Informational Notice (IN)

IN no.:	**IN-141 rev 1.1**		Date:	**2021-10-11**
Device affected:	**nRF52840-QIAA and nRF52840-CKAA**		Device version / Build Code: **Dx0**	

Data sheet references: **N/A**	Agreement reference: **N/A**	Customers reference: **N/A**

Description of change:

The nRF52840 revision 3 (build code Fx0) introduces four changes to the product.

1. Behavioral changes and new/modified registers to the access port protection.
2. New (optional) filter coefficients for pulse shaping of the transmitted signal.
3. Improved wideband blocking.
4. The pin DEC5 is no longer connected.

All new registers and changes in functionality for revision 3 are documented in the nRF52840 product specification rev 1.5 (and later) and the errata document.

Customers who want to take advantage of the changes introduced in revision 3 will need to place orders via separate ordering codes (nRF52840-CKAA-**F** and nRF52840-QIAA-**F**). Production of revision 2 (build code Dx0) is maintained and can be ordered using the existing ordering codes (nRF52840-CKAA, nRF52840-QIAA).

Impact: Does the change affect **product**:

1.	Form	☒ No	☐ Yes – describe:
2.	Fit	☒ No	☐ Yes – describe:
3.	Function	☐ No	☒ Yes – describe: See description below.
4.	Quality or Reliability	☒ No	☐ Yes – describe:

Reason for change:

Changes to the access port protection:
Informational Notice 133 (IN-133) identifies a fault injection technique that may cause failure of the access port protection mechanisms on the nRF52 series. The introduced changes to revision 3 seek to mitigate this known fault injection technique.

Added filter coefficients for pulse shaping of the transmitted signal:
The filter has been added to improve margins with respect to section TP/154/PHY24/TRANSMIT-05 of the ZigBee IEEE 802.15.4 Test Specification when using the nRF52840 in a system with the nRF21540 (or other power amplifiers) with high output power (above 14 dBm).

Improved wideband blocking:
The update improves the wideband blocking performance margins with respect to the ETSI EMC immunity requirement. It also improves reception in noisy environments. This improvement is particularly important when using an external LNA.

Changes to the pinout:
This is to reduce the number of external components. The nRF52840 revision 3 requires one less decoupling capacitor.

Consequences of change:

Access port protection:

In factory state, the nRF52840 revision 3 comes with the access port protection enabled. An ERASEALL command via the control access port (CTRL-AP) is required to enable access.

In order to lock the device debug port, execute the following steps to enable the access port protection:

1. Start with a CTRL-AP ERASEALL operation.
2. Program code compiled with MDK 8.40.2 or later, with ENABLE_APPROTECT defined.
3. Write Enabled (0x00) to UICR.APPROTECT
4. Perform a hard reset to protect the device. The programmed code from step 2 will write APPROTECT.FORCEPROTECT to Force (0x00).

To unlock device debug port (for debugging etc.), execute the following steps to disable the access port protection:

1. Start with a CTRL-AP ERASEALL operation.
2. Program code compiled with MDK 8.40.2 or later, without ENABLE_APPROTECT defined.
3. Write HwDisabled (0x5A) to UICR.APPROTECT
4. Perform any reset to run the code. The programmed code from step 2 will open access port by writing to APPROTECT.DISABLE during startup.

If an nRF52840 revision 3 is programmed with software compiled with earlier versions of the MDK than 8.40.2 the debug port will be locked. However, the APPROTECT.FORCEPROTECT will not be written to Force (0x0), and the errata workarounds implemented in the MDK may not be applied to revision 3. Thus, it is required to upgrade to the latest MDK (MDK 8.40.2 or later) to ensure correct behavior.

Added filter coefficients for pulse shaping of the transmitted signal:

No consequence unless the filter is activated as described in FTPAN-254. If the filter is activated, it reduces the power emitted in adjacent RF channels when transmitting in IEEE802.15.4 mode.

Improved wide band blocking:

The blocking performance improvement will be in the order of 10-15 dB for frequency offsets of 50-300 MHz from the carrier frequency compared to previous nRF52840 revisions.

Changes to pin-out:

Existing PCB designs for the nRF52840 (rev. 2 and earlier) are compatible with the nRF52840 revision 3 without performance degradation. For new designs an updated bill of material for the reference schematic is available in the product specification rev. 1.5 or later. The new bill of material requires one less decoupling capacitor.
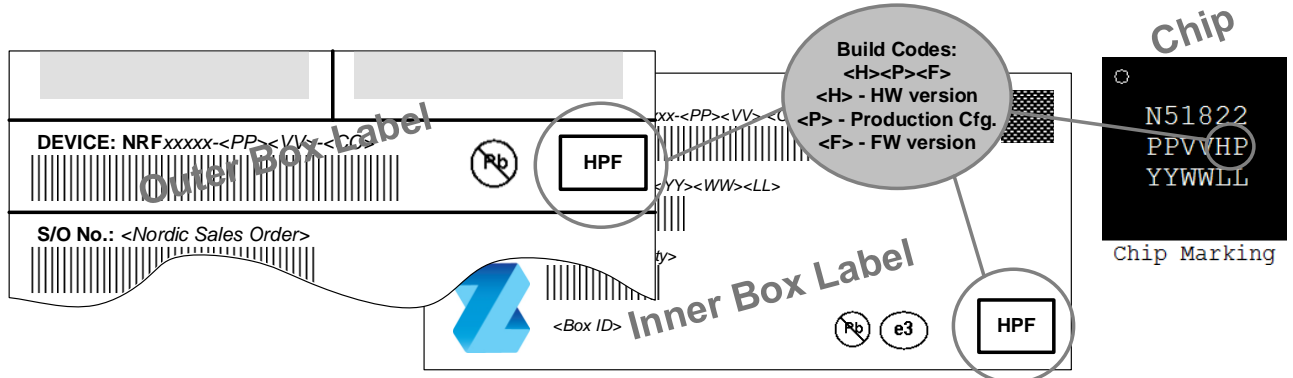
Tele regulatory and Bluetooth certification:

The new revision has no impact on ETSI, FCC or Bluetooth certifications unless the new pulse shaping filter is enabled.
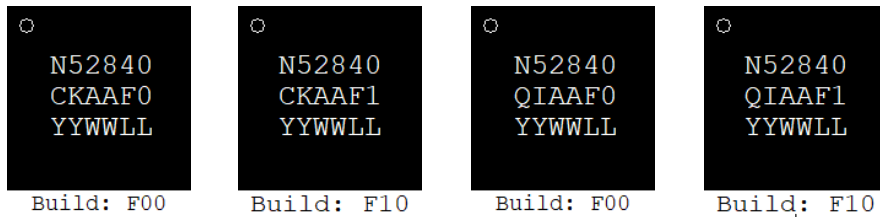

Verification of change:

The new build code was qualified according to Nordic Semiconductor's standard product approval and quality procedures.

Marking/Shipping labels:

Outer Box Label

DEVICE: NRF*xxxxx-<PP><VV><CC*

Pb (crossed out)   **HPF**

xxx-<PP><VV><C

Build Codes:
<H><P><F>
<H> - HW version
<P> - Production Cfg.
<F> - FW version

Chip

```
○
  N51822
  PPVVHP
  YYWWLL
```
Chip Marking

S/O No.: *<Nordic Sales Order>*

<YY><WW><LL>

ty>

<Box ID>   *Inner Box Label*   **Pb** **e3**   **HPF**

Chips:

```
○
  N52840
  CKAAF0
  YYWWLL
```
Build: F00

```
○
  N52840
  CKAAF1
  YYWWLL
```
Build: F10

```
○
  N52840
  QIAAF0
  YYWWLL
```
Build: F00

```
○
  N52840
  QIAAF1
  YYWWLL
```
Build: F10

Labels:

| F00 | F10 | F00 | F10 |

Change active from (date):

Orders can be placed now.

Change active from (lot no/date code/build code):

Build code – Fx0

Samples Available (date/build code):

2021-09-08 / F00

Attachments: ☒ No   ☐ Yes – describe:

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