# MiniLAB | 6 GHz OTA

5G by MVG

**LITTLE BIG LAB**

Affordable Shielded Wireless Test System for IoT Testing

Little in size,
BIG in performance


**Passive & RSE Capabilities!**

mvg Microwave Vision Group

“With **Internet of Things** the connected society is becoming a reality. A world where everything that benefits from being connected will be connected. Internet moves beyond Smartphones and into a wide range of new markets and devices, impacting all industries. Wearables, connected homes, connected cities, healthcare and industrial sectors all benefit from the services enabled by wireless connectivity. The affordable price point, ease of use and compact size enables companies targeting these new markets and products to benefit from MiniLAB I 6 GHz OTA for testing and optimizing wireless performance.”


# The MiniLAB I 6 GHz OTA

**is a combination of a full turn-key wireless test system in a compact and perfectly shielded box.** MiniLAB I 6 GHz OTA enables OTA measurements to be performed rapidly with high accuracy, including critical low power sensitivity measurements, as well as radiation pattern measurement (passive measurement) and RSE testing. Users can obtain figures of merit of the wireless connectivity performance as well as diagnostically analyze how to optimize the product, thanks to the full spherical radiation characterization of the tested device. **The automation of the test system and the intuitive user interface enables companies with no experience from the past in antenna testing to efficiently perform connectivity tests of their devices with high accuracy.**

## Key benefits

- **Full turn-key wireless test system**
- **Accurate OTA testing**
- **Full passive antenna measurement**
- **RSE Testing**
- **Shielded chamber with high RF attenuation**
- **Wide range of supported protocols including IoT & low power**


## Solution for

- IoT measurements, M2M, wearable devices
- Smartphones, tablets, laptops
- Radiation visualization

## Main features

### Technology

- Multi-probe

### Measurement capabilities

- Active OTA testing
  - TRP, TIS
- Passive antenna measurement
  - Radiation pattern characteristics
- RSE testing

### Supported protocols

- Bluetooth, Bluetooth Low Energy (BLE)
- Zigbee
- LTE Cat-M
- NB-IoT
- Wi-Fi 802.11 a/b/g/n/ac
- GPS, A-GPS, GNSS, A-GNSS
- LTE TDD/FDD
- GSM, GPRS, EDGE
- CDMA2000, CDMA 1xRTT, CDMA 1xEVDO
- WCDMA, HSDPA, HSPA, HSPA+, HSUPA
- TD-SCDMA, TD-HSDPA

### Frequency bands

- 650 MHz to 6 GHz

### Anechoic chamber

- Shielded chamber with 100 dB RF attenuation, critical for IoT & low power protocol Rx testing
- Fully absorber lined
- Automated door opening / closing. (<15 seconds)
- Integrated LED & fiber-optic lighting inside chamber

### Max. size of DUT

- Up to 40 cm

### Max. weight of DUT (centered load)

- 10 kg with styrofoam mast

## System configurations

### Software

Measurement control, data acquisition and post processing

■ WaveStudio

OTA measurement suite

■ WaveStudio

### Equipment

■ Arch with probe array, DUT positioner
■ Portable shielded chamber with absorbers, automatic door
■ Lighting inside chamber

### Accessories

■ PC
□ Laptop support interface
□ Hand and head phantoms
□ Reference antennas

### Services

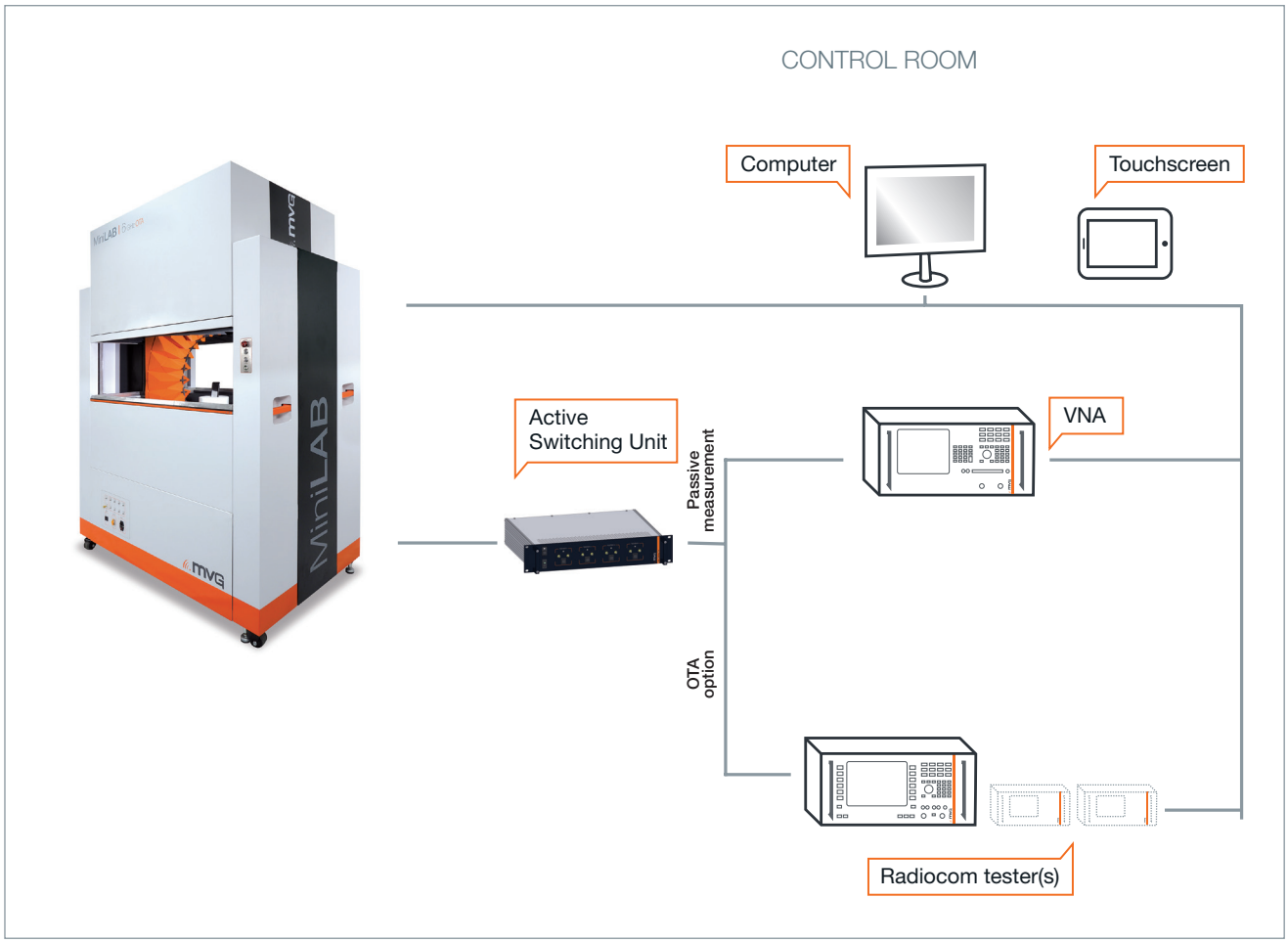
■ Warranty
□ Installation
□ Training
□ Post warranty service plans

### Product reference

SKU: ML 6 GHz OTA

■ Included □ Optional ○ Required

## System overview




## OTA Testing

MiniLAB I 6 GHz OTA uses microwave electronic scanning technology to evaluate the electromagnetic field in a full sphere around the antenna. A phase-amplitude test is performed using a multi-probe array of dual-polarized sensors which scans the antenna within seconds.

The field is then reconstructed and integrated for calculation of OTA parameters. The fully shielded chamber with absorbers ensures a stable and controlled RF environment securing the possibility to measure all OTA parameters including low power sensitivity tests with high accuracy.

## Passive Measurement

Its electronically scanned probe-array arch enclosed in a high-isolated chamber, speeds up the measurement time of radiation patterns of devices up to 30 cm diameters*, making MiniLAB the ideal solution for antenna performance optimization of all kinds of devices.

* Depending on the frequency

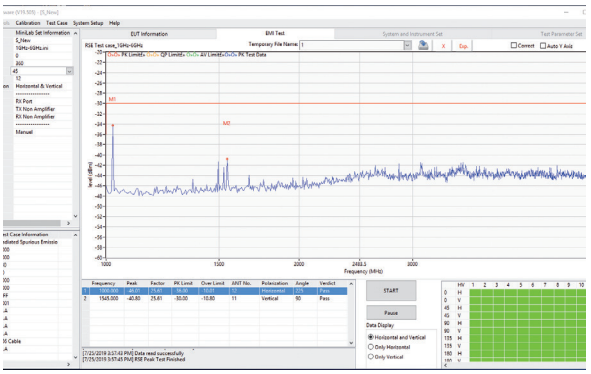
**MiniLAB | 6GHz is optimized for testing 5G applications, including**

Smartphones | IoT | Wearables | M2M

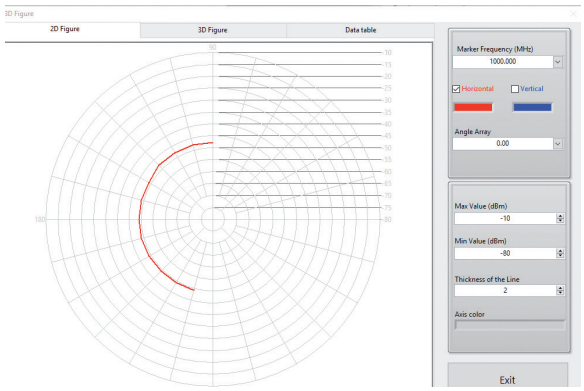
5G SUPPORT

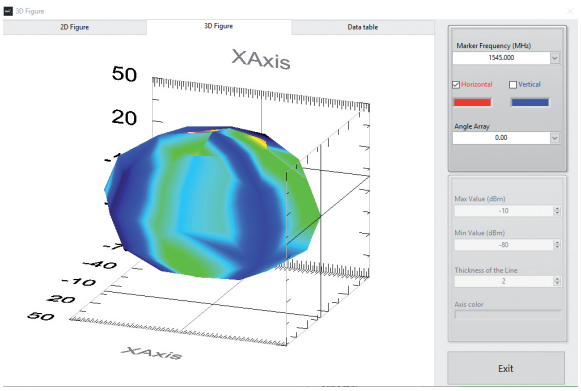
# RSE Testing

MiniLAB I 6GHz OTA employs multi-probe technology to offer a new approach to measuring RSE on LTE devices, unlike the traditional RSE measurement methods which vertically scan the device as it rotates in azimuth.
With dramatically reduced measurement time and the deliverance of precise measurement data, its integrated probe-array arch uses electronic scans to measure the wireless device, making it easier and faster for users to measure RSE in the presence of LTE frequency bands up to 6 GHz. Once the measurements are complete, the RSE measurement results can be obtained within 20 seconds. Equipped with an anechoic shielded chamber of 100 dB RF attenuation, MiniLab offers a high dynamic range to measure peak levels of both the transmitted wireless signals and the surrounding emissions without distortions.



Example of RSE Test 1 GHz - 6 GHz




At the selected frequency, the radiated power can be read at various angles in 2D and 3D plots

## OTA performance measurement specifications*

### ACCORDING TO CTIA SPECIFICATIONS

| | |
|---|---|
| TRP accuracy free space | <± 1.9 dB |
| TRP accuracy talk position | <± 2.0 dB |
| TRP repeatability | ± 0.3 dB |
| Typical TRP measurement time** | < 2 min |
| TIS accuracy free space | <± 2.0 dB |
| TIS accuracy talk position | <± 2.1 dB |
| TIS repeatability | ± 0.5 dB |
| Typical TIS measurement time*** | 15 min → 60 min |

### CTIA COMPARABLE

| | |
|---|---|
| GSM/WCDMA protocols: | |
| TIS based on Rx Level accuracy | <± 2.8 dB |
| TIS based on Rx Level repeatability | <± 1.5 dB |
| Typical TIS based on Rx level measurement time*** | < 6 min |
| CDMA2000 protocol: | |
| TIS optimized accuracy | <± 2.0 dB |
| TIS optimized repeatability | <± 0.5 dB |
| Typical TIS optimized measurement time*** | < 11 min |

* Specifications given according to the following assumptions:
- Controlled temperature and humidity during measurement
- Measurements inside an anechoic chamber
- DUT phase center does not exceed 15 cm from arch center
- Calibration done with dipole gain reference values
- Measurement performed with a suitable mast depending on the load and directivity of the DUT

Specifications also depend on Radio Communication Tester and Protocol

** One channel, 15 deg sampling, one time each probe, measurement time depends on protocol

*** One channel, 30 deg sampling, one time each probe, measurement time depends on protocol

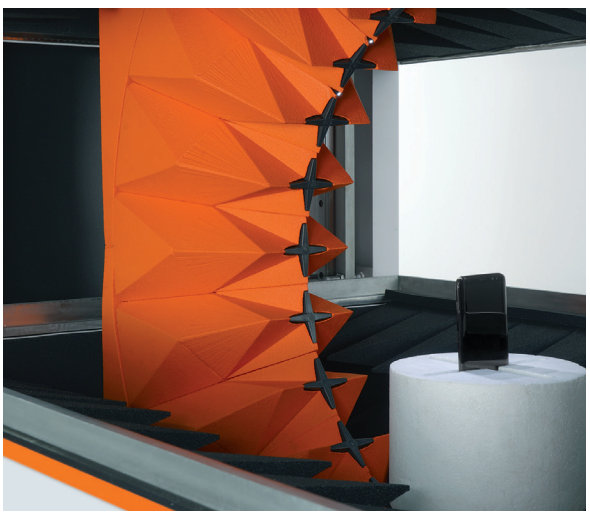
## Passive measurement specifications

### PASSIVE MEASUREMENT DUT SIZE

| Frequency (GHz) | Maximum DUT Size (m) |
|---|---|
| 0.65 | 0.30 |
| 1.0 | 0.30 |
| 2.0 | 0.30 |
| 3.0 | 0.30 |
| 4.0 | 0.29 |
| 5.0 | 0.23 |
| 6.0 | 0.19 |
| 8.0 | 0.14 |
| 10.0 | 0.11 |

### PASSIVE MEASUREMENT PEAK GAIN ACCURACY

| | 10 dBi AUT |
|---|---|
| **PEAK GAIN ACCURACY** | |
| 0.65 GHz to 0.8 GHz | ± 2 dB |
| 0.8 GHz to 1 GHz | ± 1.5 dB |
| 1 GHz to 6 GHz | ± 1 dB |
| Peak gain repeatability | ±0.5 dB |



Inside view of MiniLAB I 6 GHz OTA when open


Door closed view of MiniLAB I 6 GHz OTA

# Standard system components

## 1 Compact chamber on wheels

- High RF attenuation capability with at 100 dB shielding
- Compact and mobile, the system passes easily through standard office double doors
- Test system equipped with stabilisers
- Absorbers optimized to minimize reflections

## 2 WaveStudio

- Best-in-class OTA measurement software suite
- Modular configuration allowing for test set-up and results analysis on separate workstations
- Automatic reporting ability
- Intuitive, user-friendly interface
- Supports all wireless protocols (CTIA, 3GPP etc.)

## 3 Advanced ergonomic design

- Excellent accessibility from both sides of the system
- Doors fully automatic at the press of a button
- Integrated fiber-optic lighting provides clear inside view

### Mechanical characteristics

| | |
|---|---|
| External dimensions of MiniLAB I 6 GHz OTA | 1.63 x 1.00 m (L x W) |
| Height closed | 1.81 m |
| Height open | 2.16 m |
| **DUT MAX. WEIGHT*** | |
| Styrofoam mast | 10 kg |
| **WEIGHT*** | |
| Approx. | 360 kg |

* Centered load

### RF equipment characteristics

| | |
|---|---|
| Number of probes | 12 |
| Frequency range | 650 MHz - 6 GHz |

Microwave Vision Group

**Contact your local sales representative for more information**

www.mvg-world.com/minilab

salesteam@mvg-world.com