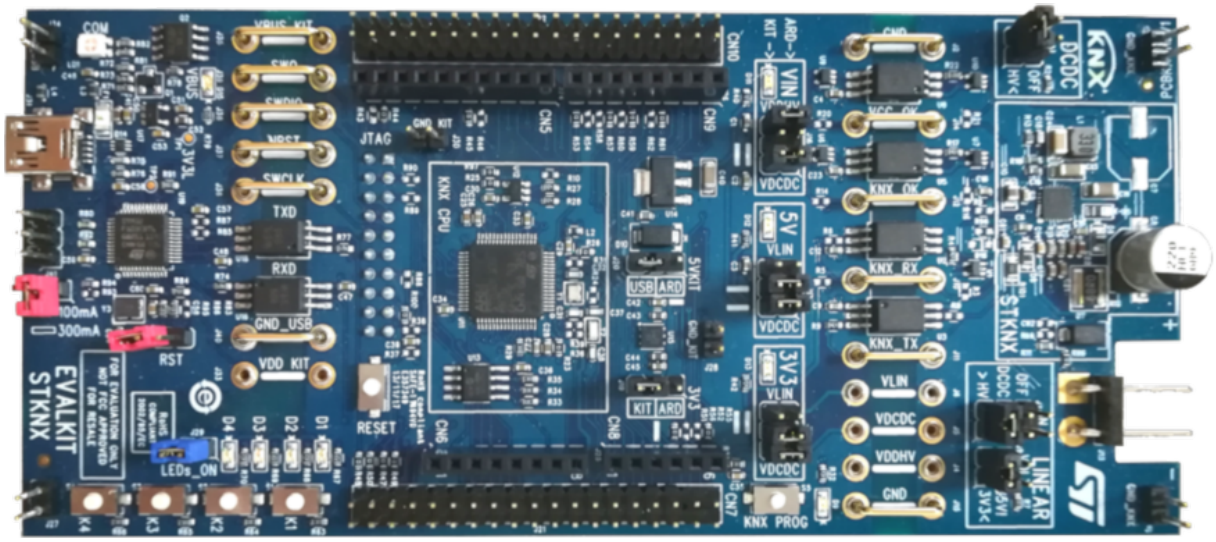
Evaluation and development kit for miniature STKNX transceiver

Introduction

The EVALKITSTKNX evaluation and development kit can be powered in several alternative ways. You can supply the kit exclusively via USB connector (for SW development), exclusively via KNX bus (to demonstrate all the STKNX power capabilities), or partially from the expansion board.

The modular design lets you perform all the necessary tests before building your own prototype.

Figure 1. EVALKITSTKNX evaluation and development board



1 Jumpers in ST-LINK and LED sections

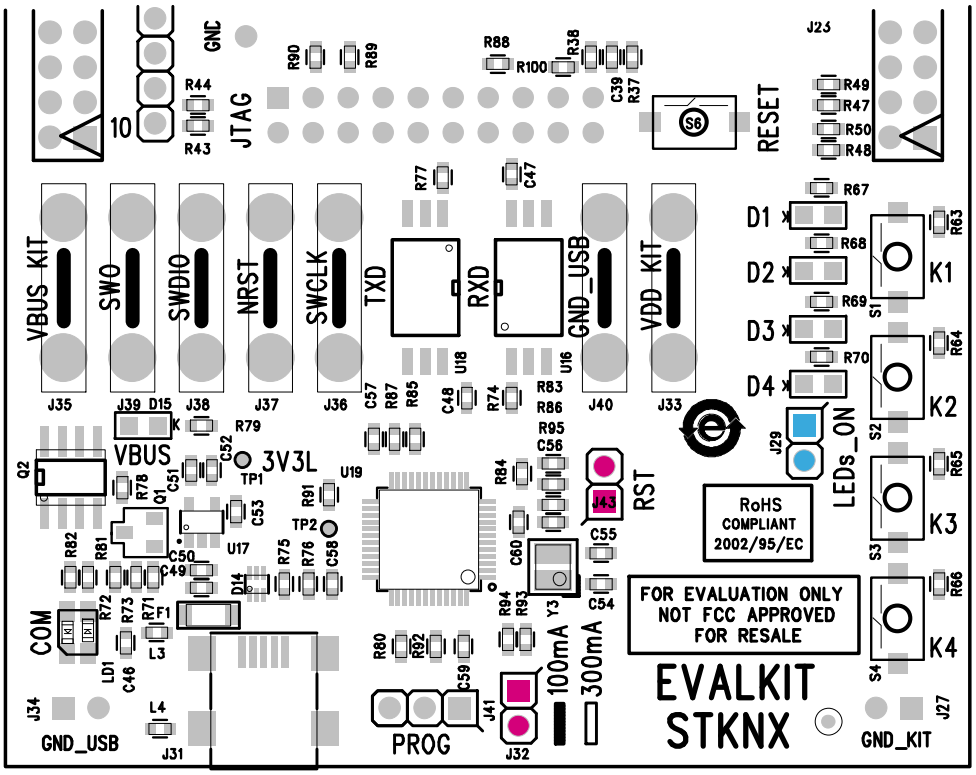
Jumpers J32 and J43:

- open during normal kit use.

Jumper J29:

- closed to make LEDs D1 to D4 active
- open if GPIOs PA5, PB12, PC2 and PC12 are used for different purposes.

Figure 2. EVALKITSTKNX J32 ,J43 and J29 jumper locations



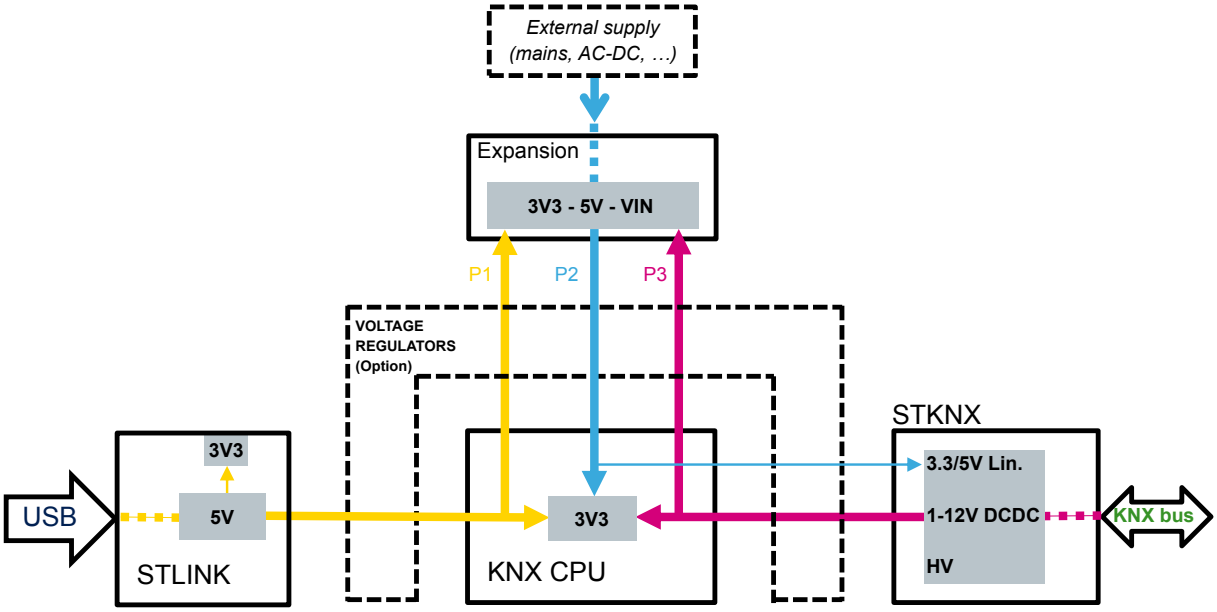
2 EVALKITSTKNX power supply configuration

The block diagram in Figure 3. EVALKITSTKNX block diagram with power supply routes shows the STKNX evaluation kit divided into five logical sections:

1. STKNX
2. KNX CPU
3. Expansion connectors
4. STLINK debug
5. Embedded regulators

Those sections are able to generate or receive (or both) power to and from the others sections.

Figure 3. EVALKITSTKNX block diagram with power supply routes



Regarding the power supply paths:

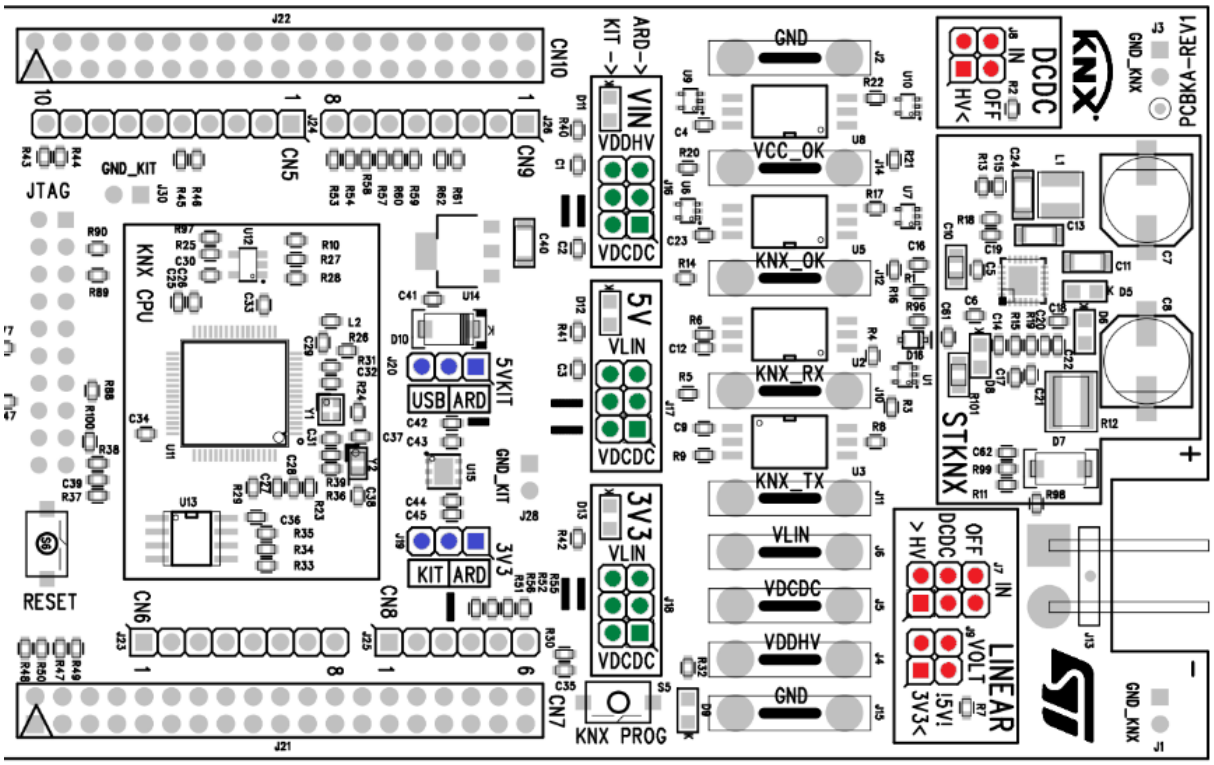
- Path P1 supplies the kit and any daughter boards through the USB connector, which is good for firmware editing and debugging. No supply is required (except KNX bus if bus communication is expected).
- Path P2 allows supplying the whole kit from the expansion board.
- Path P3 supplies the entire kit through the STKNX device.

Note: When the USB cable is removed, you have to disconnect jumper M37 in order to release the target CPU reset pin.

It is also possible to mix the three paths modes, thanks to two voltage regulators (5V and 3.3V) on the kit.

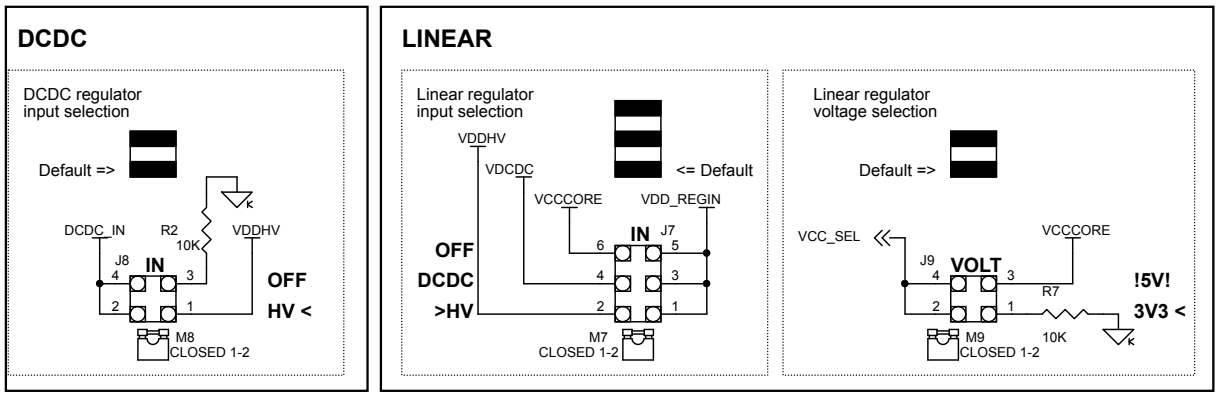
You can configure and evaluate several power supply configurations through the jumpers on the kit.

Figure 4. **Jumper locations for power supply routing and configuration**



2.1 Jumpers in STKNX section

Figure 5. **Jumpers in STKNX section**



J8 lets you control the STKNX DC-DC switching converter (VDCDC):

- M8 pos 3-4: DC-DC disabled
- M8 pos 1-2: DC-DC enabled (default setting)

Note: DC-DC voltage can be configured through the external resistor divider on the DCDC_FB pin of the STKNX. See the STKNX datasheet for more information

J7 lets you control the STKNX linear voltage regulator (VCCCORE):

- M7 pos 5-6: regulator disabled
- M7 pos 3-4: regulator fed by VDCDC
- M7 pos 1-2: regulator fed by VDDHV(default setting)

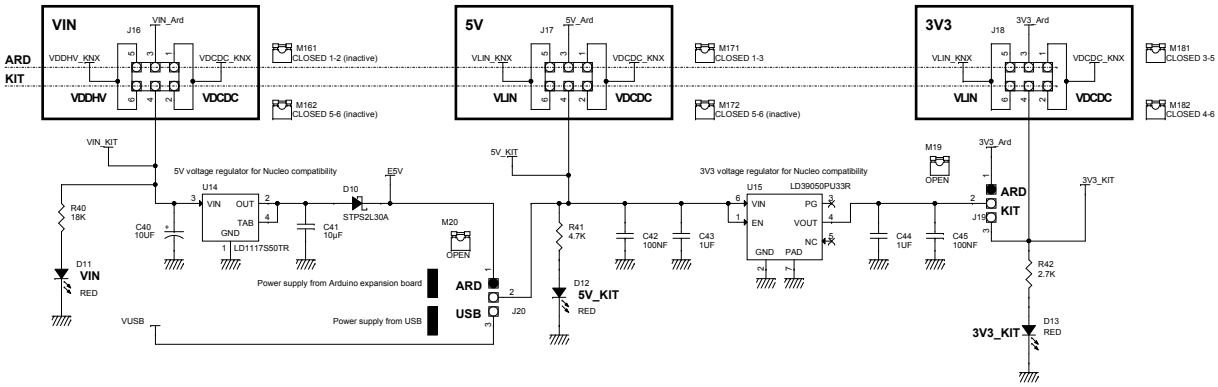
J9 allows to configure the voltage output of STKNX linear regulator (VCCCORE):

- M9 pos 1-2: VCCCORE = 3.3 V (default setting)
- M9 pos 3-4: VCCCORE = 5 V

Note: Be careful with this 5 V output mode mode as it may damage the kit.

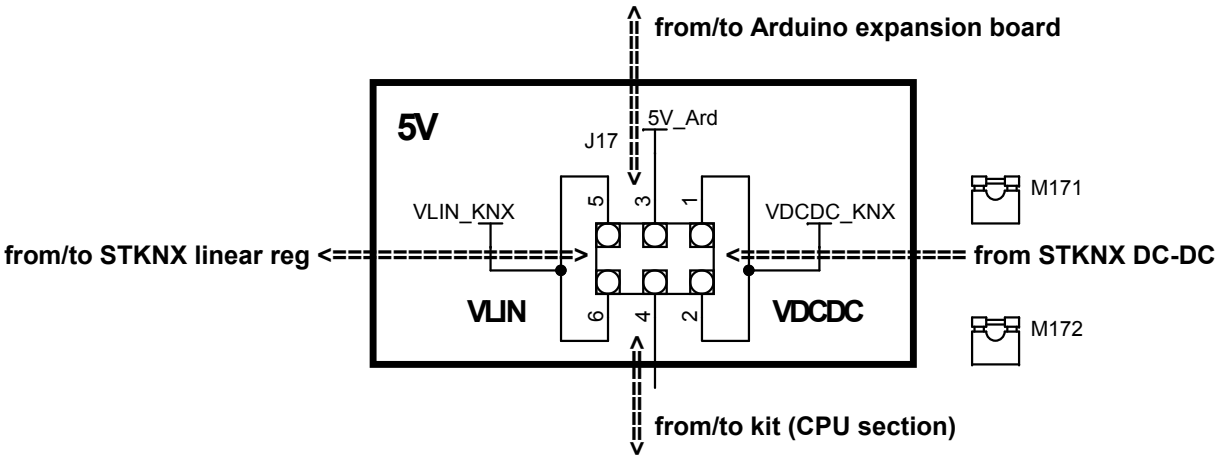
2.2 Jumpers for power supply routing

Figure 6. Jumpers for supply routing



Jumpers J16, J17 and J18 allows connection between power supply sources and loads.

Figure 7. Power supply routing with J16, J17 and J18



In the example below, J17 allows the following:

- Use STKNX DCDC to supply the kit (pos. 2-4) and/or the Arduino daughter board (pos. 1-3)
- Do not use STKNX DCDC (pos. 1-2)
- Use STKNX linear regulator to supply the kit (pos. 4-6) and/or the Arduino daughter board (pos. 3-5), or vice versa supply STKNX VCCCORE from the kit or Arduino
- Do not use STKNX linear regulator (pos. 5-6)
- Supply kit from Arduino or vice versa (pos. 3-4)

The same principle applies to J16 and J18.

2.3 Jumpers for kit regulator routing

When it is not possible to use the STKNX DC-DC or linear regulator, you can use regulators U14 (5V) and U15 (3.3V) as an alternative. Jumpers J19 and J20 allow routing U14/5V and/or U15/3.3V to the Arduino board, the kit, or to STKNX VCCCORE.

J20 is also used to supply the kit via USB source.

RELATED LINKS

2.2 Jumpers for power supply routing on page 5

3 Power supply configuration examples

3.1 STKNX mode DC-DC 5 V (default)

Figure 8. **STKNX mode DC-DC 5 V**

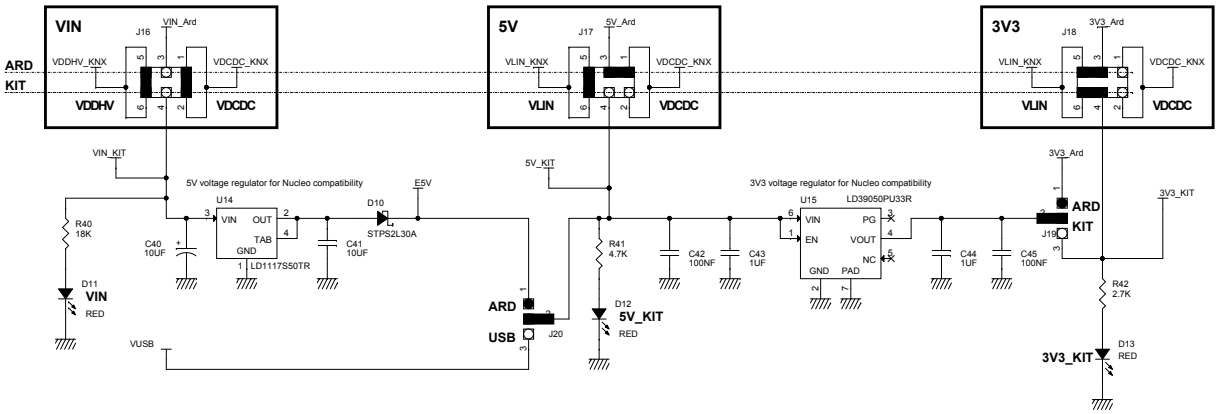
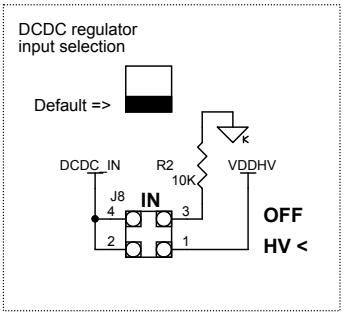
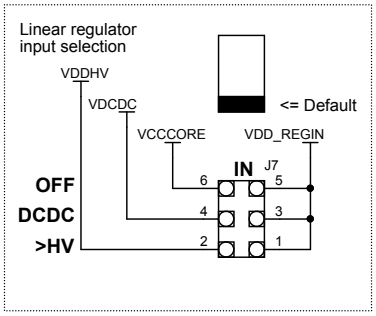


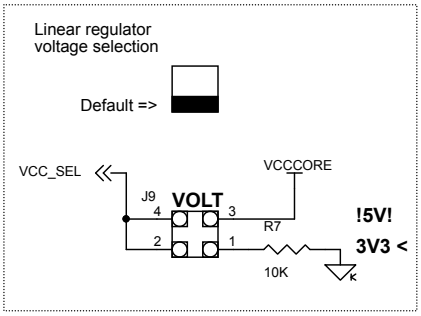
Figure 9. **J7, J8 and J9 config for DC-DC 5 V mode**

DCDC



LINEAR





The default kit configuration is shown above:

- The STKNX linear regulator supplies the CPU section.
- The STKNX DCDC converter is available for the Arduino daughter board.
- The kit regulators are not used.
- On the STKNX side, the DC-DC converter (5 V) and linear regulator are active.

3.2 STKNX mode DC-DC 3V3

Figure 10. STKNX mode DC-DC 3V3

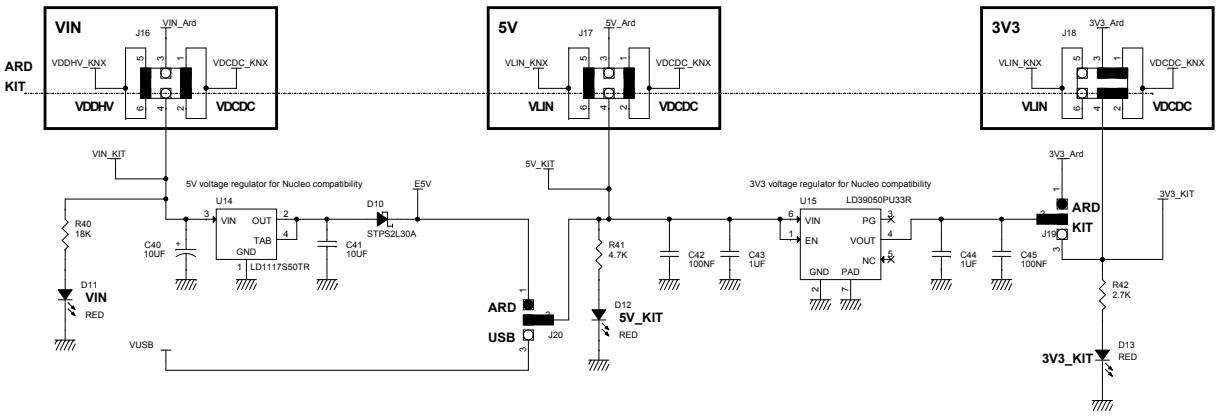
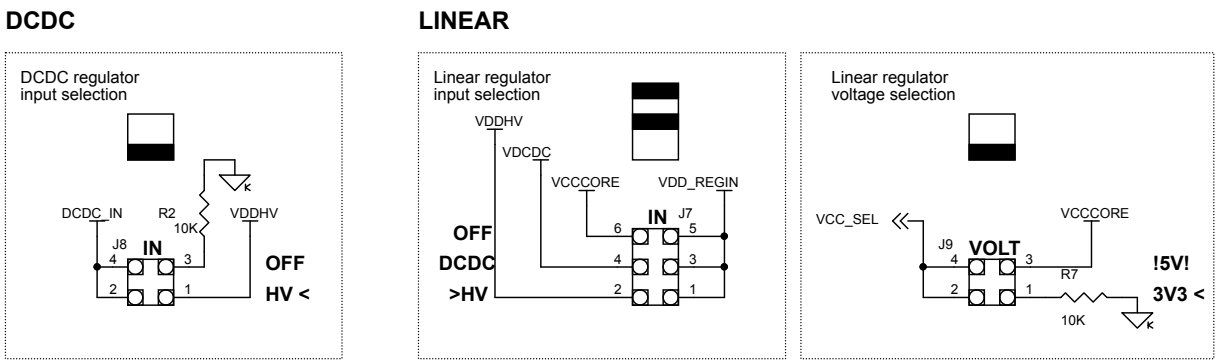


Figure 11. J7, J8 and J9 config for DC-DC 3V3 mode

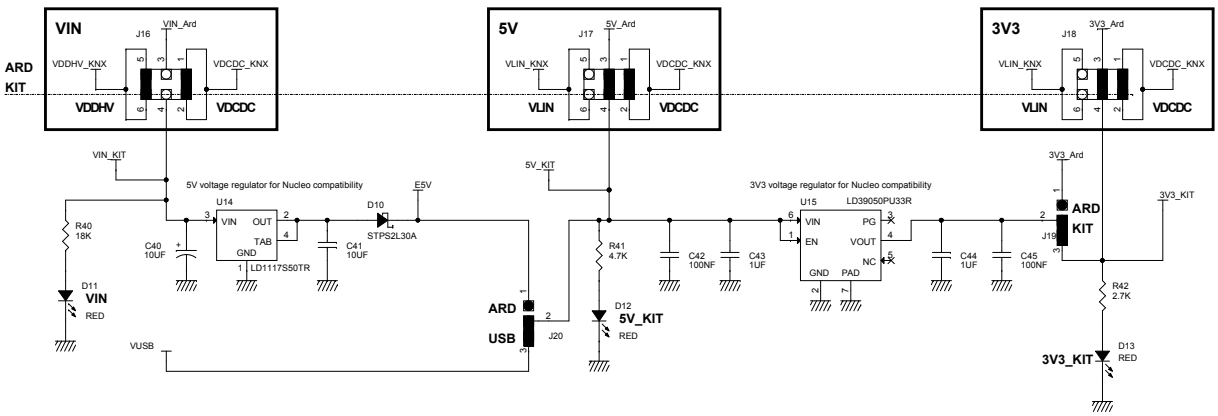


This mode offers the best consumption on KNX bus

- The DC-DC converter is tuned to 3.3V and supplies both CPU section and Arduino board
- The STKNX linear regulator is disabled

3.3 FW mode

Figure 12. FW mode



This mode lets you use the kit on a desk with a PC as communication on the KNX bus is not necessary and you don't need a laboratory supply.

This mode is suitable for firmware editing and debugging:

- The +5V generated from USB connector is available as VUSB and sent to Arduino board.
- U15 allows generating 3.3V voltage (from VUSB) for the kit and the Arduino board.

3.4 Dimming demonstration mode

Figure 13. **Dimming demonstration mode**

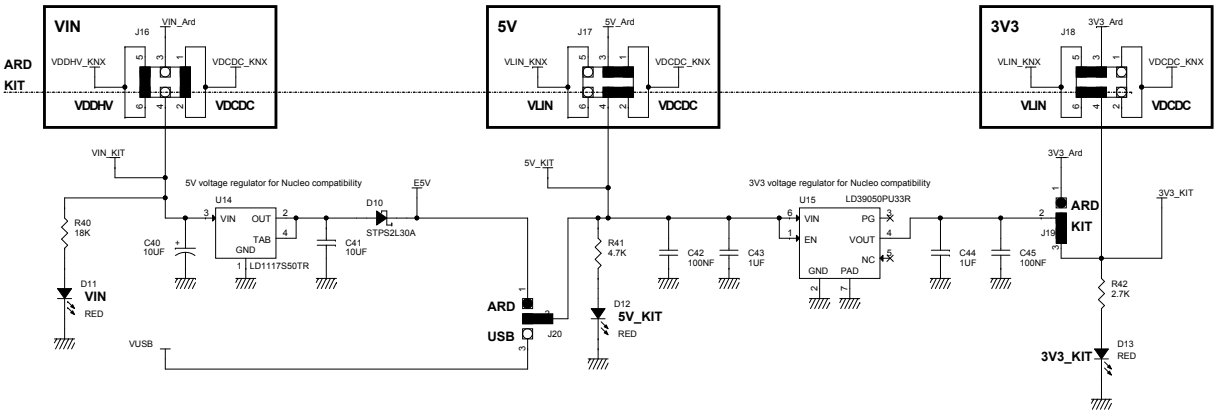
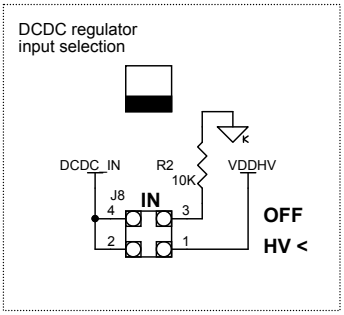
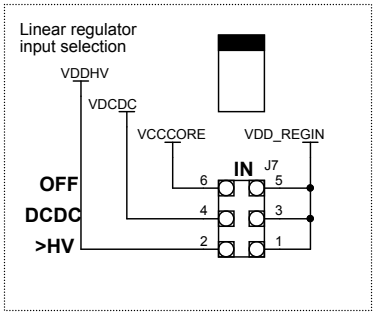


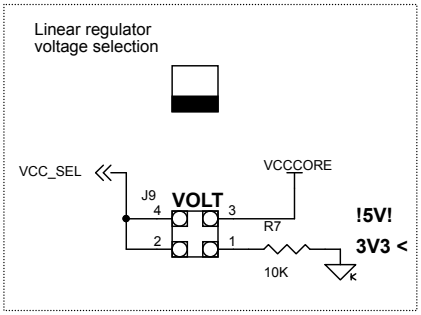
Figure 14. **J7, J8 and J9 config for Dimming demonstration mode**

DCDC



LINEAR





In this mode, the STKNX supplies the entire kit (apart from ST-LINK) from the KNX bus:

- The STKNX DC-DC is tuned on 5 V and supplies the dimming board and kit regulator U15.
- This 3.3 V regulator supplies the kit, the Arduino board, and the STKNX VCCCORE. This offers better current consumption than using the STKNX linear regulator fed by VDDHV.
- On the STKNX side, the DC-DC converter must be active and linear regulator disabled.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
05-Jul-2018	1	Initial release.

Contents

List of figures

List of tables

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved