Product Change Notice

ISP4520US_PCN252231

Reference

Device affected	Module Marking
ISP4520-US	Change Build Code ACxxxxxxx or TBxxxxxxx with New Build Code ADxxxxxxx or TCxxxxxxx Date Code 2509 and after

Date	PAN Number	Document version
30 June 2025	ISP4520US_PCN252231	1.0

Change Log

Description of change

The ISP4520-US with Build Code ADxxxxxxx or TCxxxxxxx and Date Code 2509 or later introduces three changes to the product, related to the nRF52832 revision 3 (Gx0):

- Behavioral changes and new/modified registers to the access port protection.
- New (optional) filter coefficients for pulse shaping of the transmitted signal.
- Improved wideband blocking.

For detailed information, it is recommended to refer to the nRF52832 product specification rev 1.5 (and later) and the errata document available on the Nordic website:
nRF52832 Product Specification
All deliveries with date codes 2509 and after are concerned with the new Hardware Revision.

Reason for change

- Changes to the access port protection

Nordic Semi identifies a fault injection technique that may cause failure of the access port protection mechanisms on the nRF52 series. The introduced changes to hardware 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 ISP4520-US in a system with the nRF21540 (or other power amplifiers) with high output power (above 14 dBm).

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- 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.

Consequences of change

- Access port protection

In factory state, the ISP4520-US with Build Code ADxxxxxxx or TCxxxxxxx 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 8.45.0 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 8.45.0 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 ISP4520-US with Build Code ADxxxxxxx or TCxxxxxxx is programmed with software compiled with earlier versions of the MDK than 8.45.0 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 8.45.0 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 ISP4520-US revisions.

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