

## RF SoCs and SiPs

|                      |                                                               |  |  |  |  |  |
|----------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                      |                                                               | nRF91 Series                                                                      | nRF70 Series                                                                      | nRF54L Series                                                                      | nRF53 Series                                                                        | nRF52 Series                                                                        |
| IC TYPE              |                                                               | Wireless SiP                                                                      | Wi-Fi Companion IC                                                                | Wireless SoC                                                                       | Wireless SoC                                                                        | Wireless SoC                                                                        |
| ICs                  |                                                               | nRF9161, nRF9160, nRF9151, nRF9131                                                | nRF7002, nRF7001, nRF7000                                                         | nRF54L15, nRF54L10, nRF54L05                                                       | nRF5340                                                                             | nRF52840, nRF52833, nRF52832, nRF52820, nRF52811, nRF52810, nRF52805                |
| WIRELESS             | LTE-M, NB-IoT, NON-TERRESTRIAL NETWORKS (NTN), DECT NR+, GNSS | Yes                                                                               |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                      | DUAL-BAND Wi-Fi 6                                             |                                                                                   | Yes (with host)                                                                   | Yes (with nRF70 Series)                                                            | Yes (with nRF70 Series)                                                             | Yes (with nRF70 Series)                                                             |
|                      | Wi-Fi LOCATIONING                                             | Yes (with nRF70 Series)                                                           | Yes (with host)                                                                   | Yes (with nRF70 Series)                                                            | Yes (with nRF70 Series)                                                             | Yes (with nRF70 Series)                                                             |
|                      | BLUETOOTH LOW ENERGY 6.0                                      |                                                                                   |                                                                                   | Yes                                                                                | Yes                                                                                 | Yes                                                                                 |
|                      | BLUETOOTH CHANNEL SOUNDING                                    |                                                                                   |                                                                                   | Yes                                                                                |                                                                                     |                                                                                     |
|                      | BLUETOOTH LE AUDIO                                            |                                                                                   |                                                                                   |                                                                                    | Yes                                                                                 |                                                                                     |
|                      | BLUETOOTH MESH, ZIGBEE, THREAD, MATTER, AMAZON SIDEWALK, NFC  |                                                                                   |                                                                                   | Yes                                                                                | Yes                                                                                 | Yes                                                                                 |
|                      | ESB AND 2.4 GHz PROPRIETARY PROTOCOLS                         |                                                                                   |                                                                                   | Yes up to 4 Mbps                                                                   | Yes up to 2 Mbps                                                                    | Yes up to 2 Mbps                                                                    |
| MCU FUNCTIONALITY    | PROCESSOR                                                     | 64 MHz Arm Cortex-M33                                                             |                                                                                   | 128 MHz Arm Cortex-M33                                                             | 2× Arm Cortex-M33, up to 128 MHz                                                    | 64 MHz Arm Cortex-M4                                                                |
|                      | RISC-V COPROCESSOR                                            |                                                                                   |                                                                                   | 128 MHz FLPR                                                                       |                                                                                     |                                                                                     |
|                      | NVM                                                           | 1 MB                                                                              |                                                                                   | Up to 1.5 MB                                                                       | 1 MB + 256 KB                                                                       | Up to 1 MB                                                                          |
|                      | RAM                                                           | 256 KB                                                                            |                                                                                   | Up to 256 KB                                                                       | 512 KB + 64 KB                                                                      | Up to 256 KB                                                                        |
|                      | STANDARD PERIPHERALS AND INTERFACES                           | Yes                                                                               | High-speed SPI/QSPI                                                               | Yes                                                                                | Yes                                                                                 | Yes                                                                                 |
|                      | HIGHLIGHTED DIGITAL INTERFACES                                |                                                                                   |                                                                                   |                                                                                    | 12 Mbps USB                                                                         | 12 Mbps USB                                                                         |
| SECURITY             | ISOLATION                                                     | TrustZone                                                                         |                                                                                   | TrustZone                                                                          | TrustZone                                                                           | TrustZone                                                                           |
|                      | CRYPTOGRAPHIC ACCELERATOR                                     | Yes                                                                               |                                                                                   | Yes with side-channel leakage protection                                           | Yes                                                                                 | Yes                                                                                 |
|                      | TAMPER DETECTORS                                              |                                                                                   |                                                                                   | Yes                                                                                |                                                                                     |                                                                                     |
| GPIOs                |                                                               | 32                                                                                |                                                                                   | Up to 32                                                                           | 48                                                                                  | Up to 48                                                                            |
| PACKAGE TYPES        |                                                               | LGA                                                                               | QFN, WLCSP                                                                        | QFN, WLCSP                                                                         | αQFN, WLCSP                                                                         | αQFN, QFN, WLCSP                                                                    |
| MINIMUM PACKAGE SIZE |                                                               | 11×7×1 mm                                                                         | 3.8×3.4 mm                                                                        | 2.4×2.2 mm                                                                         | 3.5×3.6 mm                                                                          | 2.5×2.5 mm                                                                          |
| COMPATIBLE PMICs     |                                                               | nPMI300, nPM6001                                                                  | nPM6001                                                                           | nPMI300, nPMI100, nPM6001                                                          | nPMI300, nPMI100, nPM6001                                                           | nPMI300, nPMI100, nPM6001                                                           |
| nRF Cloud SERVICES   |                                                               | Yes                                                                               | Yes                                                                               |                                                                                    |                                                                                     |                                                                                     |

# PMICs



|                       |                          | nPM6001                        | nPM2100                                                                                  | nPMI304                                                                      | nPMI300                                                                      | nPMI100                        |
|-----------------------|--------------------------|--------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------|
| TYPE                  | PMIC                     | ●                              | ●                                                                                        | ●                                                                            | ●                                                                            | ●                              |
|                       |                          |                                |                                                                                          |                                                                              |                                                                              |                                |
| FEATURES              | BUCK REGULATOR           | 4                              |                                                                                          | 2                                                                            | 2                                                                            | 1                              |
|                       | BOOST REGULATOR          |                                | 1                                                                                        |                                                                              |                                                                              |                                |
|                       | BATTERY CHARGER          |                                |                                                                                          | ●                                                                            | ●                                                                            | ●                              |
|                       | LDO                      |                                | 1                                                                                        | 2                                                                            | 2                                                                            |                                |
|                       | LOAD SWITCH              |                                | 1                                                                                        | 2                                                                            | 2                                                                            |                                |
| CHARGER               | TERMINATION VOLTAGE      |                                |                                                                                          | 3.5 to 4.65 V                                                                | 3.5 to 4.45 V                                                                | 4.1 to 4.2 V or 4.25 to 4.35 V |
|                       | MAX CHARGING CURRENT     |                                |                                                                                          | 100 mA                                                                       | 800 mA                                                                       | 400 mA                         |
|                       | POWER PATH MANAGEMENT    |                                |                                                                                          |                                                                              | ●                                                                            | ●                              |
|                       | THERMAL PROTECTION       |                                |                                                                                          |                                                                              | ●                                                                            | ●                              |
|                       | BATTERY COMPATIBILITY    |                                | LiMnO <sub>2</sub> , AA/AAA 1S or 2S, Silver Oxide<br>LiFePO <sub>4</sub> , Li-ion, LiPo | LiFePO <sub>4</sub> , Li-ion, LiPo                                           | LiFePO <sub>4</sub> , Li-ion, LiPo                                           | Li-ion, LiPo                   |
| POWER RAILS           | INPUT VOLTAGE            | 3 to 5.5 V                     | 0.7 to 3.4 V                                                                             | 4 to 5.5 V                                                                   | 4 to 5.5 V                                                                   | 4.1 to 6.7 V                   |
|                       | USB COMPLIANCE           |                                |                                                                                          | Type-C                                                                       | Type-C                                                                       | ●                              |
|                       | REGULATED OUTPUT VOLTAGE | 0.5 to 3.3 V                   | 1.8 to 3.3 V                                                                             | V <sub>I</sub> to 3.3 V                                                      | 1 to 3.3 V                                                                   | 1.8 to 3 V                     |
|                       | MAX CURRENT PER BUCK     | 550 mA, 200 mA, 150 mA, 150 mA | 150 mA                                                                                   | 200 mA, 200 mA                                                               | 200 mA, 200 mA                                                               | 150 mA                         |
| SYSTEM MANAGEMENT     | SYSTEM MONITORING        |                                | Battery-voltage and -temp (derived from die temp)                                        | System-, input bus- and battery-voltage; battery-current and -temp; die temp | System-, input bus- and battery-voltage; battery-current and -temp; die temp |                                |
|                       | FUEL GAUGE               |                                | ●                                                                                        | ●                                                                            | ●                                                                            |                                |
|                       | HARD SYSTEM RESET        |                                | ●                                                                                        | ●                                                                            | ●                                                                            |                                |
|                       | TIMED WAKE-UP            |                                | ●                                                                                        | ●                                                                            | ●                                                                            |                                |
|                       | WATCHDOG TIMER           | ●                              | ●                                                                                        | ●                                                                            | ●                                                                            |                                |
|                       | SHIP MODE / HIBERNATE    | ●                              | ●                                                                                        | ●                                                                            | ●                                                                            | ●                              |
|                       | BROWN-OUT DETECTOR       | ●                              | ●                                                                                        | ●                                                                            | ●                                                                            | ●                              |
|                       | LED DRIVERS, GPIOs       | 0, 3                           | 0, 2                                                                                     | 3, 5                                                                         | 3, 5                                                                         | 2, 0                           |
|                       | CONTROL INTERFACE        | TWI                            | TWI                                                                                      | TWI                                                                          | TWI                                                                          | Pin-configurable               |
| REGULATORY COMPLIANCE |                          | CE, RoHS                       | CE, RoHS                                                                                 | CE, JEITA, RoHS                                                              | CE, JEITA, RoHS                                                              | CE, JEITA, RoHS                |
| OPERATING TEMPERATURE |                          | -40 to 85°C                    | -40 to 85°C                                                                              | -40 to 85°C                                                                  | -40 to 85°C                                                                  | -40 to 85°C                    |
| EVALUATION KITS       |                          | nPM6001 EK                     | nPM2100 EK                                                                               | nPM6001 EK                                                                   | nPMI300 EK                                                                   | nPMI100 EK                     |
| PACKAGE OPTIONS       |                          | 2.2×3.6 mm WLCSP               | 4×4 mm QFN16, 1.9×1.9 mm WLCSP                                                           | 5.5 mm QFN32, 3.1×2.4 mm WLCSP                                               | 5×5 mm QFN32, 3.1×2.4 mm WLCSP                                               | 4×4 mm QFN24, 2.1×2.1 mm WLCSP |