

## NEXT-GEN BLUETOOTH LOW ENERGY AND NFC ON ONE MODULE



Our BL652 contains the latest generation silicon with **Bluetooth 5 Low Energy (LE)** capabilities and groundbreaking ultra-low power performance. Building on the expertise of the BL600 Series, the BL652's smaller form factor, class leading Nordic nRF52 silicon, optimized low power schemes and *smartBASIC* programming language provide a secure, stable, hostless Bluetooth environment. The BL652 **introduces Bluetooth 5 and NFC (via firmware v28.7.3.0 and later)**, bringing industrial security and feature expansion to our proven Bluetooth Low Energy modules. Let our innovative BL652 series and decades of expertise in Bluetooth module design speed your product to market.

- **Bluetooth 5** Bluetooth Low Energy (LE) plus **NFC**
- **Widest range of configurable interfaces:** UART, I2C, SPI, ADC, GPIO, PWM, FREQ, and NFC
- **Industrial Temp Rating** (-40° to +85° C)
- **Ultra-Small footprint** (14 mm x 10 mm x 2.1 mm)
- **Bluetooth LE Peripheral/Central roles** with DTM embedded
- **Major security upgrades:** AES-128, Diffie-Hellman pairing, link layer privacy
- **Hostless operation** – Internal MCU reduces BOM
- **Larger flash file systems** for data and app storage
- **Built on years of experience with Nordic** (BL600 Series Bluetooth LE modules)
- **Fully featured development kit** with Arduino shield connectors, support for multiple external sensors
- **Application Design Choice:** Leverage our *smartBASIC* or utilize Nordic SDK directly.

## FEATURES AT A GLANCE



### TRULY HOSTLESS OPERATION FOR AUTOMATED USE CASES

On-module MCU, *smartBASIC* and simultaneous central/peripheral role support combine for a powerful hostless solution for sensor applications.



### SPEED TO MARKET

Easily write event-driven, automated applications, no toolchain required with *smartBASIC*. Or utilize the Nordic SDK directly.



### 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, ISED, EU, UKCA, MIC, KC, NCC, AS/NZS, and Bluetooth SIG approvals.



### PERSONAL SUPPORT FROM DESIGN TO MANUFACTURE

Our industry-renowned support is passionate about helping you speed your design to market.

## APPLICATION AREAS



EIoT Devices and Sensors



Beacons and Proximity Applications



Secure Medical Peripherals



Industrial Monitoring

## Shared Specifications

| Category                              | Feature                                    | Specification  |
|---------------------------------------|--|--|
| <b>Wireless Specification</b>         | Bluetooth®                                 | Bluetooth 5 – Single-Mode (Peripheral and Central Roles)<br><b>Note: Bluetooth 5 requires firmware v28.7.3.0 or later</b>                                    |
|                                       | Frequency                                  | 2.402 - 2.480 GHz  |
|                                       | Transmit Power                             | + 4 dBm (maximum). Configurable down to -40 dBm  |
|                                       | Receive Sensitivity                        | -96 dBm (typical)  |
|                                       | Link Budget                                | 100 dB (conducted)   |
|                                       | Antenna Options                            | Chip antenna or IPEX MHF4 Connector  |
|                                       | Raw Data Rates (Air)                       | 1 Mbps   |
| <b>Host Interface and Peripherals</b> | UART Interface                             | TX, RX, CTS, RTS, DTR, DSR, DCD, RI possible in <i>smartBASIC</i> (GPIO)<br>Default 115200, N, 8, 1. From 1200 bps to 1 Mbps                                 |
|                                       | Other                                      | GPIO (31 maximum configurable lines), I2C (1 from GPIO), SPI (1 from GPIO), ADC (8 from GPIO), PWM and FREQ (Up to 12), NFC (1 in NFC-A Listen Mode, Type 2) |
| <b>Profiles</b>                       | Bluetooth Low Energy                       | GATT Client & GATT Server – Any Adopted or Custom Services   |
| <b>Roles</b>                          | Bluetooth Low Energy                       | Central or Peripheral Role. Programs can be loaded via UART or over the air.   |
| <b>Programmability</b>                | <i>smartBASIC</i>                          | On-board BASIC programming language  |
|                                       | Nordic SDK                                 | Software / Support available from Nordic directly  |
| <b>Control Protocols</b>              |  | Any that can be implemented using <i>smartBASIC</i><br>vSP – Virtual Serial Port for Bluetooth LE  |
|                                       | Bluetooth Low Energy                       | Max 8 connections  |
| <b>FW upgrade</b>                     |  | Via UART or JTAG   |
| <b>Supply Voltage</b>                 |  | 1.8V – 3.6V  |
| <b>Power Consumption</b>              | Current                                    | Max Peak Radio Current (@ +4 dBm TX) – 7.5 mA (DCDC)   |
|                                       |  | Standby Doze – 1.2 uA  |
|                                       |  | Deep Sleep –0.4 uA (external signal wake up)   |
| <b>Physical</b>                       | Dimensions                                 | 14 mm x 10 mm x 2.1 mm   |
| <b>Environmental</b>                  | Temperature Range                          | -40°C to +85°C   |
| <b>Miscellaneous</b>                  | Lead Free                                  | Lead-free and RoHS compliant   |
|                                       | Development Kit                            | Development board and free software tools  |
| <b>Development Tools</b>              | Utilities                                  | UwTerminalX (Multi-platform)   |
|                                       |  | Android and iOS applications   |
|                                       |  | UART firmware upgrade  |
| <b>Qualifications</b>                 | Bluetooth®                                 | Complete Declaration ID  |
| <b>Approvals</b>                      | FCC, ISSED, EU, UKCA, MIC, KC, NCC, AS/NZS | All BL652 Series   |

For full specifications on BL652 modules, please see the BL652 datasheet.

## ORDERING INFORMATION

| Part         | Description   |
|--------------|---|
| BL652-SA     | Bluetooth 5 Low Energy + NFC module – integrated antenna          |
| BL652-SC     | Bluetooth 5 Low Energy + NFC module – IPEX MHF4 antenna connector |
| DVK-BL652-SA | Development board for BL652-SA                                    |
| DVK-BL652-SC | Development board for BL652-SC                                    |