

PCN no.: <b>PCN-084 1.0</b>	Date: <b>2013-12-19</b>
Device affected: <b>nRF51422-QFAA</b> <b>nRF51422-CEAA</b>	Device version / Build Code: CA, CO AOA (see <i>Marking/Shipping labels</i> section)
Data sheet references: <b>See Appendix 1</b>	Agreement reference: <b>N/A</b>
	Customers reference: <b>N/A</b>

**Description of change:**

New version of the IC with the following key changes:

**Fixes of anomalies**  
The new IC version includes a number of fixes and improvements of anomalies reported in PAN-028. PAN-028 is now replaced by nRF51422-PAN v2.0 which includes an updated list of anomalies for all IC versions.

**New features and changes in electrical specifications**  
All new features and changes in electrical specifications for this new IC version are documented in the nRF51422 Product Specification version 2.0 and the nRF51 Reference Manual version 2.0. Appendix 1 lists all changes with reference to these documents.

**Reduced radio local oscillator (LO) spurious emissions**  
The new IC version includes design adjustments to the pad ring to improve LO spurious emission. The radio transceiver has not been modified.

**No pre-programmed S210 ANT SoftDevice**  
The new IC version does *not* contain a pre-programmed S210 ANT SoftDevice. Instead the S210 ANT SoftDevice is available for download from [www.nordicsemi.com](http://www.nordicsemi.com).

**Compatibility with S310 ANT and BLE SoftDevice**  
The new IC versions add compatibility with the S310 ANT and BLE SoftDevice. S310 is available for download from [www.nordicsemi.com](http://www.nordicsemi.com).

**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: Added/changed features, see Appendix 1
4. Quality or Reliability	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes – describe:

Classification of change     Minor     Major

**Reason for change:**  
Fixed anomalies in affected devices and added new features.

**Consequences of change:****Hardware**

The new device versions are drop-in compatible with the current versions, but note the following:

- External pull-down resistor on SWDCLK pin is no longer mandatory.
- Designs based on nRF51422-QFAA combined with ST Microelectronics balun, BAL-NRF01D3 (as described in the reference layout nRF51422-DF-ST v1.0), are likely to fail Korean teleregulatory spurious emission limits due to LO leakage.

**Software:**

The new device versions are software compatible with the current version for application code, but note the following:

- Since there is no pre-programmed SoftDevice, customers need to program the SoftDevice during development and production.
- New IC versions are only compatible with the following SoftDevices:
  - S210 v3.0.0 or later.
  - S310 v1.0.0 or later.
- Only nRF51 SDK v5.1.0 or later will have support for the new IC version (including the new SoftDevice version available on [www.nordicsemi.com](http://www.nordicsemi.com)).
- Customers that are implementing their own protocol stack on this device have to be aware of the following: Qualification in accordance with 47 CFR Part 15.247 of products using the nRF\_1MBIT radio mode will require a stack update to ensure that FICR override parameters are copied to the RADIO control register. The nRF51 Series Reference Manual v2.0 provides a description of FICR and RADIO override features. For questions or clarifications, please contact Nordic technical support.
- Note that the S210 v3.0.0 includes API changes that may trigger changes to applications written for the current version. For more information refer to S210 Release Notes and Migration Document that are available in the SoftDevice download.

**Teleregulatory certification**

Based on measurements performed on reference design nRF51822-DF/ nRF51822-CEAA-DF, the new IC versions can be considered equal to the current IC versions. Therefore, for end products based on these reference designs a device update will have no consequence for teleregulatory compliance. This is because the new IC versions are considered as a production update and not as a component replacement.

For end products not identical to nRF51822-DF/ nRF51822-CEAA-DF, a reassessment of spurious emissions is advised in order to confirm teleregulatory equivalence.

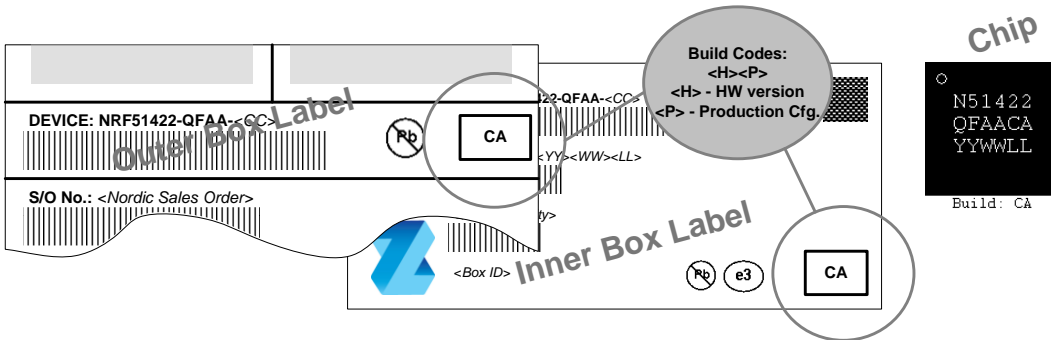
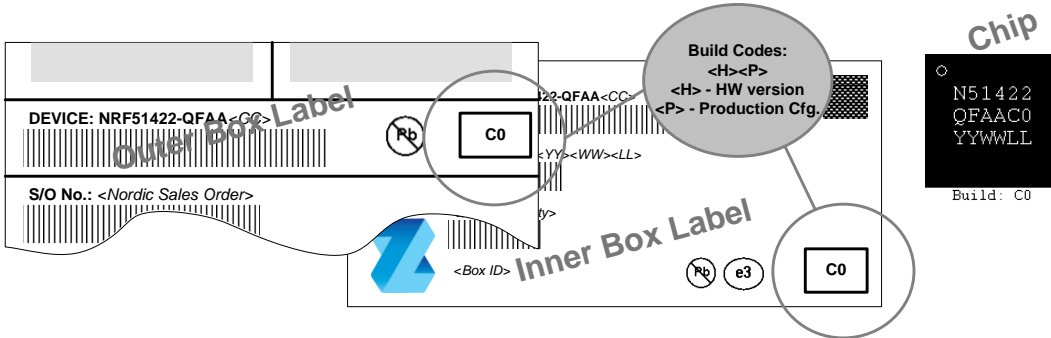
**Verification:**

New device version will be approved and qualified under standard Nordic Semiconductor ASA QA procedures.

**Marking/Shipping labels:**

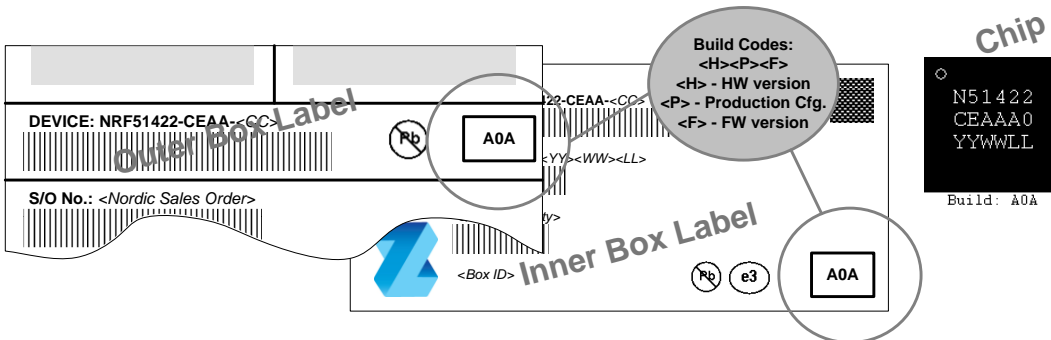
Affected IC versions:

**nRF51422-QFAA**



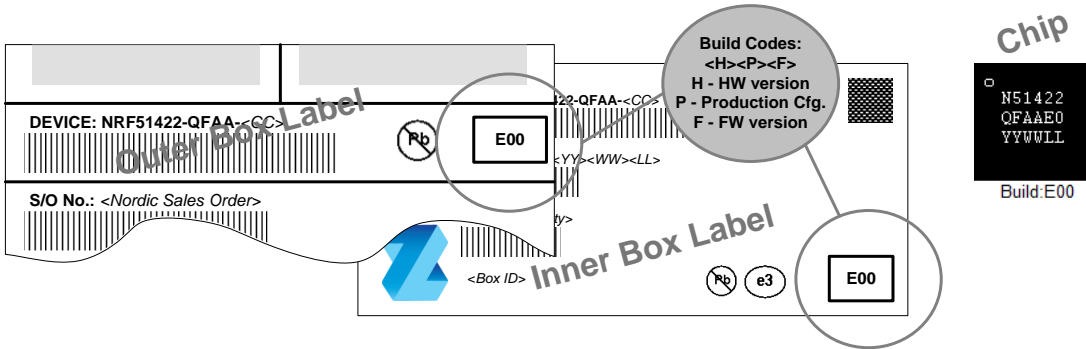
**Note:** ICs with the build codes CO/CA are using the old build code scheme of two digits.

**nRF51422-CEAA**

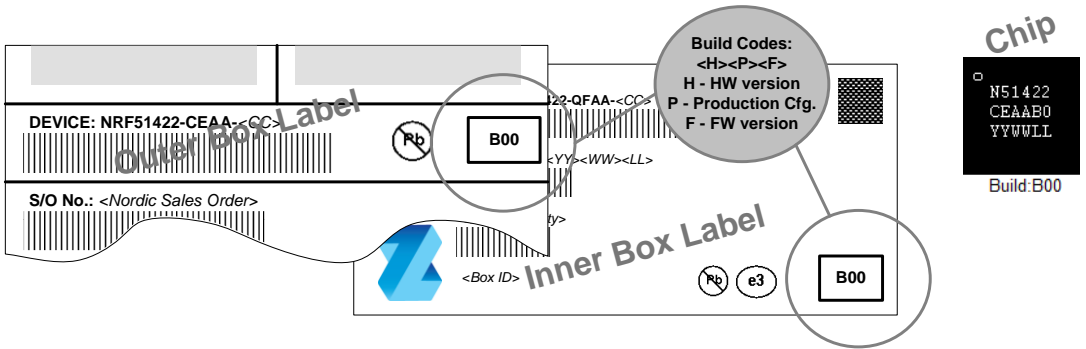


**New IC versions:**

**nRF51422-QFAA**



**nRF51422-CEAA**



**Change active from (date):**

March 20<sup>th</sup> 2014  
 Production samples and qualification report are available now.

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

nRF51422-QFAA, build code E00  
 nRF51422-CEAA, build code B00

**Early production ramp**

Nordic can support a limited set of customers with production ramp and volume before March 20<sup>th</sup> 2014. Please contact Nordic sales for more information.

**Last time order (date):** (optional)

N/A

**Final shipment date:** (optional)

Existing stock to be depleted

**Attachments:**  No

Yes – describe: see Appendix 1

**Technical contact at Nordic Semiconductor:**

See *Support* at [www.nordicsemi.com](http://www.nordicsemi.com)

**Commercial contact at Nordic Semiconductor:**

See *Contact Us* at [www.nordicsemi.com](http://www.nordicsemi.com)

**Authorization for Nordic Semiconductor**

Product Manager

Date: 2013-12-16

Sign:



Quality Director

Date: 2013-12-16

Sign:



*Please note that all last time buy orders are non-cancellable and non-returnable.*

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Norway  
Tel.: +47 72 89 89 00

## Appendix 1

### Product Changes

Module	nRF51422 PS v2.0 chapter	nRF51 Series Reference Manual v2.0 chapter	Part changed/ Added	Comment
SPIS	4.10	26	SPI Slave	New peripheral module.
LPCOMP	4.16	31	Low Power Comparator	New peripheral module.
FICR	-	6.1.1	Override parameters	Added description on how to handle the override parameter set in FICR.
		6.2.15	OVERRIDDEN	New register.
		6.2.16	NRF_1MBIT[n]	New register set for the NRF_1BIT mode.
		6.2.17	BLE_1MBIT[n]	New register set for the BLE_1BIT mode.
POWER	-	11.1.2	System OFF mode	LPCOMP is a new wakeup source from System OFF.
		11.2.1	RESETREAS	New reset source (bit 17 = LPCOMP).
PPI	3.5	15.1.1	Pre-Programmed channels	Channel 20-31 is a set of Pre-programmed channels.
		15.2.1	CHEN	Added control of channel 20..31.
		15.2.2	CHENSET	Added control of channel 20..31.
		15.2.3	CHENCLR	Added control of channel 20..31.
		15.2.6	CHG[n] (n=0..3)	Added control of channel 20..31.
MPU	3.3	8.1.5	NVM protection blocks	Added functionality to have runtime protection of memory blocks preventing unauthorized erasing and writing.
		8.2.3	PROTENSETO	New register to control the NVM protection mechanism.
		8.2.4	PROTENSSET1	New register to control the NVM protection mechanism.
		8.2.5	DISABLEINDEBUG	New register to control the NVM protection mechanism.
UART	4.12	28	Universal Asynchronous Receiver/ Transmitter	Increased the receive buffer from 2 to 6 byte.
		28.5	Reception	Changed the behavior of how the RTS line is handled. The UART will now deactivate the RTS signal when there is only space for four more bytes in the receiver FIFO.
				Changed the behavior on STOPRX task. The UART is now capable of receiving data for a given period after the STOPRX task is triggered. In addition it will give a RXTO event when the receiving period has elapsed.
	Receive buffer	Clarify how the receive buffer should be handled. The RXD register (receive buffer) can only be read when a RXDRDY event has been received, and the RXDRDY event must be cleared before the data is read.		

Module	nRF51422 PS v2.0 chapter	nRF51 Series Reference Manual v2.0 chapter	Part changed/ Added	Comment																															
		28.8 / 28.9.9	Parity configuration/ CONFIG	Changed the Reset value and how the parity is setup on the UART. Also, see anomaly 40 in nRF51422-PAN.																															
RADIO	4.1	16.1.14	Bit counter	Added new functionality in the radio. A simple counter has been added that can be configured to generate an event after a specific number of bits have been transmitted or received.																															
		16.1.15/ 16.2.30-31	Override registers	Describe how to handle the override registers, copying data from FICR to the radio override registers when using the radio in NRF_1MBIT or BLE_1MBIT mode.																															
		16.2.1	SHORTS	Added one new short: DISABLED_RSSISTOP.																															
LFCLK	3.6.3	12.1.3	Calibrating the 32.768 kHz RC oscillator	The 16MHz crystal oscillator must be started before LFCLK calibration by the use of TASKS_HFCLKSTART task.																															
TIMER	4.2	17	Timer/ Counter	Timer0 now supports bit modes 8,16,24, and 32. This will also affect the default bit mode.																															
				Timer 1 and 2 now support both bit mode 8 and 16.																															
SYSTEM	6	--	Absolute maximum rating (Table 14)	<b>Supply voltage</b> VDD Min: -0,3 V, Max: <b>+3.9 V</b>																															
SYSTEM	8	--	Electrical specifications																																
	8.1.2	--	Table 19	<table border="1"> <thead> <tr> <th>Symbol</th> <th>Old value</th> <th>New value</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>I<sub>X16M</sub></td> <td>400</td> <td>470</td> <td>µA</td> </tr> <tr> <td>I<sub>STBY,X16M</sub></td> <td>35</td> <td>25</td> <td>µA</td> </tr> </tbody> </table>	Symbol	Old value	New value	Units	I <sub>X16M</sub>	400	470	µA	I <sub>STBY,X16M</sub>	35	25	µA																			
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				8.12	8.12	--	Table 45	<table border="1"> <thead> <tr> <th>Symbol</th> <th>Old value</th> <th>New value</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>I<sub>ADC</sub></td> <td>290</td> <td>260</td> <td>μA</td> </tr> </tbody> </table>	Symbol	Old value	New value	Units	I <sub>ADC</sub>	290	260	μA											
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