Getting started with the STEVAL-25R300KA kit based on the ST25R300 high-performance NFC universal device and EMVCo reader

Introduction

The STEVAL-25R300KA is a ready-to-use kit based on the ST25R300 high-performance NFC universal device for contactless applications. The kit allows evaluating this device features and functionality in the reader/writer, and card emulation modes.

The kit consists of:

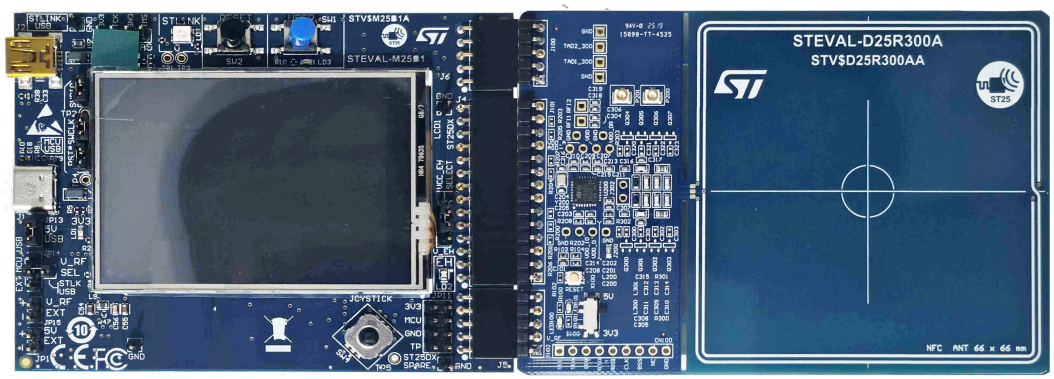
- a microprocessor main board (STEVAL-M25B1), which includes hardware and software tools that enable using the entire STM32 ecosystem. This board is powered through a mini USB connectors
- a reader expansion board (STEVAL-D25R300A), which embeds the ST25R300 device and an antenna etched on the PCB with its tuning circuit

The communication link between the two boards is the SPI bus. The processor card provides the power. Specific data lines complete the pin connector assignment shared between the cards.

Thanks to several demonstrations that can be performed, this kit helps the users develop and test their applications.

The kit is FCC certified, with FCC ID: YCPR300AD1. It is also IC certified, with IC: 8976A-R300AD1; PMN: STEVAL-25R300KA; HVIN: STEVAL-25R300KA.

Figure 1. STEVAL-25R300KA kit (top view)



Notice: *For dedicated assistance, submit a request through our online support portal at **www.st.com/support**.*

1 Features

- NFC card reader IC: ST25R300
- 13.56 MHz inductive antenna etched on PCB and associated tuning circuit
- NFC Forum NFC-A, NFC-B, NFC-F, and NFC-V poller
- NFC Forum NFC-A, NFC-F listener
- Support for all five NFC Forum Tag types in reader mode
- NFC Forum Type 3 tag (NFC-F) host card emulation
- NFC Forum Type 4A tag (NFC-A) host card emulation
- Integrated inductive sensing system for low-power detection of a tag presence using I and Q measurement
- Dynamic Hight power output (DPO): Field strength is controlled to stay within given limits (software feature)
- User selectable and automatic gain control
- Serial peripheral interface (SPI) up to 10 Mb/s

2 Hardware overview

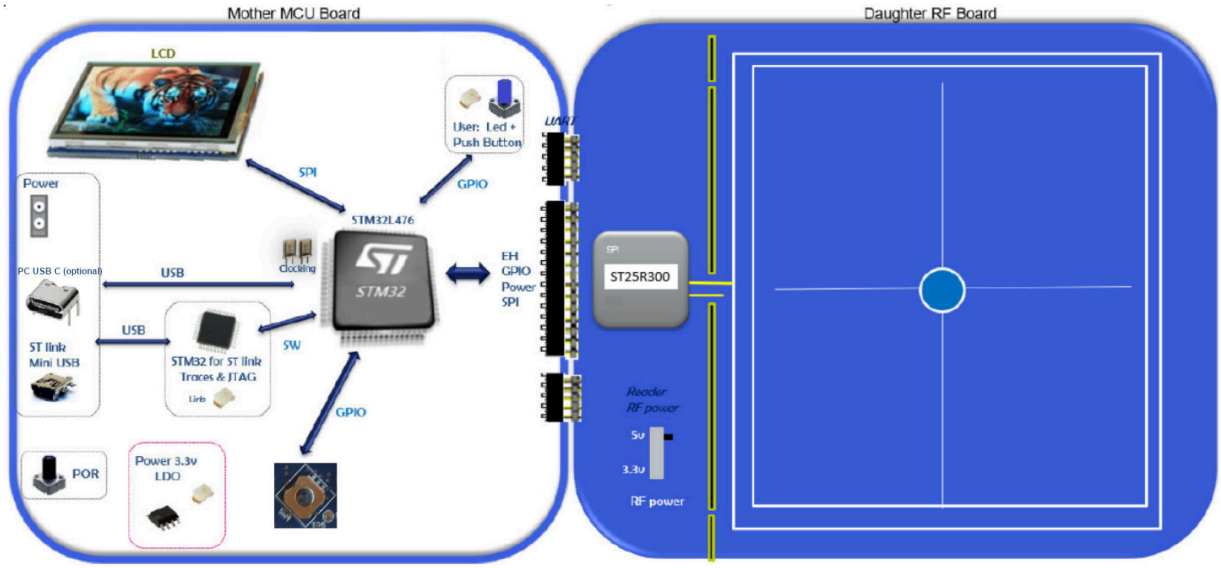
The main board PCB is usually connected to the PC via the DEBUG/FLASH mini USB connector.

The STM32 MCU firmware controls the ST25R300 via the extension connectors.

The 5 V supply of the USB bus powers both boards. An LDO converts this voltage down to 3.3 V to supply the microcontroller and the ST25R300.

For the reader expansion board, you can select a 3.3 or 5 V RF powering. A green LED, close to the motherboard USB C plug (optional), indicates when the board is powered.

Figure 2. Hardware connection



2.1 Main board hardware

The STEVAL-M25B1 main board embeds a 32-bit microcontroller of the STM32L476 series, which is based on the Arm Cortex-M4 high-performance CPU with FPU. This board is powered by default throught the mini USB connector.

It includes:

- an ST-LINK in-circuit debugger and programmer for STM32 microcontrollers
- push buttons (reset and user)
- a mini-USB debug connector
- a user-dedicated USB-C connector (optional)
- support for ST NFC tag

Table 1. RF Powering options

Item	Connector	Position	Description
KIT powering options			
1	JP13	closed 1-2	Powered by usb C connector (optional)
2	JP1	Open	External source available on JP1
MCU powering options			
1	JP16	closed 1-2	Internal source
2	JP16	closed 2-3	External source
RF powering			
1	JP14	closed 1-2	External source available on JP15

Item	Connector	Position	Description
2	JP14	closed 2-3	Powered by usb C connector (optional)
3	JP14	closed 4-2	Powered by mini usb connector

Figure 3. STEVAL-M25B1 main board layout (top view)

1. Software bus (ST-LINK)
2. ST-LINK activity LED
3. Reset button
4. User button
5. User LED
6. Extension connectors
7. On-going tag detection indicator
8. Extension connector - GPIO setting
9. Joystick
10. Power 3.3 V LED
11. Powering options
12. User USB (optional)

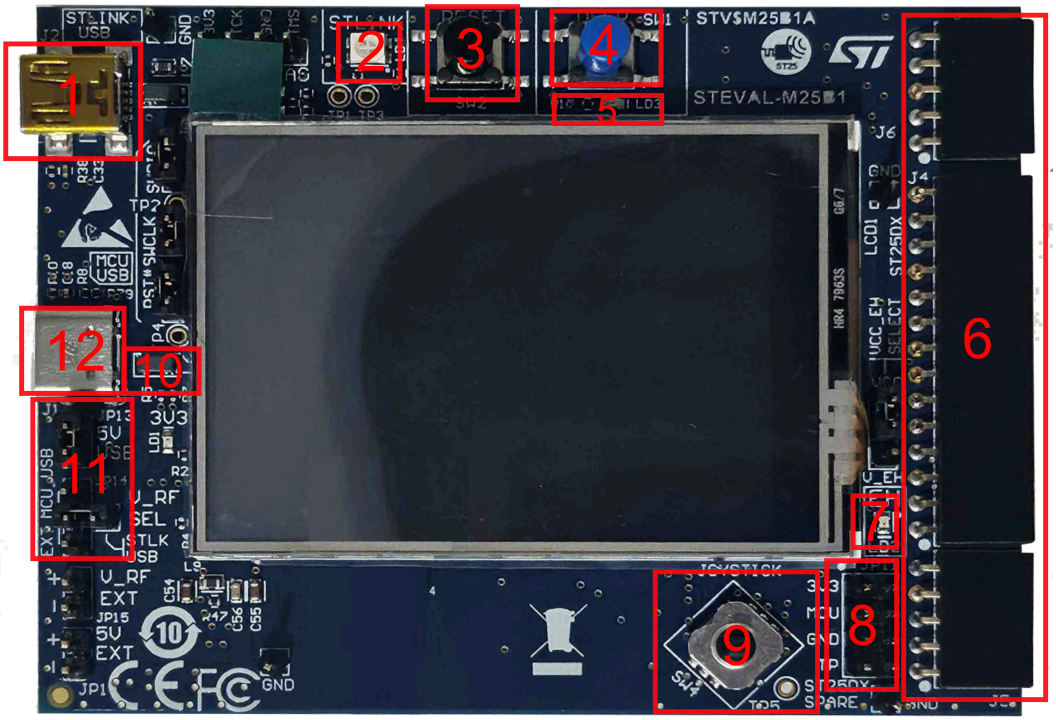
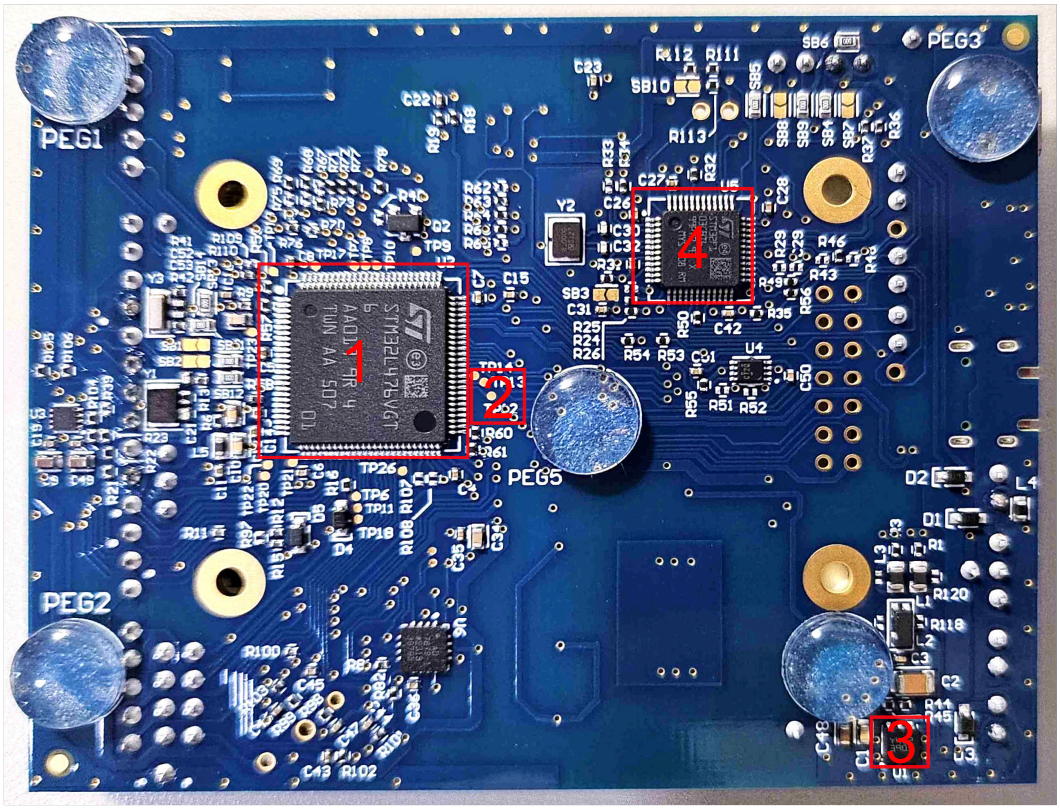


Figure 4. STEVAL-M25B1 main board layout (bottom view)

1. STM32L476 MCU
2. Test points for external connections
3. Regulator
4. STM32 ST-LINK



2.1.1 Jumper default configuration

The STEVAL-M25B1 jumpers are configured by default to power the kit through the mini USB connector.

Figure 5. **Jumper default configuration**

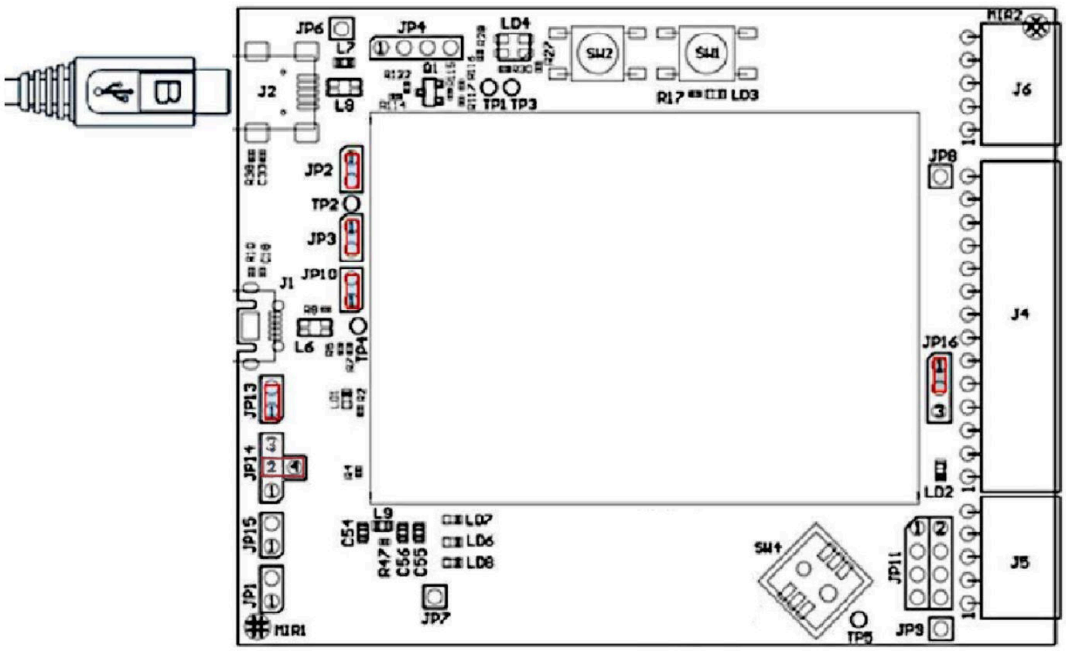


Table 2. **Jumper default configuration**

Connector	Position	Description
JP2	Closed 1-2	ST-LINK UART debug features
JP3		
JP10		
JP13		Card powered by USB C (optional)
JP16	Closed 1-2	Board powering specific feature

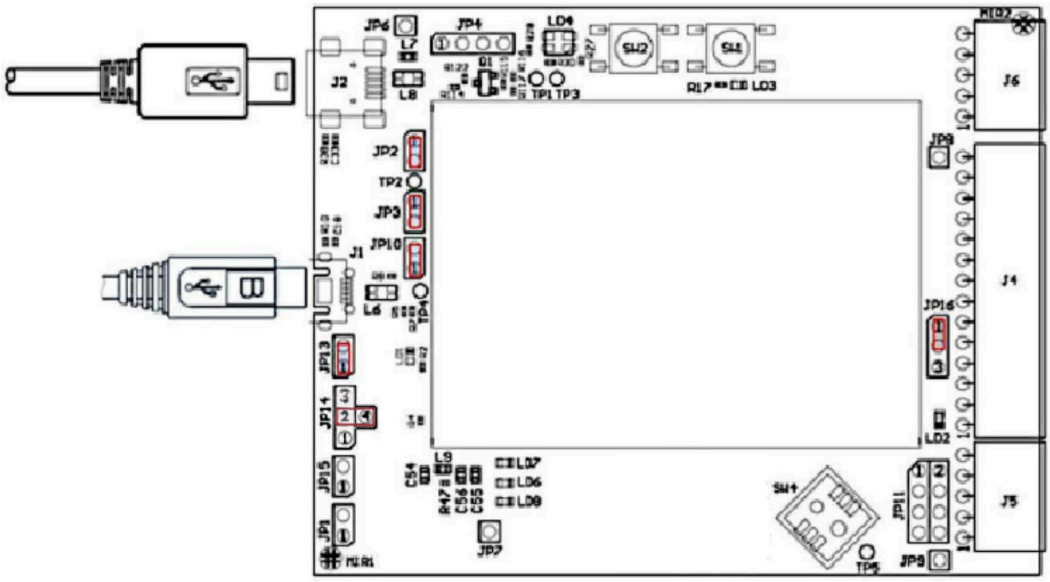
2.1.2 Software development configuration

This section describes the software development configuration for the main board. It also describes the USB connection when using the embedded ST-LINK.

The J2 mini-USB is the main power supply that allows exchanging data between the board and the computer.

The optional J1 USB-C connector is a dedicated USB for developers

Figure 6. **Software development configuration**



2.2 Expansion board hardware

The STEVAL-25R300KA reader expansion board embeds:

- ST25R300
- an antenna, with its own tuning circuit, etched on the PCB
- a switch to select 3.3 V or 5 V RF powering

The ST25R300 is directly connected to the filtered 5 V USB supply.

There are additional supply filtering components close to the NFC/HF reader IC. All the decoupling capacitors have been placed as close as possible to the ST25R300.

Figure 7. **STEVAL-25R300KA expansion board layout (top view)**

1. RF front-end area
2. ST25R300
3. RF powering selection switch (3.3 or 5 V)

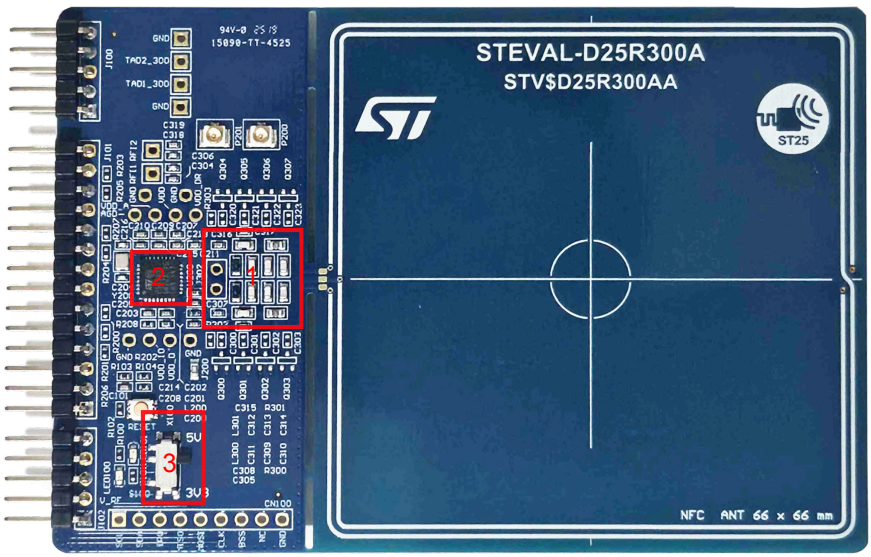


Figure 8. **STEVAL-25R300KA expansion board layout (bottom view)**



2.2.1 Antenna and matching network components

This board contains the matching network and the automatic antenna tuning capacitors.

3 Getting started

3.1 System requirements

- A mini-USB cable to use the embedded ST-LINK and the STM32 ecosystem development
- A safety extra-low voltage (SELV) limited power source to supply the unit through the USB port

3.2 How to use the kit in standalone mode

Step 1. Connect the STEVAL-25R300KA main board to the reader expansion board.

Important: *It must be used on a clean and non-flammable surface.*

Step 2. The kit is delivered with the default jumper configuration. Power it through the mini-USB via a cable connected to the power source.

Step 3. Supply the unit through a safety extra-low voltage (SELV) limited power source via the USB port.

When powered up, the microcontroller starts the firmware, which is already downloaded in the flash memory. This allows demonstrating the ST25R300 features:

- reader and writer
- card emulation
- automatic antenna tuning
- USB mode (refer to the next section for further details)

3.3 How to use the kit in USB mode

Step 1. Connect the STEVAL-25R300KA kit to a PC via a mini-USB cable.

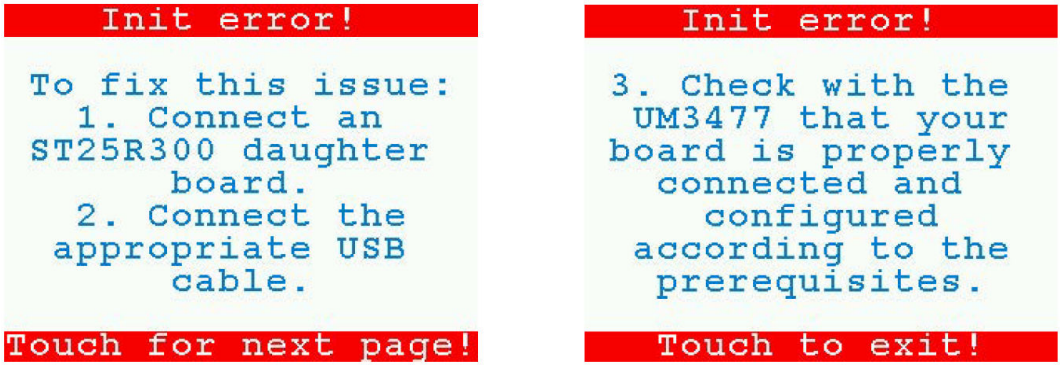
Important: *It must be used on a clean and non-flammable surface.*

The PC USB port must be capable of delivering at least 250 mA at 5 V.

Step 2. To control the board, download the STSW-ST25R022 software and install it.

3.4 Errors

Figure 9. Init error



Step 1. Make sure that STEVAK-D25R300A is pluged.

Step 2. Control the jumper configuration.

Step 3. Check if the kit is powered through the mini-USB cable.

Warning: *If the board is only powered by the optional USB-C connector control the position of JP14 (closed 2-3).*

4 Schematic diagrams

Figure 10. STEVAL-M25B1 main board circuit schematic (1 of 9)

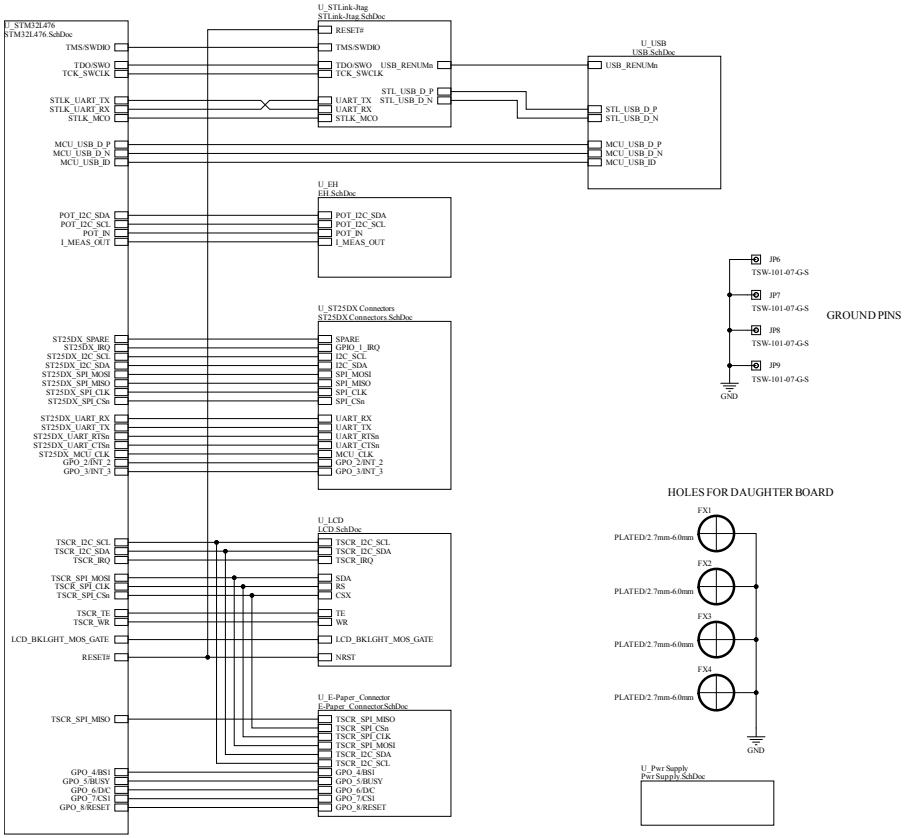


Figure 11. STEVAL-M25B1 main board circuit schematic (2 of 9)

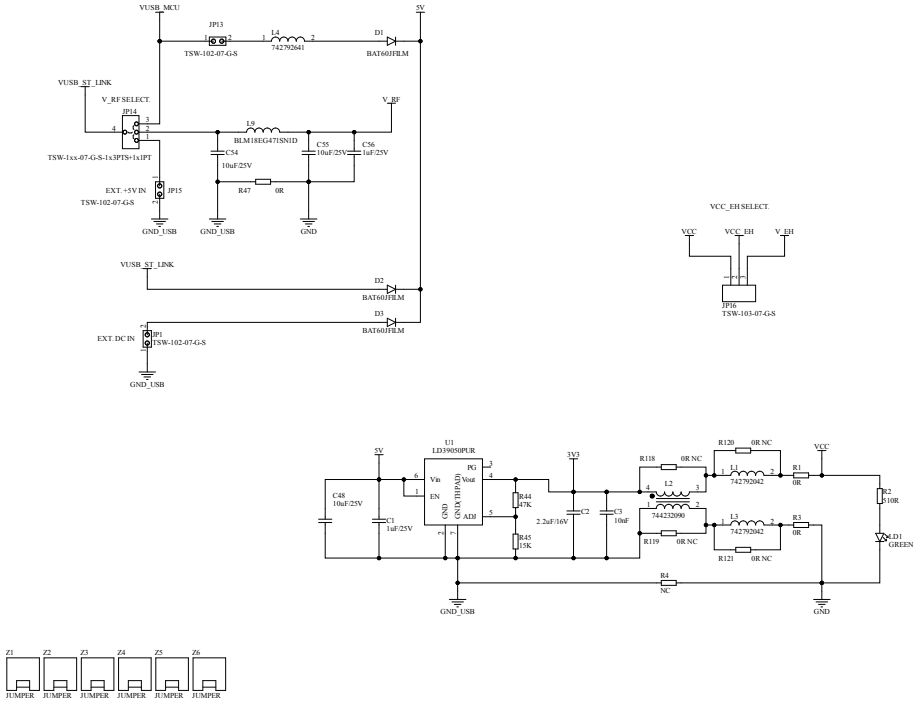


Figure 12. **STEVAL-M25B1 main board circuit schematic (3 of 9)**

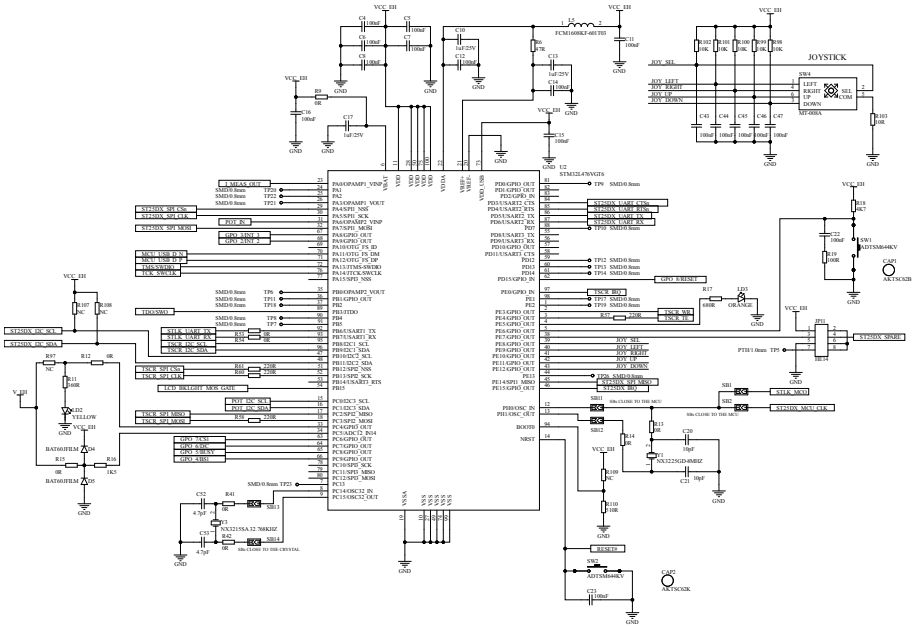


Figure 13. **STEVAL-M25B1 main board circuit schematic (4 of 9)**

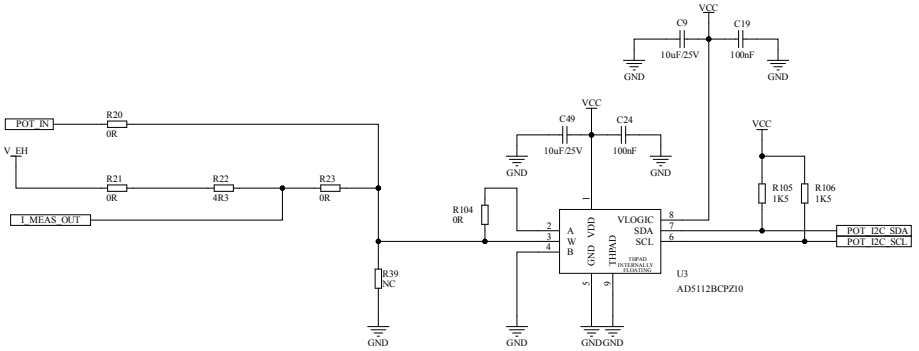


Figure 14. STEVAL-M25B1 main board circuit schematic (5 of 9)

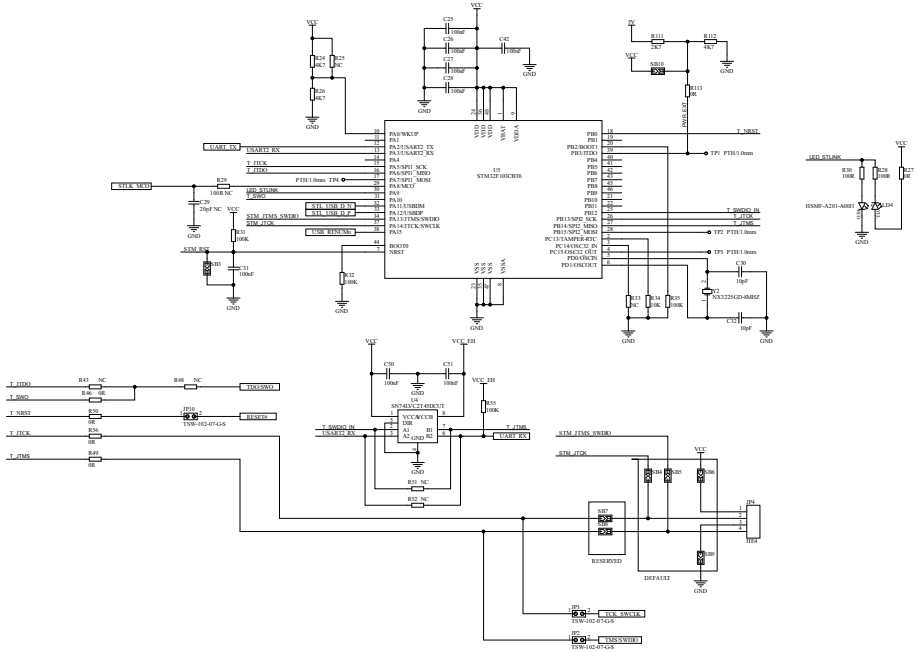


Figure 15. STEVAL-M25B1 main board circuit schematic (6 of 9)

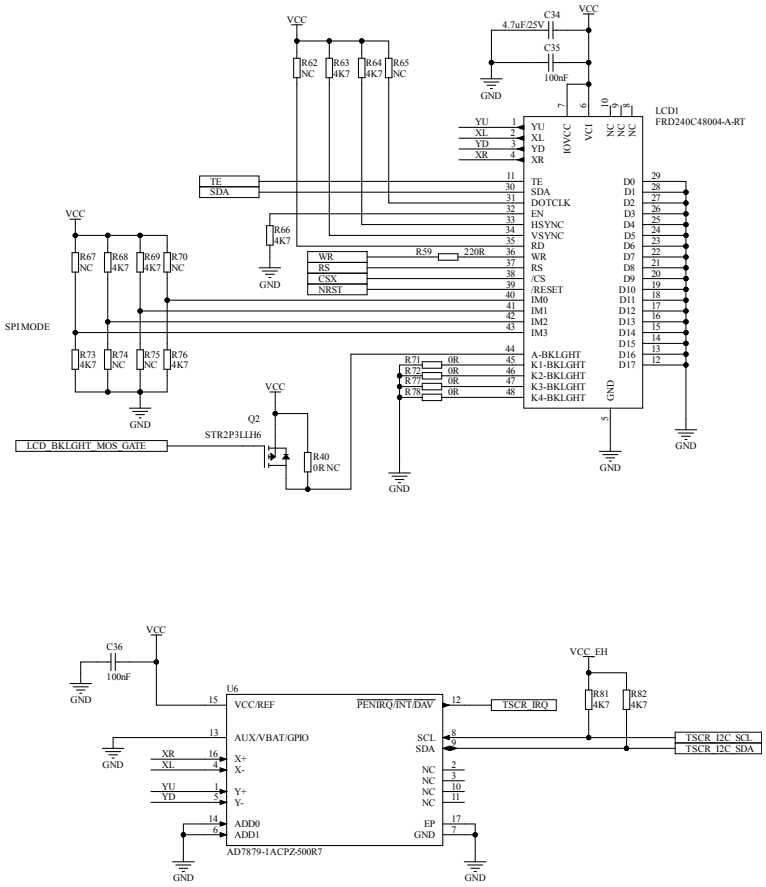


Figure 16. STEVAL-M25B1 main board circuit schematic (7 of 9)

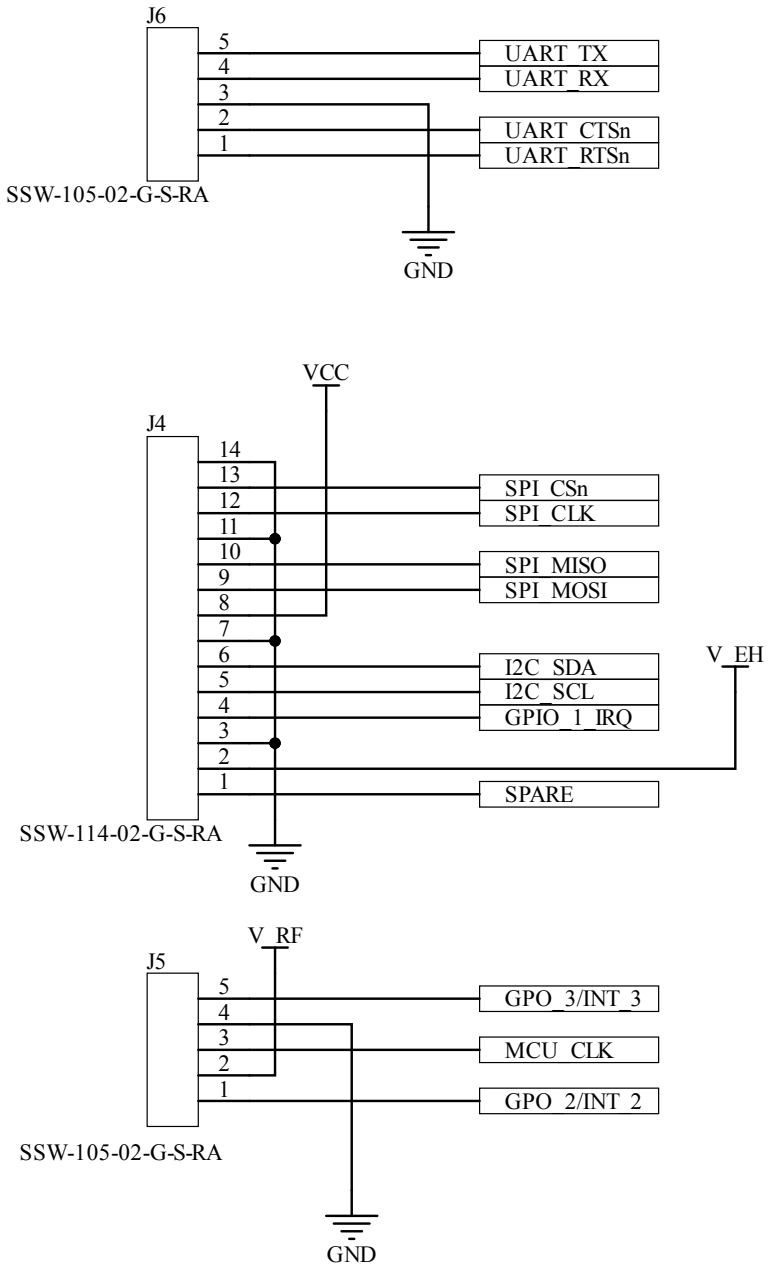


Figure 17. STEVAL-M25B1 main board circuit schematic (8 of 9)

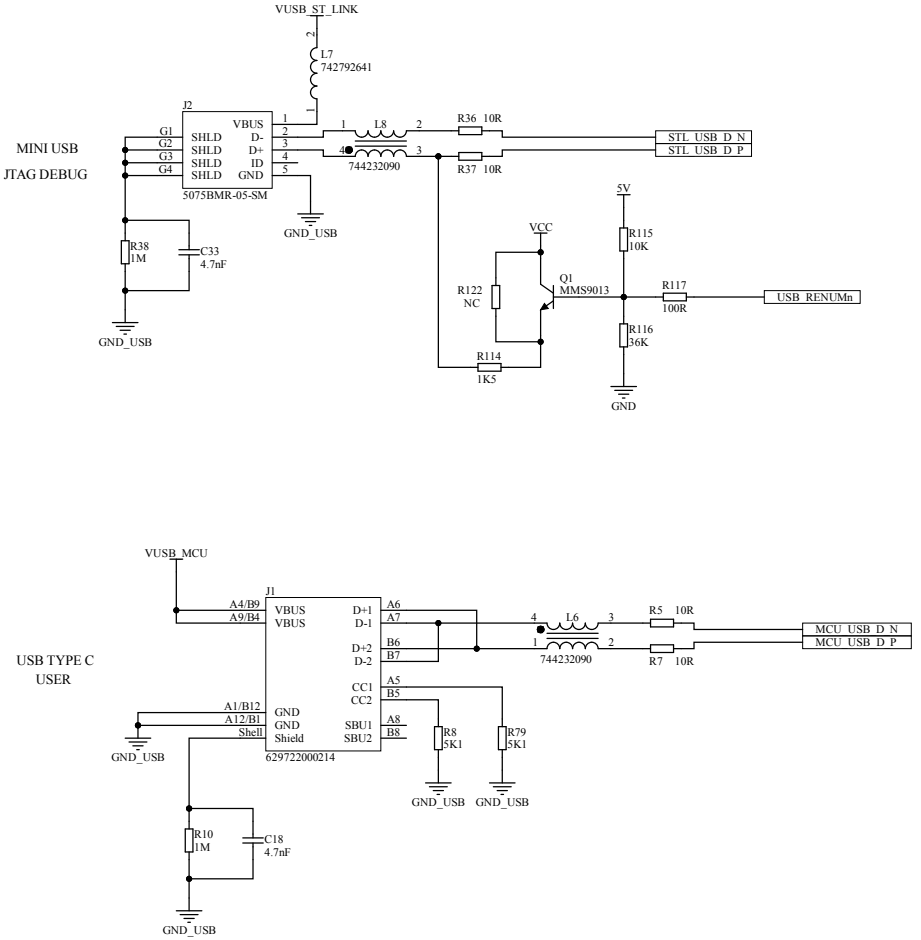


Figure 18. **STEVAL-M25B1 main board circuit schematic (9 of 9)**

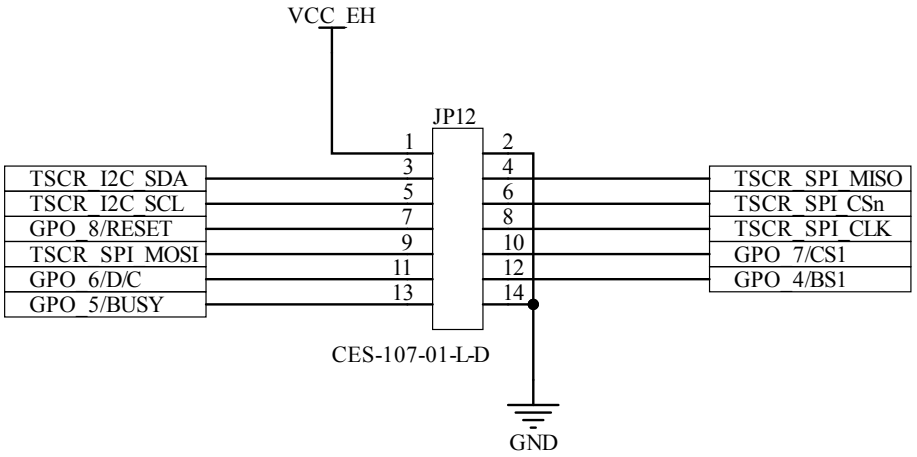


Figure 19. **STEVAL-D25R300A reader expansion board circuit schematic (1 of 3)**

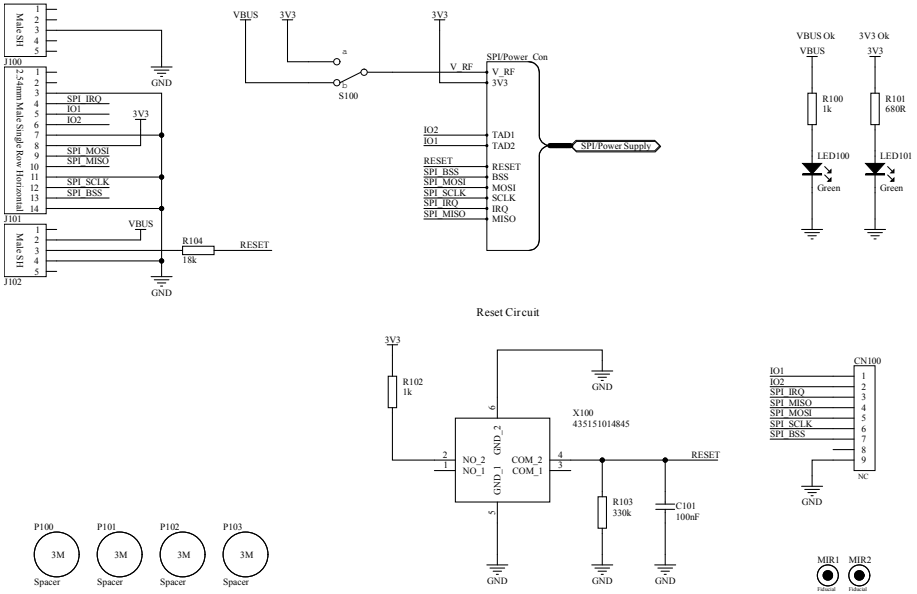


Figure 20. STEVAL-D25R300A reader expansion board circuit schematic (2 of 3)

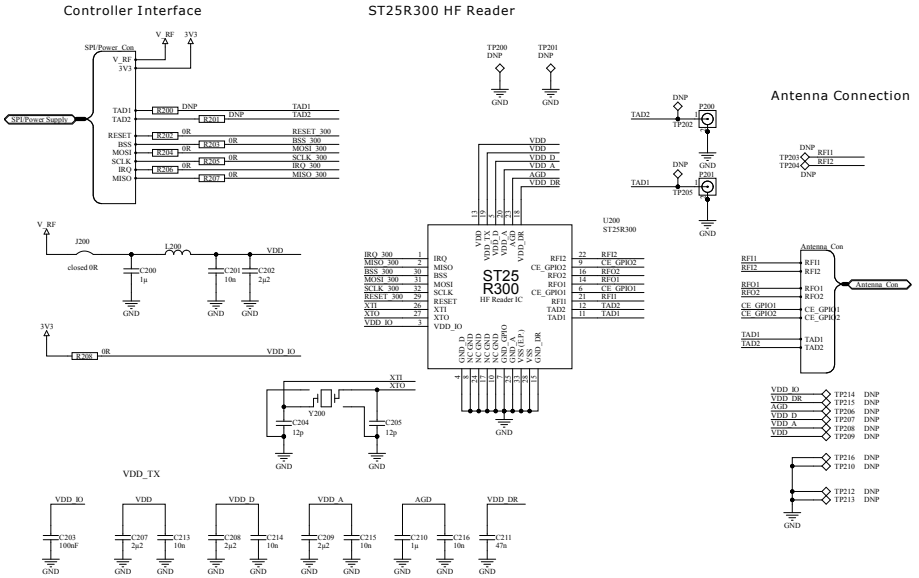
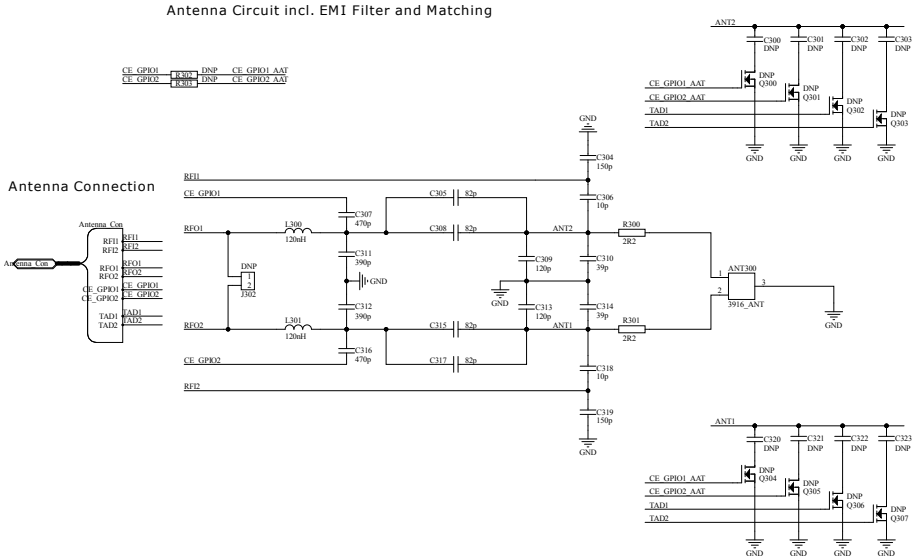


Figure 21. STEVAL-D25R300A reader expansion board circuit schematic (3 of 3)



5 Bill of materials

Table 3. STEVAL-25R300KA bill of materials

Item	Q.ty	Ref.	Part/Value	Description	Manufacturer	Order code
1	1	-	Table 4. STEVAL-M25B1 bill of materials	-	ST	Not available for separate sale
2	1	-	Table 5. STEVAL-D25R300A bill of materials	-	ST	Not available for separate sale

Table 4. STEVAL-M25B1 bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	5	C1, C10, C13, C17, C56	1uF	CAPACITOR 1uF 25V 10% X5R 0603	TDK	C1608X5R1E105K080AC
					Wurth Elektronik(1)	885012206076
2	1	C2	2.2uF	CAPACITOR 2.2uF 16V 10% X7R 1206	KEMET	C1206C225K4RACTM
					Wurth Elektronik(1)	885012208038
3	1	C3	10nF	CAPACITOR 10nF 16V 10% X7R 0402	KEMET	C0402T103K4RALTU
					Wurth Elektronik(1)	885012205031
4	29	C4, C5, C6, C7, C8, C11, C12, C14, C15, C16, C19, C22, C23, C24, C25, C26, C27, C28, C31, C35, C36, C42, C43, C44, C45, C46, C47, C50, C51	100nF	CAPACITOR 100nF 16V 10% X7R 0402	Samsung	CL05B104KO54PNC
					Wurth Elektronik(1)	885012205037
5	5	C9, C48, C49, C54, C55	10uF	CAPACITOR 10uF 25V 10% X5R 0603	Murata	GRM188R61E106KA73J
					Wurth Elektronik(1)	885012106031
6	2	C18, C33	4.7nF	CAPACITOR 4.7nF 50V 10% X7R 0402	Murata	GRM155R71H472KA01D
					Wurth Elektronik(1)	885012205065
7	4	C20, C21, C30, C32	10pF	CAPACITOR 10pF 50V 5% NPO 0402	KEMET	C0402C100J5GALTU
					Wurth Elektronik(1)	885012005055
8	1	C29	20pF	CAPACITOR 20pF 0402 NOT FITTED	N/A	N/A
9	1	C34	4.7uF	CAPACITOR 4.7uF 25V 10% X5R 0603	TDK	C1608X5R1E475K080AC
10	2	C52, C53	4.7pF	CAPACITOR 4.7pF +/-0.25pF 50V NPO 0402	Yageo	CC0402CRNPO9BN4R7
					Wurth Elektronik(1)	885392005012

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
11	1	CAP1		Châssis de commutateur / capuchons de commutateur Tact Switch	APEM	AKTSC62B
12	1	CAP2		Châssis de commutateur / capuchons de commutateur Tact Switch	APEM	AKTSC62K
13	5	D1, D2, D3, D4, D5		DIODE BAT60JFILM	STMicroelectronics	BAT60JFILM
14	1	J1 (optional)		Conenctor USB 2.0 Type C Horizontal SMT	Wurth Electronics	629722000214
15	1	J2		MINI USB B 5075BMR-05-SM	Samtec	MUSB-05-F-B-SM-A
16	1	J4		CONNECTOR SSW-114-02-G-S-RA	Samtec	SSW-114-02-G-S-RA
17	2	J5, J6		CONNECTOR SSW-105-02-G-S-RA	Samtec	SSW-105-02-G-S-RA
18	6	JP1, JP2, JP3, JP10, JP13, JP15		CONNECTOR TSW-102-07-G-S 1x2Pts	Samtec	TSW-102-07-G-S
19	2	JP4, JP14		CONNECTOR TSW-104-07-G-S 1x4Pts	Samtec	TSW-104-07-G-S
20	4	JP6, JP7, JP8, JP9		CONNECTOR TSW-101-07-G-S 1Pt	Samtec	TSW-101-07-G-S
21	1	JP11		CONNECTOR TSW-104-07-G-D 2x4Pts	Samtec	TSW-104-07-G-D
22	1	JP12		CONNECTOR CES-107-01-L-D	Samtec	CES-107-01-L-D
23	1	JP16		CONNECTOR TSW-103-07-G-S 1x3Pts	Samtec	TSW-103-07-G-S
24	2	L1, L3	600 Ohms	EMI FERRITE BEAD 600 Ohms 742792042	Wurth Electronics	742792042
25	3	L2, L6, L8	90 Ohms	COMMON MODE FILTER 744232090	Wurth Electronics	744232090
26	2	L4, L7	300 Ohms	EMI FERRITE BEAD 300 Ohms 742792641	Wurth Electronics	742792641
27	1	L5	600 Ohms	FERRITE CHIP BEAD FCM1608KF-601T03	Tai Tech	FCM1608KF-601T03
28	1	L9	470 Ohms	SELF BLM18EG471SN1D	Murata	BLM18EG471SN1D

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
29	1	LCD1		LCD MODULE FRD240C48004-A-RT	FRIDA	FRD240C48004-A-RT
30	1	LD1		LED GREEN 19-21SYGC/S530-E1/TR8	Dialight	598-8060-107F
					Wurth Elektronik(1)	150060VS75000
31	1	LD2		LED YELLOW TLMY1000-GS08	Vishay Semiconductors	VLMY1300-GS08
32	1	LD3		LED ORANGE 19-217/S2C-AM2N2VY/3T	Vishay Lite-On	LTST-C191KFKT
33	1	LD4		LED BICOLOR HSMF-A201-A00J1	Broadcom Avago	HSMF-A201-A00J1
34	5	PEG1, PEG2, PEG3, PEG4, PEG5		SELF ADHESIVE RUBBER BUMPER SJ5306	3M	SJ-5306CLEAR
35	1	Q1		Bipolar Transistors - BJT NPN 40Vcbo 25Vceo 5Vebo 500mA 300mW	MCC	MMS9013L-TP
36	1	Q2		Transistor STR2P3LLH6, SOT23	ST	STR2P3LLH6
37	26	R1, R3, R9, R12, R13, R14, R15, R20, R21, R23, R27, R41, R42, R46, R47, R49, R50, R53, R54, R56, R71, R72, R77, R78, R104, R113	0R	RESISTOR 0R 0402	Vishay	CRCW04020000Z0ED
					Wurth Elektronik(1)	560112110001
38	2	R2, R110	510R	RESISTOR 510R 1% 0402	Vishay	CRCW0402510RFKED
39	17	R4, R25, R33, R39, R43, R48, R51, R52, R62, R65, R67, R70, R74, R75, R97, R109, R122		RESISTOR 0402 NOT FITTED	N/A	N/A
40	5	R5, R7, R36, R37, R103	10R	RESISTOR 10R 1% 0402	Vishay	CRCW040210R0FKED
					Wurth Elektronik(1)	560112110034
41	1	R6	47R	RESISTOR 47R 1% 0402	Yageo	RC0402FR-0747RL
42	2	R8, R79	5K1	RESISTOR 5K1 1% 0402	Vishay	CRCW04025K10FKTD
43	2	R10, R38	1M	RESISTOR 1M 1% 0402	Vishay	CRCW04021M00FKED
					Wurth Elektronik(1)	560112110033
44	1	R11	360R	RESISTOR 360R 1% 0402	Yageo	RC0402FR-07360RL
45	4	R16, R105, R106, R114	1K5	RESISTOR 1K5 1% 0402	Vishay	CRCW04021K50FKED

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
45	4	R16, R105, R106, R114	1K5	RESISTOR 1K5 1% 0402	Wurth Elektronik(1)	560112110095
46	2	R107, R108	1K5	RESISTOR 1K5 1% 0402	Vishay	CRCW04021K50FKED
					Wurth Elektronik(1)	560112110095
47	1	R17	680R	RESISTOR 680R 1% 0402	Vishay	CRCW0402680RFKED
48	13	R18, R24, R26, R63, R64, R66, R68, R69, R73, R76, R81, R82, R112	4K7	RESISTOR 4K7 1% 0402	Yageo	RC0402FR-134K7L
					Wurth Elektronik(1)	560112110245
49	4	R19, R28, R30, R117	100R	RESISTOR 100R 1% 0402	Vishay Dale	CRCW0402100RFKED
					Wurth Elektronik(1)	560112110022
50	1	R22	4R3	RESISTOR 4.3 Ohms 1% 0402	Vishay Dale	CRCW04024R30FKED
51	1	R29	100R	RESISTOR 100R 0402 NOT FITTED	N/A	N/A
52	4	R31, R32, R35, R55	100K	RESISTOR 100K 1% 0402	Vishay	CRCW0402100KFKED
					Wurth Elektronik(1)	560112110019
53	7	R34, R98, R99, R100, R101, R102, R115	10K	RESISTOR 10K 1% 0402	Vishay Dale	CRCW040210K0FKEDHP
54	5	R40, R118, R119, R120, R121	0R	RESISTOR 0R 0402 NOT FITTED	N/A	N/A
55	1	R44	47K	RESISTOR 47K 1% 0402	Vishay	CRCW040247K0FKED
					Wurth Elektronik(1)	560112110055
56	1	R45	15K	RESISTOR 15K 1% 0402	Vishay Dale	CRCW040215K0FKEDHP
57	5	R57, R58, R59, R60, R61	220R	RESISTOR 220R 1% 0402	Vishay	CRCW0402220RFKED
					Wurth Elektronik(1)	560112110047
58	1	R111	2K7	RESISTOR 2K7 1% 0402	Vishay	CRCW04022K70FKED
					Wurth Elektronik(1)	560112110266
59	1	R116	36K	RESISTOR 36K 1% 0402	Vishay	CRCW040236K0FKED
					Wurth Elektronik(1)	560112110157
60	6	SB1, SB2, SB3, SB7, SB8, SB10		SOLDER BRIDGE OPEN SIZE 0603	N/A	N/A
61	8	SB4, SB5, SB6, SB9, SB11, SB12, SB13, SB14		SOLDER BRIDGE CLOSED SIZE 0603		

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
62	2	SW1, SW2		Interrupteurs de contact SW TACT SPST 0.05A 12VDC 6MM	APEM	ADTSM644KV
63	1	SW4		JOYSTICK MT-008A	SparkFun	COM-10063
64	5	TP1, TP2, TP3, TP4, TP5		PLATED HOLE DIAM. 1.0mm	Keystone Electronics	5001
65	17	TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP26		TESTPOINT COPPER LAND DIAM. 0.8mm	Multicomp	TEST-12
66	1	U1		REGUL LDO LD39050PUR, DFN6 3x3	ST	LD39050PUR
67	1	U2		IC STM32L476VGT6 LQFP100	ST	STM32L476VGT6
68	1	U3		DIGITAL POT AD5112BCPZ10	Analog Devices	AD5112BCPZ10-500R7
69	1	U4		LEVEL SHIFTER SN74LVC2T45DCUT VSSOP8	Texas Instruments	SN74LVC2T45DCUT
70	1	U5		IC STM32F103CBT6, LQFP48	ST	STM32F103CBT6
71	1	U6		IC SCREEN CNTRL 12BIT 16LFCSP	Analog Devices	AD7879-1ACPZ-500R7
72	2	Y1, Y2		SMD CRYSTAL NX3225GD-8MHZ-EXS00A-CG04874	NDK	NX3225GD-8MHZ-STD-CRA-3
73	1	Y3		SMD CRYSTAL NX3215SA 32.768KHZ	NDK	NX3215SA-32.768K-STD-MUA-8
					Wurth Elektronik(1)	830009678
74	6	Z1, Z2, Z3, Z4, Z5, Z6		Carte de CI WR-PHD 2.54mm Jumper with Test Point	Wurth Elektronik	60900213421

1. *Alternative manufacturer.*

Table 5. STEVAL-D25R300A bill of materials

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
1	1	U200	ST25R300-AQET, UFQFPN 32		ST	ST25R300-AQET
2	1	X100			Wurth Elektronik	435151014845

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
3	1	S100			C & K COMPONENTS	PCM12SMTR
4	1	Y200			NDK	CS01188-27.12M
5	2	C303, C323	68pF	68pF ±1% 50V C0G, NP0 0402	Murata	GRT1555C1H680FA02J
6	2	LED100, LED101			Lite-On	LTST-C190KGKT
					Wurth Elektronik(1)	150060VS75000
7	4	R200, R201, R302, R303		210 ohm, 50 V, 0402, >100 mW, ± 1%	MULTICOMP	MC00625W040210R
8	7	R202, R203, R204, R205, R206, R207, R208	210 Ohm	210 ohm, 50 V, 0402, >100 mW, ± 1%	MULTICOMP	MC00625W040210R
9	1	R100, R102	1 kohm	1 kohm, 50 V, 0402, >100 mW, ± 5%	Panasonic	ERJ2GEJ102X
					Wurth Elektronik(1)	560112110012
10	2	R300, R301	2.2 Ohm	2.2 Ohm ±1% 0.1W, 1/10W Chip Resistor 0603	Vishay Dale	CRCW06032R20FKEA
					Wurth Elektronik(1)	560112116088
11	2	C310, C314	39pF	39pF ±1% 50V C0G, NP0 0603	KEMET	C0603C390F5GACTU
12	2	C305, C317	82pF	82pF ±1% 50V C0G, NP0 0402	YAGEO	CC0402FRNPO9BN820
13	2	C308, C315	82pF	82pF ±1% 50V C0G, NP0 0603	KEMET	C0603C820F5GACTU
14	2	C309, C313	120pF	120pF ±1% 50V C0G, NP0 0603	KEMET	C0603C121F5GACAUTO
16	1	R103	330 kohm	330 kohm, 50 V, 0402, >62.5 mW, ± 1%	VISHAY	CRCW0402330KFKED
					Wurth Elektronik(1)	560112110088
17	1	R104	18 kohm	18 kohm, 50V, 0402, >62.5 mW, ± 1%	MULTICOMP	MCWR04X1802FTL
18	2	C311, C312	390pF	390pF ±1% 50V C0G, NP0 0603	KEMET	C0603C391F5GACTU
19	5	C201, C213, C214, C215, C216	0.01 µF	0402, 0.01 µF, 25 V, ± 10%, X7R	AVX	04023C103KAT2A
					Wurth Elektronik(1)	885012205050
20	2	C200, C210	1 µF	0402, 1 µF, 16 V, ± 10%, X5R,	MURATA	GRM155R61C105KA12D
21	4	C202, C207, C208, C209	2.2 µF	0402, 2.2 µF, 6.3 V, ± 20%, X5R	MURATA	GRM155R60J225ME01D
					Wurth Elektronik(1)	885012105013
22	2	C307, C316	470pF	470pF ±1% 50V C0G 0402	Murata	GRT1555C1H471FA02D
23	1	R101	680 Ohm	680 Ohm ±5% 0.063W, 1/16W Chip Resistor 0402	Yageo	RC0402JR-07680RL

Item	Q.ty	Ref.	Part / Value	Description	Manufacturer	Order code
23	1	R101	680 Ohm	680 Ohm ±5% 0.063W, 1/16W Chip Resistor 0402	Wurth Elektronik(1)	560112110024
24	2	C300, C320	6.8pF	AEC-Q200 6.8pF ±0.1pF 50V C0G 0402	MURATA	GCM1555C1H6R8BA16D
					Wurth Elektronik(1)	885392005074
25	2	C306, C318	10pF	AEC-Q200 10pF ±1% 50V C0G 0402	MURATA	GCM1555C1H100FA16D
26	2	C204, C205	12pF	AEC-Q200 12pF ±1% 50V C0G 0402	MURATA	GCM1555C1H120FA16D
27	2	C301, C321	12pF	AEC-Q200 12pF ±1% 50V C0G 0402	MURATA	GCM1555C1H120FA16D
28	2	C302, C322	27pF	AEC-Q200 27pF ±1% 50V C0G 0402	MURATA	GCM1555C1H270FA16D
29	1	C211	47nF	AEC-Q200 47nF ±10% 10V 0402	MURATA	GCM155R71E473KA55D
					Wurth Elektronik(1)	885012205054
30	2	C101, C203	100nF	AEC-Q200 100nF ±10% 50V 0402	MURATA	GCM155R71H104KE02J
					Wurth Elektronik(1)	885012205086
31	2	C304, C319	150pF	AEC-Q200 150pF ±1% 50V C0G 0402	MURATA	GCM1555C1H151FA16D
32	1	J101			Samtec	TSW-114-08-G-S-NA
33	2	J100, J102			Samtec	TSW-105-08-G-S-NA
34	4	P100, P101, P102, P103			3M	SJ-5306 CLEAR
35	2	L300, L301	120nH		Murata	LQW18CNR12J0ZD
36	8	Q300, Q301, Q302, Q303, Q304, Q305, Q306, Q307			Diodes Incorporated	BSS123WQ-7-F
37	1	L200	120 Ohm		muRata	BLM15EG121SH1D
38	2	P200, P201			HIROSE(HRS)	U.FL-R-SMT-1(10)
					Wurth Elektronik(1)	636101111001

1. *Alternative manufacturer.*

6 Kit versions

Table 6. **STEVAL-25R300KA versions**

PCB version	Schematic diagrams	Bill of materials
STV$25R300KAA (1)	STV$25R300KAA schematic diagrams	STV$25R300KAA bill of materials

1. *This code identifies the STEVAL-25R300KA evaluation kit first version. The kit consists of a main board STEVAL-M25MB1 whose version is identified by the code STV$M25MB1A and a reader expansion board STEVAL-D25R300 whose version is identified by the code STEVAL$D25R300A.*

7 Regulatory compliance information

Notice for US Federal Communication Commission (FCC)

Part 15.19

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Part 15.21

Any changes or modifications to this equipment not expressly approved by STMicroelectronics may cause harmful interference and void the user's authority to operate this equipment.

Part 15.105

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: YCPR300AD1

Notice for Innovation, Science and Economic Development Canada (ISED)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

[only if EMC testing performed on the radio board as well:]

This class B device complies with Canadian Interference-Causing Equipment Standard ICES-003: CAN ICES-003(B) / NMB-003(B)

Conformité à Innovation, Sciences et Développement Économique Canada (ISDE)

L'emetteur/recepteur exempt de licence contenu dans le present appareil est conforme aux CNR d'Innovation, Sciences et Developpement economique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes: (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement. Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à faire fonctionner l'équipement.

[only if EMC testing performed on the radio board as well:]

Cet appareil numerique de classe B est conforme à la Norme sur le Matériel Brouilleur NMB-003 du Canada: CAN ICES-003(B) / NMB-003(B)

IC: 8976A-R300AD1; PMN: STEVAL-25R300KA ; HVIN: STEVAL-25R300KA

Notice for the European Union

The kit STEVAL-25R300KA is in conformity with the essential requirements of the Directive 2014/53/EU (RED)and of the Directive 2011/65/EU (RoHS II), including subsequent revisions and additions, as well as amended by the Delegated Directive 2015/863/EU (RoHS III). Applied harmonized standards are listed in the EU Declaration of Conformity.

Notice for the United Kingdom

The kit STEVAL-25R300KA is in conformity with the essential requirements of the Directive 2014/53/EU (RED) and of the Directive 2011/65/EU (RoHS II), including subsequent revisions and additions, as well as amended by the Delegated Directive 2015/863/EU (RoHS III). Applied harmonized standards are listed in the UK Declaration of Conformity.

Revision history

Table 7. **Document revision history**

Date	Revision	Changes
01-Jul-2025	1	Initial release.
12-Feb-2026	2	Updated Section Introduction, Section 2: Hardware overview, Section 2: Hardware overview and Section 5: Bill of materials. Added Section 3.4: Errors.

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