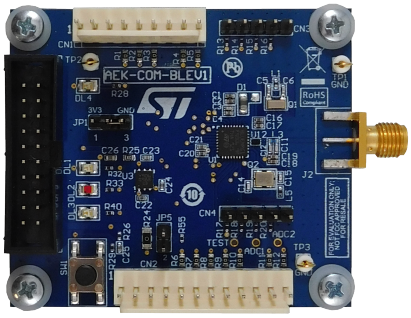
AEK-COM-BLEV1

Data brief

Bluetooth communication board based on BlueNRG-1



AutoDevKit

LONGEVITY 10 YEARS COMMITMENT

SPC5 Studio

Features

- Based on the BlueNRG-1 Bluetooth low energy system on chip
- Associated STSW-BLUENRG-DK (BlueNRG-1 development kit software package) including firmware and documentation
- Up to +8 dBm available output power (at antenna connector)
- Excellent receiver sensitivity (-88 dBm)
- Very low power consumption: 7.7 mA RX and 8.2 mA TX at +0 dBm
- Bluetooth® low energy compliant: supports master, slave and simultaneous master-and-slave roles
- New integrated balun BALF-NRG-02D3 which integrates a matching network and harmonics filter
- 3 user LEDs
- JTAG debug connector
- Pre-programmed as network processor
- Board size: 60 x 40 mm.
- Part of the AutoDevKit™ initiative
- RoHS and WEEE compliant

Description

The AEK-COM-BLEV1 evaluation board is based on the BlueNRG-1 low power Bluetooth® smart system on chip, compliant with the Bluetooth® specification.

The evaluation board can be connected to a microcontroller via a 12-pin or alternative 9-pin male connector for SPI, serial interface or I²C communication.

The BlueNRG-1 device is supplied with the network processor software loaded and ready to process Bluetooth commands. The software image (DTM_UART.hex) is available in the BlueNRG design kit.

The STSW-AEKBLE firmware provides a straightforward demonstration of the AEK-COM-BLEV1 board functionality used in conjunction with the AEK-MCU-C4MLIT1 evaluation board with microcontroller.

Product summary	
Bluetooth communication board based on the BlueNRG-1	AEK-COM-BLEV1
Firmware for AEK-COM-BLEV1 testing	STSW-AEKBLE
Bluetooth® low energy system-on-chip	BlueNRG-1
Setup for BlueNRG kits	STSW-BLUENRG-DK
50 Ω, conjugate match balun to BlueNRG transceiver, with integrated harmonic filter	BALF-NRG-02D3
Applications	Factory Automation Bluetooth Low Energy Mobility Services

1 Loading firmware onto the BlueNRG-1 chip

Follow the procedure below to restore the factor firmware on the BlueNRG-1 device.

1.1 Hardware and software requirements

- ST-LINK/V2 programmer/debugger, which is connected through the evaluation board JTAG port
- STSW-LINK007 - ST-LINK/V2 firmware upgrade
- STSW-LINK009 - ST-LINK/V2 Windows driver
- STSW-BNRG1STLINK - ST-LINK utility required to burn the code in the BlueNRG-1
- STSW-BLUENRG-DK - design kit containing the Flash image for the BlueNRG-1. After installing the design kit, go to the installation directory ([**Firmware**]>[**BLE_Examples**]>[**DTM**]>[**BlueNRG-1**]) to find the “DTM_UART.hex” file

1.2 Firmware burning procedure

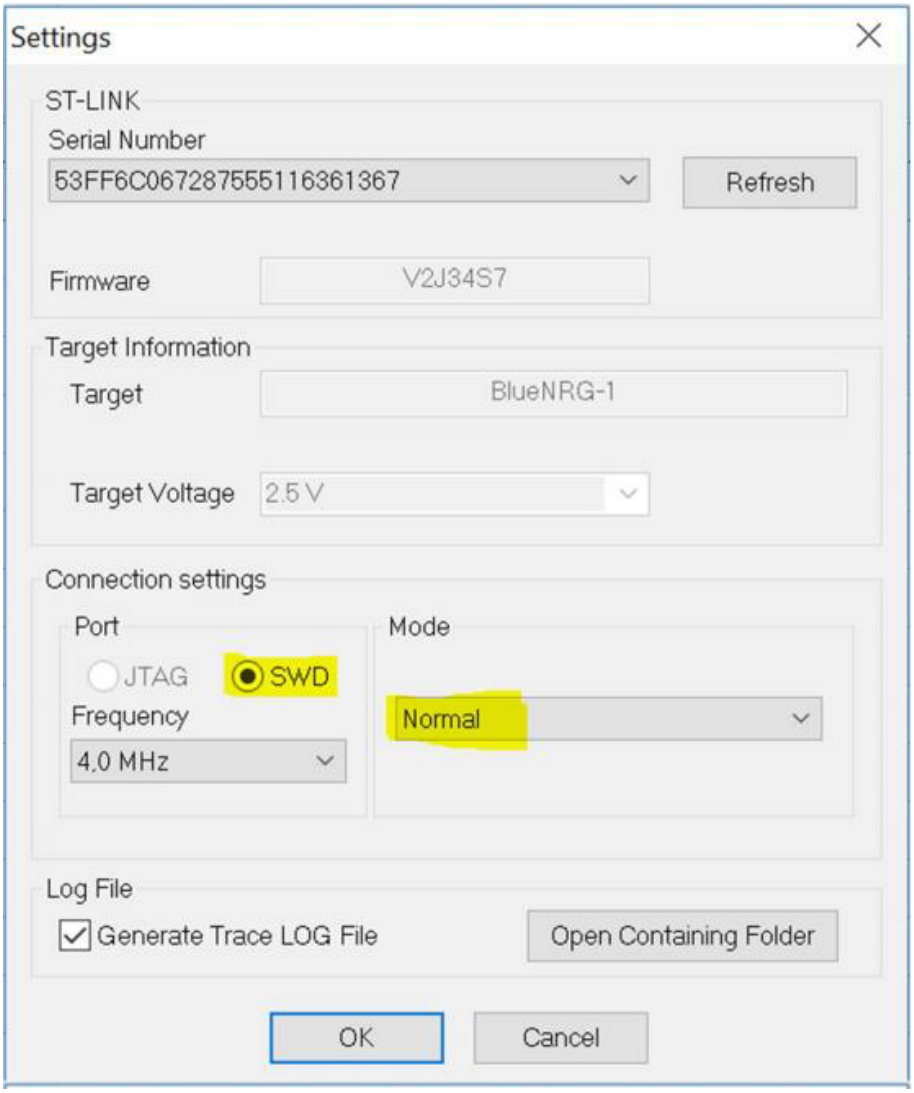
Step 1. Connect the ST-LINK/V2 to the PC via USB and to the AEK-COM-BLEV1 evaluation board JTAG port

Step 2. Run the BlueNRG-1 ST-LINK Utility

Step 3. From the top menu, select [**Target**]>[**Settings**] and ensure the following parameters are set:

- Frequency: 4.0 MHz
- Mode: Normal
- Port: SWD

Figure 1. BlueNRG-1 ST-LINK Utility settings



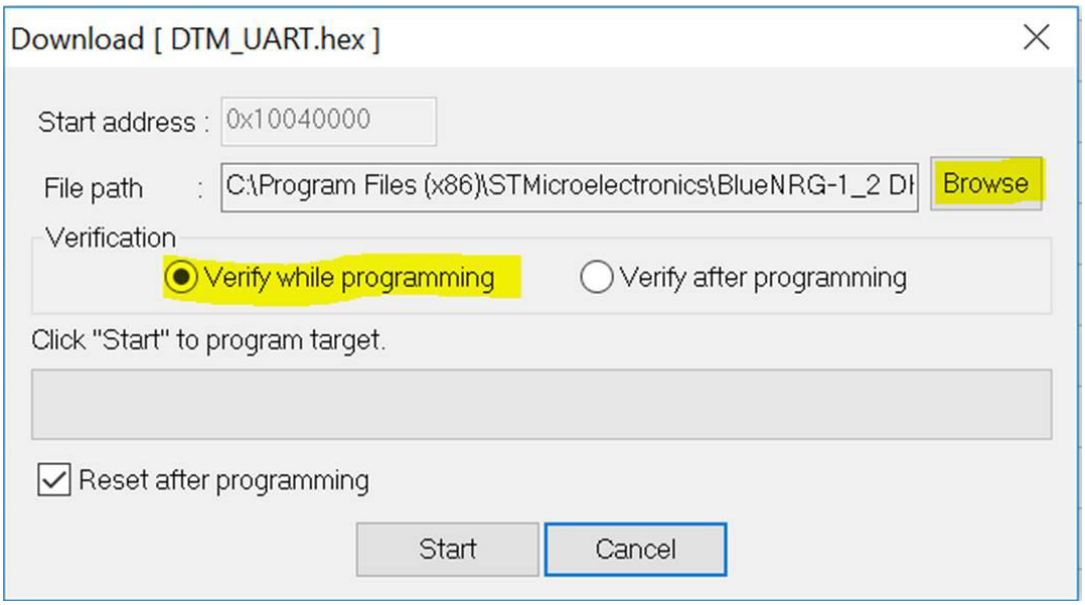
Step 4. Press [**OK**] to confirm

Step 5. From the main menu, select [**Target**]>[**Connect**] to connect the programmer
The ST-LINK/V2 LED starts blinking

Step 6. From main menu, select [**Target**]>[**Program Verify**]

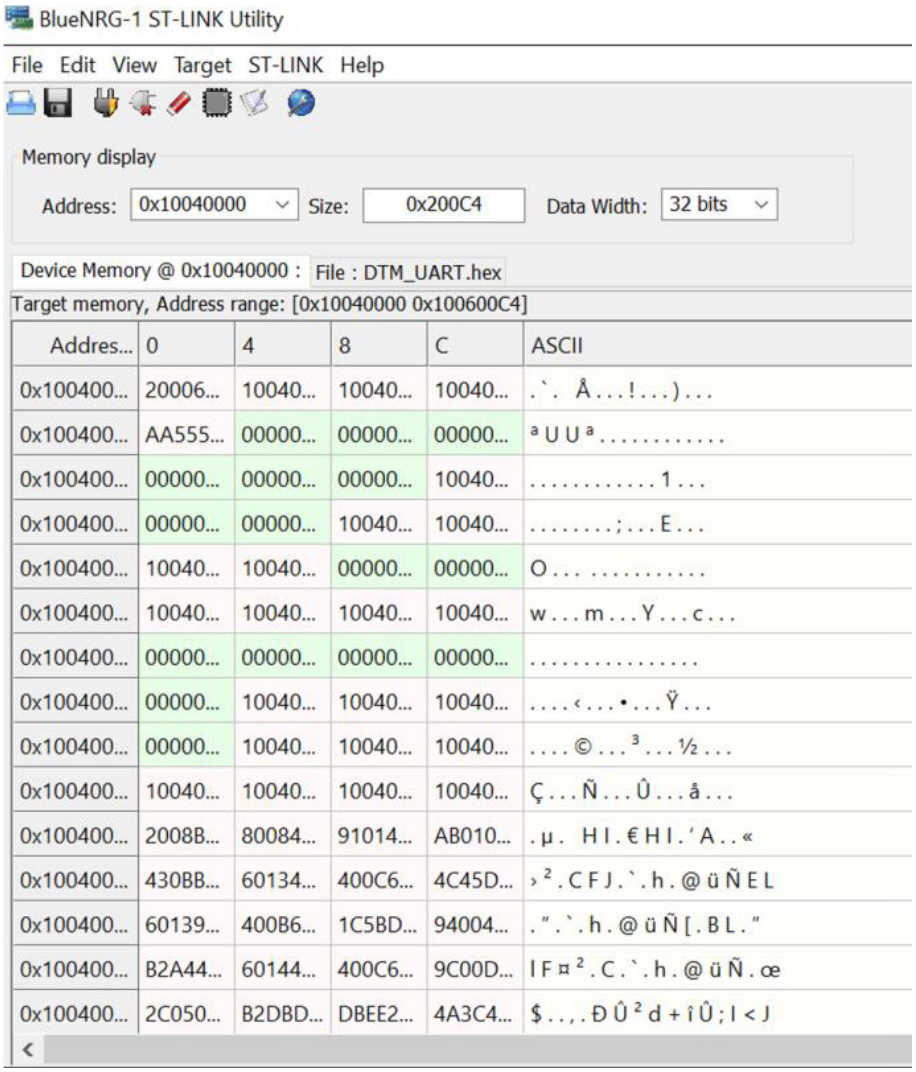
Step 7. Press [**Browse**] and select DTM_UART.hex from the disk to download it

Figure 2. DTM_UART.hex file downloading



Step 8. Press [**Start**] to Flash the image onto the BlueNRG-1 memory

Figure 3. BlueNRG-1 ST LINK Utility device memory

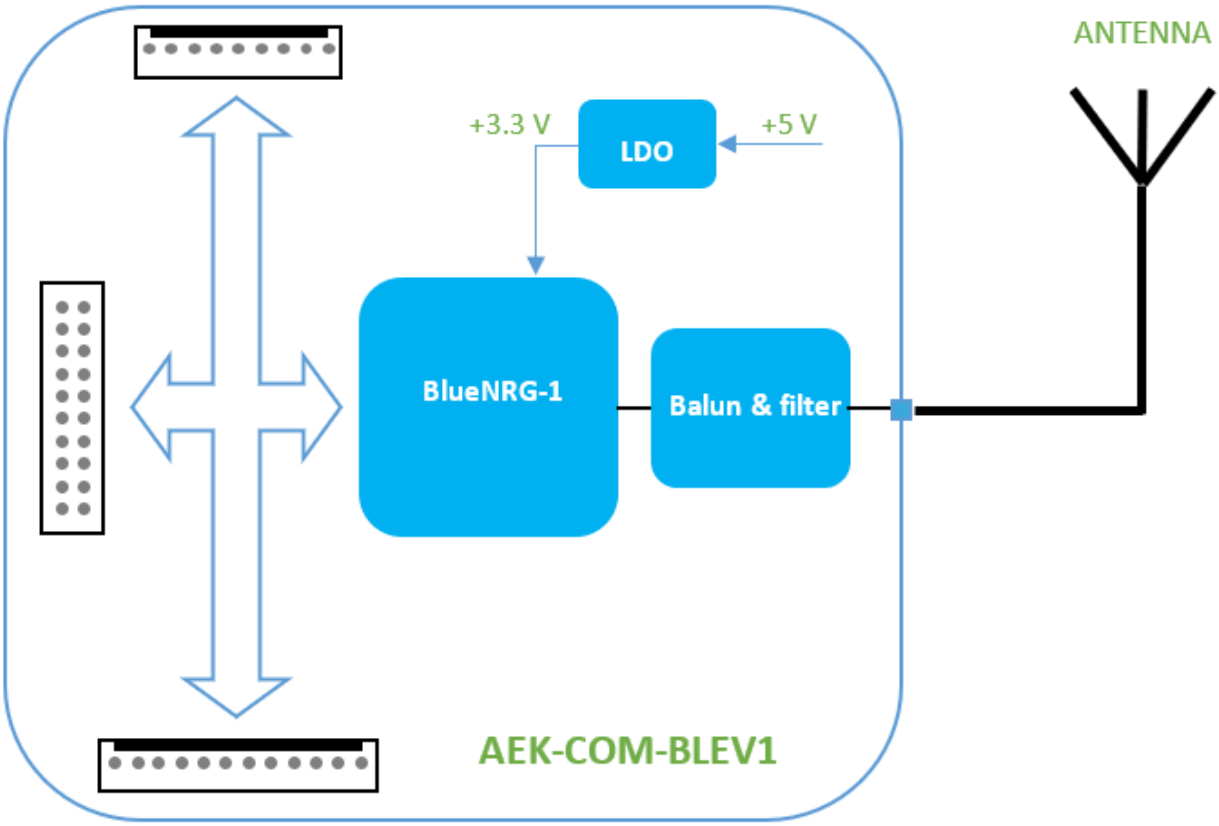


Addres...	0	4	8	C	ASCII
0x100400...	20006...	10040...	10040...	10040...	.`. Å...!...)...
0x100400...	AA555...	00000...	00000...	00000...	ª U U ª.....
0x100400...	00000...	00000...	00000...	10040...	.....1...
0x100400...	00000...	00000...	10040...	10040...	.....;...E...
0x100400...	10040...	10040...	00000...	00000...	O.....
0x100400...	10040...	10040...	10040...	10040...	w...m...Y...c...
0x100400...	00000...	00000...	00000...	00000...	.....
0x100400...	00000...	10040...	10040...	10040...	....‹...•...Ÿ...
0x100400...	00000...	10040...	10040...	10040...	....©...³...½...
0x100400...	10040...	10040...	10040...	10040...	Ç...Ñ...Û...å...
0x100400...	2008B...	80084...	91014...	AB010...	.µ. HI.€HI.'A..«
0x100400...	430BB...	60134...	400C6...	4C45D...	›².CFJ.`.h.@üÑEL
0x100400...	60139...	400B6...	1C5BD...	94004...	.".`.h.@üÑ[.BL."
0x100400...	B2A44...	60144...	400C6...	9C00D...	IF¤².C.`.h.@üÑ.œ
0x100400...	2C050...	B2DBD...	DBEE2...	4A3C4...	$..,.ĐÛ²d+îÛ;I<J

Step 9. From the main menu, select[]>[**Target**]>[**Disconnect**] to disconnect the programmer

2 Block diagram

Figure 4. **AEK-COM-BLEV1 block diagram**



3 Schematic diagrams

Figure 5. **AEK-COM-BLEV1 schematic diagram (1 of 4)**

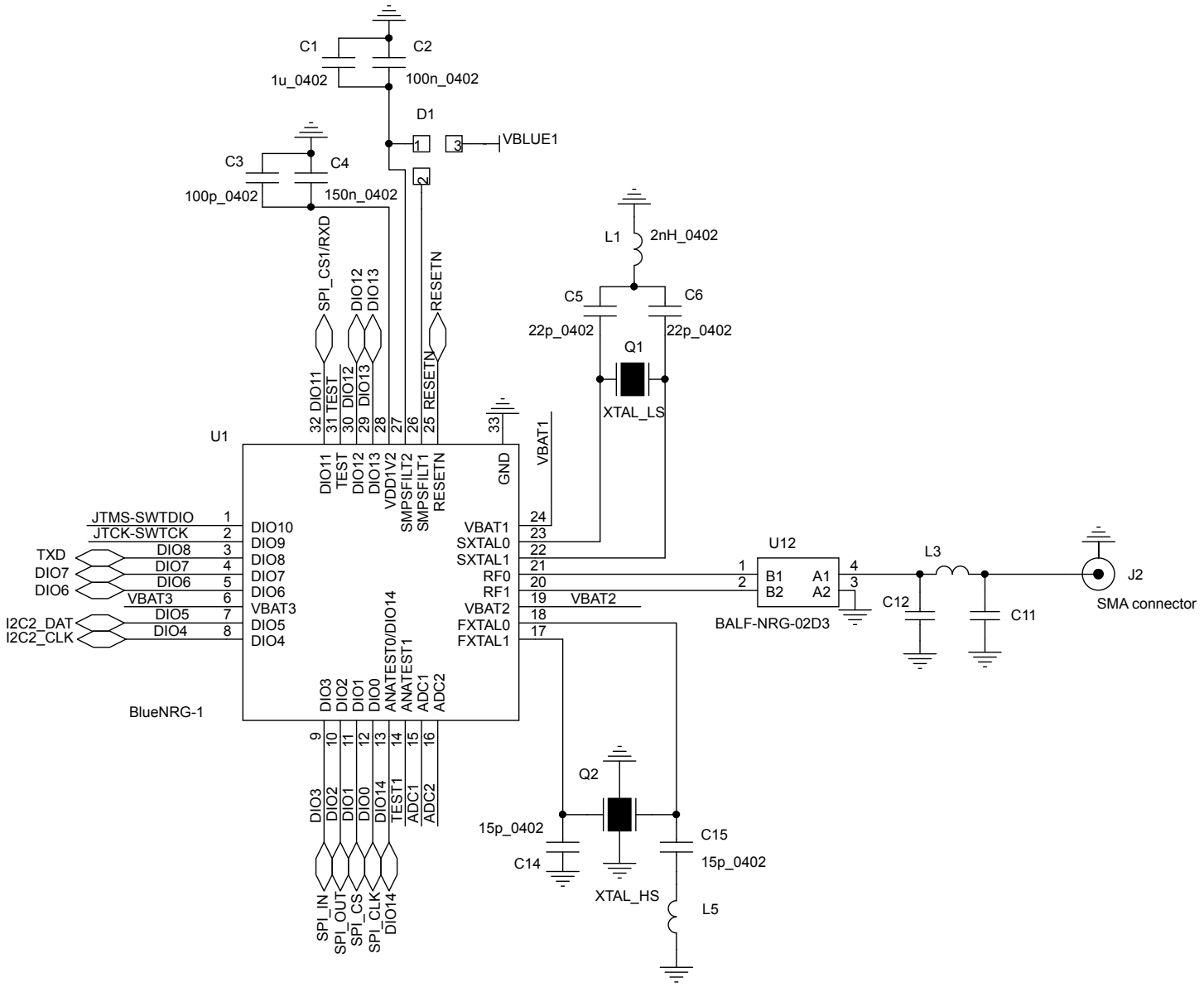


Figure 6. **AEK-COM-BLEV1 schematic diagram (2 of 4)**

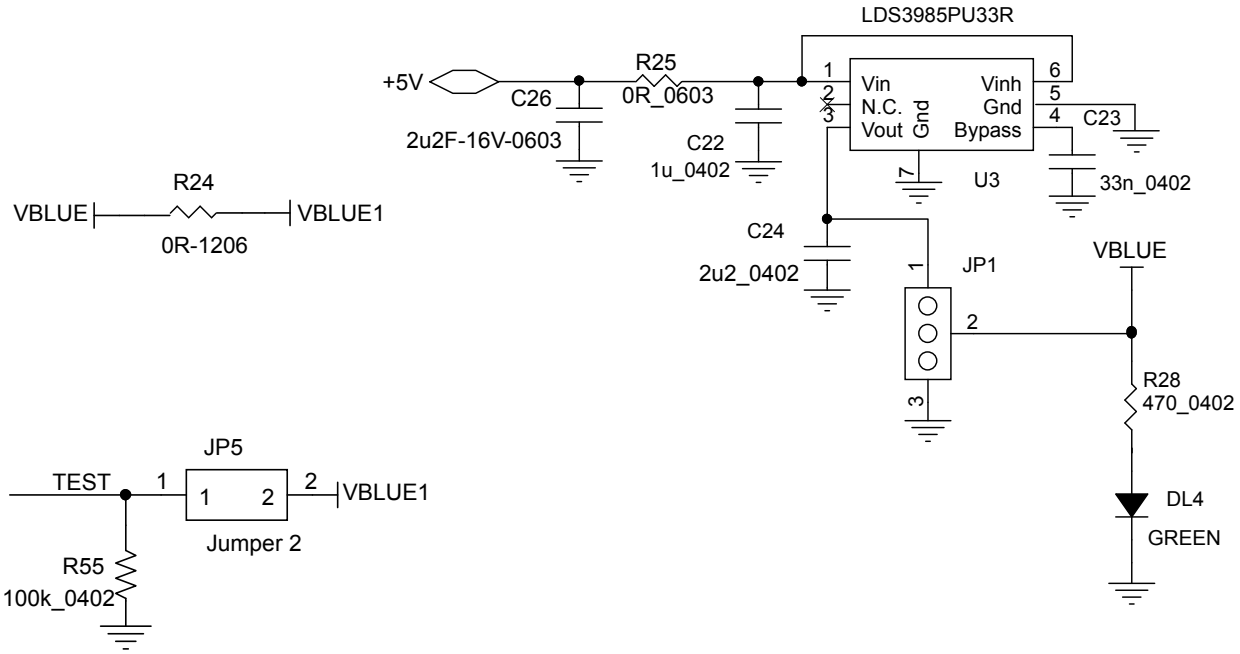


Figure 7. **AEK-COM-BLEV1 schematic diagram (3 of 4)**

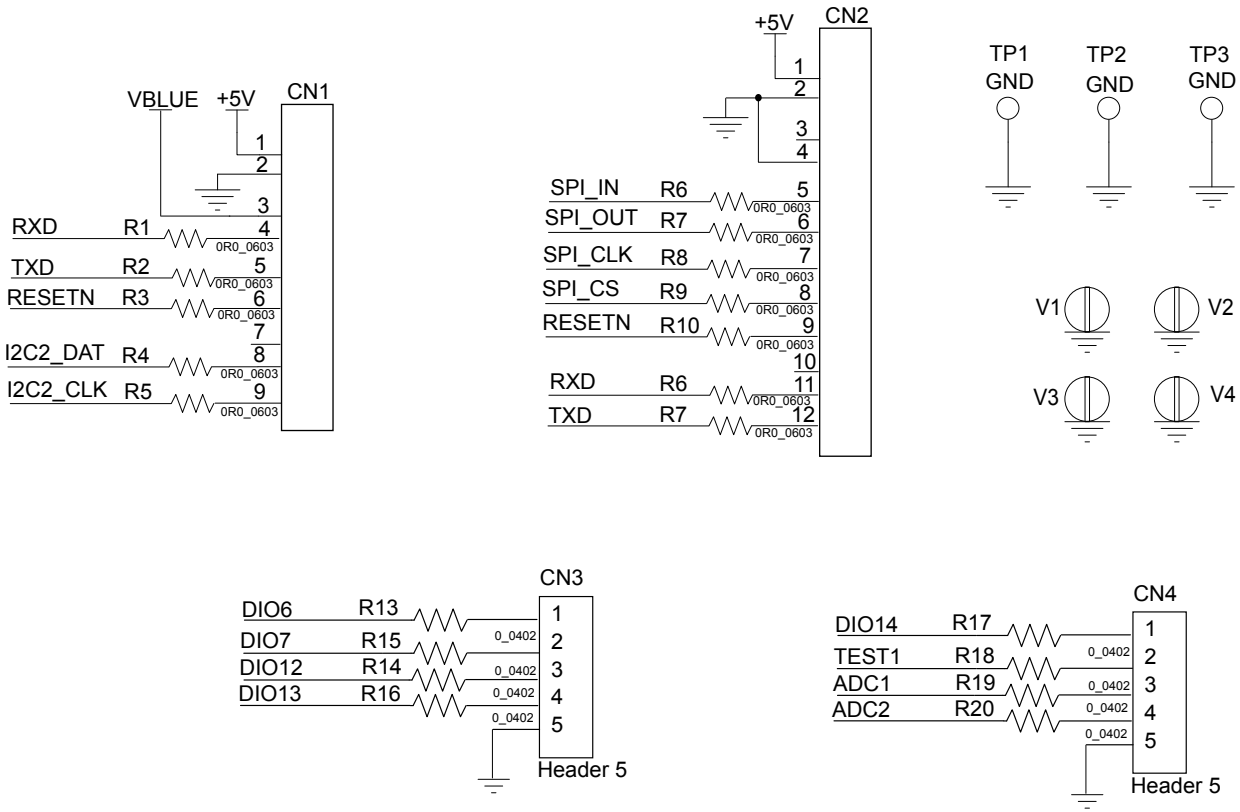
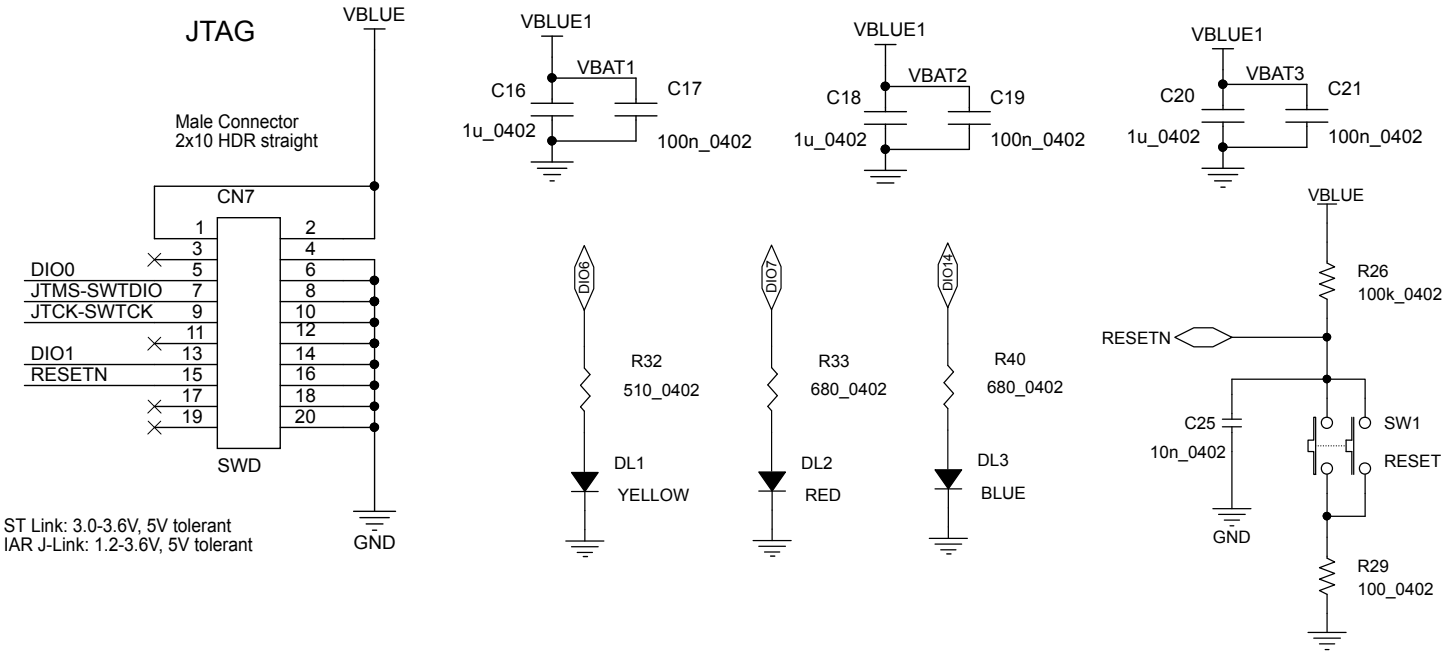


Figure 8. **AEK-COM-BLEV1 schematic diagram (4 of 4)**



Revision history

Table 1. **Document revision history**

Date	Version	Changes
19-Feb-2020	1	Initial release.

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. For additional information about ST trademarks, please refer to www.st.com/trademarks. 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.

© 2020 STMicroelectronics – All rights reserved