

IN no.: **IN-149 rev 1.1**

 Date: **2021-10-11**

Device affected:

**nRF52833-QIAA, nRF52833-QDAA and nRF52833-CJAA**

 Device version / Build Code: **Ax0**

Data sheet references:

**N/A**

Agreement reference:

**N/A**

Customers reference:

**N/A**

## Description of change:

The nRF52833 revision 2 (build code Bx0) 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 DECS is no longer connected.

All new registers and changes in functionality for revision 2 are documented in the nRF52833 product specification rev 1.4 and the errata document.

Customers who want to take advantage of the changes introduced in revision 2 will need to place orders via separate ordering codes (nRF52833-CJAA-**B**, nRF52833-QIAA-**B** or nRF52833-QDAA-**B**). Production of revision 1 (build code Ax0) is maintained and is ordered using the existing ordering codes (nRF52833-CJAA, nRF52833-QIAA or nRF52833-QDAA).

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

- |                           |  |  |
|---------------------------|--|--|
| 1. Form                   | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Yes – describe:                                   |
| 2. Fit                    | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Yes – describe:                                   |
| 3. Function               | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> Yes – describe: See description below. |
| 4. Quality or Reliability | <input checked="" type="checkbox"/> No | <input type="checkbox"/> 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 2 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 nRF52833 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 nRF52833 revision 2 requires one less decoupling capacitor.

**Consequences of change:***Access port protection:*

In factory state, the nRF52833 comes with the access port protection enabled. An ERASEALL command via 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 nRF52833 revision 2 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 2. Thus, it is required to upgrade to the latest MDK (version 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 nRF52833 revisions.

*Changes to pin-out:*

Existing PCB designs for the nRF52833 (rev. 1) are compatible with the nRF52833 rev. 2 without performance degradation. For new designs an updated bill of material for the reference schematic is available in the product specification rev. 1.4 or later. The new bill of material requires one less decoupling capacitor.

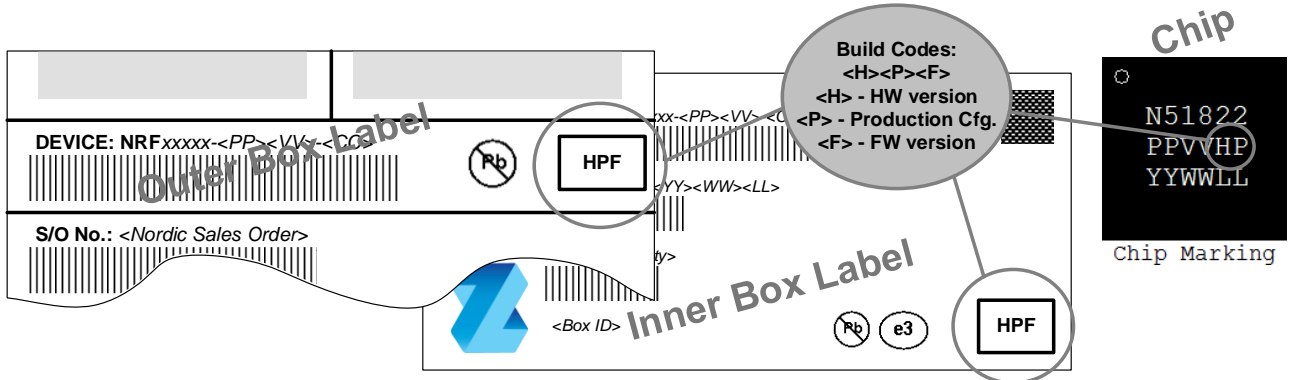
*Teleregulatory and Bluetooth certification:*

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

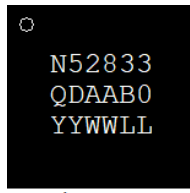
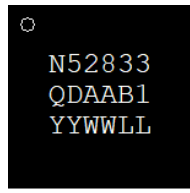
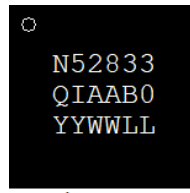
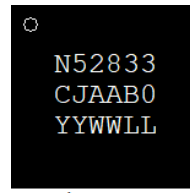
**Verification of change:**

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

**Marking/Shipping labels:**



**Chips:**

			
Build: B00	Build: B10	Build: B00	Build: B00

**Labels:**

B00	B10	B00	B00
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**Change active from (date):**

Orders can be placed now.

**Samples Available (date/build code):**

2021-09-08 / B00

**Attachments:**

No

Yes – describe:

**Technical contact at Nordic Semiconductor:**

[www.nordicsemi.com](http://www.nordicsemi.com), "Support"

**Authorization for Nordic Semiconductor**

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

Build code – Bx0

**Commercial contact at Nordic Semiconductor:**

[www.nordicsemi.com](http://www.nordicsemi.com), "Contact Us"

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Date: 2021-10-11

Sign: 

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Date: 2021-10-11

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