TELEDYNE LECROY
Everywhereyoulook™

# TLF3000®

## RF PHY Test Solution for 2.4GHz ISM Band Technologies


## Key Features and Benefits

- Highly versatile solution covering multiple 2.4 GHz technologies including Bluetooth Classic BR/EDR, Bluetooth LE and 802.15.4 with Developer and Production licenses available
- New license options available for Bluetooth LE Developer and Production testers to support all AoA/AoD test cases in Bluetooth SIG RF test specification
- New License options available for Bluetooth LE Production tester to support multiple DUT testing, 2, 4, 8, 16 and 32 options
- Bluetooth Classic (BR/EDR) and LE Licenses include test scripts to run all test cases from Bluetooth RF Test specification – provides pre-compliance test solution prior to formal testing at test house
- Eliminates the need for multiple pieces of test equipment and simplifies test case set-up
- High-speed test solution e.g. In-band emissions test completes in 2.5 ms
- Packetized and interferer signal generation and analysis in one package
- Simple and intuitive GUI quickly identifies faults
- Standalone mode - test scripts can reside on a USB drive
- Test results can be exported to HTML, XML, CSV, and raw data formats
- Python + C API available for production environment

**TLF3000 Wireless RF PHY tester is a wideband, ultra-high dynamic range 2.4 GHz software-defined receiver, signal analyzer and signal generator. It captures and analyzes the entire 2402-2480 MHz band, simultaneously providing RF PHY testing, signal generation, signal analysis in one powerful package.**

**Licensing options are available to cover Bluetooth® Classic (BR/EDR), Bluetooth LE and 802.15.4 technologies with two modes of functionality for Developer and Production line test environments, making the TLF3000 a highly versatile RF PHY tester.**

### One-Box Test Solution

A significant challenge for wireless product manufacturers has traditionally been the daunting range of test equipment and test set-up required for thorough testing of the RF interface. Often, issues are not found until products are submitted for testing at a qualification test house. With one portable package, the TLF3000 negates the need for multiple pieces of RF test equipment, and simplifies the test set-up using pre-defined test scripts that set all the parameters for each test. TLF3000 combines packetized signal generation, in-band and out-of-band interferers, and a signal analyzer all combined into one box.

The TLF3000 can be used as a pre-compliance tester to ensure that products are ready for formal testing.

### Developer Tester

The TLF3000 developer configurations are designed for in-depth analysis of the RF PHY layer enabling developers to create products with a robust RF foundation that comply with the relevant specifications for **Bluetooth Classic (BR/EDR)**, **Bluetooth LE** and **802.15.4**.

For Bluetooth Classic (BR/EDR) and Bluetooth LE, the developer licenses provide access to predefined RF PHY test scripts to execute test cases from the Bluetooth RF test specifications. In addition to testing to the specification as the default mode, the user has the ability to change the parameters so that the DUT can be tested beyond the limits of the test specification. Users also have access to signal generator and signal analysis modes to test RX and TX interfaces independently.

### Production Tester

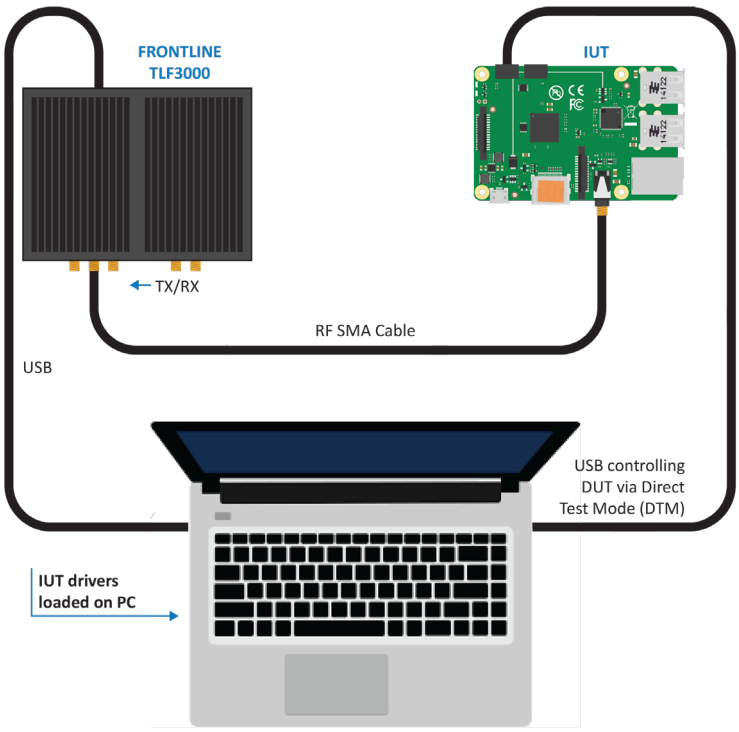
The TLF3000 production configurations, which also cover **Bluetooth Classic (BR/EDR)**, **Bluetooth LE** and **802.15.4**, provide a limited GUI allowing the user to preselect relevant test cases which, when saved as a script, can then be run remotely in a production line test environment. The TLF3000 has a native language to control test case functionality and an API that can be driven via Python or C/C++ scripts.

For Bluetooth LE, there are licenses available to support testing of multiple (2, 4, 8, 16, or 32) DUTs simultaneously.

### Specifications

- **Supported Host OS**
  Windows 7 and Windows 10
- **Host Interfaces**
  USB
  - Connector type: Micro-USB
  - Speed Rating: High Speed
  - VBUS Load: 2.2 µF, > 10 kΩ

  Ethernet
  - Connector type: RJ45
  - Speed: 10 / 100 / 1000
- **Input Power**
  - Connector type: 2.5 mm jack
  - Input voltage: 12 V DC
  - Power: 10 W typ (application dependent)
  - Reverse polarity protection: Yes
  - Over voltage protection: Yes
  - Under voltage protection: Yes
- **Dimensions**
  158.5 mm x 160.0 mm x 47.0 mm (6.3" X 1.9" X 6.3" )
- **Weight**
  1.3 kg (2.87 lb)
- **Operating Temperature**
  0°C to 40°C
- **Humidity**
  0% - 90% (0 °C – 35 °C), noncondensing




**Typical Testing Configuration**

### TX/RX Port

| | |
|---|---|
| Function | Low sensitivity 2.4 GHz RF input and signal generator output / Suitable for conducted measurements |
| Connector Type | SMA |
| Impedance | 50 Ω |
| Coupling | AC |
| Maximum DC Voltage | 50V |

### Receiver Specification for TX/RX Port

| | |
|---|---|
| Noise figure | 4.6 dB typ |
| IP3 @ max sensitivity | +47 dBm typ |
| SNR in 1MHz bandwidth | 80 dB typ |
| Maximum input signal | 27 dBm |
| Maximum usable signal | 27 dBm typ |
| Frequency range | 2401-2481 MHz |

## Ordering Information

| Product Description / Developer Configuration | Product Code |
|---|---|
| TLF3000 RF PHY Tester Hardware | 2014-25000-000 |
| TLF3000 RF Tester Suite - Bluetooth LE Developer | 2014-22250-003 |
| AoA/AoD Test Case Support (requires 2014-22250-003) | 2013-22250-020 |
| TLF3000 RF Tester Suite - BR/EDR Developer | 2014-22250-002 |
| TLF3000 RF Tester Suite - 802.15.4 Developer | 2014-22250-001 |

| Product Description / Production Configuration | Product Code |
|---|---|
| TLF3000 RF PHY Tester Hardware | 2014-25000-000 |
| TLF3000 RF Tester Suite - BR/EDR Production | 2013-22250-005 |
| TLF3000 RF Tester Suite - 802.15.4 Production | 2013-22250-006 |
| TLF3000 RF Tester Suite - Bluetooth LE Production | 2013-22250-004 |
| AoA/AoD Test Case Support (requires 2014-22250-004) | 2013-22250-007 |
| 2 DUT support (requires 2014-22250-004) | 2013-22250-009 |
| 4 DUT support (requires 2014-22250-004) | 2013-22250-010 |
| 8 DUT support (requires 2014-22250-004) | 2013-22250-021 |
| 16 DUT support (requires 2014-22250-004) | 2013-22250-022 |
| 32 DUT support (requires 2014-22250-004) | 2013-22250-023 |

***To order or for more information:***

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