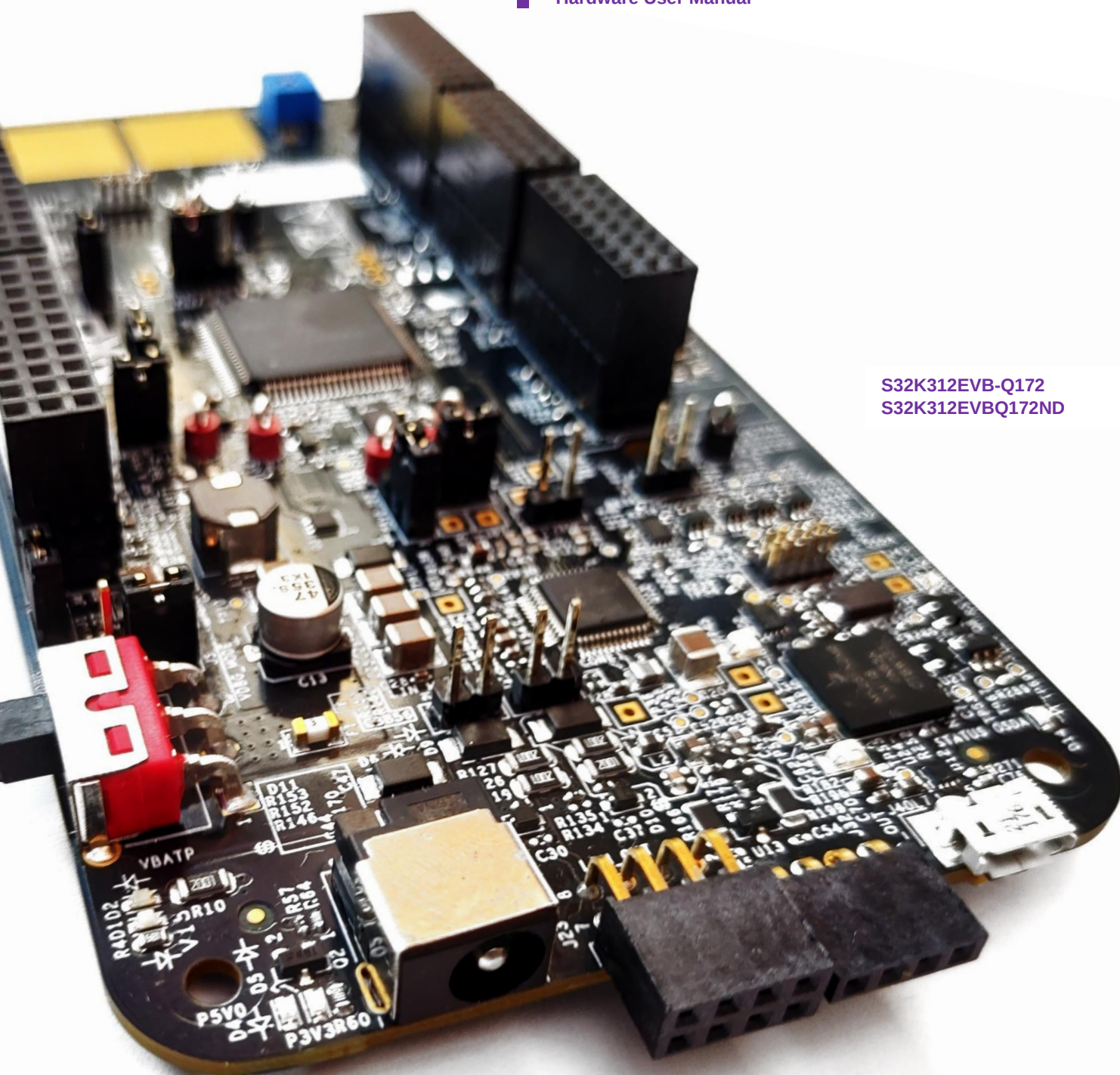


# S32K312EVB-Q172

Customer Evaluation Board for S32K312 MCUs  
Hardware User Manual



S32K312EVB-Q172  
S32K312EVBQ172ND



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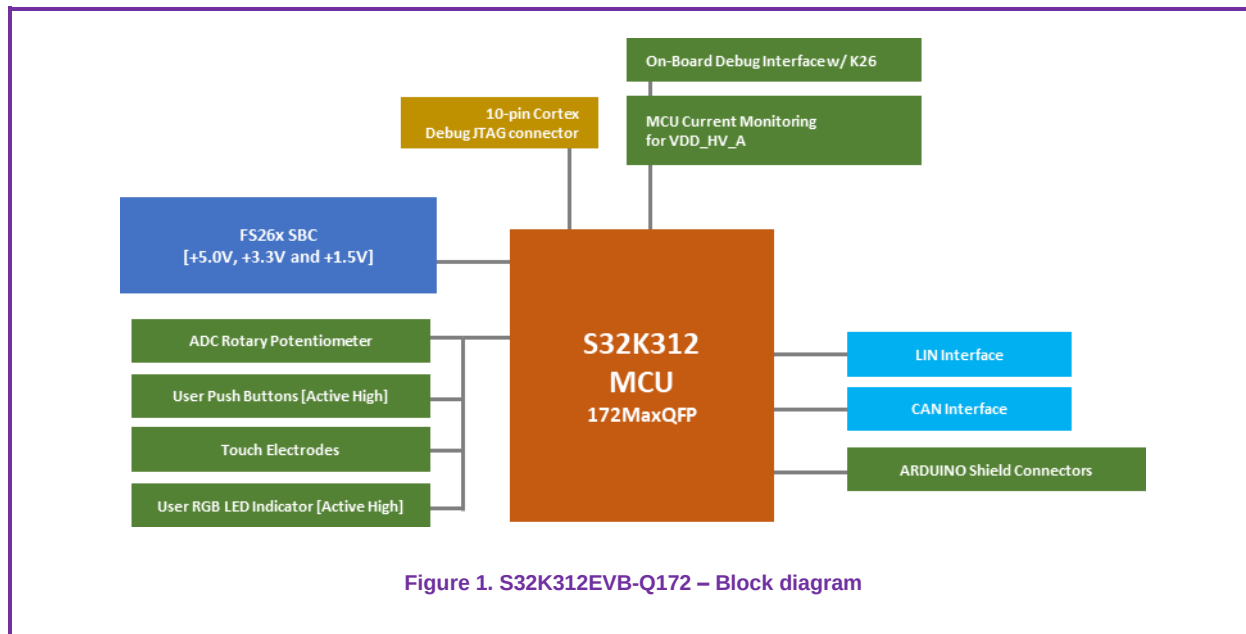
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## 2 Definitions, Acronyms, and Abbreviations

The following list defines the abbreviations used in this document.

|        |                                                                   |
|--------|-------------------------------------------------------------------|
| CD     | Compact Disk                                                      |
| CMOS   | Complementary Metal Oxide Semiconductor                           |
| CPLD   | Custom Programmed Logic Devices                                   |
| CPU    | Central Processing Unit                                           |
| CSI    | Camera Sensor Imaging                                             |
| CSPI   | Serial Peripheral Interface                                       |
| DDR    | Double Data Rate                                                  |
| DIP    | Dual In-line Package                                              |
| EEPROM | Electrically Erasable Programmable Read Only Memory               |
| EPROM  | Erasable Programmable Read Only Memory                            |
| GPIO   | General Purpose Input/output                                      |
| GPO    | General Purpose Output                                            |
| I2C    | Inter-Integrated Circuit                                          |
| ICE    | In-Circuit Emulator                                               |
| I/O    | Input/output                                                      |
| JTAG   | Joint Test Access Group                                           |
| LAN    | Local Area Network                                                |
| LCD    | Liquid Crystal Display                                            |
| LED    | Light Emitting Diode                                              |
| MB     | Megabyte                                                          |
| MCU    | Microcontroller Unit                                              |
| MMC    | Multi-Media Card                                                  |
| MCP    | Multi-chip product                                                |
| MS     | Memory Stick                                                      |
| NVRAM  | Non-volatile Random-Access Memory                                 |
| PC     | Personal Computer                                                 |
| PCB    | Printed Circuit Board                                             |
| PHY    | Physical interface                                                |
| POR    | Power on Reset                                                    |
| PSRAM  | Pseudo Random Access Memory                                       |
| PWR    | Power                                                             |
| PWM    | Pulse Width Modulation                                            |
| QVGA   | Graphics Adapter                                                  |
| RAM    | Random Access Memory                                              |
| SD     | SanDisk (Smart Media)                                             |
| SDRAM  | Synchronous Dynamic Random-Access Memory                          |
| SI     | System International (international system of units and measures) |
| SIMM   | Single In-Line Memory Module                                      |
| SPST   | Single Pole Single Throw                                          |
| TFT    | Thin Film Transistor                                              |
| UART   | Universal Asynchronous Receiver/Transmitter                       |
| USB    | Universal Serial Bus.                                             |
| HW     | Hardware.                                                         |
| POP    | Populate – Component placed                                       |
| DNP    | Do not populate – Component removed                               |

### 3 S32K312EVB-Q172 - Block Diagram

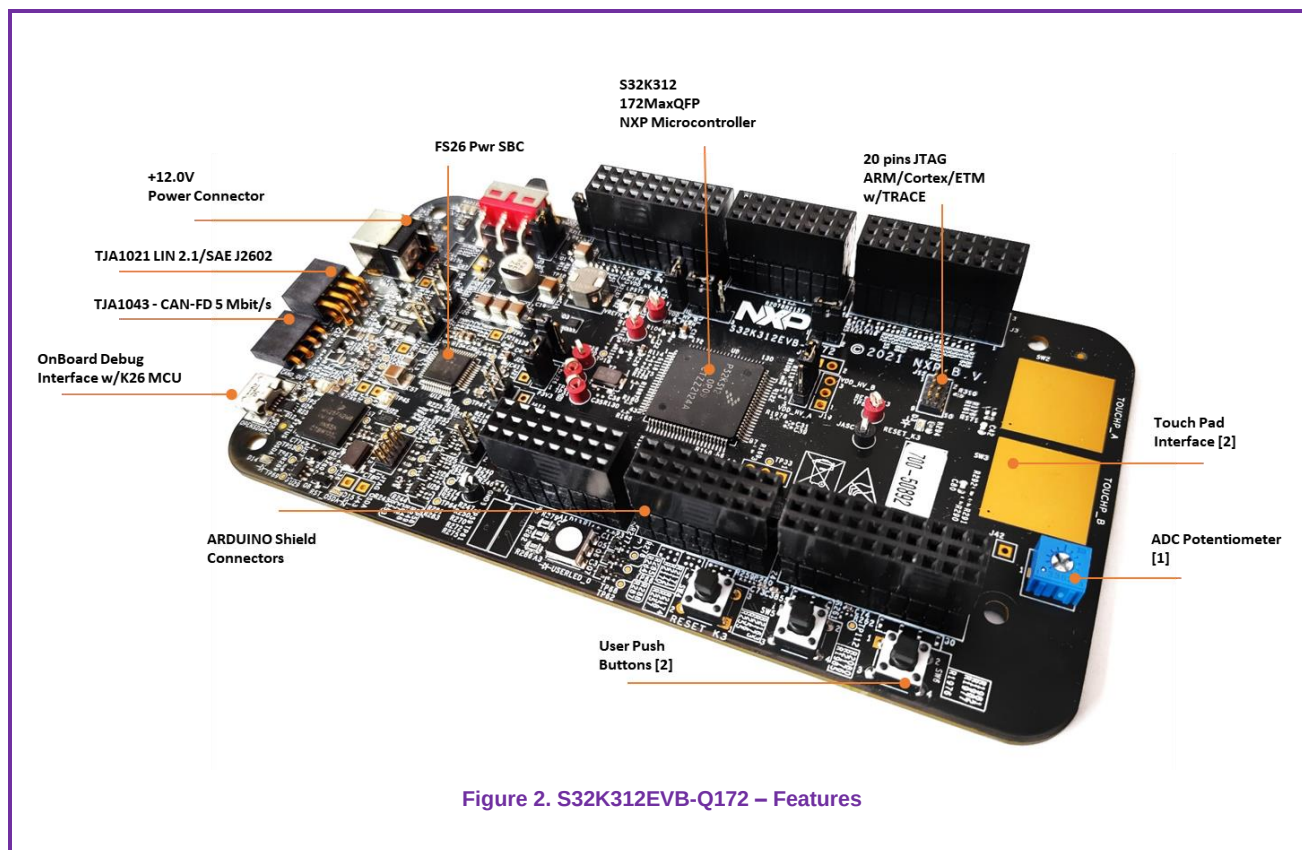


### 4 S32K312EVB-Q172 - Features

#### IMPORTANT

- Verify and download the last version of this document in <http://www.nxp.com>
- Before the S32K312 Customer Evaluation board is used or power is applied, please fully read this user manual. An incorrect configuration in the board may cause a damage irreparable on the component, MCU or EVB. Power must be removed from the EVB prior to:
  - Removing or placing some component or measurement
  - Re-configuring the board jumpers





## 5 S32K312EVB-Q172 - Default Configuration

Table 1. S32K312EVB-x172 - Default Configuration

| Interface        | S32K312 EVB-Q172 | S32K312 EVBS172 ND | Reference / Signal | Default Configuration | Description/Comment                                               |
|------------------|------------------|--------------------|--------------------|-----------------------|-------------------------------------------------------------------|
| S32K312 MCU      | ●                | ●                  | U9                 | V1.01                 | P32K344EHT1VPBST                                                  |
| MCU Power Supply | ●                | ●                  | VDD_HV_A_MCU       | +5.0V                 | The VDDA_HV_A domain is connected to +5.0V–Switching Power Supply |
|                  | ●                | ●                  | VDD_HV_B_MCU       | +3.3V                 | The VDDA_HV_B domain is connected to +3.3V–Switching Power Supply |
|                  | ●                | ●                  | VDD_REFH_MCU       | [VDD_HV_A]            | The VDD_REFH domain is connected to VDD_HV_A_MCU                  |
| OnBoard Debug    | ●                | -                  |                    | PTA15                 | PTA15/LPUART6_RX is routed to OpenSDA for serial interface        |
|                  |                  |                    |                    | PTA16                 | PTA16/LPUART6_TX is routed to OpenSDA for serial interface        |
| CAN Interface    | ●                | ●                  | TJA1043/CAN0       | PTA6                  | PTA26 is routed to the CAN0_RX signal                             |
|                  |                  |                    |                    | PTA7                  | PTA27 is routed to the CAN0_TX                                    |
|                  |                  |                    |                    | PTC23                 | PTC23 is routed to the CAN0_ERRN                                  |

S32K312EVB-Q172  
S32K312EVBQ172ND  
HWUM

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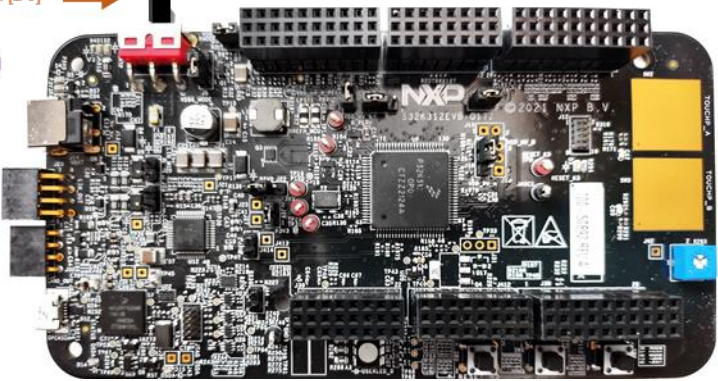
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| Interface            | S32K312<br>EVB-<br>Q172 | S32K312<br>EVBS172<br>ND | Reference / Signal | Default<br>Configuration | Description/Comment                          |
|----------------------|-------------------------|--------------------------|--------------------|--------------------------|----------------------------------------------|
| LIN<br>Interface     | ●                       | ●                        | LIN1<br>TJA1022T   | PTC21                    | PTCCAN0_EN                                   |
|                      |                         |                          |                    | PTC20                    | CAN0_STB                                     |
|                      |                         |                          |                    | PTB9                     | LPUART9_RX is routed to LIN Phy0             |
|                      |                         |                          |                    | PTB10                    | LPUART9_TX is routed to LIN Phy0             |
|                      |                         |                          |                    | PTB28                    | LPUART5_RX is routed to LIN Phy1             |
|                      |                         |                          |                    | PTB27                    | LPUART5_TX is routed to LIN Phy1             |
| User Push<br>Buttons | ●                       | ●                        | SW4                | Disabled                 | Active Low,                                  |
|                      |                         |                          |                    | PTB19                    | Active Low, before PTA1                      |
| User LED             | ●                       | ●                        | D13                | PTA29                    | Red                                          |
|                      |                         |                          |                    | PTA30                    | Green                                        |
|                      |                         |                          |                    | PTA31                    | Blue                                         |
| ADC<br>Potentiometer | ●                       | ●                        | ADCPOT0            | PTA11                    | ADCPOT0 [R293] is routed to PTA11 - ADC1_S10 |
| ARDUINO              | ●                       | ●                        | -                  | -                        |                                              |

## 6 S32K312EVB-Q172 - Startup

Follow these steps to connect and power on the board

1. Carefully unpack the S32K312EVB-Q172 and observe ESD preventive measures while handling the K3 development board.
2. Connect necessary cables between host PC and EVB board prior to applying power to the EVB.
3. The power-ON sequence for the EVB must be as follows:

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a) | <p>- The power switch -SW1 must be in OFF position before to the EVB be connected to an external power supply.</p> <p>Unconnected / Unpowered</p> <p>OFF Power Position [2-3]</p>  The image shows the S32K312EVB-Q172 EVB. A red slide switch (SW1) is located at the top left. An orange arrow points to the switch, which is currently in the 'OFF' position (position 2-3). The board is labeled 'Unconnected / Unpowered'.                           |
| b) | <p>- Once the power switch -SW1 is in OFF position, then the EVB can be connected to an external power supply.</p> <p>External power supply +12.0V/2Amp</p> <p>OFF Power Position [2-3]</p>  The image shows the S32K312EVB-Q172 EVB with a black power cable connected to the left side. An orange arrow points to the red slide switch (SW1), which is in the 'OFF' position (position 2-3). The board is labeled 'External power supply +12.0V/2Amp'. |
| c) | <p>- Now the power switch -SW11 can be changed to ON- position.</p> <p>On Power Position [1-2]</p> <p>External power supply +12.0V/2Amp</p>  The image shows the S32K312EVB-Q172 EVB with the black power cable still connected. An orange arrow points to the red slide switch (SW1), which has been moved to the 'ON' position (position 1-2). The board is labeled 'On Power Position [1-2]' and 'External power supply +12.0V/2Amp'.                |

4. When power is applied to the EVB, three orange LED's adjacent to the voltage regulators show the presence of the supply voltages as follows:
- LED D2 Indicates that the 12.0V is connected to the EVB correctly.
  - LED D4 Indicates that the 5.0V linear regulator is enabled and working correctly.
  - LED D5 Indicates that the +3.3V linear regulator is enabled and working correctly.

D2 [Orange] – LED Indicator +12.0V  
D4 [Orange] – LED Indicator +5.0V  
D5 [Orange] – LED Indicator +3.3V

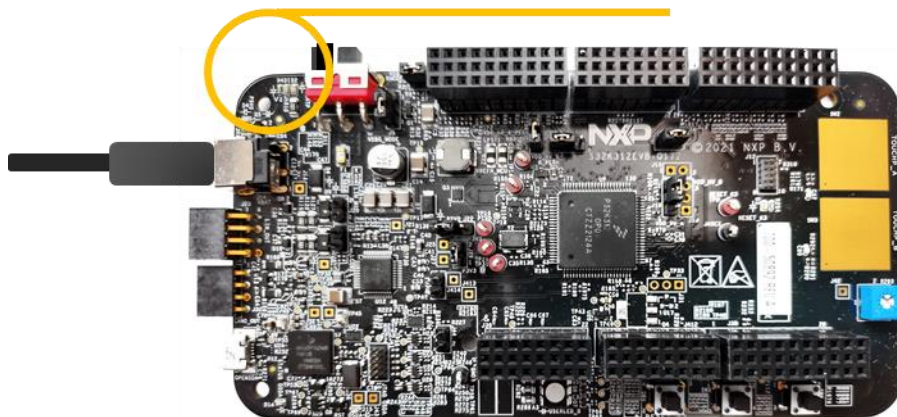


Figure 3. S32K312EVB-Q172 – Power supply Input and LED power indicators

If no LED's are illuminated when power is applied to the EVB and the regulators are correctly enabled using the appropriate jumpers, it is possible that either power supply is not connected properly, or the voltage level is lower than the specified [+12.0V to  $\geq 2$ Amps].

Note that the fuse will not protect against one of the EVB regulators being shorted. If this happens, damage is likely to occur to the EVB and / or components.

5. The board is ready to use now.

## 7 S32K312EVB-Q172 - Power supply

The EVB requires an external power supply voltage of between +12V/ $\geq 2$ A. This allows the EVB to be easily used in a vehicle if required. The 12v input on the EVB is used to supply a FS26/SBC – U1, the power management IC controller provides +5.0V, +3.3V and +1.5V, for the different power configurations of VDD\_HV\_A, VDD\_HV\_B, V15 and other interfaces



7.1 S32K312EVB-Q172 - Main Power Supply

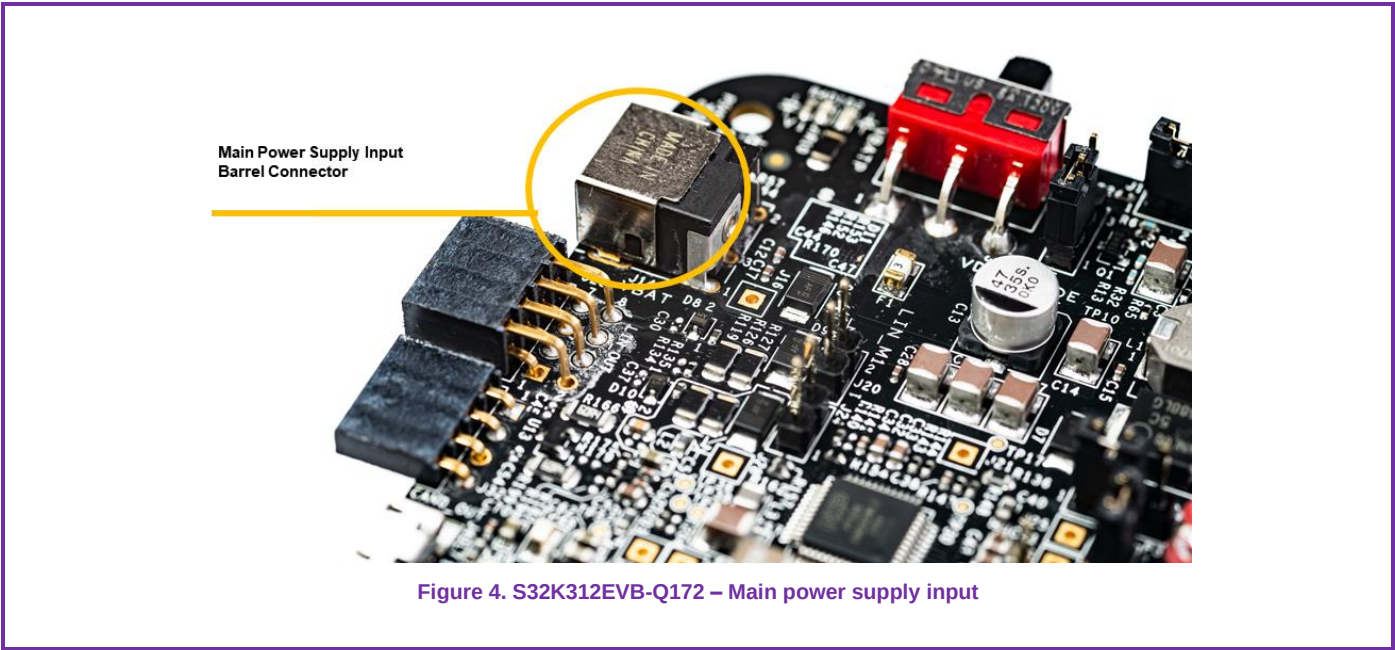


Table 2. Main power supply connector

| Connector                                                                                                                        | Description                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><p>Ground</p><p>V+ (+12Volts).</p></div> | <p><b>2.1mm Barrel Connector – J14</b></p> <p>This connector should be used to connect the supplied wall-plug mains adapter. Note – if a replacement or alternative adapter is used, care must be taken to ensure the 2.1mm plug uses the correct polarization as shown</p> |

### 7.1.1 S32K312EVB-Q172 – FS26/Modes Operation

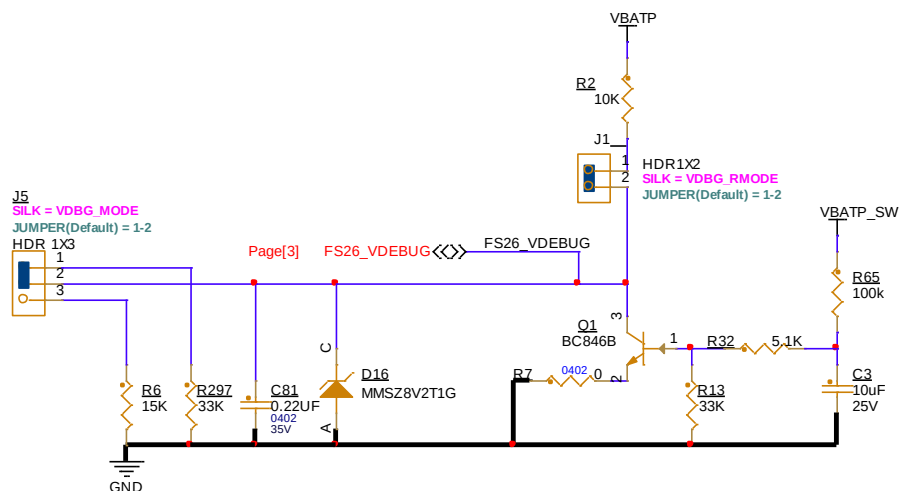


Figure 5. S32K312EVB-Q172 – FS26/Modes Operation

Table 3. S32K312EVB-Q172 – FS26/Modes Operation

| Reference                             | Jumper Position |     |  | Description                                                                                                                                                                                                                                                                                                                                                                                                               | Comments |
|---------------------------------------|-----------------|-----|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Flash Mode<br>[Default configuration] | J1              | 1-2 |  | The R2 resistor to VBATP (VBAT protected +12.0V) is routed as pull-up to the VDEB pin. This is a common pull-up resistor for the 2 voltage divider configurations, with R6 or R297.                                                                                                                                                                                                                                       |          |
|                                       | J5              | 1-2 |  | The R297 is selected for the divider voltage, +8.0V is applied on VDEB pin to set the FS26-SBC on MCU Flash Mode. In this mode device power up sequence starts with debug mode enabled and can be used during customer production process to flash MCU without need of WD refresh. After ~80ms once the SW1 is in ON-position the VDEB pin will be switching to a low voltage (GND) due to the RC delay circuitry and Q18 |          |
| Debug Mode                            | J1              | 1-2 |  | The R2 resistor to VBATP (VBAT protected +12.0V) is routed as pull-up to the VDEB pin. This is a common pull-up resistor for the 2 voltage divider configurations, with R6 or R297.                                                                                                                                                                                                                                       |          |
|                                       | J5              | 2-3 |  | The R297 is selected for the divider voltage, +5.0V is applied on VDEB pin to set the FS26-SBC on Debug Mode, voltage must be removed from debug pin in order to start power up sequence. In this mode Watchdog refresh is not needed. After ~80ms once the SW1 is in ON-position the VDEB pin will be switching to a low voltage (GND) due to the RC delay circuitry and Q18.                                            |          |

| Reference                                                                                | Jumper Position |      |                                                                                                                                                                                                                                                                                                                                     | Description                                                                                                                                                                | Comments |
|------------------------------------------------------------------------------------------|-----------------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Normal Mode                                                                              | J1              | OPEN | <div><div>1</div><div></div><div>2</div></div>                                                                                                                                                                                                     | In this mode the FS26 can enter Normal mode by configuring the init_fs window and sending properly serviced watchdog refresh by SPI. Please review the FS26 documentation. |          |
|                                                                                          | J5              | OPEN | <div><div>1</div><div></div><div>2</div><div></div><div>3</div><div></div></div> |                                                                                                                                                                            |          |
| All change of jumpers must be done once the EVB is unpowered from J3 and J5 as MANDATORY |                 |      |                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                            |          |

## 7.2 S32K312EVB-Q172 – +5.0 Volts Power Supply

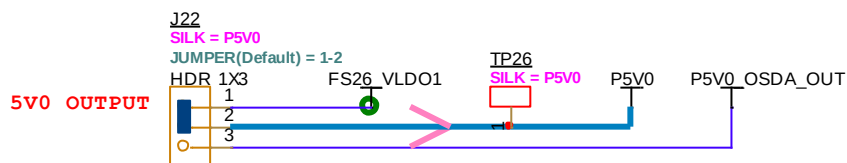


Figure 6. S32K312EVB-Q172 – General jumper for the P5V0 (+5.0V) reference

Table 4. S32K312EVB-Q172 – +5.0 Volts Power Supply

| Reference | Jumper Position |                                                                                     | Description                                                                                             | Comments       |
|-----------|-----------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------|
| J22       | 1-2             |  | The +5.0V output of the FS26x SBC [FS26_VLDO1] is routed to the main P5V0 domain (+5.0V for all board). | Default closed |
|           | OPEN            |  | P5V0 domain (+5.0V for all board) is isolated/disconnected from the FS26x                               |                |

## 7.3 S32K312EVB-Q172 – +3.3 Volts Power Supply

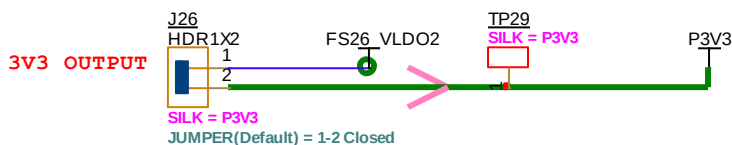


Figure 7. S32K312EVB-Q172 – General jumper for the P3V3 (+3.3V) reference

Table 5. S32K312EVB-Q172 – +3.3 Volts Power Supply

| Reference | Jumper Position                                                                        |      | Description                                                                                  | Comments       |
|-----------|----------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------|----------------|
| J26       | 1<br> | 1-2  | The +3.3V Switching power supply is routed to the main P3V3 domain (+3.3V for all board).    | Default closed |
|           | 2                                                                                      |      |                                                                                              |                |
|           | 1<br> | OPEN | The +3.3V output of the FS26x SBC is isolated to the main P3V3 domain (+3.3V for all board). |                |
|           | 2<br> |      |                                                                                              |                |

## 7.4 S32K312EVB-Q172 – VDD\_HV\_A

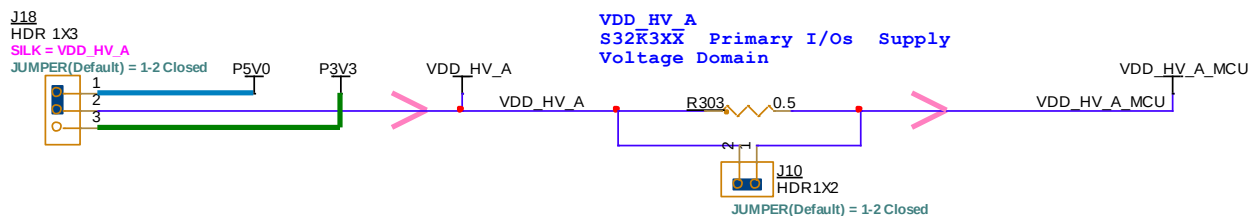


Figure 8. S32K312EVB-Q172 – VDD\_HV\_A power supply



Table 6. S32K312EVB-Q172 – VDD\_HV\_A

| Reference | Jumper Position                                                                                                                  |      | Description                                                                                                          | Comments       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------------------------------|----------------|
| J18       | <div><div>1</div><div>2</div><div>3</div></div> | 1-2  | P5V0 (+5.0V from the FS26) is selected for the VDD_HV_A_MCU reference                                                | Default closed |
|           | <div><div>1</div><div>2</div><div>3</div></div> | 2-3  | P3V3 (+3.3V from the FS26) is selected for the VDD_HV_A_MCU reference                                                |                |
|           | <div><div>1</div><div>2</div><div>3</div></div> | OPEN | VDD_HV_A domain is isolated and unpowered                                                                            |                |
| J10       | <div><div>1</div><div>2</div></div>             | 1-2  | VDD_HV_A is routed to VDD_HV_A_MCU reference. This jumper can be used to current measurements in the VDD_HV_A domain | Default closed |
|           | <div><div>1</div><div>2</div></div>           | OPEN | Without this jumper the VDD_HV_A domain will not be powered. The S32K312 MCU will be turned-OFF                      |                |

## 7.5 S32K312EVB-Q172 – VREFH

The VREFH reference of the S32K312 MCU is directly routed to the VDD\_HV\_A\_MCU domain.

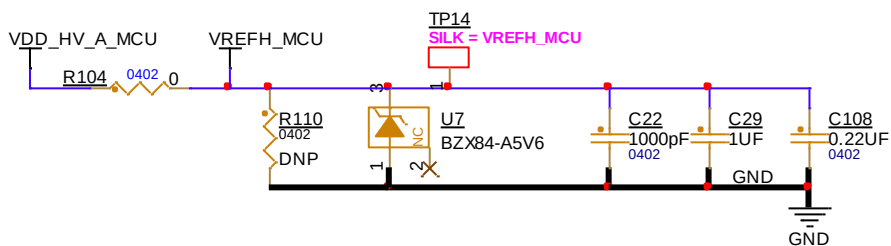


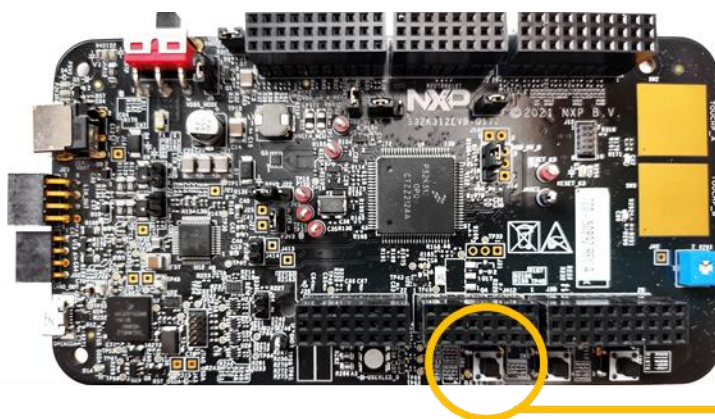
Figure 9. S32K312EVB-Q172 – VREFH power supply

CCCC

## 8 S32K312EVB-Q172 - Programming and Debug Interface

### 8.1 RESET Switch and LED indicator

The RESET switch [SW2] provides for manual application of the RESET input signal. The S32K3 MCU will drive the RESET signal to reset the EVB board peripherals. The RESET LED indicator [D22] will be ON for the duration of the RESET signal. This operation indicates the S32K312 MCU is in the Reset state.



SW4 – RESET Switch with LED indicator for the S32K3 MCU

Figure 10. S32K312EVB-Q172 – RESET Switch

## 8.2 On-board Debugger

The EVB incorporates an On-Board Debugger embedded well as JTAG connectors. It bridges serial and debug communications between a USB host and an embedded target processor.

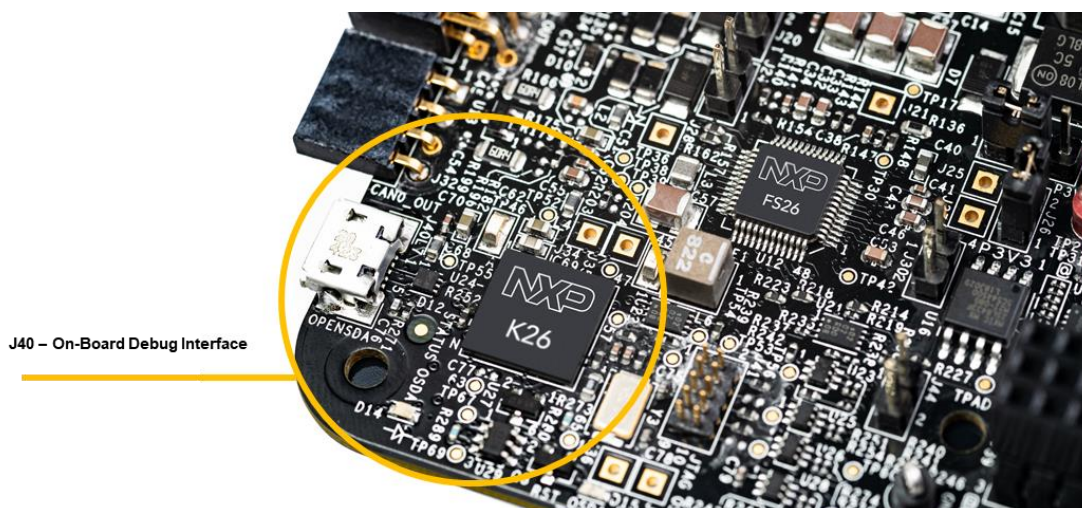


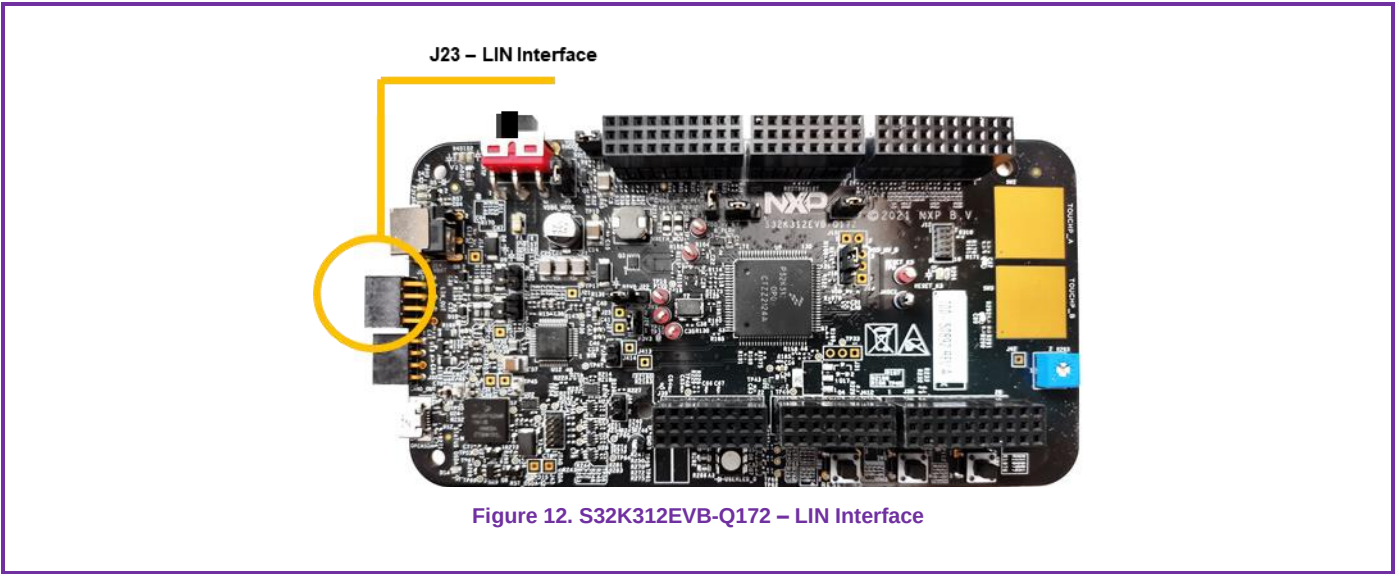
Figure 11. S32K312EVB-Q172 – On-board S32K3 Debugger

Table 7. Programming and Debug Connectors

| Connector                                                                                                                                                                     |                                                                                     | Reference/<br>Component | Description                                                                                                                                                                                                                                         |                              |                            |                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|---------------------|
| 20-Pin Cortex<br>Debug + ETM<br>Connector                                                                                                                                     |  | <b>J50</b>              | This small 20-pin (0.05") connector provides access to SWD, SWV, JTAG, and ETM (4-bit) signals available on a Cortex-M3/M4/M7 device.<br>A 20-pin header (Samtec FTSH-110-01) is specified with dimensions:<br>0.50" x 0.188" (12.70 mm x 4.78 mm). |                              |                            |                     |
|                                                                                                                                                                               |                                                                                     |                         | <b>NOTE - JTAG – TRACE Signals</b><br>Due that the MCU ports used for the trace signals also are shared with other interfaces. It is important to isolate these signals/interfaces for the <b>J4-Cortex Debug D ETM connector</b> .                 |                              |                            |                     |
|                                                                                                                                                                               |                                                                                     |                         | <b>SIGNAL<br/>Name</b>                                                                                                                                                                                                                              | <b>MCU<br/>Port<br/>Name</b> | <b>Signal<br/>Resistor</b> | <b>COMMENT</b>      |
|                                                                                                                                                                               |                                                                                     |                         | TRACE_CLK                                                                                                                                                                                                                                           | PTC2                         | R192                       | Disabled as DEFAULT |
|                                                                                                                                                                               |                                                                                     |                         | TRACE_D0                                                                                                                                                                                                                                            | PTD7                         | R452                       | Disabled as DEFAULT |
| TRACE_D1                                                                                                                                                                      | PTD12                                                                               | R190                    | Disabled as DEFAULT                                                                                                                                                                                                                                 |                              |                            |                     |
| TRACE_D2                                                                                                                                                                      | PTD11                                                                               | R435                    | Disabled as DEFAULT                                                                                                                                                                                                                                 |                              |                            |                     |
| TRACE_D3                                                                                                                                                                      | PTD10                                                                               | R511                    | Disabled as DEFAULT                                                                                                                                                                                                                                 |                              |                            |                     |
| All TRACE signals are DISABLED as default configuration. In order to enable the TRACE interface, the MCU signals routed to the QSPIA interface must be disabled and isolated. |                                                                                     |                         |                                                                                                                                                                                                                                                     |                              |                            |                     |

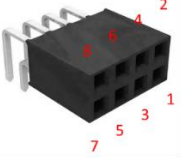
## 9 S32K312EVB-Q172 - LIN Interface

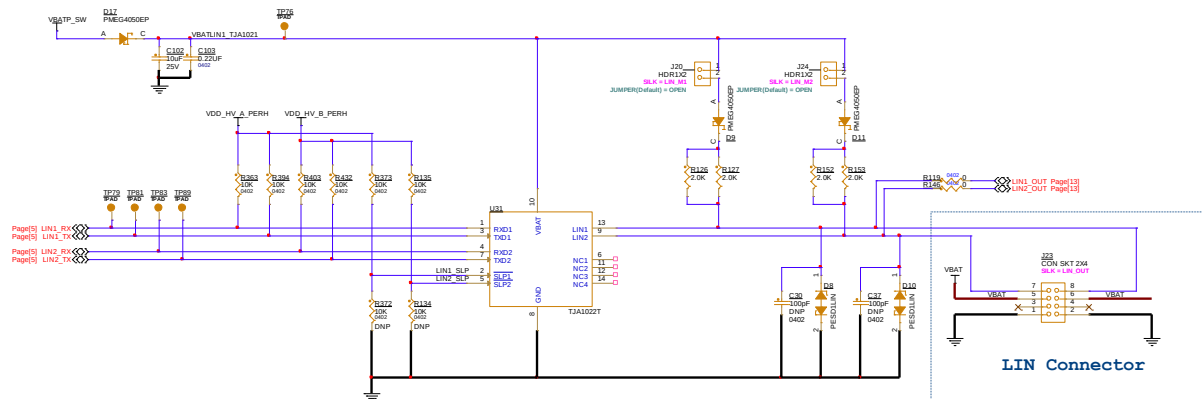
The EVB incorporates two LIN interfaces connected the S32K312 MCU. Using an NXP LIN transceivers the TJA1021T/20/C, supporting both master and slave mode (jumper selectable). The output from the LIN transceivers is connected to J23.



The pinout of these headers is shown below and is also detailed on the PCB silkscreen.

Table 8. LIN Connector

| Connector                                                                           | Reference | Pin Number | Signal/Connection |
|-------------------------------------------------------------------------------------|-----------|------------|-------------------|
|  | J23       | 1          | GND               |
|                                                                                     |           | 2          | GND               |
|                                                                                     |           | 3          | NC                |
|                                                                                     |           | 4          | NC                |
|                                                                                     |           | 5          | VBAT              |
|                                                                                     |           | 6          | VBAT              |
|                                                                                     |           | 7          | LIN2_OUT          |
|                                                                                     |           | 8          | LIN1_OUT          |



**Figure 13. S32K312EVB-Q172 – LIN Physical Layer1 TJA1021HG: Quad LIN 2.2A/SAE J2602 transceiver**

### Table 9. LIN Interface – MCU Connections

| LIN Interface | Signal Name | MCU Port | Comment/Description              |
|---------------|-------------|----------|----------------------------------|
| TJA1021 /LIN1 | LIN1_RX     | PTB9     | LPUART9_RX is routed to LIN Phy1 |
|               | LIN1_TX     | PTB10    | LPUART9 is routed to LIN Phy1    |
|               | LIN2_RX     | PTB28    | LPUART5_RX is routed to LIN Phy1 |
|               | LIN2_TX     | PTB27    | LPUART5_TX is routed to LIN Phy1 |
|               |             |          |                                  |

## 10 S32K312EVB-Q172 - CAN Interface

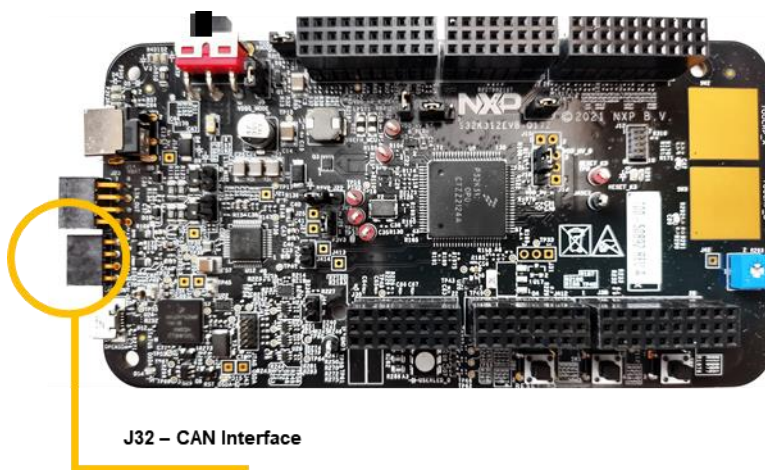
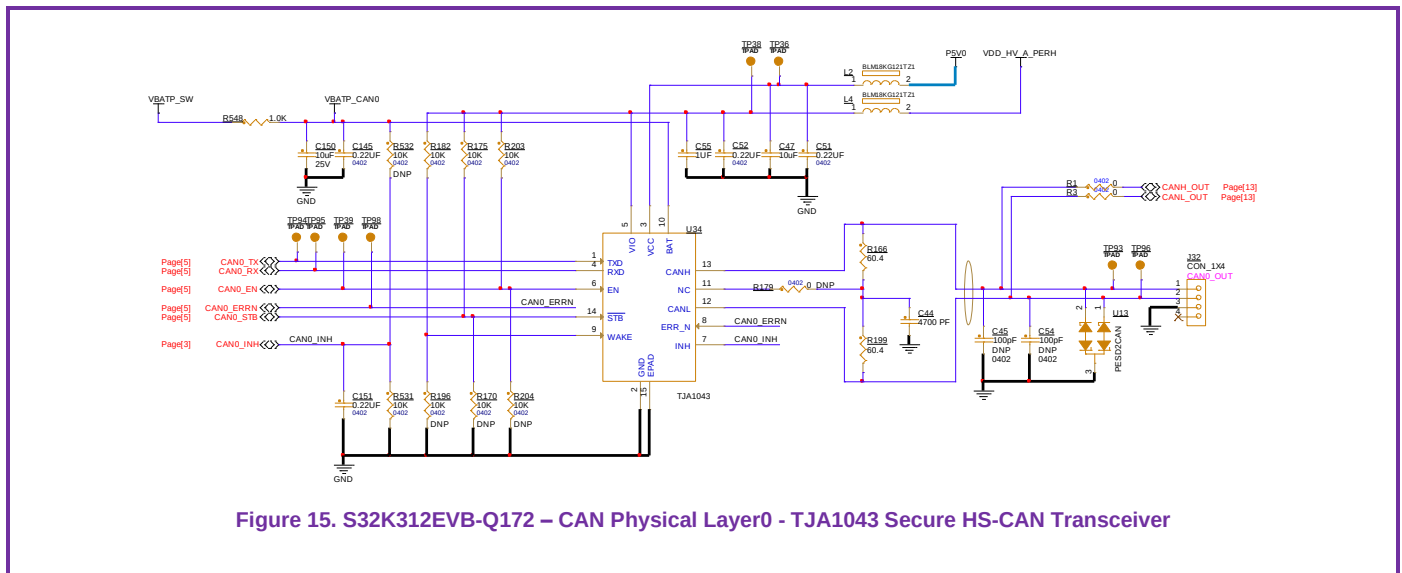


Figure 14. S32K312EVB-Q172 – CAN Interface



### Table 10. CAN Interface - Connectors

| Connector                                                                         | Reference | Circuit/<br>Interface | Pin<br>Number | Signal/Connection |
|-----------------------------------------------------------------------------------|-----------|-----------------------|---------------|-------------------|
|  | J32       | CAN0                  | 1             | CANH0             |
|                                                                                   |           |                       | 2             | CANL0             |
|                                                                                   |           |                       | 3             | GND               |
|                                                                                   |           |                       | 4             | NC                |



### Table 11. CAN Interface – MCU Connections

| CAN Interface                  | Signal Name | MCU Port | Comment/Description                      |
|--------------------------------|-------------|----------|------------------------------------------|
| <b>TJA1153</b><br><b>/CAN0</b> | CAN0_RX     | PTA6     | [CAN0_RX Module] is routed to CAN Phy0   |
|                                | CAN0_TX     | PTA7     | [CAN0_TX Module] is routed to CAN Phy0   |
|                                | CAN0_ERRN   | PTC23    | PTC23 is routed to CAN Phy0 as CAN0_ERRN |
|                                | CAN0_EN     | PTC21    | PTC21 is routed to CAN Phy0 as CAN0_EN   |
|                                | CAN0_STB    | PTC20    | PTC20 is routed to CAN Phy0 as CAN0_STB  |

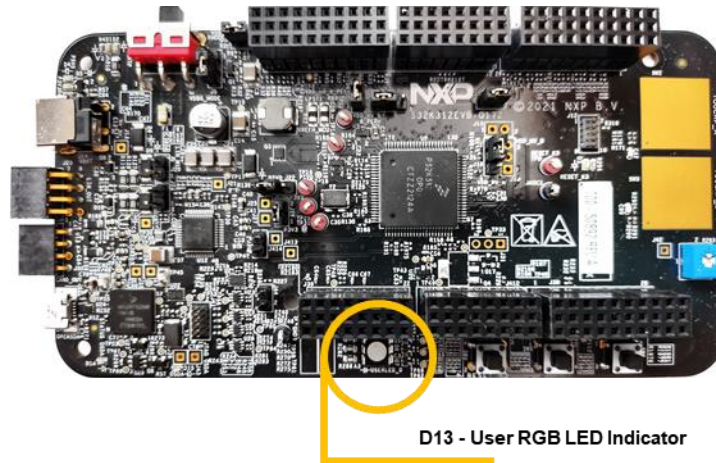
## 11 S32K312EVB-Q172 - User Peripherals

## 11.1 User RGB LED Indicator

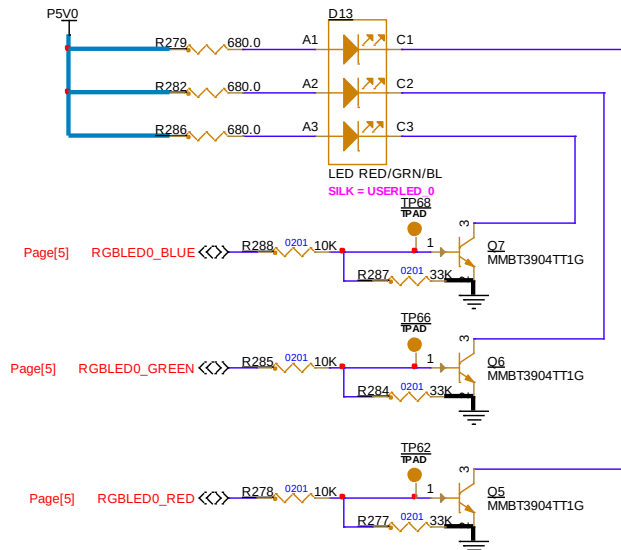
There is 1 active high user RGB LEDs are connected by NPN transistors to the MCU ports. The USERLEDs are connected as follows:

### Table 12. User LED Indicators

| Reference | Signal Name   | MCU Port Default | Color | Comment     |
|-----------|---------------|------------------|-------|-------------|
| D13       | RGBLED0_RED   | PTA29            | Red   | Active High |
|           | RGBLED0_GREEN | PTA30            | Green | Active High |
|           | RGBLED0_BLUE  | PTA31            | Blue  | Active High |



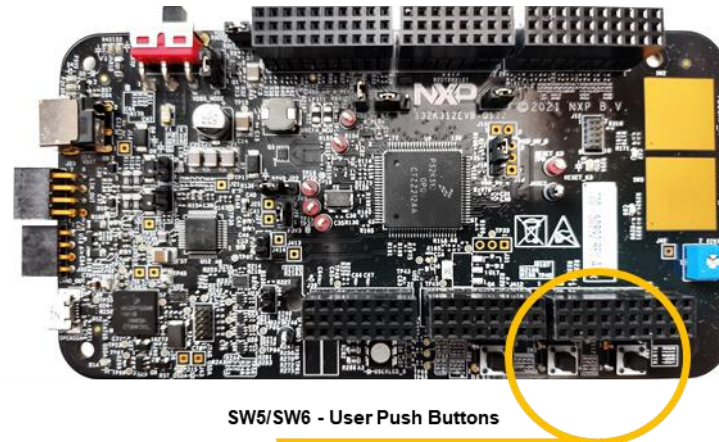
**Figure 16. S32K312EVB – User RGB LED Indicator**



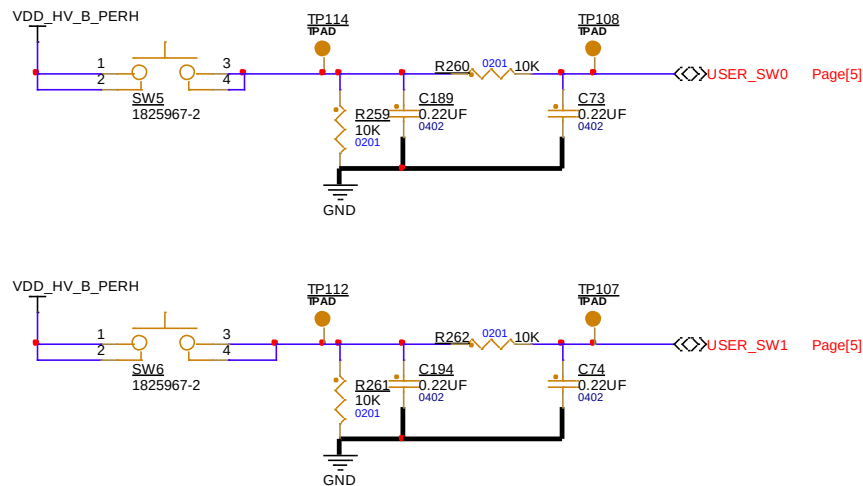
**Figure 17. S32K312EVB-Q172 – User LED indicators**

## 11.2 User Pushbuttons

There are 2 push-buttons active to high (pulled low, driven to VDD\_HV\_A and VDD\_HV\_B), the push button switches (SW6 and SW5) connected to MCU ports. The switches are connected as follows:



### Figure 18. S32K312EVB-Q172 – User Pushbuttons



### Figure 19. S32K312EVB-Q172 – User Pushbuttons

Table 13. User Pushbuttons

| Reference | Function | MCU Port | Comments           |
|-----------|----------|----------|--------------------|
| SW5       | USER_SW0 | PTB26    | Disabled           |
| SW6       | USER_SW1 | PTB19    | Enabled as DEFAULT |
|           |          | PTF31    | Disabled           |
|           |          | PTC18    | Disabled           |

1. There are zero-ohm resistors on the direct connections between each **USER\_SWx** and the MCU pins. These can be removed if required to isolate or change the User Switch from the default MCU pin.

## 11.3 ADC Rotary Potentiometers

The EVB incorporates a couple of ADC Rotary Potentiometer [which routes a voltage between 0v to VD\_HV\_A] directly connected to ADC Precise Input Chanel of the S32K312 Microcontroller.

Table 14. ADC Potentiometers

| Reference | Function | MCU Port | Comments           |
|-----------|----------|----------|--------------------|
| R393      | ADC_POT0 | PTA11    | Enabled as DEFAULT |
|           |          | PTA9     | Disabled           |

**NOTE**

1. There are zero-ohm resistors on the direct connections between each **USERSW** and the MCU pins. These can be removed if required to isolate or change the User Switch from the default MCU pin.

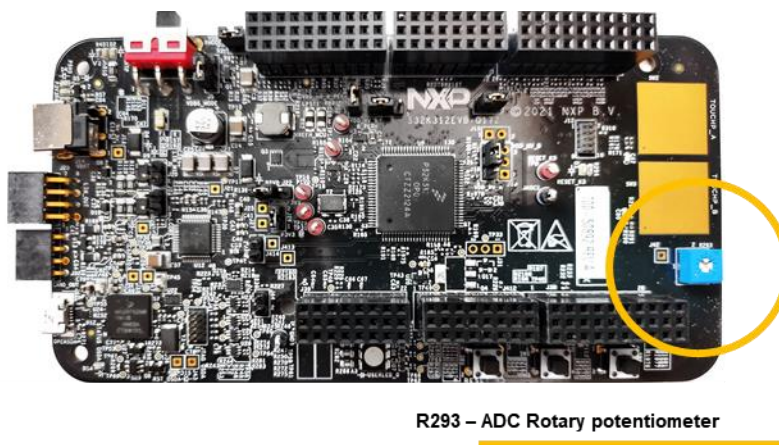


Figure 20. S32K312EVB-Q172 – ADC Rotary Potentiometers

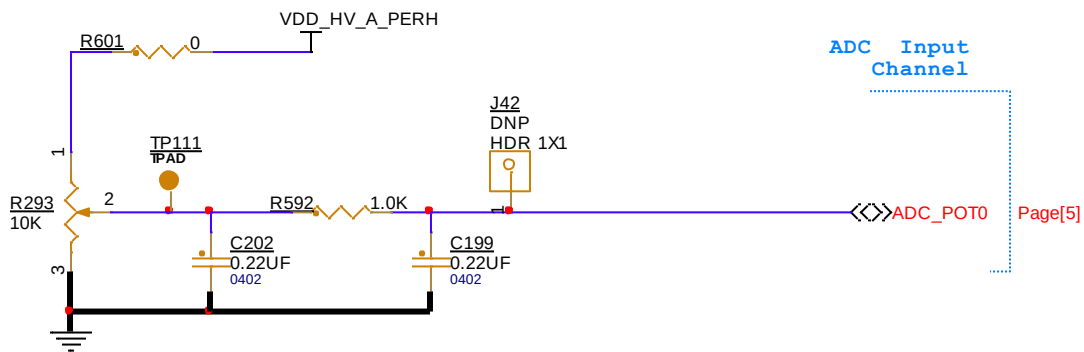


Figure 21. S32K312EVB-Q172 – ADC Rotary Potentiometers

## 12 S32K312EVB-Q172 - Default Jumpers

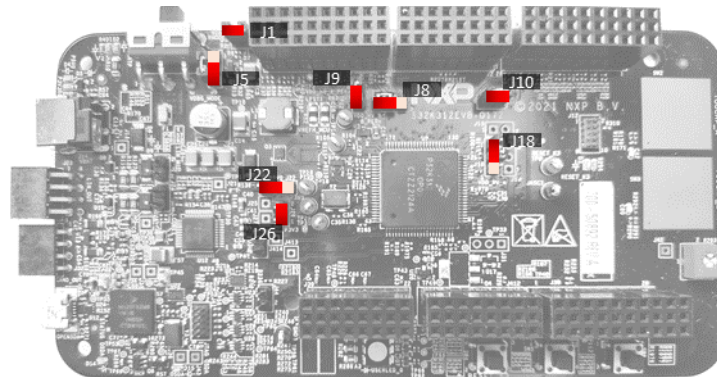


Figure 22. S32K312EVB-Q172 – Default jumpers' configuration



Table 15. Default Jumper Configuration

| Interface                | Reference | Position | Description / Comments                                                                                                                                           |
|--------------------------|-----------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FS26x SBC Power Supply   | J22       | 1-2      | FS26_VLDO1 [+5.0V] is routed to P5V0 domain                                                                                                                      |
|                          | J26       | 1-2      | FS26_VLDO2 [+3.3V] is routed to P3V3 domain                                                                                                                      |
|                          | J1        | 1-2      | Flash Mode – configuration in the FS26                                                                                                                           |
|                          | J5        | 1-2      |                                                                                                                                                                  |
| S32K312 MCU Power Supply | J18       | 1-2      | P5V0 (+5.0V from the FS26) is selected for the VDD_HV_A_MCU reference.                                                                                           |
|                          | J10       | 1-2      | VDD_HV_A is routed to VDD_HV_A_MCU reference. A jumper on this position disables the shunt resistors R57 and R58 are disabled for current measurement proposals. |
|                          | J9        | 1-2      | VDD_HV_B is routed to VDD_HV_B_PERH                                                                                                                              |
|                          | J8        | 1-2      | VDD_HV_A is routed to VDD_HV_A_PERH                                                                                                                              |

## 13 S32K312EVB-Q172 - Revision history

Table 16. Revision history

| Document Revision | Date    | Schematic / Board Number | Schematic / Board Revision | Changes          | Author        |
|-------------------|---------|--------------------------|----------------------------|------------------|---------------|
| A1                | 01/2021 | 51972                    | A                          | Internal version | Jesús Sánchez |

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