SPIRENT 8100 MOBILE DEVICE TEST SYSTEM

A-GPS Over-The-Air Test Solutions

Spirent’s A-GPS Over-The-Air (OTA) test solutions for UMTS, CDMA and LTE devices automate the CTIA-defined OTA Test Plan while also providing the customization capability needed for R&D testing. With a wide range of OTA test options, the solutions provide seamless integration with radiated testing hardware.

APPLICATIONS

Test Labs:
- OTA testing to the CTIA Test Plan
- Operator-specific OTA testing
- Future standards-based OTA testing

Device Manufacturers
- GPS antenna characterization and performance benchmarking
- Impact of antenna placement and device form factor
- Degradation due to interference of A-GPS and other radiation sources
- LTE and GPS coexistence and interference testing

With its A-GPS Over The Air test solutions, Spirent brings A-GPS expertise and industry leadership to an OTA test environment. The OTA test pack option offers full automation of all A-GPS OTA tests in the CTIA Test Plan for Mobile Station Over the Air Performance. Customizable parameters enable test time optimization, as well as testing beyond the requirements of industry standards.

OTA test capability is supported on Spirent’s Location Technology Solution (LTS) for UMTS and CDMA devices and Position Location Test System (PLTS) for CDMA devices. A combined LTS/PLTS solution is also supported, enabling testing of UMTS, CDMA, and LTE devices using a single solution.

The Spirent solution is supported by automation software from the leading suppliers of radiated test solutions: SATIMO’s SMM (for UMTS and CDMA) and ETS-Lindgren’s EMQuest™ (for UMTS, CDMA and LTE). An OTA Open API option and the Spirent Test Pack are also available for users needing more advanced customization, flexibility and open interfaces for customized test development. This API speeds test development by encapsulating commonly-used functionality.

A new service recently added to the test solution is the option of Custom Chamber Integration. Spirent Professional Services is able to integrate a customer-supplied chamber and associated hardware with the Spirent A-GPS OTA solution. Please refer to “Custom Chamber Integration” data sheet for more information.
KEY FEATURES

- Fully supports CTIA’s A-GPS OTA Test Plan v 3.2
- Supports OTA performance testing beyond CTIA Test Plan requirements, including A-GLONASS OTA
- Uses standard cellular signaling channels for direct over the air measurements
- Supported by ETS-Lindgren’s EMQuestTM automation software
- Supported by SATIMO’s SMM automation software
- OTA Open API option for advanced customization and test case development
- Easy integration of Spirent’s PLTS and LTS for a combined CDMA, UMTS, and LTE A-GPS OTA test solution
- Scalable to industry-leading coverage of conducted A-GPS conformance and performance test capability for UMTS, CDMA and LTE devices
- Supports standalone GNSS LTE OTA tests

BENEFITS

- Comprehensive radiated GPS antenna testing – OTA testing measures the true radiated GPS performance of mobile devices, unlike conducted testing where GPS signals bypass the GPS antenna and key RF components
- Automated CTIA A-GPS OTA testing – Full automation executes all the testing required by the CTIA Test Plan with minimum user intervention
- Flexible parameters maximize test efficiency – Optimize test time by modifying parameters and running only tests that are needed
- Testing capability beyond industry standards – Extensive customization options enable advanced performance testing

GPS antenna pattern testing at different angles of arrival and signal polarizations.
TECHNICAL SPECIFICATIONS

Anechoic chamber requirements

- Anechoic chamber with turntable/positioning system, GPS antenna, and cellular communication antenna
- Typical GPS OTA path loss range: 30-60 dB. Note: Max. 60 dB OTA Loss supported
- Linearly polarized GPS antenna, able to transmit two orthogonal polarizations supporting the frequency 1575.42 MHz
- Minimum of one cellular antenna (two antenna configuration also supported)
- Uplink Limiting Amplifier
- Turntable or other method of changing angle of arrival

THE CTIA TEST PLAN

Spirent’s OTA test solutions automate the CTIA’s OTA Test Plan for A-GPS, which includes the following key steps:

- Establish the Antenna Pattern by radiating a reference GPS Signal to the Device Under Test (DUT) and varying the angle of arrival in two planes using the chamber’s positioning system
- Carry out a Linearization procedure to characterize and remove any non-linearities introduced by the DUT’s measurements
- Measure Radiated Sensitivity by lowering the GPS signal until the DUT is unable to meet the performance requirements of the Test Plan
- Calculate Total Isotropic Sensitivity (TIS), Upper Hemispheric Isotropic Sensitivity (UHIS) and Partial Isotropic GPS Sensitivity (PIGS), metrics which combine the Antenna Pattern and Radiated Sensitivity
- Test Intermediate Channel Degradation (ICD) to establish A-GPS performance across a range cellular channels likely to be encountered by the DUT while roaming
- Spirent also features support for CTIA OTA test plan v3.2, which includes A-GPS OTA TIS measurements over LTE, using the SUPL 2.0 protocol.

List of Spirent A-GPS OTA solutions approved and placed on the CTIA Authorized Equipment List:

- Spirent UMTS+GSM A-GPS
- Spirent CDMA A-GPS
- ETS-Lindgren’s EMQuestTM & Spirent UMTS+GSM+LTE A-GPS
- ETS-Lindgren’s EMQuestTM & Spirent CDMA A-GPS
- Satimo SMM & Spirent UMTS+LTE A-GPS
- Satimo SMM & Spirent CDMA A-GPS
SYSTEM REQUIREMENTS

**LTS**
All OTA test options are available on the following LTS configurations:
8100-A500, 8100-B500, 8100-A600, 8100-A750, and 8100-B750

**PLTS**
All OTA test options are available on the following PLTS configurations:
C2K-CFG[6, 7, 8, 9, 12, 13, and 14]-SYS

**LTS + PLTS**
LTE, UMTS and CDMA devices can be tested on a single solution by upgrading any of the following PLTS configurations with:
8100-A750 (LTS)
C2K-CFG[6, 7, 8, 9, 12, 13, and 14]-SYS

<table>
<thead>
<tr>
<th>SPIRENT A-GPS OTA TEST SOLUTIONS</th>
<th>SATIMO SMM</th>
<th>ETS-Lindgren EMQuest™</th>
<th>Spirent TestDrive-OTA Automation Software</th>
<th>OTA API for Custom Development</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8100-LTS (UMTS &amp; LTE Devices)</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PLTS (CDMA Devices)</strong></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Custom Chamber Integration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UMTS DEVICES (LTS)</th>
<th>CDMA DEVICES (PLTS)</th>
<th>LTE DEVICES (LTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATIMO SMM</td>
<td>8100-CFG-LBS-OTA-APP</td>
<td>PLTS-API</td>
</tr>
<tr>
<td>ETS-Lindgren EMQuest™</td>
<td>8100-CFG-LBS-OTA-APP</td>
<td>PLTS-OTA-API</td>
</tr>
<tr>
<td>OTA API for Custom Development</td>
<td>8100-CFG-LBS-OPEN-API</td>
<td>N/A</td>
</tr>
<tr>
<td>Custom Chamber Integration*</td>
<td>PAWP-SVC-PRO-6050-LTS</td>
<td>PAWP-SVC-PRO-6050-PLTS</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION
Due to the modularity and wide range of available 8100 Mobile Device Test System configurations, please contact your regional Spirent sales representative for detailed ordering information.

SPIRENT GLOBAL SERVICES
Spirent Global Services provides a variety of professional services, support services and education services — all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirent.com/gs or contact your Spirent sales representative.

* Ask about supported chambers.

**AMERICAS** 1-800-SPIRENT  •  +1-818-676-2683  •  sales@spirent.com

**EUROPE AND THE MIDDLE EAST**  +44 (0) 1293 767979  •  emeainfo@spirent.com

**ASIA AND THE PACIFIC**  +86-10-8518-2539  •  salesasia@spirent.com

© 2013 Spirent Communications, Inc. All of the company names and/or brand names and/or product names and/or logos referred to in this document, in particular the name “Spirent” and its logo device, are either registered trademarks or trademarks pending registration in accordance with relevant national laws. All rights reserved. Specifications subject to change without notice.  Rev. H 01/13