TEST REPORT

REPORT NUMBER: I13GC9474-EMC

Sort of equipment: GSM/GPRS(850/900/1800/1900MHz)+BT Wireless Data Module
Type of designation: SIM800H
Manufacturer: Shenyang Simcom Technology Ltd.

ACCORDING TO:

ETSI EN 301 489-1 V1.9.2 (2011-09)
ETSI EN 301 489-7 V 1.3.1(2005-11)
ETSI EN 301 489-17 V2.1.1(2009-05)

China Telecommunication Technology Labs.

Month, date, year
August 22, 2013

Signature

Ma Xin
Director
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1 General Information

1.1 Notes

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with EN 301 489-7 V 1.3.1(2005-11), EN 301 489-17 V2.1.1(2009-05).

The test results of this test report relate exclusively to the item(s) tested as specified in section 2.

The following deviation from, additions to, or exclusions from the test specifications have been made. See Annex C.

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1.2 Testers

Name: Pan Yang
Position: Engineer
Department: Department of EMC test
Signature: 

Editor of this test report:
Name: Pan Yang
Position: Engineer
Department: Department of EMC test
Date: 2013-08-22
Signature: 

Technical responsibility for area of testing:
Name: Zou Dongyi
Position: Manager
Department: Department of EMC test
Date: 2013-08-22
Signature: 

1.3 Testing Laboratory

1.3.1 Location

Name: China Telecommunication Technology Labs.
Address: 11 YUE TAN NAN JIE
          BEIJING
          P.R.CHINA
          100045
Tel: +86 10 68094053
Fax: +86 10 68011404
Email: emc@chinattl.com

1.3.2 Details of accreditation status

Accredited by: DATech Deutsche Akkreditierungsstelle Technik in der
               TGA GmbH (German Accreditation Body for Technology
               in the TGA)
Lab number: DA7130
DAR Registration number: DAT-PL-162/04-01
Accredited by: CNAS (China National Accreditation Service for
               Conformity Assessment)
Registration number: CNAS L0570
Standard: ISO/IEC 17025:2005

1.3.3 Test location, where different from section 1.3.1

Name: -------
Address: -------
1.4 Details of applicant or manufacturer

1.4.1 Applicant

Name: Shanghai SIMCom Wireless Solutions Co., Ltd.
Address: Building A, SIM Technology Building, No. 633, Jinzhong Road, Changning District, Shanghai R.R. China
Country: China
Telephone: +86-021-32523300
Fax: +86-021-32523020
Contact: Liweixing
Telephone: +86-021-32523300

1.4.2 Manufacturer (if different from applicant in section 1.4.1)

Name: Shenyang Simcom Technology Ltd
Address: No. 37, Shenbei Rd, Shenbei New Aear, Shenyang, P.R. China

1.4.3 Manufactory (if different from applicant in section 1.4.1)

Name: ------
Address: ------
2 Test Item
2.1 General info.:
Manufacturer: Shenyang Simcom Technology Ltd
Name: GSM/GPRS(850/900/1800/1900MHz)+BT Wireless Data Module
Model Number: SIM800H
Serial Number: IMEI: 860719020042408
Production Status: Product
Receipt date of test item: 2013-08-14

2.2 Outline of E.U.T.:
EUT is a GSM/GPRS(850/900/1800/1900MHz)+BT Wireless Data Module

2.3 Modifications Incorporated in E.U.T.:
The E.U.T. has not been modified from what is described by the brand name and unique type identification stated above.

2.4 Equipment Configuration:
Equipment configuration list:

<table>
<thead>
<tr>
<th>Item</th>
<th>Generic Description</th>
<th>Type</th>
<th>Serial No.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Module</td>
<td>SIM800H</td>
<td>MP06133111797</td>
<td>None</td>
</tr>
<tr>
<td>B</td>
<td>Main board 1</td>
<td>Sim800L-TE</td>
<td>--</td>
<td>None</td>
</tr>
<tr>
<td>C</td>
<td>Main board 2</td>
<td>SIM900-EVB</td>
<td>MP061319214721</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Adapter</td>
<td>DSA-0131F-06 EU 12</td>
<td>--</td>
<td>None</td>
</tr>
<tr>
<td>C</td>
<td>Antenna</td>
<td>--</td>
<td>1005 058600</td>
<td>None</td>
</tr>
</tbody>
</table>

2.5 Other Information:
Hardware version: V1.02
Software version: SIM800 R13.08
2.6 E.U.T Photographs:
3 Summary of Test

3.1 Test Results

General: All measurements are traceable to national standards.

Standard:
- EN 301 489-1 V1.9.2 (2011-09)
- EN 301 489-7 V1.3.1 (2005-11)
- EN 301 489-17 V2.1.1 (2009-05)

Test Voltage: 230VAC 50Hz

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Basic Standard</th>
<th>Application</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiated emission</td>
<td>EN 55022 (2006)</td>
<td>Enclosure of ancillary equipment</td>
<td>Complies</td>
</tr>
<tr>
<td>Conducted emission</td>
<td>EN 55022 (2006)</td>
<td>AC mains input/output port</td>
<td>Complies</td>
</tr>
<tr>
<td>Conducted emission</td>
<td>EN 55022 (2006)</td>
<td>DC power input/output port</td>
<td>NA</td>
</tr>
<tr>
<td>Conducted emission</td>
<td>EN 55022 (2006)</td>
<td>Telecommunication port</td>
<td>NA</td>
</tr>
<tr>
<td>Harmonic current emissions</td>
<td>EN 61000-3-2 (2006)</td>
<td>AC mains input port</td>
<td>NA</td>
</tr>
<tr>
<td>Voltage fluctuations and</td>
<td>EN 61000-3-3 (2005)</td>
<td>AC mains input port</td>
<td>NA</td>
</tr>
<tr>
<td>flicker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF electromagnetic field</td>
<td>EN 61000-4-3 (2006)</td>
<td>Enclosure</td>
<td>Complies</td>
</tr>
</tbody>
</table>
### 3.2 Test Manner

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test setup and operating modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Radiated emission</td>
<td>30MHz-1GHz frequency range:</td>
</tr>
<tr>
<td></td>
<td>Mode 1: GSM900 + GPRS + idle + Adapter</td>
</tr>
<tr>
<td></td>
<td>Mode 2: GSM1800 + GPRS + Idle + Adapter</td>
</tr>
<tr>
<td></td>
<td>Mode 5: BT + Adapter</td>
</tr>
<tr>
<td></td>
<td>1GHz-6GHz frequency range:</td>
</tr>
<tr>
<td></td>
<td>Mode 1: GSM900 + GPRS + idle + Adapter</td>
</tr>
<tr>
<td></td>
<td>Mode 2: GSM1800 + GPRS + Idle + Adapter</td>
</tr>
<tr>
<td></td>
<td>Mode 5: BT + Adapter</td>
</tr>
</tbody>
</table>

| 2) Conducted emission      | Mode 3: GSM900 + GPRS + Traffic + Adapter                                |
|                            | Mode 4: GSM1800 + GPRS + Traffic + Adapter                              |
|                            | Mode 5: BT + Adapter                                                     |

| 3) RF electromagnetic field| Mode 3: GSM900 + GPRS + Traffic + Adapter                                |
| (80MHz to 2700MHz)        | Mode 4: GSM1800 + GPRS + Traffic + Adapter                              |
|                            | Mode 5: BT + Adapter                                                     |

| 4) Electrostatic discharge| Mode 3: GSM900 + GPRS + Traffic + Adapter                                |
|                           | Mode 4: GSM1800 + GPRS + Traffic + Adapter                              |
|                           | Mode 5: BT + Adapter                                                     |

| 5) Fast transients common mode | Mode 3: GSM900 + GPRS + Traffic + Adapter                                |
|                               | Mode 4: GSM1800 + GPRS + Traffic + Adapter                              |
|                               | Mode 5: BT + Adapter                                                     |

| 6) RF Common Mode           | Mode 3: GSM900 + GPRS + Traffic + Adapter                                |
|                            | Mode 4: GSM1800 + GPRS + Traffic + Adapter                              |
|                            | Mode 5: BT + Adapter                                                     |
**Remark:**

1. The worst case of radiated emission for 30MHz-1GHz is mode 2 and for 1-6GHz is mode 2.
2. The worst case for conducted emission is mode 4.
<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test setup and operating modes</th>
</tr>
</thead>
</table>
| 7) Voltage dips and interruptions | Mode 3: GSM900 + GPRS + Traffic + Adapter  
Mode 4: GSM1800 + GPRS + Traffic + Adapter  
Mode 5: BT + Adapter |
| 8) Surges, line to line and line to ground | Mode 3: GSM900 + GPRS + Traffic + Adapter  
Mode 4: GSM1800 + GPRS + Traffic + Adapter  
Mode 5: BT + Adapter |

Remark:
1. The worst case of radiated emission for 30MHz-1GHz is mode 2 and for 1-6GHz is mode 2.
2. The worst case for conducted emission is mode 4.
3.3 Monitoring EUT in test

3.3.1 Monitoring for continuous phenomena applied to MS

3.3.1.1 GSM and WCDMA mode
At the start of the test, a communication link shall be established. During the test, the operator shall observe whether the communication link is maintained. The RX Quality for GSM and BER for WCDMA of the communication is measured by SS. There should be not more than 3 and 0.1% respectively. At the conclusion of the test, the operator shall directly check whether the EUT operate as intended with no loss of user control functions or stored data. For GPS mode, the GPS was activated and connected with GPS communication tester.
In addition to confirming the above performance during a communication, the test is also performed in idle mode, with an interference receiver to monitor whether the transmitter unintentionally operates.

3.3.2 Monitoring for transient phenomena applied to MS

3.3.2.1 GSM and WCDMA mode
At the start of the test, a communication link shall be established. At the conclusion of each exposure, the operator shall directly observe if the EUT operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the operator shall directly check whether the EUT operate as intended with no loss of user control functions or stored data, and the communication link has been maintained. For GPS mode, the GPS was activated and connected with GPS communication tester.
In addition to confirming the above performance during a communication, the test is also been performed in idle mode, and monitor if transmitter unintentionally operates with an interference receiver.
4 Test Results

4.1 Radiated Emissions (Enclosure of ancillary equipment)

Specifications:
- EN 301 489-1 V1.9.2 (2011-09)
- EN 301 489-7 V 1.3.1(2005-11)
- EN 301 489-17 V2.1.1(2009-05)

Date of tests: 2013-08-15
Test conditions:
- Ambient Temperature: 15°C - 35°C
- Relative Humidity: 30% - 60%

Method of measurement: EN 55022(2006)

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMI Test Receiver</td>
<td>R/S</td>
<td>ESI26</td>
<td>EMI Test Receiver</td>
<td>2014-01-09</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Ultra Broadband Antenna</td>
<td>R/S</td>
<td>VULB 9160</td>
<td>Ultra Broadband Antenna</td>
<td>2013-09-05</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>Double-Ridged Horn Antenna</td>
<td>R/S</td>
<td>HF906</td>
<td>Double-Ridged Horn Antenna</td>
<td>2014-01-23</td>
<td>Normal</td>
</tr>
<tr>
<td>4</td>
<td>Fully-Anechoic Chamber</td>
<td>ETS</td>
<td>11.8m×6.5m×6.3m</td>
<td>Fully-Anechoic Chamber</td>
<td>2013-11-16</td>
<td>Normal</td>
</tr>
<tr>
<td>5</td>
<td>Radio Communications Analyzer</td>
<td>Anritsu</td>
<td>MT8820B</td>
<td>Radio Communications Analyzer</td>
<td>2014-01-26</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Remarks: The measurement distance is 3 meters.

Limits for radiated emissions from ancillary equipment at a measuring distance of 3m:

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Limits (Quasi-peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 MHz to 230 MHz</td>
<td>40 dBµV/m</td>
</tr>
<tr>
<td>230 MHz to 1000 MHz</td>
<td>47 dBµV/m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Average limit</th>
<th>Peak limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1GHz to 3GHz</td>
<td>50 dBµV/m</td>
<td>70 dBµV/m</td>
</tr>
<tr>
<td>3GHz to 6GHz</td>
<td>54 dBµV/m</td>
<td>74 dBµV/m</td>
</tr>
</tbody>
</table>

Test Results:

The E.U.T. complies.
Test data:

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>QuasiPeak (dBuV/m)</th>
<th>Meas. Time (ms)</th>
<th>Bandwidth (kHz)</th>
<th>Height (cm)</th>
<th>Polarization</th>
<th>Azimuth (deg)</th>
<th>Corr. (dB)</th>
<th>Margin (dB)</th>
<th>Limit (dBuV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.568333</td>
<td>10.7</td>
<td>1000.0</td>
<td>120.000</td>
<td>113.0</td>
<td>V</td>
<td>254.0</td>
<td>-26.7</td>
<td>29.3</td>
<td>40.0</td>
</tr>
<tr>
<td>87.439333</td>
<td>9.1</td>
<td>1000.0</td>
<td>120.000</td>
<td>100.0</td>
<td>V</td>
<td>-24.0</td>
<td>-27.2</td>
<td>30.9</td>
<td>40.0</td>
</tr>
<tr>
<td>100.001667</td>
<td>13.1</td>
<td>1000.0</td>
<td>120.000</td>
<td>120.0</td>
<td>H</td>
<td>-29.0</td>
<td>-24.9</td>
<td>26.9</td>
<td>40.0</td>
</tr>
<tr>
<td>300.015667</td>
<td>15.5</td>
<td>1000.0</td>
<td>120.000</td>
<td>211.0</td>
<td>V</td>
<td>-6.0</td>
<td>-21.5</td>
<td>31.5</td>
<td>47.0</td>
</tr>
</tbody>
</table>

Remarks:
The worst case for radiated emission (30M-1GHz) is mode 2, and only the test data of this mode was reported.
The measurement uncertainty is 4.16 dB (k=2) when antenna is vertical polarization and 4.50 (k=2) when antenna is horizontal polarization.
### Final Result 1

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>MaxPeak (dBuV/m)</th>
<th>Meas. Time (ms)</th>
<th>Bandwidth (kHz)</th>
<th>Height (cm)</th>
<th>Polarization</th>
<th>Azimuth (deg)</th>
<th>Corr. (dB)</th>
<th>Margin (dB)</th>
<th>Limit (dBuV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1288.280000</td>
<td>37.5</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>H</td>
<td>194.0</td>
<td>-5.1</td>
<td>32.5</td>
<td>70.0</td>
</tr>
<tr>
<td>1762.346667</td>
<td>42.7</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>V</td>
<td>2.0</td>
<td>0.0</td>
<td>27.3</td>
<td>70.0</td>
</tr>
<tr>
<td>2379.640000</td>
<td>49.0</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>H</td>
<td>11.0</td>
<td>6.1</td>
<td>21.0</td>
<td>70.0</td>
</tr>
<tr>
<td>2768.333333</td>
<td>51.6</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>V</td>
<td>-7.0</td>
<td>8.7</td>
<td>18.4</td>
<td>70.0</td>
</tr>
</tbody>
</table>

### Final Result 2

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Average (dBuV/m)</th>
<th>Meas. Time (ms)</th>
<th>Bandwidth (kHz)</th>
<th>Height (cm)</th>
<th>Polarization</th>
<th>Azimuth (deg)</th>
<th>Corr. (dB)</th>
<th>Margin (dB)</th>
<th>Limit (dBuV/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1291.173333</td>
<td>25.6</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>V</td>
<td>293.0</td>
<td>-5.1</td>
<td>24.4</td>
<td>50.0</td>
</tr>
<tr>
<td>1777.240000</td>
<td>30.9</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>H</td>
<td>-11.0</td>
<td>0.2</td>
<td>19.1</td>
<td>50.0</td>
</tr>
<tr>
<td>2380.613333</td>
<td>37.0</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>H</td>
<td>2.0</td>
<td>6.1</td>
<td>13.0</td>
<td>50.0</td>
</tr>
<tr>
<td>2766.480000</td>
<td>39.1</td>
<td>100.0</td>
<td>1000.000</td>
<td>155.0</td>
<td>V</td>
<td>11.0</td>
<td>8.7</td>
<td>10.9</td>
<td>50.0</td>
</tr>
</tbody>
</table>

Remarks:
The worst case for radiated emission (1-6GHz) is mode 2, and only the test data of this mode was reported.
The measurement uncertainty is 4.20 dB (k=2) when antenna is vertical polarization and 4.55 (k=2) when antenna is horizontal polarization.
Test Photos:

Photo of RE test
4.2 Conducted Emissions (AC Mains Ports)

Specifications: EN 301 489-1 V1.9.2 (2011-09)  
EN 301 489-7 V 1.3.1(2005-11)  
EN 301 489-17 V2.1.1(2009-05)

Date of tests: 2013-08-17  
Test conditions: Ambient Temperature:15℃-35℃  
Relative Humidity:30%-60%

Method of measurement: EN 55022(2006)

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMI Test Receiver</td>
<td>R/S ESCI</td>
<td>101235</td>
<td></td>
<td>2013-11-01</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>V-LISN</td>
<td>R/S ENV216</td>
<td>101386</td>
<td></td>
<td>2013-11-05</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>Universal Radio Communication tester</td>
<td>R/S CMU200</td>
<td>123125</td>
<td></td>
<td>2013-09-26</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Limits of the conducted disturbance at the AC mains ports:

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Limit (Quasi-peak)</th>
<th>Limit (Average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15 MHz to 0.5 MHz</td>
<td>66 dBμV–56 dBμV</td>
<td>56 dBμV–46 dBμV</td>
</tr>
<tr>
<td>&gt;0.5 MHz to 5 MHz</td>
<td>56 dBμV</td>
<td>46 dBμV</td>
</tr>
<tr>
<td>&gt;5 MHz to 30 MHz</td>
<td>60 dBμV</td>
<td>50 dBμV</td>
</tr>
</tbody>
</table>

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

Footnotes: (if necessary)

Test Results:

The E.U.T. complies.
Test data:

![Graph showing test data](image)

### Final Result 1

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>QuasiPeak (dBμ V)</th>
<th>Meas. Time</th>
<th>Bandwidth (kHz)</th>
<th>Filter</th>
<th>Line</th>
<th>Corr. (dB)</th>
<th>Margin (dB)</th>
<th>Limit (dBμ)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.302981</td>
<td>40.2</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>10.0</td>
<td>19.9</td>
<td>60.2</td>
<td></td>
</tr>
<tr>
<td>0.672375</td>
<td>34.0</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>10.1</td>
<td>22.0</td>
<td>56.0</td>
<td></td>
</tr>
<tr>
<td>1.049231</td>
<td>31.7</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>24.3</td>
<td>56.0</td>
<td></td>
</tr>
<tr>
<td>1.586531</td>
<td>29.4</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>26.6</td>
<td>56.0</td>
<td></td>
</tr>
<tr>
<td>1.993238</td>
<td>30.1</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>25.9</td>
<td>56.0</td>
<td></td>
</tr>
<tr>
<td>3.075300</td>
<td>28.1</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.8</td>
<td>27.9</td>
<td>56.0</td>
<td></td>
</tr>
</tbody>
</table>

### Final Result 2

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Average (dBμ V)</th>
<th>Meas. Time</th>
<th>Bandwidth (kHz)</th>
<th>Filter</th>
<th>Line</th>
<th>Corr. (dB)</th>
<th>Margin (dB)</th>
<th>Limit (dBμ)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.302981</td>
<td>26.8</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>10.0</td>
<td>23.4</td>
<td>50.2</td>
<td></td>
</tr>
<tr>
<td>0.672375</td>
<td>17.8</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>10.1</td>
<td>28.2</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>1.049231</td>
<td>16.2</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>29.8</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>1.582800</td>
<td>16.3</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>29.7</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>1.993238</td>
<td>16.1</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.9</td>
<td>29.9</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>3.075300</td>
<td>16.1</td>
<td>1000.0</td>
<td>9.000</td>
<td>On</td>
<td>L1</td>
<td>9.8</td>
<td>29.9</td>
<td>46.0</td>
<td></td>
</tr>
</tbody>
</table>

Remarks:
The worst case for conducted emission is mode 4, and only the test data of this mode was reported.
The measurement uncertainty is 3.74 dB (k=2).

Test Photos:
4.3 Harmonic Current Emissions (AC Mains Input Ports)

**Specifications:**
EN 301 489-1 V1.9.2 (2011-09)
EN 301 489-7 V 1.3.1(2005-11)
EN 301 489-17 V2.1.1(2009-05)

**Test conditions:**
Ambient Temperature: 15°C - 35°C
Relative Humidity: 30% - 60%

**Method of measurement:**
EN 61000-3-2 (2005)

**Test equipment:**

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacture</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digital power analyzer</td>
<td>EMTEST</td>
<td>DPA500N</td>
<td>v1126109988</td>
<td>2014-02-14</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Universal Radio Communication tester</td>
<td>R/S</td>
<td>CMU200</td>
<td>123125</td>
<td>2013-09-26</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>ultra compact simulator</td>
<td>EMTEST</td>
<td>UCSS00n7</td>
<td>v1126109983</td>
<td>2014-01-05</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Remarks: The E.U.T is a Class A equipment. The test observation period is 150s.

**Limits for class A equipment:**

<table>
<thead>
<tr>
<th>Harmonic order n</th>
<th>Maximum permissible harmonic current A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Odd harmonics</strong></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2.30</td>
</tr>
<tr>
<td>5</td>
<td>1.14</td>
</tr>
<tr>
<td>7</td>
<td>0.77</td>
</tr>
<tr>
<td>9</td>
<td>0.40</td>
</tr>
<tr>
<td>11</td>
<td>0.33</td>
</tr>
<tr>
<td>13</td>
<td>0.21</td>
</tr>
<tr>
<td>15≤n≤39</td>
<td>0.15(\frac{n}{15})</td>
</tr>
<tr>
<td><strong>Even harmonics</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.08</td>
</tr>
<tr>
<td>4</td>
<td>0.43</td>
</tr>
<tr>
<td>6</td>
<td>0.30</td>
</tr>
<tr>
<td>8≤n≤40</td>
<td>0.23(\frac{8}{n})</td>
</tr>
</tbody>
</table>

**Test Results:**
Since the EUT’S power is less than 75w, so this test is not apply.
4.4 Voltage Fluctuations and Flicker (AC Mains Input Ports)

Specifications:  
EN 301 489-1 V1.9.2 (2011-09)  
EN 301 489-7 V 1.3.1(2005-11)  
EN 301 489-17 V2.1.1(2009-05)

Test conditions:  
Ambient Temperature: 15°C - 35°C  
Relative Humidity: 30% - 60%

Method of measurement:  
EN 61000-3-3 (2005)

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacture</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Digital power analyzer</td>
<td>EMTEST</td>
<td>DPA500N</td>
<td>v11261099 88</td>
<td>2014-02-14</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Universal Radio Communication tester</td>
<td>R/S</td>
<td>CMU200</td>
<td>123125</td>
<td>2013-09-26</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Limits:

EN 61000-3-3 (2005) clause 5:

The following limits apply:
— the value of $P_{st}$ shall not be greater than 1,0;
— the value of $P_{lt}$ shall not be greater than 0,65;
— the value of $d(t)$ during a voltage change shall not exceed 3,3 % for more than 500 ms;
— the relative steady-state voltage change, $d_c$, shall not exceed 3,3 %;
— the maximum relative voltage change, $d_{\text{max}}$, shall not exceed;
  a) 4 % without additional conditions;
  b) 6 % for equipment which is:
   — switched manually, or
   — switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

NOTE: The cycling frequency will be further limited by the $P_{st}$ and $P_{lt}$ limit. For example: a $d_{\text{max}}$ of 6 % producing a rectangular voltage change characteristic twice per hour will give a $P_{lt}$ of about 0,65.
Limits (continued):

c) 7 % for equipment which is:
   — attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen
   equipment such as mixers, garden equipment such as lawn mowers, portable tools such
   as electric drills), or
   — switched on automatically, or is intended to be switched on manually, no more
   than twice per day, and also has either a delayed restart (the delay being not less than
   a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with
6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power
supply interruption; or all equipment with automatic switching which is energized
immediately on restoration of supply after a power supply interruption, limits a) shall
apply; for all equipment with manual switching, limits b) or c) shall apply depending on
the rate of switching.

P_{st} and P_{lt} requirements shall not be applied to voltage changes caused by manual
switching.

The limits shall not be applied to voltage changes associated with emergency switching
or emergency interruptions.

Test Results:
Since the EUT is unlikely to produce significant voltage fluctuations or flicker, the test item is not
applicable.
4.5 RF Electromagnetic Field (80MHz to 2700MHz)

Specifications:  
EN 301 489-1 V1.9.2 (2011-09)  
EN 301 489-7 V1.3.1(2005-11)  
EN 301 489-17 V2.1.1(2009-05)

Date of tests:  
2013-08-19

Test conditions:  
Ambient Temperature: 15°C - 35°C  
Relative Humidity: 30% - 60%

Method of measurement:  
EN 61000-4-3 (2006)

Test levels:  
80MHz-1000MHz, 1400MHz-2700MHz,  
3V/m(unmodulated, r.m.s), 80%AM(1kHz), Dwell time: 3s

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal Generator</td>
<td>R/S</td>
<td>SMY02</td>
<td>100024</td>
<td>2013-10-25</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Power Meter</td>
<td>R/S</td>
<td>NRVS</td>
<td>100085</td>
<td>2014-01-06</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>Radio Communications Analyzer</td>
<td>Anritsu</td>
<td>MT8820B</td>
<td>6200772659</td>
<td>2014-01-26</td>
<td>Normal</td>
</tr>
<tr>
<td>4</td>
<td>Audio analyzer</td>
<td>R/S</td>
<td>UPL</td>
<td>100061</td>
<td>2014-07-01</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Performance Criteria:

EN 301 489-7 v1.3.1(2005-11)

Method of Measurement

a. The test procedure was in accordance with IEC 61000-4-3.

b. A communication link should be established and the testing was performed in a full-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.

c. The frequency range is swept from 80MHz to 1000MHz, 1400MHz to 2700MHz, with the signal 80% amplitude modulated with a 1 KHz sine wave. The frequency range is swept incrementally, and the step size was 1% of fundamental. The field strength level was 3V/m.

d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

e. The EUT was exposed to both vertically and horizontally polarized fields on each of the four sides.

At the conclusion of the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Test Conditions

<table>
<thead>
<tr>
<th>Frequency</th>
<th>EUT state</th>
<th>Polarity</th>
<th>Field</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
</table>
### Test Data (only the worst case was reported):

#### Mode 3

**RX quality 80MHz-2.7GHz  Horizontal**

<table>
<thead>
<tr>
<th>(MHz)</th>
<th>Strength (V/m)</th>
<th>Mode 3</th>
<th>RX Qual</th>
</tr>
</thead>
<tbody>
<tr>
<td>80M-1GHz, 1.4-2.7GHz</td>
<td>H/V</td>
<td>3</td>
<td>Pass</td>
</tr>
<tr>
<td>Front side</td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>80M-1GHz, 1.4-2.7GHz</td>
<td>H/V</td>
<td>3</td>
<td>Pass</td>
</tr>
<tr>
<td>Back side</td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>80M-1GHz, 1.4-2.7GHz</td>
<td>H/V</td>
<td>3</td>
<td>Pass</td>
</tr>
<tr>
<td>Left side</td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>80M-1GHz, 1.4-2.7GHz</td>
<td>H/V</td>
<td>3</td>
<td>Pass</td>
</tr>
<tr>
<td>Right side</td>
<td></td>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

![Graph](attachment:image.png)
RX quality 80MHz-2.7GHz Vertical

Up Link 80MHz-2.7GHz Horizontal
Down Link 80MHz-2.7GHz Horizontal

Up Link 80MHz-2.7GHz Vertical
Down Link 80MHz-2.7GHz Vertical
4.6 Electrostatic Discharge

Specifications:
EN 301 489-1 V1.9.2 (2011-09)
EN 301 489-7 V 1.3.1(2005-11)
EN 301 489-17 V2.1.1(2009-05)

Date of tests: 2013-08-19

Test conditions:
Ambient Temperature: 15°C-35°C
Relative Humidity: 30%-60%

Method of measurement: EN 61000-4-2 (2001)

Test levels: 4kV contact discharge, 8kV air discharge

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacture</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ESD generator</td>
<td>EMTEST</td>
<td>Dito</td>
<td>V1126109982</td>
<td>2013-11-16</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Universal Radio Communication tester</td>
<td>R/S</td>
<td>CMU200</td>
<td>123125</td>
<td>2013-09-26</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Performance Criteria:
Clause 6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)
Clause 6.4 Performance criteria for Transient phenomena applied to Receivers (TR)

A communications link shall be established at the start of the test.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

**Test Results:**

The E.U.T. complies.
The E.U.T. meets Performance Criteria.
Test Point:

1. **HCP & VCP**

Note: VCP is Vertical Conducting Plane. HCP is Horizontal Conducting Plane.

**Test data:**

<table>
<thead>
<tr>
<th>Test Point</th>
<th>ESD Level (kV)</th>
<th>Contact or Air</th>
<th>Application Quantity</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+2</td>
<td>Contact</td>
<td>60</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>-2</td>
<td>Contact</td>
<td>60</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>+4</td>
<td>Contact</td>
<td>60</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>-4</td>
<td>Contact</td>
<td>60</td>
<td>Pass</td>
<td>None</td>
</tr>
</tbody>
</table>

Test photos:

4.7 Fast transients common mode

**Specifications:**

EN 301 489-1 V1.9.2 (2011-09)
EN 301 489-7 V1.3.1 (2005-11)
EN 301 489-17 V2.1.1 (2009-05)

**Date of tests:** 2013-08-19

**Test conditions:**

Ambient Temperature: 15°C-35°C
Relative Humidity: 30%-60%

**Method of measurement:** EN 61000-4-4 (2004)
Test levels:
0.5kV for signal, telecommunication and control ports
0.5kV for DC power input port
1kV for AC mains power input port

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ultra compact simulator</td>
<td>EMTEST</td>
<td>UCS500 N7</td>
<td>V1126109983</td>
<td>2013-11-29</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Universal Radio Communication tester</td>
<td>R/S</td>
<td>CMU200</td>
<td>123125</td>
<td>2013-09-26</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Performance Criteria:
EN 301 489-7 v1.3.1 (2005-11)
Clause 6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)
Clause 6.4 Performance criteria for Transient phenomena applied to Receivers (TR)

A communications link shall be established at the start of the test.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Test Results:

The E.U.T. complies.
The E.U.T. meets Performance Criteria.

Test ports:
1. AC mains power input port

Test Data:

<table>
<thead>
<tr>
<th>Test Port</th>
<th>Test Level</th>
<th>E.U.T. Operating Mode</th>
<th>Coupling Mode (Direct or Capacitive)</th>
<th>Time Duration</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>±1kV</td>
<td>Mode 1 Mode 4</td>
<td>Direct</td>
<td>60s</td>
<td>Pass</td>
<td>None</td>
</tr>
</tbody>
</table>
Remarks: The other signal port, telecommunication port, control port, and/or DC power port of E.U.T. do not have cables which may be longer than 3m. So these ports are not applicable for this test.

**Test system Verification Requirements:**

**Verification Waveform Characteristics:**

<table>
<thead>
<tr>
<th>Limits</th>
<th>50Ω Load (KW50)</th>
<th>1000Ω Load (KW1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rise Time</td>
<td>t_r=5ns ±30%</td>
<td>t_r=5ns ±30%</td>
</tr>
<tr>
<td>Duration time</td>
<td>t_d=50ns ±30%</td>
<td>t_d=50ns (-15,+100)</td>
</tr>
</tbody>
</table>

**Peak Voltage V_p:**

<table>
<thead>
<tr>
<th>Set voltage</th>
<th>V_p (open circuit)</th>
<th>V_p (1 000 Ω)</th>
<th>V_p (50 Ω)</th>
<th>Repetition frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>kV</td>
<td>kV</td>
<td>kV</td>
<td>kV</td>
<td>kHz</td>
</tr>
<tr>
<td>0.25</td>
<td>0.25</td>
<td>0.24</td>
<td>0.125</td>
<td>5 or 100</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
<td>0.40</td>
<td>0.25</td>
<td>5 or 100</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0.96</td>
<td>0.5</td>
<td>5 or 100</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1.9</td>
<td>1</td>
<td>5 or 100</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>3.8</td>
<td>2</td>
<td>5 or 100</td>
</tr>
</tbody>
</table>

**Verification Results Record:**

<table>
<thead>
<tr>
<th>Load</th>
<th>Voltage Level</th>
<th>t_r (ns)</th>
<th>t_d (ns)</th>
<th>V_p (V)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 Ohm</td>
<td>500 V</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>1000 V</td>
<td></td>
<td>5.51</td>
<td>54</td>
<td>960</td>
</tr>
<tr>
<td>1000 Ohm</td>
<td>500 V</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>1000 V</td>
<td></td>
<td>5.62</td>
<td>57</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Test Photos:**
4.8 RF Common Mode 0.15MHz-80MHz

Specifications: EN 301 489-1 V1.9.2 (2011-09)
EN 301 489-7 V 1.3.1(2005-11)
EN 301 489-17 V2.1.1(2009-05)

Date of tests: 2013-08-20
Test conditions: Ambient Temperature: 15°C-35°C
Relative Humidity: 30%-60%

Method of measurement: EN 61000-4-6 (2006)
Test level: 0.15MHz-80MHz, 3V(unmodulated, r.m.s), 80%AM(1kHz), Dwell time: 0.5s

Test equipment:

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal Generator</td>
<td>R/S</td>
<td>SMY02</td>
<td>100024</td>
<td>2013-10-25</td>
<td>Normal</td>
</tr>
<tr>
<td>2</td>
<td>Power Meter</td>
<td>R/S</td>
<td>NRVS</td>
<td>100231</td>
<td>2014-01-05</td>
<td>Normal</td>
</tr>
<tr>
<td>3</td>
<td>Radio Communications Analyzer</td>
<td>Anritsu</td>
<td>MT8820B</td>
<td>6200772</td>
<td>2014-01-26</td>
<td>Normal</td>
</tr>
<tr>
<td>4</td>
<td>Audio analyzer</td>
<td>R/S</td>
<td>UPL</td>
<td>100061</td>
<td>2014-07-01</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Performance Criteria:
EN 301 489-7 v1.3.1(2005-11).
Clause 6.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)
Clause 6.3 Performance criteria for Continuous phenomena applied to Receivers (CR)

A communication link shall be established at the start of the test, and maintained during the test.

During the test, the uplink and downlink speech output level and downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centered on 1 kHz (audio breakthrough check).

NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.

During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence.

At the conclusion of the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
Test Result:

The E.U.T. complies.
The E.U.T. meets Performance Criteria.

Test ports:
1. AC mains power input port

Test Conditions

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Field Strength (V/m)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15-80</td>
<td>3</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Test data (only the worst case was reported):
Mode 3
RX quality 0.15MHZ-80MHZ
Down Link 0.15MHZ-80MHZ

Up Link 0.15MHZ-80MHZ
**Test Photos:**

![Test Photos](image_url)

**4.9 Voltage Dips and Interruptions**

**Specifications:**
- EN 301 489-1 V1.9.2 (2011-09)
- EN 301 489-7 V 1.3.1(2005-11)
- EN 301 489-17 V2.1.1(2009-05)

**Date of tests:**
- 2013-08-20

**Test conditions:**
- Ambient Temperature: 15°C - 35°C
- Relative Humidity: 30% - 60%

**Method of measurement:**
- EN 61000-4-11 (2004)

**Test levels:**
- Voltage dips: 0 % residual voltage for 0.5 cycle;
- Voltage dips: 0 % residual voltage for 1 cycle;
- Voltage dips: 70 % residual voltage for 25 cycles;
- Voltage interruptions: 0 % residual voltage for 250 cycles.

**Test equipment:**

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model Number</th>
<th>Serial Number</th>
<th>Cal Due</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ultra compact simulator</td>
<td>EMTEST</td>
<td>UCS500N7</td>
<td>V1126109</td>
<td>2013-11-29</td>
<td>Normal</td>
</tr>
</tbody>
</table>
Performance Criteria:
For voltage dips, TT and CR performance criteria are used. 
For voltage interruption, TT and TR performance criteria are used.

Test Result:

The E.U.T. complies.  
The E.U.T. meets Performance Criteria.

Test ports:
1. AC Mains Port

All Test Modes:

Test Data:

<table>
<thead>
<tr>
<th>Test Port</th>
<th>% residual voltage</th>
<th>Time Duration</th>
<th>E.U.T. Operating Mode</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0.5 cycle</td>
<td>Mode 3~ Mode5</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1 cycle</td>
<td>Mode 3~ Mode5</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>70</td>
<td>25 cycle</td>
<td>Mode 3~ Mode5</td>
<td>Pass</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>250 cycle</td>
<td>Mode 3~ Mode5</td>
<td>Pass</td>
<td>None</td>
</tr>
</tbody>
</table>

4.10 Surge Immunity, line to line and line to ground

Specifications:  
EN 301 489-1 V1.9.2 (2011-09)  
EN 301 489-7 V 1.3.1(2005-11)  
EN 301 489-17 V2.1.1(2009-05)  

Date of tests: 2013-08-20  
Test conditions:  
Ambient Temperature: 15°C-35°C  
Relative Humidity: 30%-60%  

Method of measurement: EN 61000-4-5 (2005)  
Test levels: 2kV line to ground and 1kV line to line for AC mains power input port, 1.2/50μs pulse;
Performance Criteria:
EN 301 489-7 v1.3.1 (2005-11)

Clause 6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)
Clause 6.4 Performance criteria for Transient phenomena applied to Receivers (TR)

A communications link shall be established at the start of the test.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Test Results:

The E.U.T. complies.
The E.U.T. meets Performance Criteria.

Test ports:
1. AC mains power input port

Test Mode:
Mode 3~ Mode 5

Test Data:

<table>
<thead>
<tr>
<th>Test Port</th>
<th>Test level</th>
<th>E.U.T. Operating Mode</th>
<th>Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1kV line to line, 1.2/50μs pulse</td>
<td>Mode 3 Mode 4 Mode 5</td>
<td>Pass</td>
<td>None</td>
</tr>
</tbody>
</table>

Test System Verification Record:

<table>
<thead>
<tr>
<th>Open Circuit Voltage</th>
<th>Measured Voltage kV</th>
<th>Wave form 1: 1.2/50</th>
<th>Wave form 2: 10/700</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Front Time μs 1,2 ± 30 %</td>
<td>Time to Half Value μs 50 ± 20 %</td>
<td>Front Time μs 10 ±</td>
<td>Time to Half Value μs 700 ±</td>
</tr>
<tr>
<td>Voltage Level</td>
<td>Test Value</td>
<td>Code</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>0.5kV ± 10%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1.0kV ± 10%</td>
<td>1.05</td>
<td>1.41</td>
<td>50.8</td>
<td>--</td>
</tr>
<tr>
<td>2.0 kV ± 10%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4.0 kV ± 10%</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
ANNEX A Test Setup Diagrams

A.1 Radiated Emissions

Applicable to standard EN 55022(2006)
Test Configuration - Radiated Emission

The measuring distance between E.U.T and antenna is 3m.

A.2 Conducted Emissions (AC mains port)

Applicable to standard EN 55022(2006)
Test Configuration - Conducted Emission

A.3 Harmonic current emissions

Applicable to standard EN 61000-3-2(2006)
Test configuration – Harmonic emission

A.4 Voltage fluctuations and flicker

Applicable to standard EN 61000-3-3(2005)
Test configuration – Voltage fluctuations and flicker

A.5 RF electromagnetic field (80MHz to 2700MHz)

Applicable to standard IEC 61000-4-3:2006
Test Configuration - RF electromagnetic field (80MHz to 2700MHz)
A.6 Electrostatic Discharge

Applicable to standard EN 61000-4-2(2001)

Test Configuration - Electrostatic Discharge

HCP – Horizontal Coupling Plane
VCP – Vertical Coupling Plane
RGP – Reference Ground Plane
A.7 Fast transients common mode

Applicable to standard EN 61000-4-4(2004)
Test Configuration - Fast transients common mode

A.8 RF common mode 0.15 MHz to 80 MHz

Applicable to standard EN 61000-4-6(2005)
Test Configuration – RF common mode (0.15 MHz to 80 MHz)
A.9 Voltage dips and interruptions

Applicable to standard EN 61000-4-11(2004)
Test Configuration – Voltage dips and interruptions

![Diagram: Mains Interference Simulator connected to EUT]

A.10 Surges, line to line and line to ground

Applicable to standard EN 61000-4-5(2006)
Test Configuration – Surges, line to line and line to ground

![Diagram: Surge Generator connected to EUT]

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

The End of this Report