

BL651 Series

Bluetooth® 5 Low Energy Modules featuring
Nordic nRF52810



COST-EFFECTIVE BLUETOOTH 5 FOR SIMPLE BLE SOLUTIONS



Laird's BL651 Series contains the latest Nordic nRF52810 silicon with **Bluetooth 5 Low Energy** capabilities and groundbreaking ultra-low power performance. Building on Laird's multi generation module developments utilizing Nordic silicon (BL600, BL652, BL654) – now comes the latest series offering **cost effective** Bluetooth 5 enablement for simple BLE 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 & SoftDevice** or **Zephyr RTOS** to deliver your BLE application. Let Laird'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
 - Advertising Extensions
- **ANT and Proprietary 2.4GHZ** radios options
- **Powerful** - 64MHz 32-bit Cortex M4 with 192kB Flash / 24kB RAM
- **Widest range of configurable interfaces:** UART, I2C, SPI, ADC, GPIO, PWM
- **Industrial Temp Rating** (-40° to +85° C)
- **Ultra-Small footprint** (14mm x 10mm x 2.1mm)
- **BLE 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 & BL654 Series to date)
- **Fully certified:** FCC, IC, CE, MIC & 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, RCM and Bluetooth SIG approvals.



Personal support from Design to Manufacture

Laird'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
Wireless Specification	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 – 1Mbps mode) -93 dBm (typical – 2Mbps mode)
	Link Budget (1Mbps)	100 dB (conducted)
	Antenna Options	PCB Trace antenna or IPEX MHF4 Connector
	Raw Data Rates (Air)	1 Mbps / 2 Mbps
	32 Max. Lines	UART, GPIO, I2C, SPI, ADC, PWM
Host Interface and Peripherals		
Profiles	Bluetooth Low Energy	Any available via Nordic SDK or Zephyr RTOS
Roles	Bluetooth Low Energy	2x peripheral and 1x broadcaster with Nordic SDK.
Programmability	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
Supply Voltage		1.7V – 3.6V
Power Consumption	Current	Max Peak Radio Current (@ +4dBm TX) – 7.0mA (DCDC)
		Standby Doze – 1.5 uA
		Deep Sleep –0.3uA (external signal wake up)
Physical	Dimensions	14mm x 10mm x 2.1mm NOTE: Drop in PCB footprint compatible with BL652 series
Environmental	Temperature Range	-40°C to +85°C
Miscellaneous	Lead Free	Lead-free and RoHS compliant
	MSL Level	4
Development Tools	Utilities	All Nordic utilities
		Android and iOS applications (nRF Connect)
Qualifications	Bluetooth®	Complete Declaration ID
Approvals	FCC / IC / CE / MIC / 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 BLE Module with integrated antenna (Nordic nRF52810) - Tape / Reel
453-00006	Bluetooth v5.0 BLE Module with external antenna (Nordic nRF52810) - Tape / Reel
453-00005C	Bluetooth v5.0 BLE Module with integrated antenna (Nordic nRF52810) - Cut Tape
453-00006C	Bluetooth v5.0 BLE Module with external antenna (Nordic nRF52810) - Cut Tape