RTX

WIRELESS WISDOM

RTX2254
BLUETOOTH RF TESTER
DATA SHEET

Supports Bluetooth 4.0-5.1 and provides a cost-effective way of monitoring quality and performance of BLE devices by allowing users to test key RF parameters on both the PCBA and final assembly level. RF measurement performed in Direct Test Mode or Advertising mode.

RTX2254 BLUETOOTH RF TESTER

SYSTEM COMPONENTS

The RTX2254 consists of a dedicated RF analyzer and generator and a versatile software package for test of Bluetooth Low-Energy (BLE) RF performance.

FEATURES

- Supports Bluetooth versions 4.0-5.1
- Designed for high-speed, cost-effective testing of key RF parameters
- Full Host Control Interface (HCI) for control of the DUT in Direct Test Mode (DTM)
- Includes RTX's own versatile driver as well as support for the various Bluetooth chipset manufacturers drivers
- Interface to all devices through the same USB port
- HCI interface with auto-sensing level converter
- Can be used as standalone unit or integrated into users' ATE systems
- Includes PC GUI for manual operation of RTX2254
- Datalogging functionality
- Available with single- or dual-DUT support
- Supports all generally available BLE chipsets

KEY RF MEASUREMENT PARAMETERS

- Transmit power
- Carrier frequency offset
- Packet Error Rate (PER)
- Receiver sensitivity

GRAPHICAL USER INTERFACE

The RTX2254 can be operated using the RTX Windows-based GUI where all measurements are easily configured, executed and shown in the main window.

REMOTE CONTROL

The RTX2254 can be integrated into an automated test system (ATE) and controlled via the included RTX2254 driver (DLL).

VERSATILE DRIVER

- Supports standard HCI commands as well as vendor-specific commands
- Can co-exist with chip vendors dedicated BLE drivers
- Enables remote control of RTX2254 and DUT

DUT CONNECTIONS

The RTX2254 is available with 1 or 2 RF IN/OUT ports and HCI connections on the front panel for connection to DUT's. The HCI connections comply to the physical layers defined for utilization of DTM (USB, UART 4 and 2 wire). RTX2254's with dual-DUT support includes an internal switch for supporting ATE applications with dual cavities and enhance equipment utilization and reduced tact time.

OPTIONS

- Over-The-Air (OTA) RF test on the advertising channels
- Performance enhancement for ultra-low test execution time
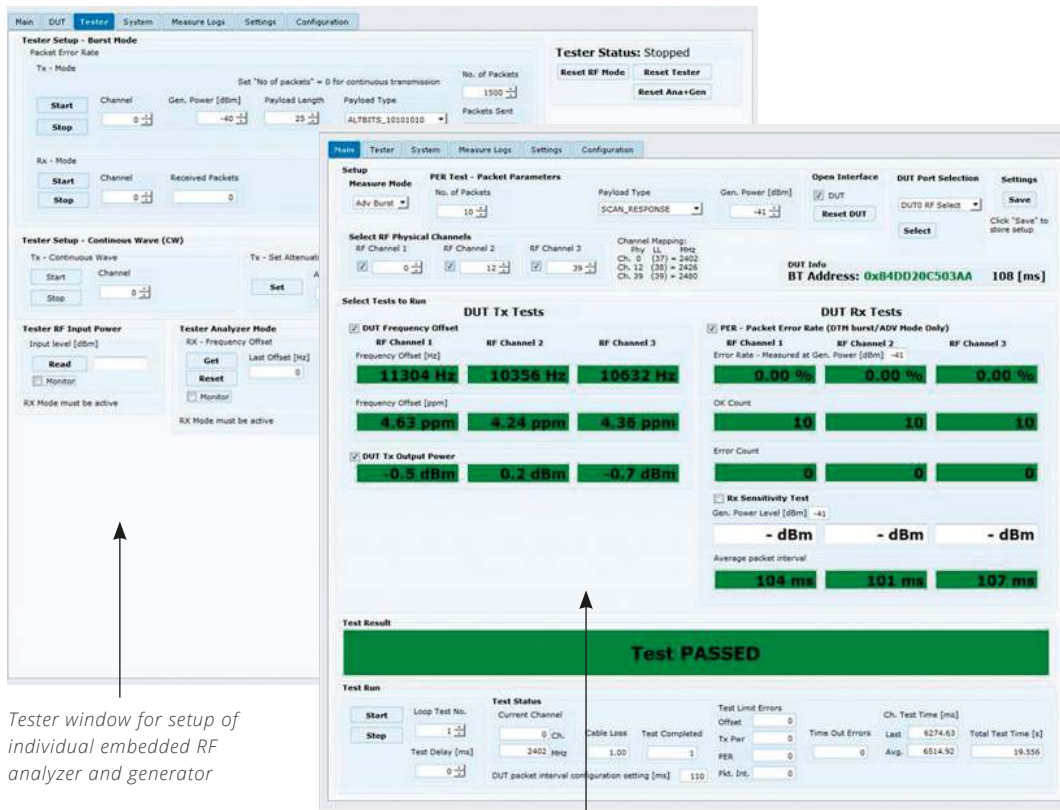
APPLICATIONS

- Manufacturing - ideal for ATE systems for inline and combined tests of BLE products
- Quality Assurance - manual or automatic test of manufactured BLE devices
- R&D - provides control of BLE devices in an R&D setup as well as swift verification of RF performance on prototypes

TESTER INTERFACES

Status LEDs   RF to DUT   USB to DUT   UART 2&4 wire to DUT

USB control interface   Power
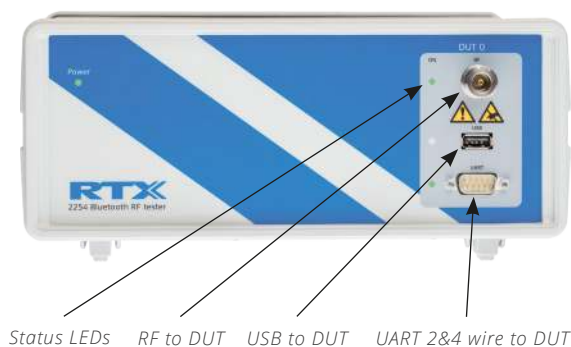
RTX2254 USER INTERFACE

The RTX2254 GUI provides easy and flexible configuration of the measurement setup for both the RTX2254 and the DUT for performing RF measurements. Users can e.g. choose the channels, parameters and number of measurements. In addition, the RTX2254 provides the user utilization of the embedded RF analyzer and signal generator as individual instruments, which can be very useful for e.g. R&D. Furthermore, the GUI includes datalogging functionality for logging measurement data into a local .txt file for later analysis.


Tester window for setup of individual embedded RF analyzer and generator

Main window for configuration and execution of RF measurements

TWO TEST MODES AVAILABLE

(DTM) DIRECT TEST MODE

BT SIG-defined test mode which allows for direct control of the DUT by utilizing the embedded HCI interface of the RTX2254. DTM requires electrical access to the HCI interface in the DUT which is typically accessible on the PCBA level. RF can be measured either radiated or conducted.

ADVERTISING MODE

Over-The-Air (OTA) test utilizing the BT SIG-defined advertising mode in the DUT for measurement of RF parameters on the advertising channels. Advertising mode does not require electrical access to the HCI interface in the DUT which is very useful for testing fully-assembled devices where the HCI interface is not exposed.
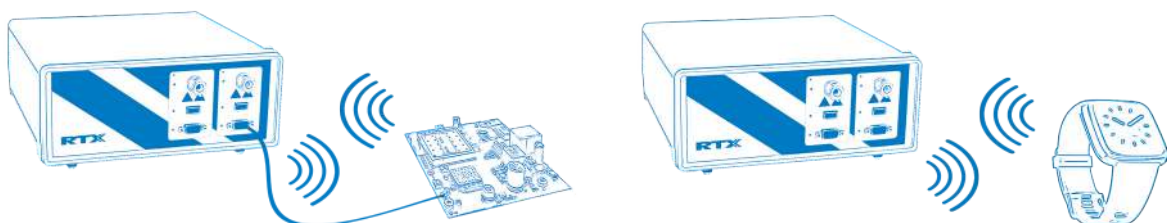
TECHNICAL SPECIFICATIONS

SUPPORT	SPECIFICATIONS
BLUETOOTH VERSIONS	4.0, 4.1, 4.2, 5.0 & 5.1

SIGNAL GENERATOR	SPECIFICATIONS
FREQUENCY RANGE	2402 MHz to 2480 MHz
FREQUENCY ACCURACY	+/- 1.0 ppm
AGING	<0.5 ppm/year at 35°C
OUTPUT LEVEL	-100 dBm to -40 dBm
RESOLUTION	0.5 dB
LEVEL ERROR	+/- 1.5 dB
MODULATION	GFSK

ANALYSER	SPECIFICATIONS
FREQUENCY RANGE	Same as signal generator
LEVEL METER (NTP) RANGE	-50 dBm to +10 dBm
LEVEL METER (NTP) RESOLUTION	0.1 dB
ACCURACY FOR NTP	+/- 1.0 dB

CONNECTIONS	SPECIFICATIONS
RF IN/OUT (DUT 0 & 1)	N (50Ω)
DUT HCI (DUT 0 &1)	USB, UART 2 & 4 wire, 1.8 - 5.0 V (auto-level sensing)

GENERAL DATA	SPECIFICATIONS
SUPPLY VOLTAGE	100-240 VAC 50-60 Hz
POWER CONSUMPTION	Approx. 18 W
OPERATING TEMPERATURE RANGE	+15°C to +40°C (59°F to 95°F)
STORAGE TEMPERATURE RANGE	-20°C to +60°C (35°F to 140°F)
OPERATING HUMIDITY	< 75% relative humidity at 40°C (104°F) non-condensing
DIMENSIONS (WXHXD)	255 x 105 x 270 mm (approx. 10 x 4 ⅛ x 10 ½ in)
WEIGHT	3.9 kg (8 lbs 10 oz)

ORDERING DETAILS

RTX NO.	INSTRUMENTATION	DESCRIPTION
95101347	RTX2254SA-1 BLE RF tester	BLE RF tester with support for 1 DUT
95101348	RTX2254SA-2 BLE RF tester	BLE RF tester with support for 2 DUTs
95101008	RTX2254 Option D	Support for test in advertising test mode
95101009	RTX2254 Option E	High-performance for reduced test time