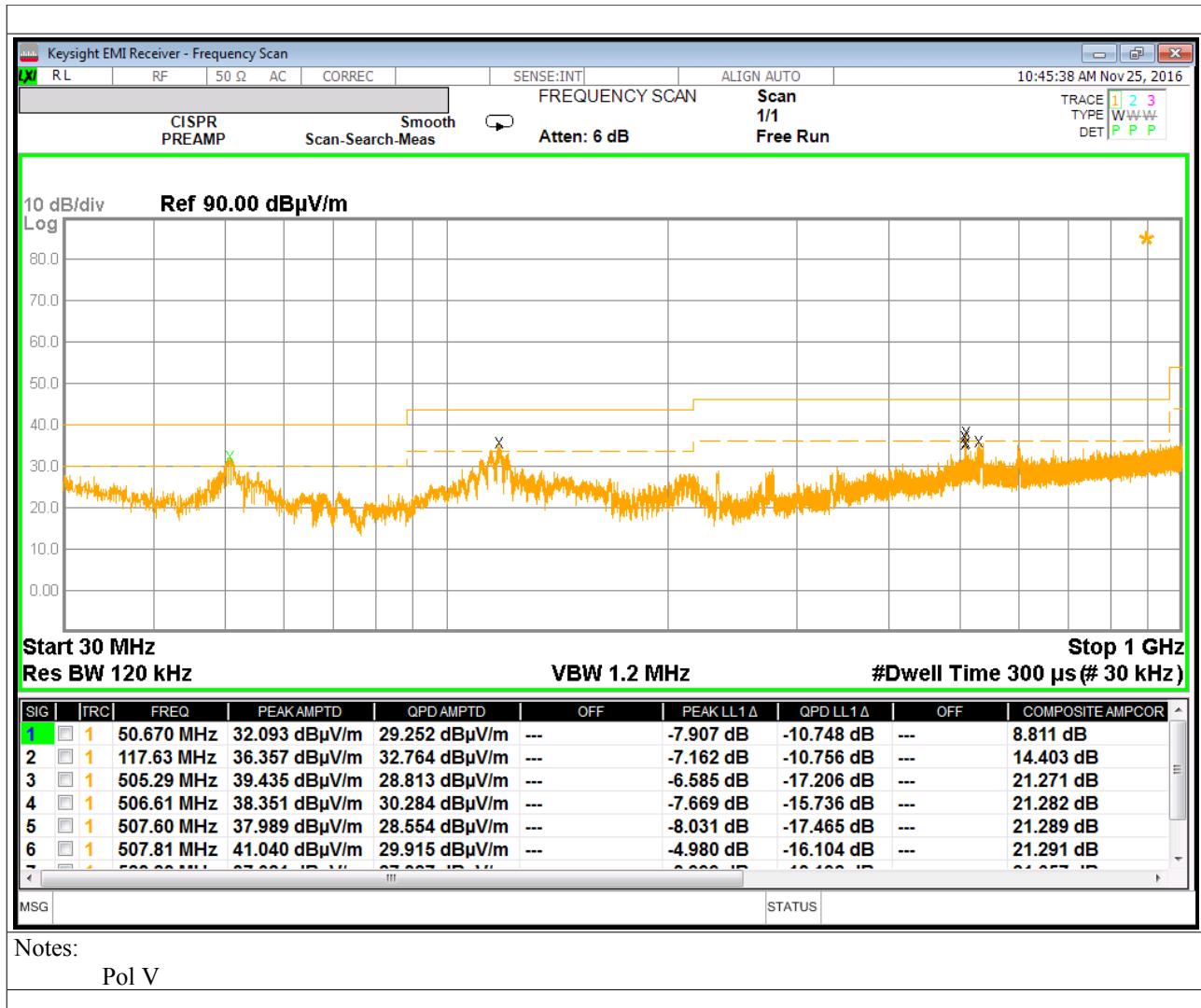
Antenna horizontal polarisation is indicated by POL=H.

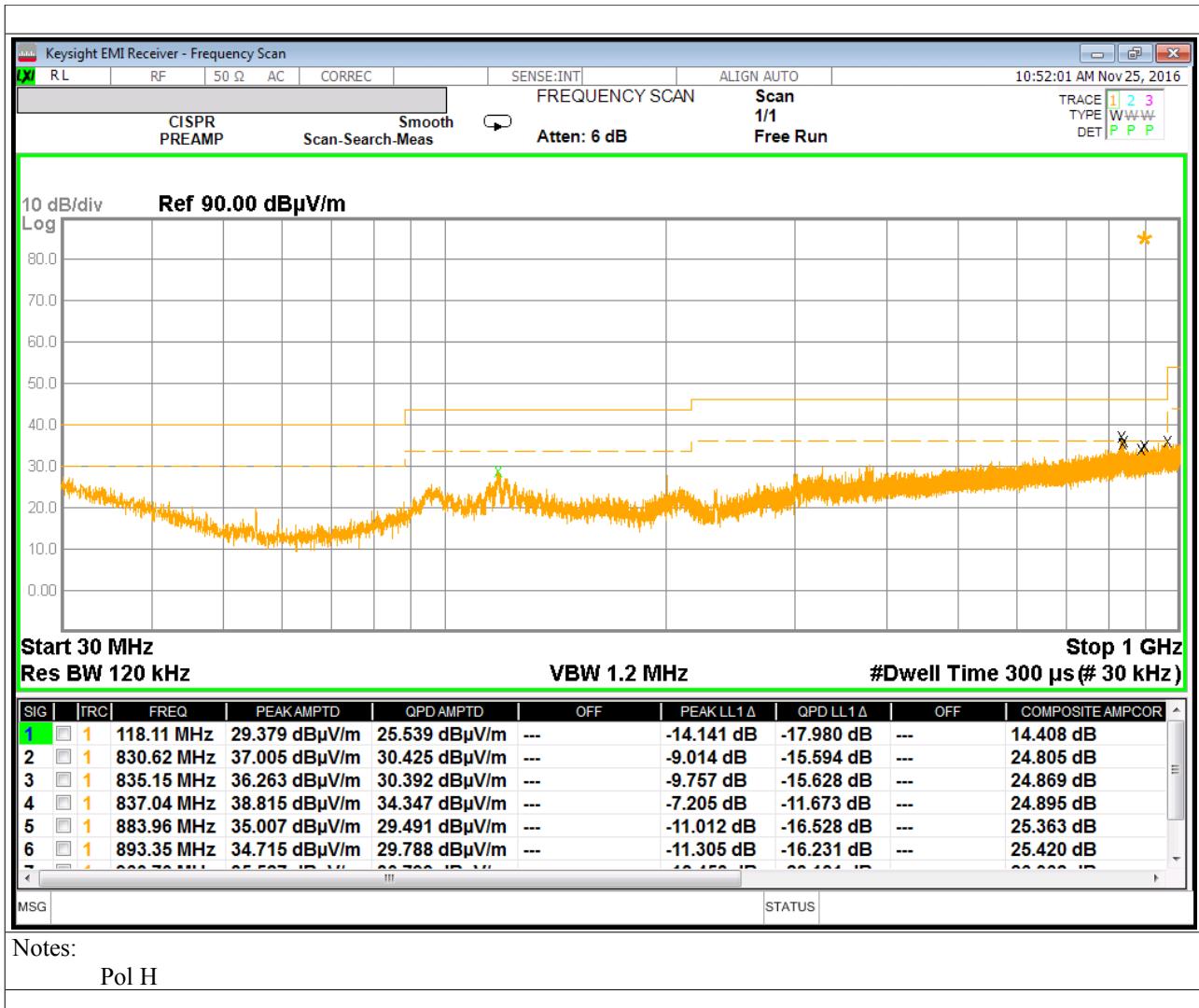
Antenna vertical polarisation is indicated by POL=V.

EUT was tested in the three orthogonal planes.

#### Results and conclusions

In all the operative conditions, equipment complied with the standard limits. Graphics in following figures show the most significant registrations of the performed measurements.





**5. POWERLINE CONDUCTED EMISSIONS**

Equipment shall meet the limits below when using a CISPR16 quasi-peak and average detector receivers.

FCC, 15.107

| <b>FREQUENCY RANGE<br/>(MHz)</b> | <b>QUASI-PEAK LIMIT<br/>[dB (<math>\mu</math>V)]</b> | <b>AVERAGE LIMIT<br/>[dB (<math>\mu</math>V)]</b> |
|----------------------------------|------------------------------------------------------|---------------------------------------------------|
| 0.15 ÷ 0.50                      | 66 ÷ 56 <sup>(*)</sup>                               | 56 ÷ 46 <sup>(*)</sup>                            |
| 0.50 ÷ 5                         | 56                                                   | 46                                                |
| 5 ÷ 30                           | 60                                                   | 50                                                |

<sup>(\*)</sup> Limit decreasing linearly with logarithm of frequency

Test Equipment

| <b>EQUIPMENT</b>            | <b>MANUFACTURER</b> | <b>MODEL</b> | <b>CAL. DUE</b> |
|-----------------------------|---------------------|--------------|-----------------|
| EMI Receiver                | HP                  | HP8546A      |                 |
| EMI Receiver Filter Section | HP                  | HP85460A     |                 |
| Screened Room               | GSD                 | CSC01        |                 |
| Transient Limiter           | HP                  | 11947A       | 01/2017         |
| LISN                        | GSD                 | GSDA01       | 01/2017         |

Test procedure: CE22R01

The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a spectrum analyzer by a transient limiter. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits

Test method

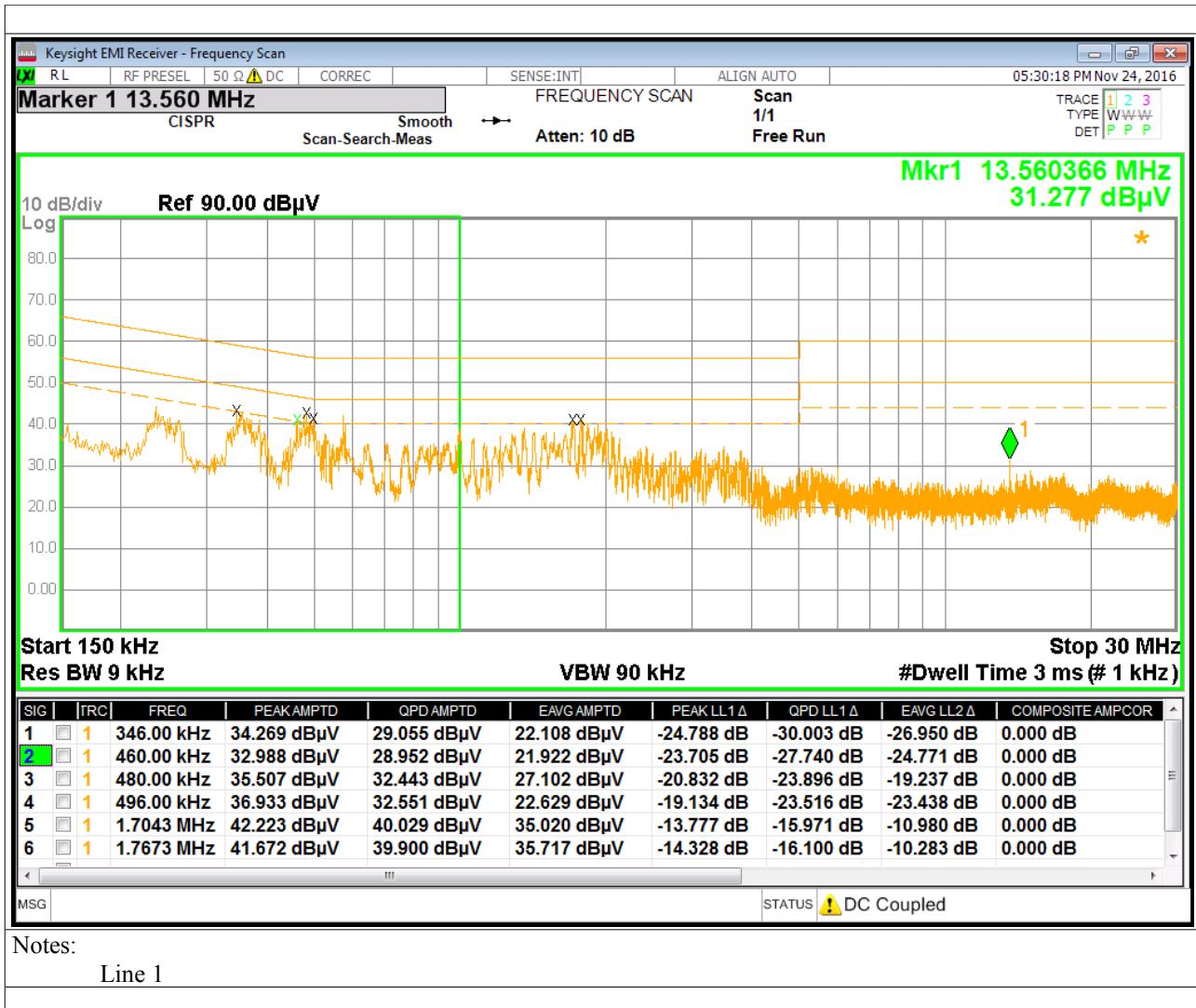
Test method was in accordance with the reference standard.

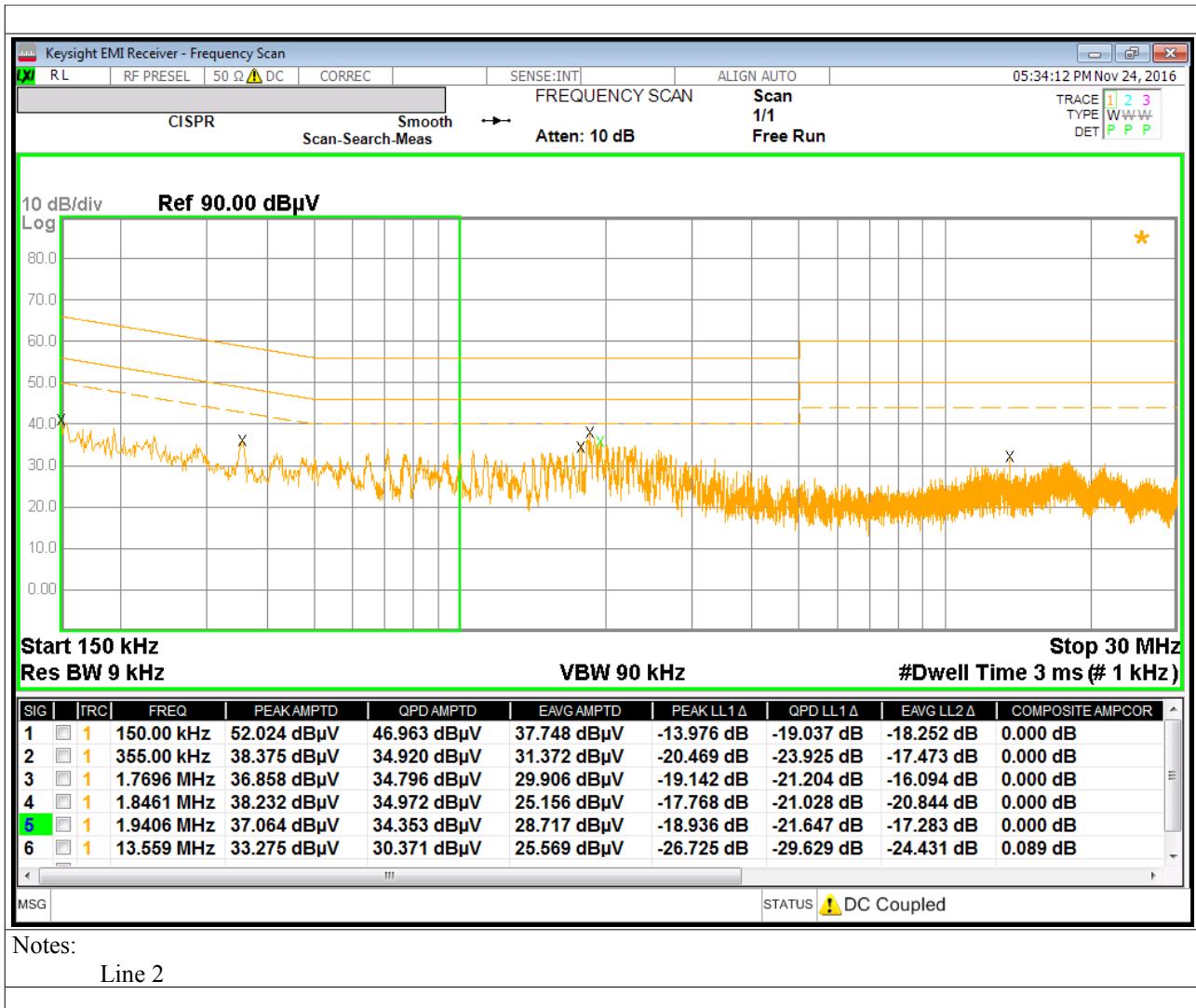
EUT modes of operations were tested in order to achieve the maximum level of emission.

Results

Equipment complied with the test specification limits.

Graphics in following figures show some registrations of the frequency spectrum of the conducted emissions.

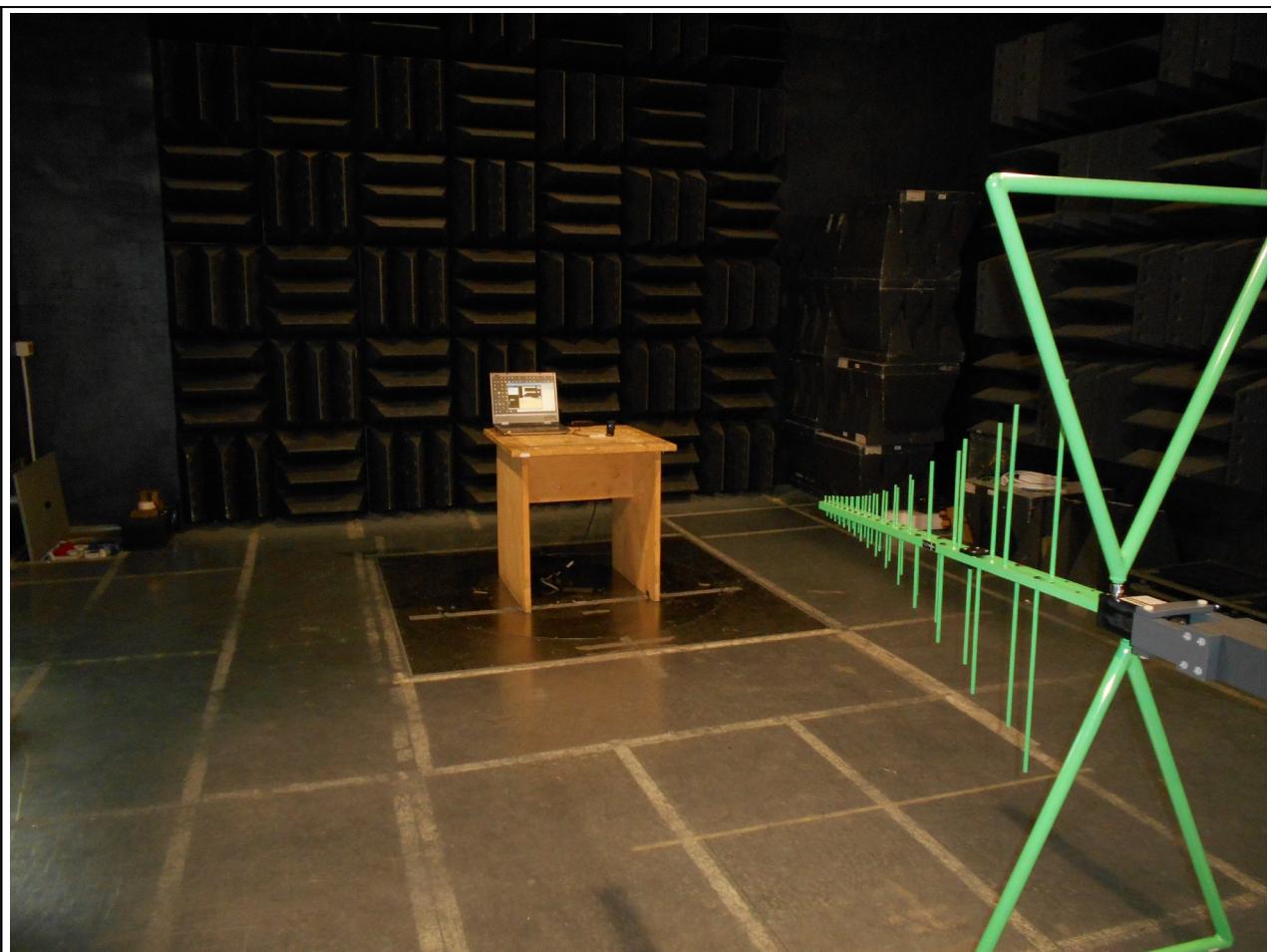




**6. PHOTO**



*Fig. 6.1  
Conducted Emissions Test Set-up*



*Fig. 6.2  
Radiated Emissions Test Set-up*