

# BL651 Series

## Bluetooth® 5 Low Energy Modules featuring Nordic nRF52810

### COST-EFFECTIVE BLUETOOTH 5 FOR SIMPLE BLUETOOTH LOW ENERGY SOLUTIONS



Laird Connectivity's BL651 Series contains the latest Nordic nRF52810 silicon with **Bluetooth 5 Low Energy** capabilities and groundbreaking ultra-low power performance. Building on Laird Connectivity's multi-generation module developments utilizing Nordic silicon (BL600, BL652, BL654) – now comes the latest series offering **cost effective** Bluetooth 5 enablement for simple Bluetooth Low Energy (LE) applications.

The BL651 series exposes all the capabilities of the Nordic nRF52810 silicon in a small, fully certified module with simple soldering castellation for easy prototyping and mass production manufacturing. Use the **Nordic SDK and SoftDevice** or **Zephyr RTOS** to deliver your Bluetooth LE application. Let Laird Connectivity's innovative BL651 series and decades of expertise in Bluetooth module design speed your product to market.

In addition, the BL651 series is 100% PCB footprint **drop-in compatible** with the BL652 Series of modules, allowing flexibility to upscale your design if more flash/RAM or further feature sets are required, during the design process.

- **Bluetooth v5**
  - Higher Throughput 2MPHY
- **ANT and Proprietary 2.4GHZ** radios options
- **Powerful** – 64 MHz 32-bit Cortex M4 with 192 kB Flash/24 kB RAM
- **Widest range of configurable interfaces:** UART, I2C, SPI, ADC, GPIO, PWM
- **Industrial Temp Rating** (-40° to +85° C)
- **Ultra-Small footprint** (14 mm x 10 mm x 2.1 mm)
- **Bluetooth LE Roles** – Peripheral (x2) and Broadcaster – concurrent (Nordic SDK).
- **Major security features:** LE Secure Connections, Link Layer Ping, Privacy v1.2
- **Built on years of experience with Nordic** (BL600, BL652, and BL654 Series to date)
- **Fully certified:** FCC, ISED, EU, UKCA, MIC, AS/NZS, and RCM

### Features at a Glance



#### SPEED TO MARKET

Easily write your hostless applications utilizing the Nordic SDK directly and all supporting Nordic utilities



#### Extremely Efficient Power Management

Customize to balance throughput with power usage, enabled by ultra-low power sleep mode.



#### Global Approvals – Make Yourself at Home

Carries several modular FCC, IC, CE, MIC, AS/NZS, RCM and Bluetooth SIG approvals.



#### Personal support from Design to Manufacture

Laird Connectivity's industry-renowned support is passionate about helping you speed your design to market.

### Application Areas



IoT Devices and Sensors



Beacons and Proximity Applications



Secure Medical Peripherals



Industrial Monitoring

## Shared Specifications

Category	Feature	Specification
<b>Wireless Specification</b>	Radios	Bluetooth 5 ANT and Proprietary 2.4 GHz
	Frequency	2.402 - 2.480 GHz
	Transmit Power	+ 4 dBm (maximum). Configurable down to -40 dBm
	Receive Sensitivity	-96 dBm (typical – 1 Mbps mode) -93 dBm (typical – 2 Mbps mode)
	Link Budget (1Mbps)	100 dB (conducted)
	Antenna Options	PCB Trace antenna or IPEX MHF4 Connector
	Raw Data Rates (Air)	1 Mbps / 2 Mbps
	<b>Host Interface and Peripherals</b>	32 Max. Lines
<b>Profiles</b>	Bluetooth Low Energy	Any available via Nordic SDK or Zephyr RTOS
<b>Roles</b>	Bluetooth Low Energy	2x peripheral and 1x broadcaster with Nordic SDK
<b>Programmability</b>	Nordic SDK	Via JTAG Software/Support available from Nordic directly
	Nordic SoftDevice v S112	Any exposed within the related Nordic softdevice
	Zephyr	Via JTAG Software/Support available from Zephyr community
<b>Supply Voltage</b>		1.7V – 3.6V
<b>Power Consumption</b>	Current	Max Peak Radio Current (@ +4 dBm TX) – 7.0 mA (DCDC)
		Standby Doze – 1.5 uA
		Deep Sleep – 0.3 uA (external signal wake up)
<b>Physical</b>	Dimensions	14 mm x 10 mm x 2.1 mm <b>NOTE:</b> Drop in PCB footprint compatible with BL652 series
<b>Environmental</b>	Temperature Range	-40°C to +85°C
<b>Miscellaneous</b>	Lead Free	Lead-free and RoHS compliant
	MSL Level	4
<b>Development Tools</b>	Utilities	All Nordic utilities Android and iOS applications (nRF Connect)
<b>Qualifications</b>	Bluetooth®	Complete Declaration ID
<b>Approvals</b>	FCC/ISED/EU/UKCA/MIC/ASNZS/RCM	All BL651 Series

**For full specifications on BL651 Series modules, please see the appropriate Hardware Integration Guide.**

## ORDERING INFORMATION

Part	Description
453-00005	Bluetooth v5.0 Bluetooth LE module with integrated antenna (Nordic nRF52810) - Tape/Reel
453-00006	Bluetooth v5.0 Bluetooth LE module with external antenna (Nordic nRF52810) - Tape/Reel
453-00005C	Bluetooth v5.0 Bluetooth LE module with integrated antenna (Nordic nRF52810) - Cut Tape
453-00006C	Bluetooth v5.0 Bluetooth LE module with external antenna (Nordic nRF52810) - Cut Tape