Nordic’s RF SoCs and SiP

This handy summary describes all of Nordic’s IoT solutions.

Full product details at www.nordicsemi.com/Products

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Range Extender
nRF21540

Description: The nRF21540 is an RF front-end module (FEM) that improves range and connection robustness for Nordic nRF52 and nRF9F3 Series SoCs. The nRF21540 is a complementary device operating as a ‘plug-and-play’ range extender with the addition of just a few external components. The nRF21540 v1.3 dB RX gain and low noise figure of 2.7 dB, coupled with up to +21 dBm TX output power, ensures superior link budget boosting the range of supported SoCs by between 6.3 and 12x. The RF FEM suits all applications that require increased range and robust coverage.

In demanding RF environments, or where the application is operating close to the range limit, it can be more energy efficient to use the nRF21540 than continuously extended packets.

Operation: The nRF21540 supports Bluetooth LE, Bluetooth mesh, Thread, Zigbee and 2.4 GHz proprietary protocol applications. The RF FEM’s TX output power is dynamically adjustable and can be set in small increments to comply with the allowable range across all geographical regions. The RF FEM can be used with Nordic’s extended temperature qualified nRF52833 and nRF52805 SoCs in industrial applications such as professional lighting.

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Power Management
nPM1100

Description: The nPM1100 is a dedicated power management IC (PMIC) with dual-mode configurable lock regulator and integrated battery charger. It is designed to work with Nordic’s nRF52 and nRF9F3 Series SoCs. It offers a reliable and stable power delivery, while maximizing battery life through high efficiency and low quiescent currents. The product can also be used as a generic PMIC for rechargeable applications. Its compact form factor makes it ideal for advanced wearables, medical devices, and other size-constrained devices. When optimized for size, PCB usage is around 23 mm².

Operation: The dual-mode regulator operates at up to 82 percent power conversion efficiency, prolonging battery life of Nordic SoC-based applications using a rechargeable battery. Hysteresis mode reduces current consumption for low loads, while PWM mode allows for cleaner power operation and better performance for higher loads. The regulator can deliver up to 150 mA, providing ample current for the SoCs plus additional circuitry.

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Cloud Services
nRF Cloud

Description: nRF Cloud is a versatile IoT connectivity enabler that can be directly used with Nordic’s cellular IoT devices or with the nRF52 and nRF9F3 Series via a gateway. nRF Cloud services support Device-to-Cloud, Cloud-to-Device, and Cloud-to-Cloud use cases. In the former, the device connects directly to nRF Cloud. In the latter, the device connects to a customer’s Cloud that then connects to nRF Cloud’s REST API.

Services: nRF Cloud Location Services are offered in nRF Cloud and include GPS and cell-based location services. The product supplies accurate and rapid location data for customer connected devices. The A-GPS service can reduce time-to-first-fix significantly compared with regular GPS. The result is lower latency and improved power consumption. P-GPS downloads predictive data, extending validity of assistance data. Cell based services use base stations to predict location. SCELL uses a nearby cell tower, whereas MCCcell uses multiple cell towers to triangulate a position. Power saving is more important than location accuracy, the cell based services are a good option. They are also useful for indoor positioning.