

A premium development tool for sensor hub applications

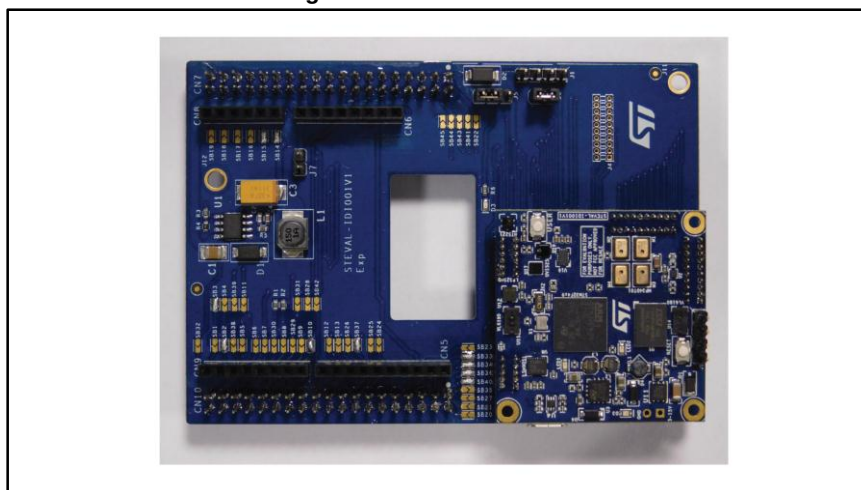
Introduction

The STEVAL-IDI001V1 is a premium development tool for “sensor hub like” applications. It has a small form factor (4x4cm) and is based on the STM32F439 microcontroller (Cortex-M4) and a wide range of STMicroelectronics sensors. It is particularly designed around:

- Environmental sensors:
 - humidity and temperature sensor (HTS221)
 - absolute pressure sensor (LPS25HB)
 - UV index sensor (UVIS25)
- iNEMO® inertial measurement unit:
 - 3D accelerometer + 3D gyroscope + 3D magnetometer (LSM9DS1)
- Proximity, ambient light sensors and VCSEL light source:
 - Three-in-one smart optical module (2x VL6180X)
- Acoustic sensors:
 - Digital MEMS microphone array (4x MP34DT01)

The STEVAL-IDI001V1 is also equipped with 8 MB external RAM for complex processing algorithms, a microSD card expansion for data storage and a Micro-USB connector to communicate with an external device and for power supply.

Figure 1: STEVAL-IDI001V1



The STEVAL-IDI001V1 offers a set of GPIO expansions that can be used to interface with external hardware. For instance, the STEVAL-IDI001V1-Exp, shown in [Figure 2: "STEVAL-IDI001V1 connected to the STEVAL-IDI001V1-Exp"](#) and provided with the STEVAL-IDI001V1 kit, allows the interoperability between STEVAL-IDI001V1, STM32-Nucleo and X-NUCLEO Expansions. Expansion boards can be connected either via Arduino or Morpho connectors. This document provides detailed hardware requirements and board descriptions.

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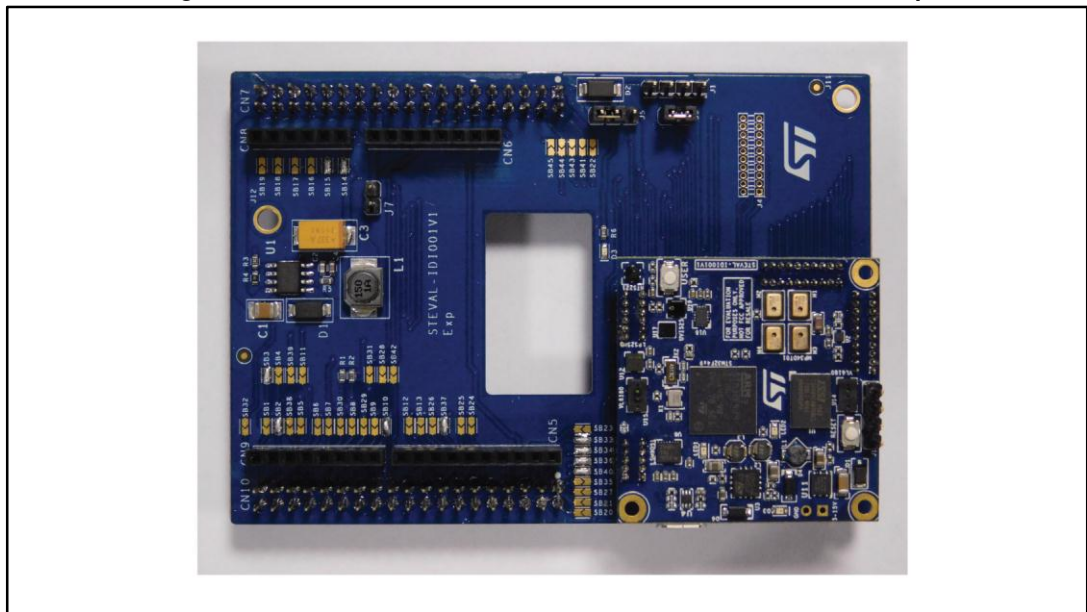
1 Getting started

This section describes the hardware requirements for the STEVAL-IDI001V1 evaluation board.

1.1 Hardware requirements

The STEVAL-IDI001V1 can be used as a standalone module or connected to the STEVAL-IDI001V1-Exp. To function correctly, the STEVAL-IDI001V1 board must be connected to the STEVAL-IDI001V1-Exp board as shown in the figure below. With this configuration, the developer can take advantage of the X-NUCLEO expansion boards, connecting them either via Arduino or Morpho connectors. The STEVAL-IDI001V1 expansion also allows interfacing the demo board with an STM32Nucleo, using the STEVAL-IDI001V1 as a sensor hub.

Figure 2: STEVAL-IDI001V1 connected to the STEVAL-IDI001V1-Exp



The STEVAL-IDI001V1 must be connected to the mainboard with care, ensuring that all the pins match those on the opposite connector. As the board has male/female pass through connectors, you must handle it carefully to avoid damage or bending the pins. Components mounted on the STEVAL-IDI001V1 are ESD sensitive, so you must implement the necessary precautionary measures when handling the board.

2 System requirements

Using the STEVAL-IDI001V1 board requires the following software and hardware:

- a Windows PC (XP, Vista, 7, 8) to install the software package
- a USB type A to Micro USB cable to connect the STEVAL-IDI001V1 to the PC for power supply and communication
- STM32 Composite driver (VCP+Audio) contained in the Driver folder of the package
- Audio recording software to record and save the audio stream. Any free or commercial audio recording software like Audacity (<http://audacity.sourceforge.net/>) can be used
- ST-Link V2 or STM32-Nucleo board, with SWD cable adapter and ST-Link Utility for firmware download (<http://www.st.com/web/en/catalog/tools/PF258168>)

A utility running on the user PC will complete the demo. The PC must have the following characteristics:

- At least 128 MB of RAM
- 50 MB of hard disk space available

The STEVAL-IDI001V1 firmware and related documentation is available on www.st.com.

3 Hardware description STEVAL-IDI001V1

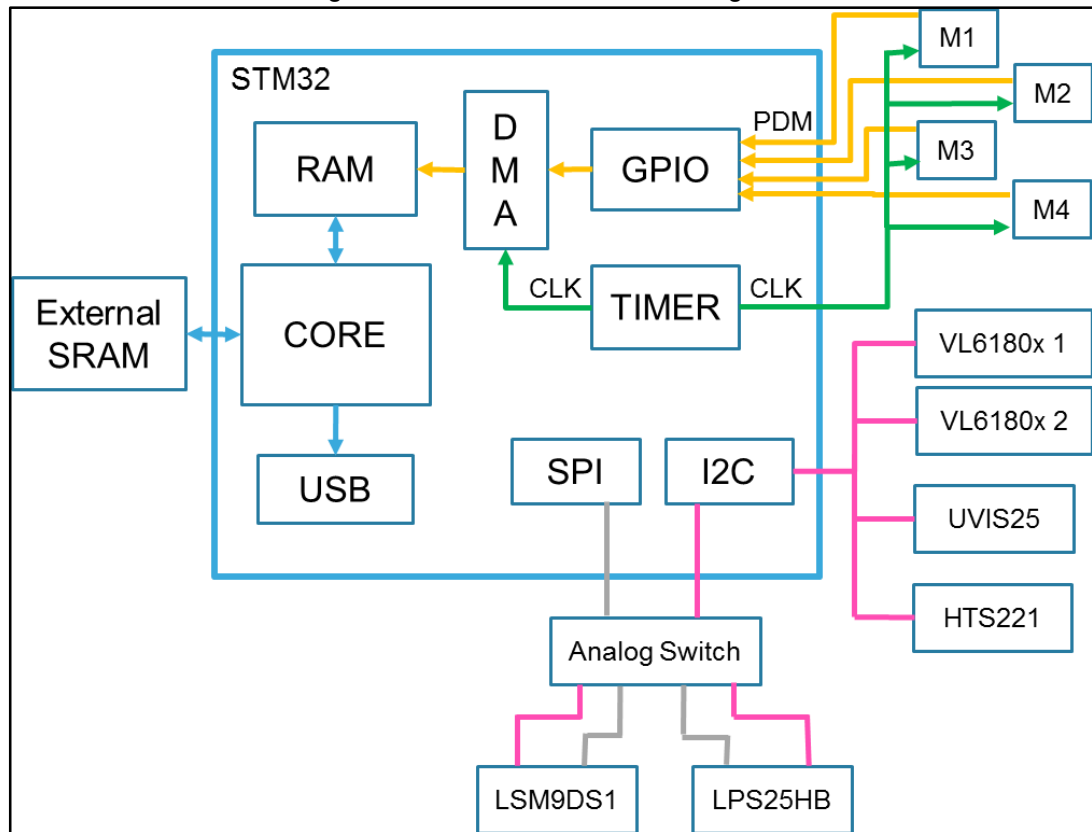
This board offers to the user an evaluation kit for STMicroelectronics motion MEMS (accelerometer, gyroscope, magnetometer), environmental sensors (humidity, temperature, pressure and UV index), optical module (proximity and ambient light) and digital microphone array. The high processing power of the STM32F439 allows the user to implement embedded sensor fusion algorithms. The obtained data can be stored in a microSD card through the adapter mounted on the board via USB, or a different interface if the proper expansion board is plugged on the STEVAL-IDI001V1-Exp. The main components mounted on board are::

- LSM9DS1: MEMS 3D accelerometer ($\pm 2/\pm 4/\pm 8g$) + 3D gyroscope ($\pm 245/\pm 500/\pm 2000dps$) + 3D magnetometer ($\pm 4/\pm 8/\pm 12/\pm 16$ gauss)
- LPS25HB: MEMS pressure sensor, 260-1260 hPa absolute digital output barometer
- HTS221: Capacitive digital relative humidity and temperature sensor
- UVIS25: Ultraviolet radiation index sensors
- 2x VL6180X: range and ambient light sensor, IR emitter
- 4x MP34DT01: ultra-compact, low-power, omnidirectional, digital MEMS microphone
- STM32F439IIH6: high performances MCU ARM®Cortex™-M4F @ 180MHz with 256KB of embedded SRAM
- External SRAM: 8MB of external SRAM

All the sensors, excluding the microphones, are connected to a single I²C bus. The LSM9DS1 and the LPS25HB can also be connected via SPI, thanks to a hardware switch which is programmable through the microcontroller. The four microphones are instead connected to four different GPIOs.

3.1 Board block diagram

Figure 3: STEVAL-IDI001V1 block diagram



3.2 Sensor I²C address selection

Most of the sensors allow selection of the LSB of the I²C address by pulling the SA0 pin low or high.

Table 1: SA0 level control

Sensor	MCU pin	Default
LSM9DS1 (U8)	PI9	Low
LPS25HB (U12)	PI10	Low
UVIS25 (U19)	PI8	Low

The proximity and ambient light sensors (VL6180x) have a default I²C address, but can be modified via I²C in order to manage more than one sensor on the same bus.

3.3 Sensors interface switch

The 9 axes IMU (LSM9DS1) and the pressure sensor (LPS25HB), can be acquired through the SPI or I²C interfaces. To make these alternatives available, an analog switch (U17) can be configured by firmware. By manipulating the proper selection pin, the developer can interact with those sensors via SPI or via I²C.

3.4 Audio acquisition

A digital MEMS microphone can be acquired using different peripherals, such as SPI, I²S or GPIO. It requires an input clock and it outputs a PDM stream at the same frequency. This PDM stream is further filtered and decimated in order to be converted in PCM format, the main standard for audio transmission. In the STEVAL-IDI001V1 board, four microphones are connected to four different GPIOs. A precise clock signal is generated by a timer and provided to the microphones; the DMA operates at the same frequency. By configuring an analog switch (U18) via firmware, you can acquire four external microphones instead of the four on-board ones on the same GPIOs. You can also acquire up to eight additional external microphones through the J9 connector.

3.5 Connectors

The next table shows the pin assignment for connectors J2, J3, J8 and J9.

Table 2: STEVAL-IDI001V1 connector table

Connector	Pin	GPIO	Specific function
J2	1	PA0	
	2		2V8
	3	PA1	
	4		5V
	5	PA2	
	6	PB12 / PF6	SAI1_SD_B
	7	PA3	
	8	PB13 / PF7	SAI1_MCLK_B
	9	PA5	
	10	PB0 / PF8	SAI1_SCK_B
	11	PA7	
	12	PB7 / PF9	SAI1_FS_B
	13	PA15	
	14	PC10	
	15	PB10	
	16	PC11	
	17	PB11	
	18	PD2	
	19	PC6	12288MHz Crystal
	20		GND
J3	1		2V8
	2	PH9	ITU_D0
	3	PH14	ITU_D4
	4	PH11	ITU_D2

Connector	Pin	GPIO	Specific function
	5	PI5	VSYNCR
	6	PH10	ITU_D1
	7	PI7	ITU_D7
	8	PH12	ITU_D3
	9	PI6	ITU_D6
	10	PA6	VCLK
	11	PI4	ITU_D5
	12	PA4	HSYNCR
	13	PF10	CAM_PDN
	14	PB6	I2C1_SCL
	15		1V8
	16	PB8	CAM_CLK
	17		GND
	18		GND
	19		3V3
	20	PB9	I2C1_SDA
J8	1	PH7	I2C3_SCL
	2	PH2	SPI_BUS_CS_1
	3	PH8	I2C3_SDA
	4	PH3	SPI_BUS_CS_2
	5	PB3	SPI1_SCK
	6	PH4	SPI_BUS_CS_3
	7	PB4	SPI1_MISO
	8		3V3
	9	PB5	SPI1_MOSI
	10		GND
J9	1	PG8	PDM_M1
	2	PG9	PDM_M2
	3	PG10	PDM_M3
	4	PG11	PDM_M4
	5	PG12	PDM_M5
	6	PG13	PDM_M6
	7	PG14	PDM_M7
	8	PG15	PDM_M8
	9	PA9	MIC_CLK
	10		3V3

Connector	Pin	GPIO	Specific function
	11	PI2	EXP_L/R
	12		GND

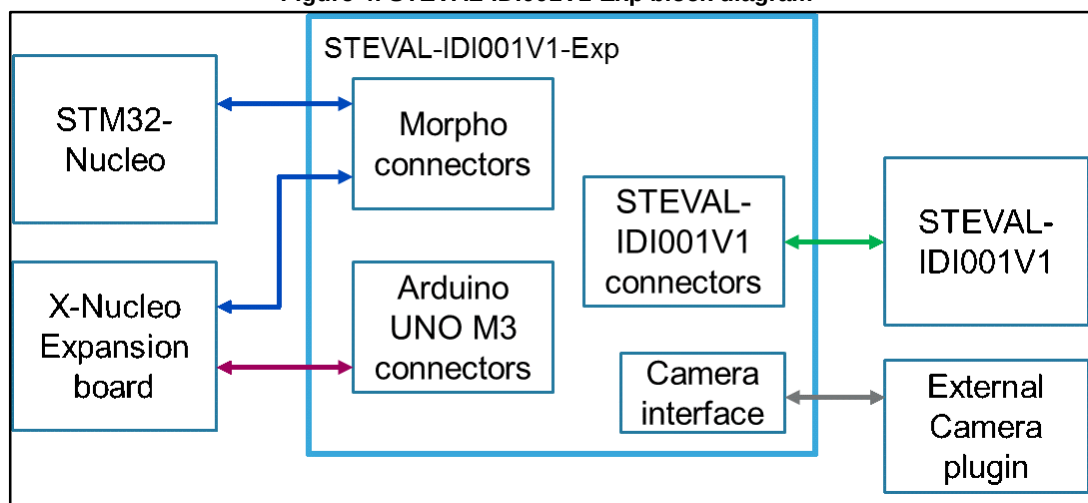
4 Hardware description - STEVAL-IDI001V1-Exp

STEVAL-IDI001V1-Exp is an expansion board that allows the interoperability between STEVAL-IDI001V1, STM32-Nucleo and X-NUCLEO expansions. Expansion boards can be connected either via Arduino or Morpho connectors. The hardware is compatible with STM32-Nucleo and it is possible to use the STEVAL-IDI001V1 as a sensor-Hub by connecting an STM32-Nucleo to the STEVAL-IDI001V1-Exp. The STEVAL-IDI001V1-Exp is equipped with Morpho connectors (upward and downward) and Arduino UNO R3 connectors (upward) to accommodate multiple boards. It is also equipped with STEVAL-IDI001V1 connectors. Three different power supply options are available: STM32-Nucleo (if plugged), STEVAL-IDI001V1 USB or an external 5 V power supply.

4.1 Board block diagram

Below is a block diagram of the STEVAL-IDI001V1-Exp board and the possible connections.

Figure 4: STEVAL-IDI001V1-Exp block diagram



4.2 Connectors

The following table shows the connections between the STEVAL-IDI001V1 connector pins and corresponding Morpho and Arduino connector pins.

Table 3: STEVAL-IDI001V1 - Exp connector table

STEVAL-IDI001V1-Exp connector	Arduino / Morpho connector	STEVAL-IDI001V1 Signal	X-Nucleo Signal	Solder jumper
J2-1	CN8-1 / CN7-28	PA0	PA0	SB14
J2-2		2V8		
J2-3	CN8-2 / CN7-30	PA1	PA1	SB15
J2-4		5V		
J2-5	CN8-3 / CN7-32	PA2	PA4	SB16
J2-6	CN5-3 / CN10-17	PB12 / PF6	PB6	SB13
	CN10-26		PB15	SB29
J2-7	CN8-4 / CN7-34	PA3	PB0	SB17
J2-8	CN10-4	PB13 / PF7	PC6	SB21

STEVAL-IDI001V1-Exp connector	Arduino / Morpho connector	STEVAL-IDI001V1 Signal	X-Nucleo Signal	Solder jumper
J2-9	CN8-5 / CN7-36	PA5	PC1	SB18
J2-10	CN10-30	PB0 / PF8	PB13	SB30
	CN9-7 / CN10-25		PB10	SB9
J2-11	CN8-6 / CN7-38	PA7	PC0	SB19
J2-12	CN9-6 / CN10-27	PB7 / PF9	PB4	SB8
	CN10-16		PB12	SB26
J2-13	CN9-8 / CN10-23	PA15	PA8	SB10
J2-14	CN9-1 / CN10-37	PC10	PA3	SB1
	CN9-2 / CN10-35		PA2	SB2
	CN9-3 / CN10-33		PA10	SB38
J2-15	CN9-4 / CN10-31	PB10	PB3	SB6
J2-16	CN9-1 / CN10-35	PC11	PA3	SB3
	CN9-2 / CN10-37		PA2	SB4
	CN5-1 / CN10-21		PA9	SB39
J2-17	CN9-3 / CN10-33	PB11	PA10	SB5
J2-18	CN5-1 / CN10-19	PD2	PA9	SB11
J2-19	CN5-2 / CN10-19	PC6	PC7	SB12
J2-20		GND		
J4-1 / J3-2		2V8		
J4-2 / J3-1		PH9		
J4-3 / J3-4		PH14		
J4-4 / J3-3		PH11		
J4-5 / J3-6		PI5		
J4-6 / J3-5		PH10		
J4-7 / J3-8		PI7		
J4-8 / J3-7		PH12		
J4-9 / J3-10		PI6		
J4-10 / J3-9		PA6		
J4-11 / J3-12		PI4		
J4-12 / J3-11		PA4		
J4-13 / J3-14		PF10		
J4-14 / J3-13		PB6		
J4-15 / J3-16		1V8		
J4-16 / J3-15		PB8		
J4-17 / J3-18		GND		

STEVAL-IDI001V1-Exp connector	Arduino / Morpho connector	STEVAL-IDI001V1 Signal	X-Nucleo Signal	Solder jumper
J4-18 / J3-17		GND		
J4-19 / J3-20		3V3		
J4-20 / J3-19		PB9		
J8-1	CN5-10 / CN10-3	PH7	PB8	SB33
J8-2	CN10-10	PH2	NC	SB23
J8-3	CN5-9 / CN10-5	PH8	PB9	SB34
J8-4	CN10-12	PH3	PA12	SB24
J8-5	CN9-4 / CN10-31	PB3	PB3	SB40
	CN5-6 / CN10-11		PA5	SB35
J8-6	CN10-14	PH4	PA11	SB25
J8-7	CN5-5 / CN10-13	PB4	PA6	SB36
J8-8		3V3		
J8-9	CN5-4 / CN10-15	PB5	PA7	SB37
J8-10		GND		
J9-1	CN10-2	PG8	PC8	SB20
J9-2	CN10-1	PG9	PC9	SB27
J9-3	CN7-1	PG10	PC10	SB22
J9-4	CN7-2	PG11	PC11	SB41
J9-5	CN10-28	PG12	PB14	SB28
J9-6	CN10-28	PG13	PB14	SB41
J9-7	CN7-3	PG14	PC12	SB43
J9-8	CN7-3	PG15	Reset	SB44
	CN7-14	PG15	Reset	SB45
J9-9	CN10-34	PA9	PC4	SB31
	CN9-5 / CN10-29		PB5	SB7
J9-10		3V3		
J9-11	CN10-36	PI2	NC	SB32
J9-12		GND		

The following table gives the power supply connections.

Table 4: Power supply connections

Connector - Pin	Signal
CN6-2 (Arduino)	3V3
CN6-4 (Arduino)	3V3
CN6-5 (Arduino)	5V

Connector - Pin	Signal
CN6-6 (Arduino)	GND
CN6-7 (Arduino)	GND
CN6-8 (Arduino)	VIN
CN5-7 (Arduino)	3V3
CN5-8 (Arduino)	GND
CN7-12 (Morpho)	3V3
CN7-16 (Morpho)	3V3
CN7-18 (Morpho)	5V
CN7-20 (Morpho)	GND
CN7-22 (Morpho)	GND
CN7-24 (Morpho)	VIN
CN10-7 (Morpho)	3V3
CN10-9 (Morpho)	GND
J9-10 (STEVAL-IDI001V1)	3V3
J9-12 (STEVAL-IDI001V1)	GND
J2-2 (STEVAL-IDI001V1)	2V8
J2-4 (STEVAL-IDI001V1)	5V
J2-20 (STEVAL-IDI001V1)	GND
J8-8 (STEVAL-IDI001V1)	3V3
J8-10 (STEVAL-IDI001V1)	GND
J3-2 (STEVAL-IDI001V1)	2V8
J3-16 (STEVAL-IDI001V1)	1V8
J3-17 (STEVAL-IDI001V1)	GND
J3-18 (STEVAL-IDI001V1)	GND
J3-20 (STEVAL-IDI001V1)	3V3
J1-1 (STEVAL-IDI001V1-Exp)	5V
J1-2 (STEVAL-IDI001V1-Exp)	3V3
J1-3 (STEVAL-IDI001V1-Exp)	2V8
J1-4 (STEVAL-IDI001V1-Exp)	GND

4.3 Jumper and solder bridge configuration

4.3.1 Jumper

The following table shows the possible jumper configurations for the STEVAL-IDI001V1-Exp.

Table 5: STEVAL-IDI001V1-Exp jumper configuration

Jumper ID	Configuration	Function
J5	Off	If STM32-Nucleo is plugged.
	On 2-3	If STM32-Nucleo isn't plugged and the STEVAL-IDI001V1 USB is used as power supply.
	On 1-2	If STM32-Nucleo isn't plugged and VIN is used as power supply.
J6	On	STEVAL-IDI001V1 is used as a Host.
	Off	STEVAL-IDI001V1 is used as an expansion board.
J7	On	5V and VIN connected
	Off	5V and VIN not connected

4.3.2 Solder bridge

The following table shows the solder bridges that need to be closed in order to use the BlueNRG (X-NUCLEO-IDB04A1) and MEMS (X-NUCLEO-IKS01A1) expansions boards.

Table 6: STEVAL-IDI001V1-Exp solder bridge configuration

Solder Jumper ID	Configuration	Function
SB2 and SB3	Closed	STEVAL-IDI001V1 is the Host
SB10	Closed	STEVAL-IDI001V1 signal: PA15
SB14	Closed	STEVAL-IDI001V1 signal: PA0
SB15	Closed	STEVAL-IDI001V1 signal: PA1
SB33	Closed	STEVAL-IDI001V1 signal: I2C3-SCL
SB34	Closed	STEVAL-IDI001V1 signal: I2C3-SDA
SB36	Closed	STEVAL-IDI001V1 signal: SPI1-MISO
SB37	Closed	STEVAL-IDI001V1 signal: SPI1-MOSI
SB40	Closed	STEVAL-IDI001V1 signal: SPI1-SCK

5 Board schematic and bill of material – STEVAL-IDI001V1

This section gives the STEVAL-IDI001V1-related bill of materials, schematic and layout.

5.1 Bill of material

Table 7: STEVAL-IDI001V1 bill of materials

Qty	Reference	Part / Value	Type / Tech info.	Package	Additional notes
1	CN1	Not mount			
3	C1,C2,C68	22 μ F	Ceramic XR5	0805	Manufacturer: Kemet or equivalent
2	C11,C81	10 pF	Ceramic C0G	0402	
2	C13,C15	4.7 pF	Ceramic C0G	0402	
31	C17,C24,C26,C27,C28,C33,C34,C35,C37,C38,C41,C42,C43,C45,C47,C49,C54,C55,C56,C57,C59,C60,C61,C63,C64,C76,C77,C79,C82,C83,C84	100 nF	Ceramic X7R	0402	
3	C21,C46,C48	2.2 μ F	Ceramic XR5	0402	
2	C22,C29	1 μ F	Ceramic XR5	0402	
3	C30,C31,C52	10 nF	Ceramic X7R	0402	
1	C32	4.7 μ F 10%	Ceramic XR5	0603	
5	C36,C66,C67,C78,C80	4.7 μ F 20%	Ceramic XR5	0402	
1	C39	15pF	Ceramic C0G	0805	
1	C40	10 μ F	Ceramic XR5	0805	
1	C58	10 μ F	Tantal	2012-12	Check polarity
1	C69	10 μ F	Ceramic XR5	1206	
1	C70	10 μ F	Ceramic XR5	0603	
1	D1	SMM4F18A	Transil	DO-222AA	ST-Supply
1	LED1	LED_R		0603	ROHM or equivalent
2	LED2,D3	LED_G		0603	ROHM or equivalent
2	D4,D6	STPS140Z	Power Schottky rectifier	SOD123	ST-Supply
1	J1	PCB Header 4 pin	PCB Header p2,54		

Qty	Reference	Part / Value	Type / Tech info.	Package	Additional notes
2	J2,J3	GPIO Expansion	PCB Header 1,27x2,54		Manufacturer: Harwin. Mount on Bottom
3	J4,J5,J14	Not mount			
1	J8	SPI + I2C Bus Expansion	PCB Header 1,27x2,54		Manufacturer: Harwin. Mount on Bottom
1	J9	Mic connector	PCB Header 1,27x2,54		Manufacturer: Harwin. Mount on Bottom
1	L1	3.6 μ H		3x3mm	Manufacturer: Panasonic
2	L2,L3	3.3 μ H / 870 mA		2.8x2.6mm	Manufacturer: TDK
4	M1,M2,M3,M4	MP34DT01	MEMS audio sensor	3x4mm	ST-Supply. Do NOT wash the PCB after assembly
12	R1,R4,R8,R13,R16,R21,R26,R33,R36,R37,R58,R68	10 K		0402	
6	R3,R12,R14,R31,R32,R65	Not mount		0402	
6	R5,R6,R28,R29,R41,R64	0R		0402	
1	R10	47 K 1%		0402	
1	R11	15 K 1%		0402	
3	R19,R20,R54	470 R		0402	
7	R22,R23,R24,R25,R27,R66,R67	4K7		0402	
1	R30	51 K 1%		0402	
1	R38	270 K 1%		0402	
1	R39	41 K 1%		0402	
1	R40	33 K 1%		0402	
1	R48	12 K 1%		0402	
1	R49	30 K 1%		0402	
1	SW1	Reset			Manufacturer: E-SWITCH
1	SW2	SYS_MODE			Manufacturer: E-SWITCH
1	U1	IS66WVE4M 16BLL	SRAM	VFPGA48	Manufacturer: ISSI

Qty	Reference	Part / Value	Type / Tech info.	Package	Additional notes
1	U2	LDK120xx	200mA very low noise LDO	DFN6	ST-Supply
1	U3	ST2S08B	Dual power switching regulator	QFN12L	ST-Supply
1	U4	USBLC6-2P6	Very low capacitance ESD protection	SOT666	ST-Supply
1	U6	USB-MICRO			Manufacturer: HIROSE
1	U7	STM32F439IH6	STM32F4 Microcontroller	uFBGA176	ST-Supply
1	U8	LSM9DS1	9 DoF IMU	LGA-24 (4x4x1.0 mm)	ST-Supply
1	U11	ST1S03PU	Power switching regulator	DFN6	ST-Supply
1	U12	LPS25H	Pressure Sensor	(2.5 x 2.5 x 1.0 mm)	ST-Supply
1	U13	HTS221	Humidity, Temperature	HLGA-6L(2 x 2 x 0.9 mm)	ST-Supply
2	U14,U15	VL6180	Proximity, ALS Sensor	12-pin optical QFN	ST-Supply
1	U16	Micro-SD	Micro-SD		Manufacturer: HIROSE
1	U17	STG3820BJR	Quad DPDT analog switch	Flip Chip 30	ST-Supply
1	U18	STG3693	Quad DPDT analog switch	QFN16L	ST-Supply
1	U19	UVIS25	UV Sensor	(2.5 x 2.5 x 1.0 mm)	ST-Supply
1	X1	16MHz		2.5x2 mm	Manufacturer: Epson Toyocom. Check orientation
1	X2	32.768 KHz		3.2x1.5 mm	Manufacturer: Epson
1	X3	Not mount		2.5x3.2mm	Manufacturer: EPSON TOYOCOM

5.2 Schematic diagrams

Figure 5: STEVAL-IDI001V1 board schematic part 1

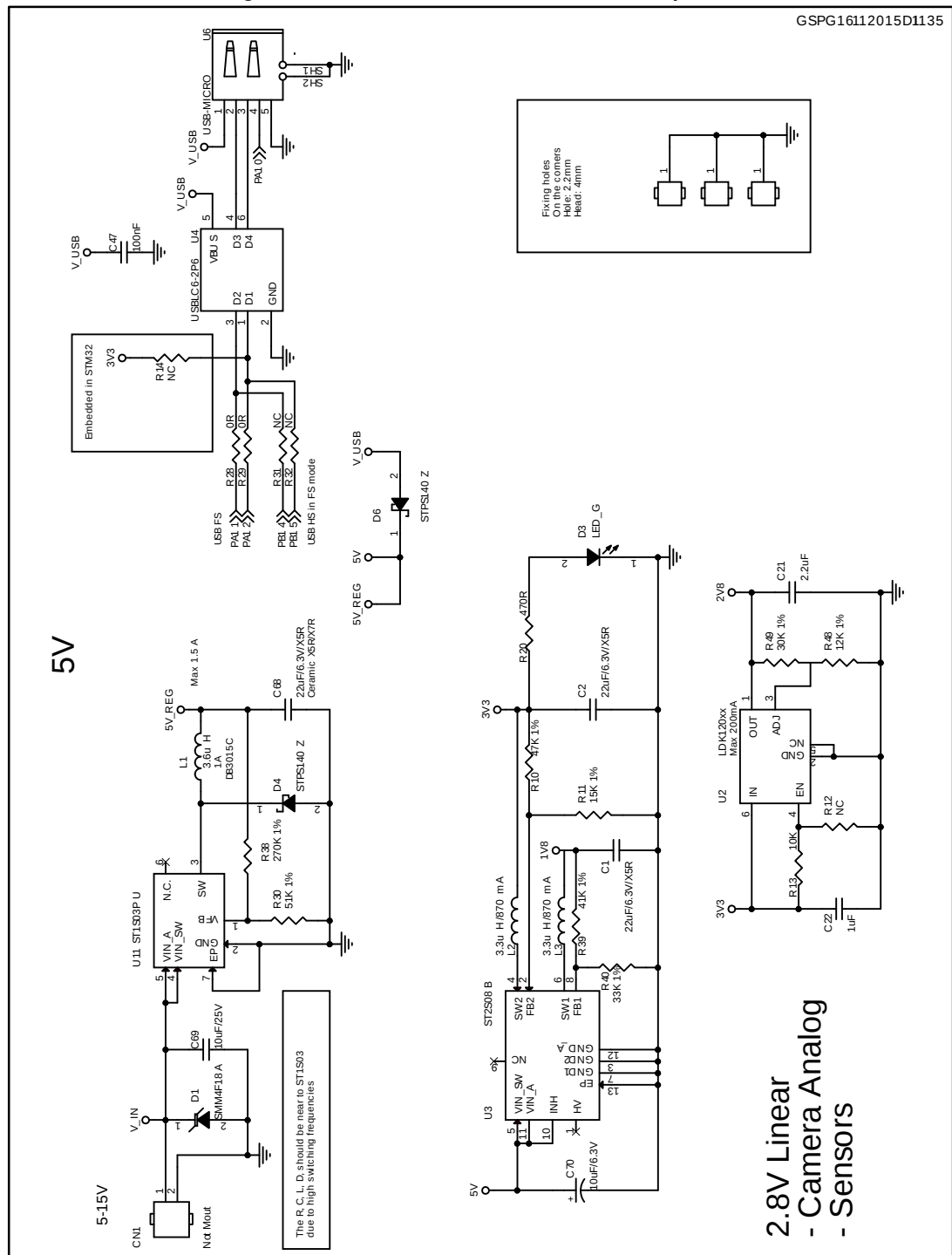
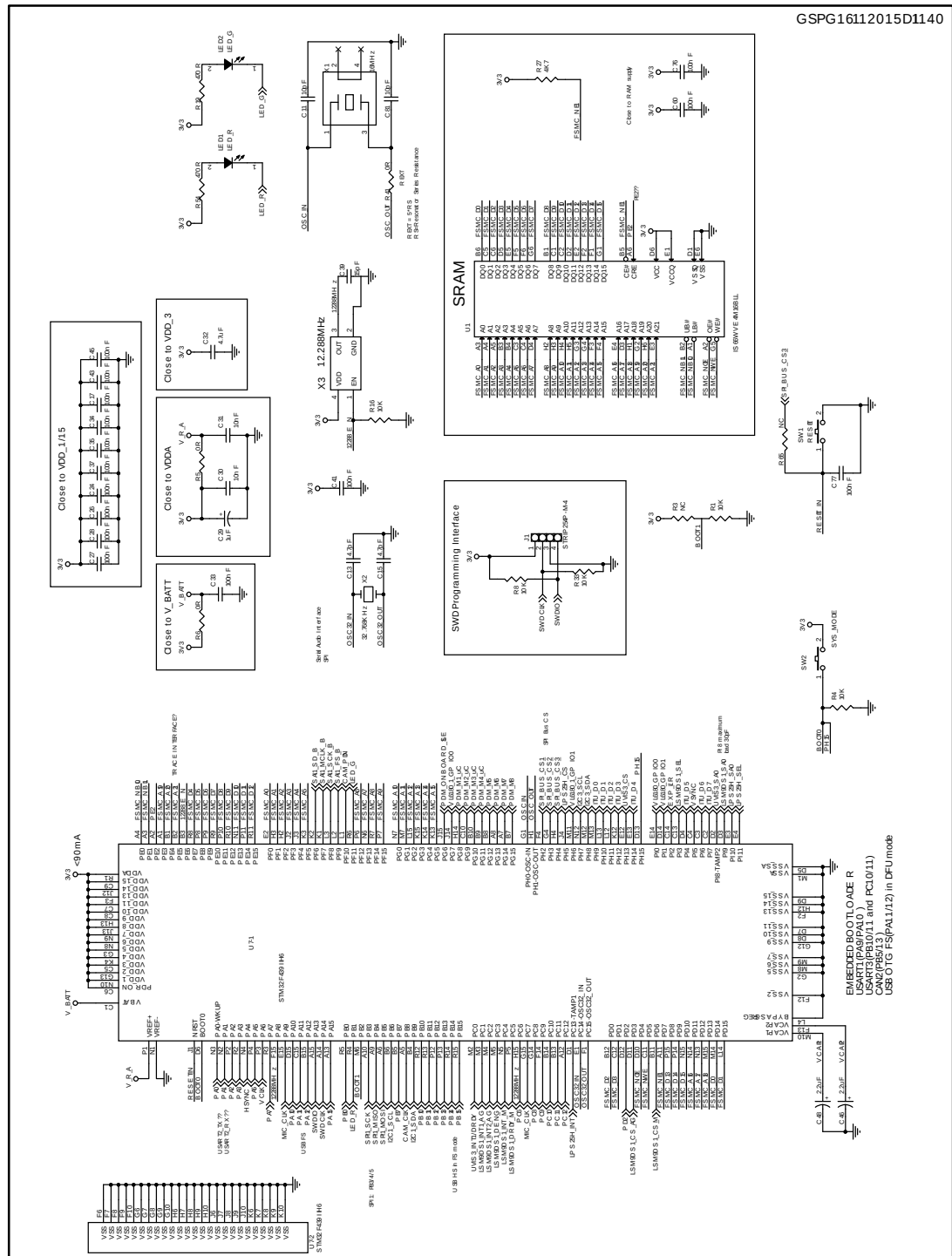


Figure 6: STEVAL-IDI001V1 board schematic part 2



GSPG16112015D1145

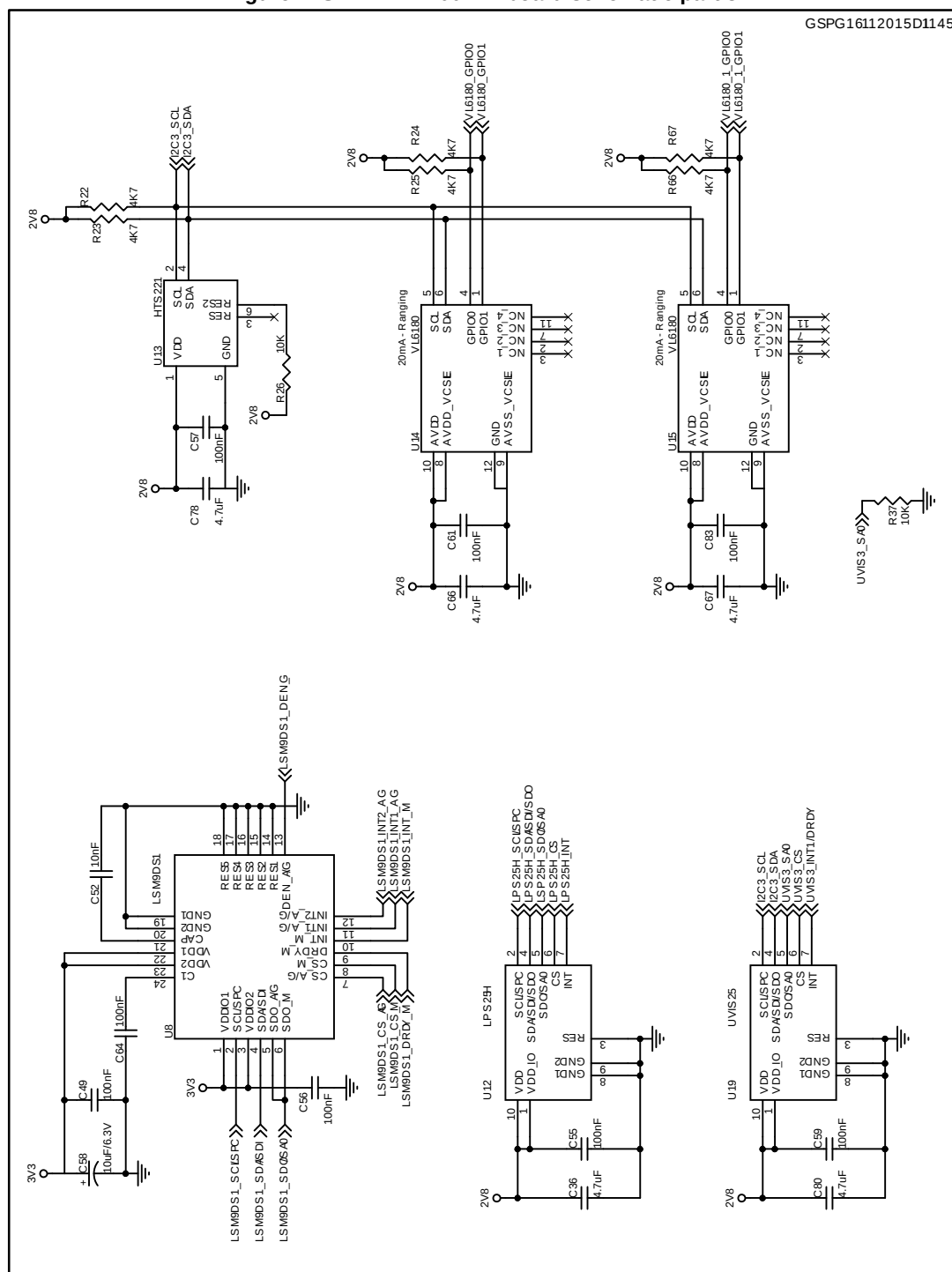


Figure 8: STEVAL-IDI001V1 board schematic part 4

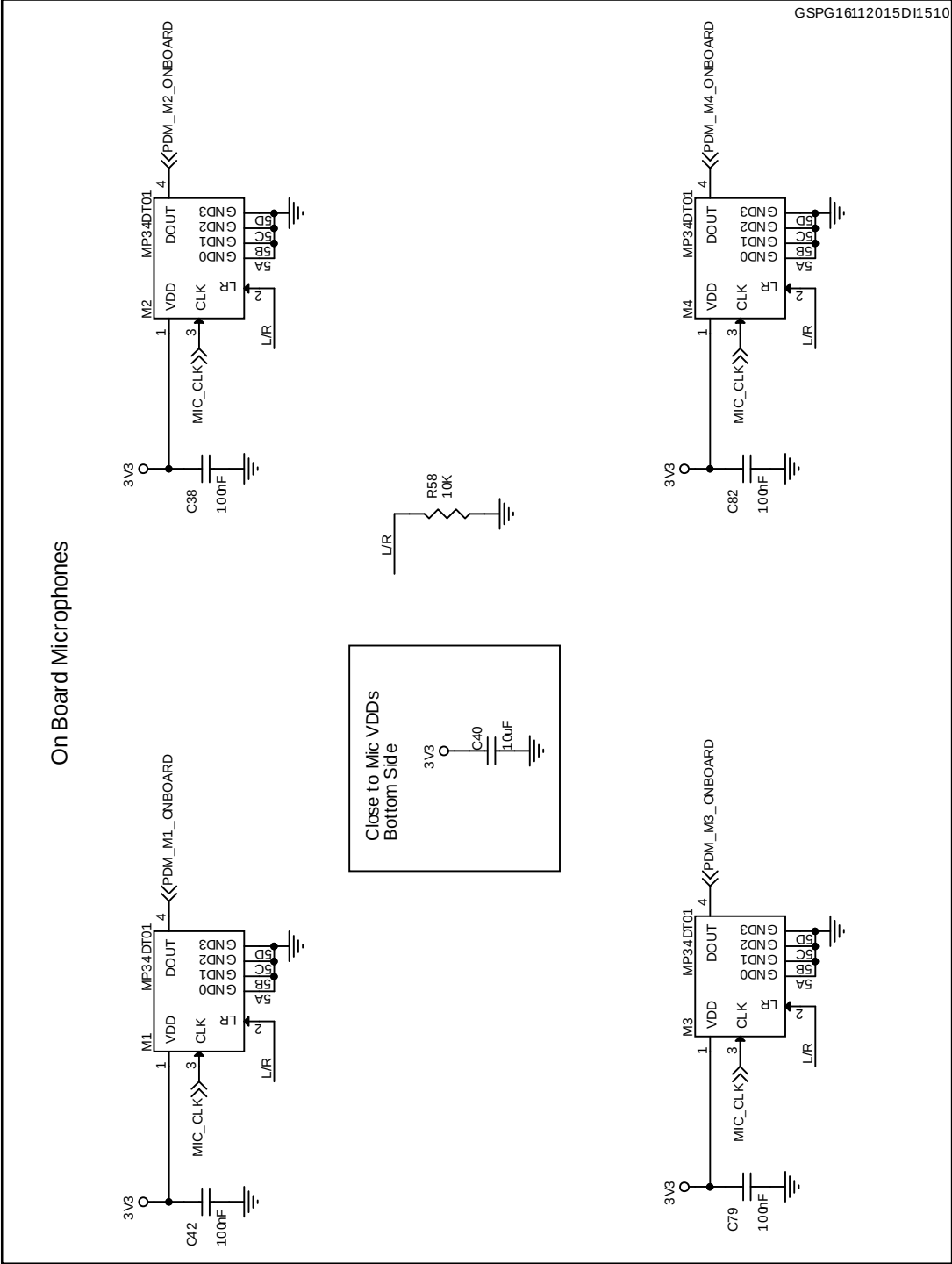


Figure 9: STEVAL-IDI001V1 board schematic part 5

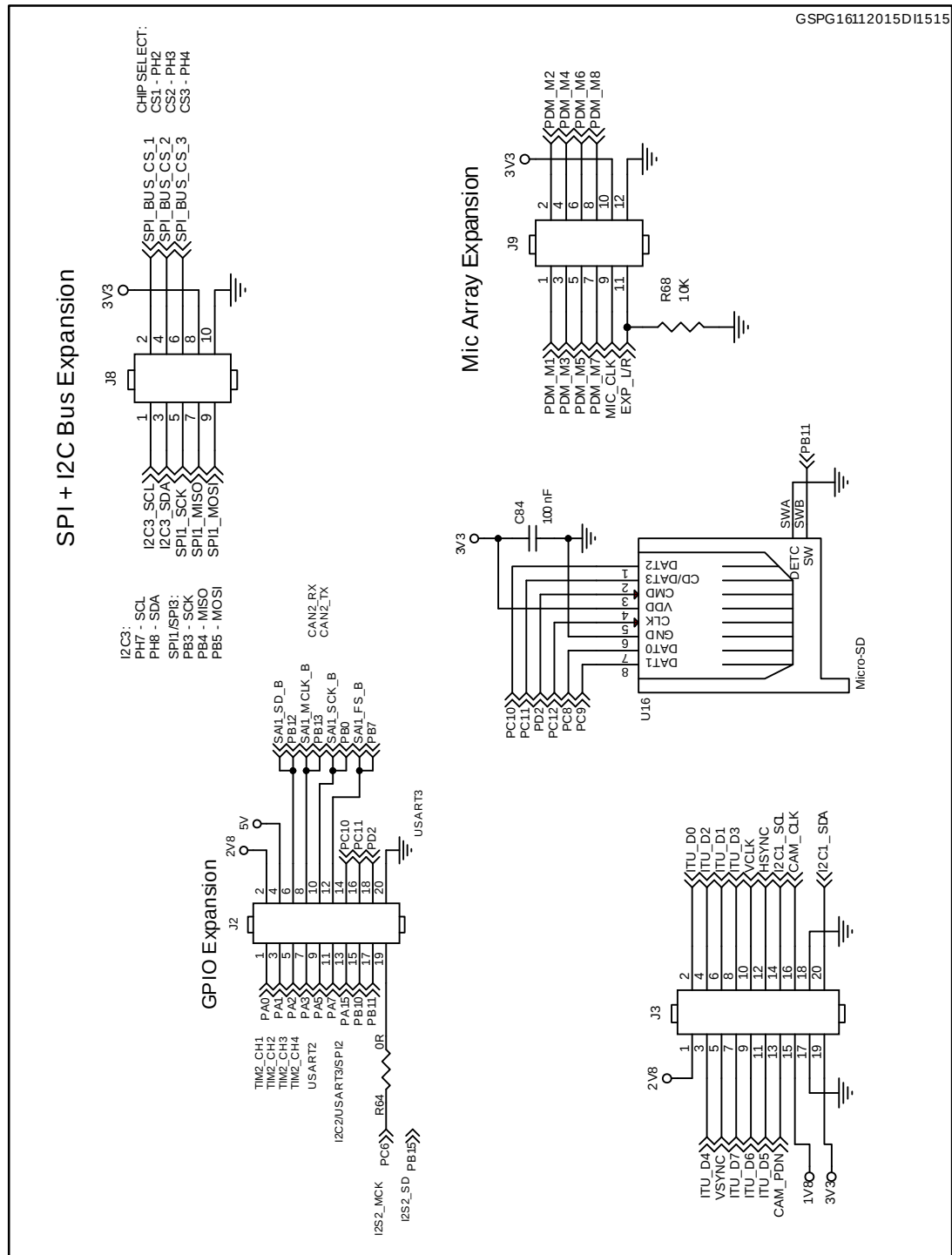
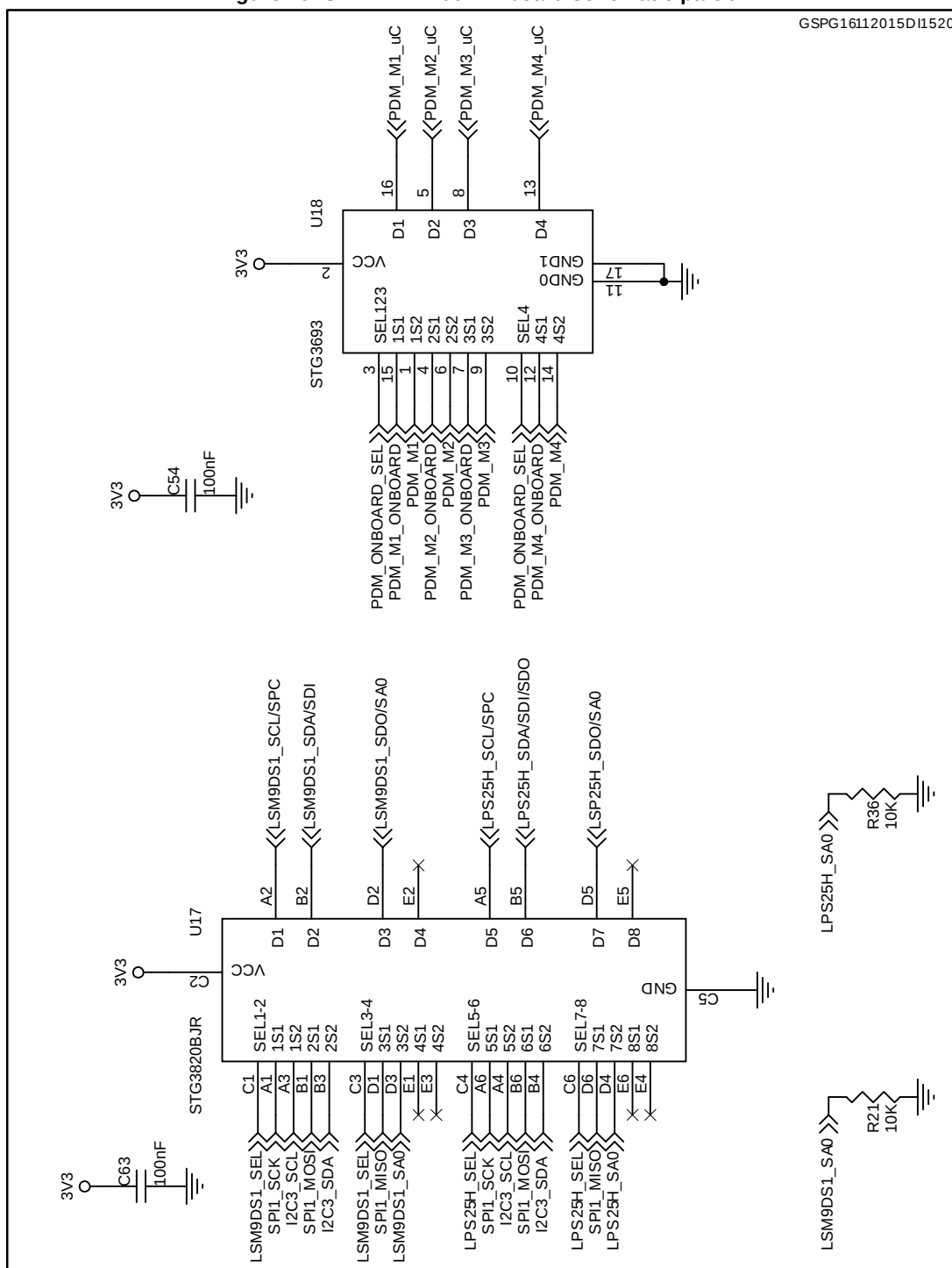


Figure 10: STEVAL-IDI001V1 board schematic part 6



5.3 Layout diagram (top/bottom)

Figure 11: STEVAL-IDI001V1 top side layout

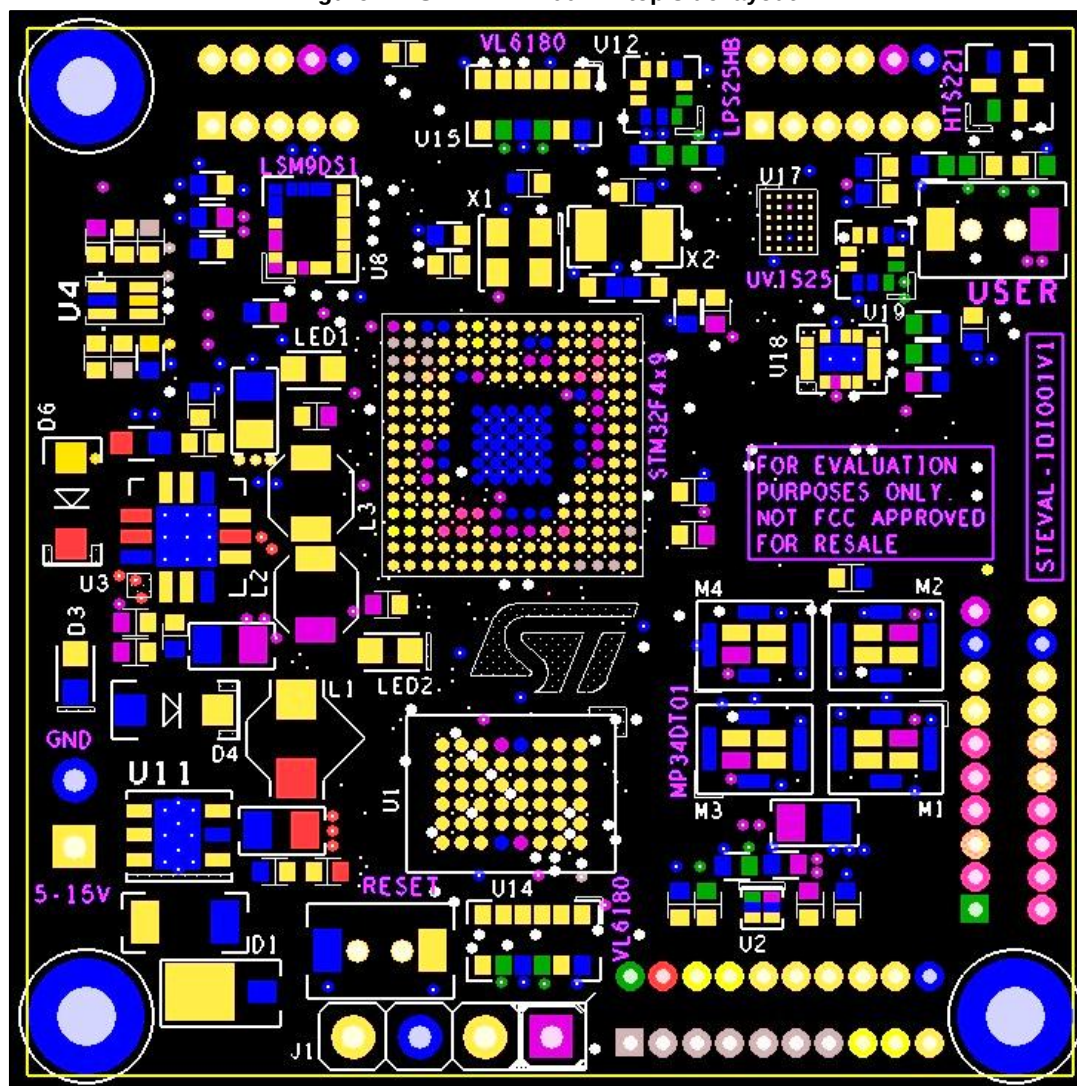
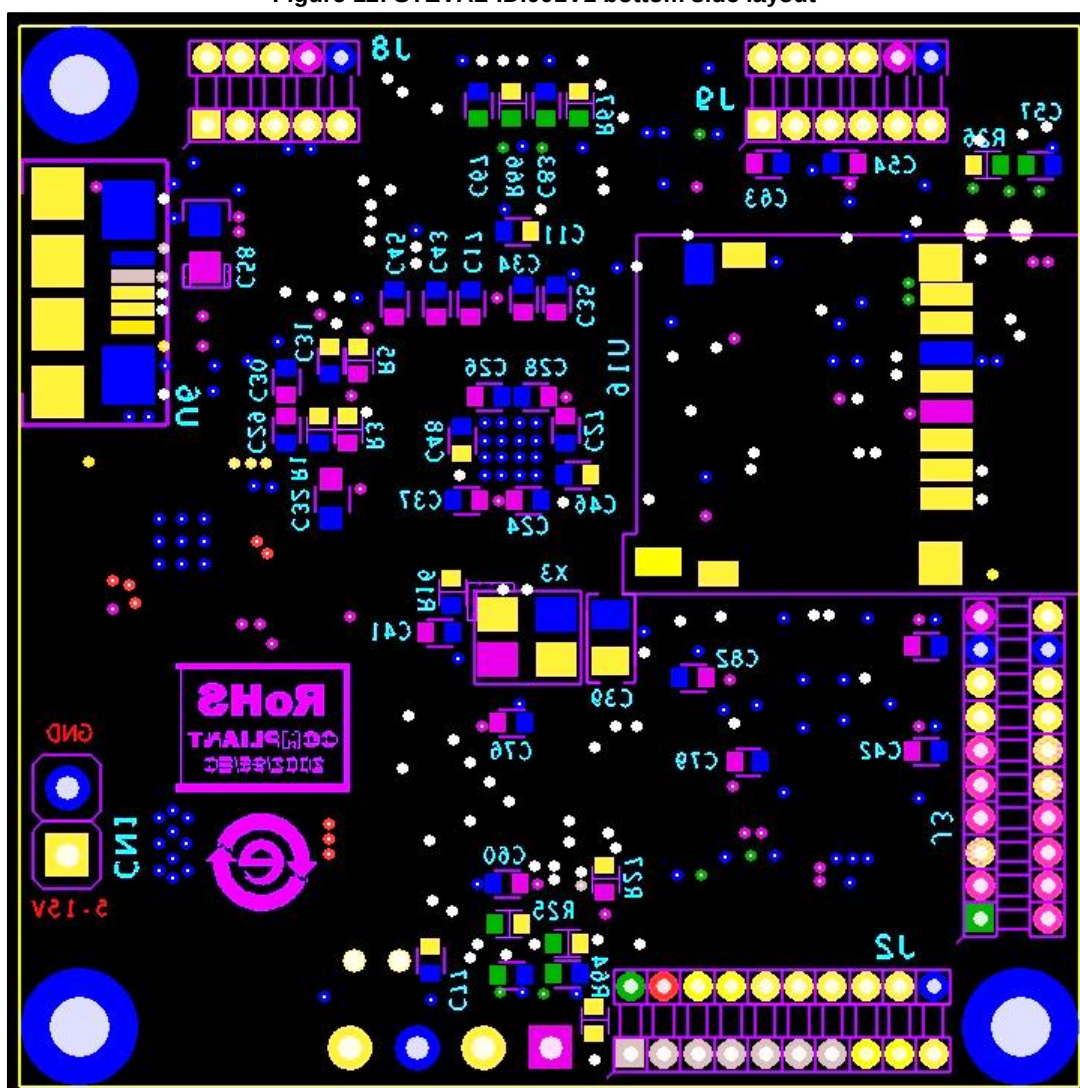


Figure 12: STEVAL-IDI001V1 bottom side layout



6 Board schematic and bill of material – STEVAL-IDI001V1-Exp

This section provides the STEVAL-IDI001V1-Exp-related bill of materials, schematic and layout.

6.1 Bill of materials

Table 8: STEVAL-IDI001V1-Exp bill of materials

Qty	Ref.	Part / Value	Tech. info.	Package	Manufacturer
1	CN5	HEADER 10			Harwin or equivalent
2	CN6,CN9	HEADER 8			Harwin or equivalent
2	CN7,CN10	HEADER 19x2			
1	CN8	HEADER 6			Harwin or equivalent
1	C1	10 μ F 10%	Ceramic	C_1210	
1	C2	220 pF		C_0603	Murata or Equivalent
1	C3	330 μ F 10%	Tantal	7343-43	
1	C4	22 nF		C_0603	Murata or Equivalent
2	D1,D2	STPS160A		SMA	STMicroelectronics
1	D3	LED_G		L_0603	ROHM or equivalent
1	J1	Pow_Supply			Harwin or equivalent
1	J2	CAMERA Expansion			Winslow Adaptics
1	J3	GPIO Expansion			Winslow Adaptics
1	J4	Not Mount			
1	J5	5 V Selector			Harwin or equivalent
1	J6	3V3 Selector			Harwin or equivalent
1	J7	5 V --> Vin			Harwin or equivalent
1	J8	SPI + I2C Bus Expansion			Winslow Adaptics
1	J9	Mic Connector			Winslow Adaptics
3	J10,J11,J12	PCB Hole			
1	L1	15 μ H		7x7mm	Panasonic
2	R1,R2	4K7		R_0603	
1	R3	10 K 1%		R_0603	
1	R4	3K3 1%		R_0603	

Qty	Ref.	Part / Value	Tech. info.	Package	Manufacturer
1	R5	4K7		R_0603	
1	R6	1 K		R_0603	
6	SB2,SB3,SB10,SB14, SB15,SB33,SB34,SB 36,SB37,SB40	Default:Close		R_0603	
38	SB1,SB4,SB5,SB6,S B7,SB8,SB9,SB11,S B12,SB13,SB16,SB1 7,SB18,SB19,SB20,S B21,SB22,SB23,SB2 4,SB25,SB26,SB27,S B28,SB29,SB30,SB3 1,SB32,SB35,SB38,S B39.SB41,SB42,SB4 3,SB44,SB45	Default:Open		R_0603	
1	U1	L5973D		HSOP8	STMicroelectronics

6.2 Schematic diagrams

Figure 13: STEVAL-IDI001V1 - Exp schematic part 1

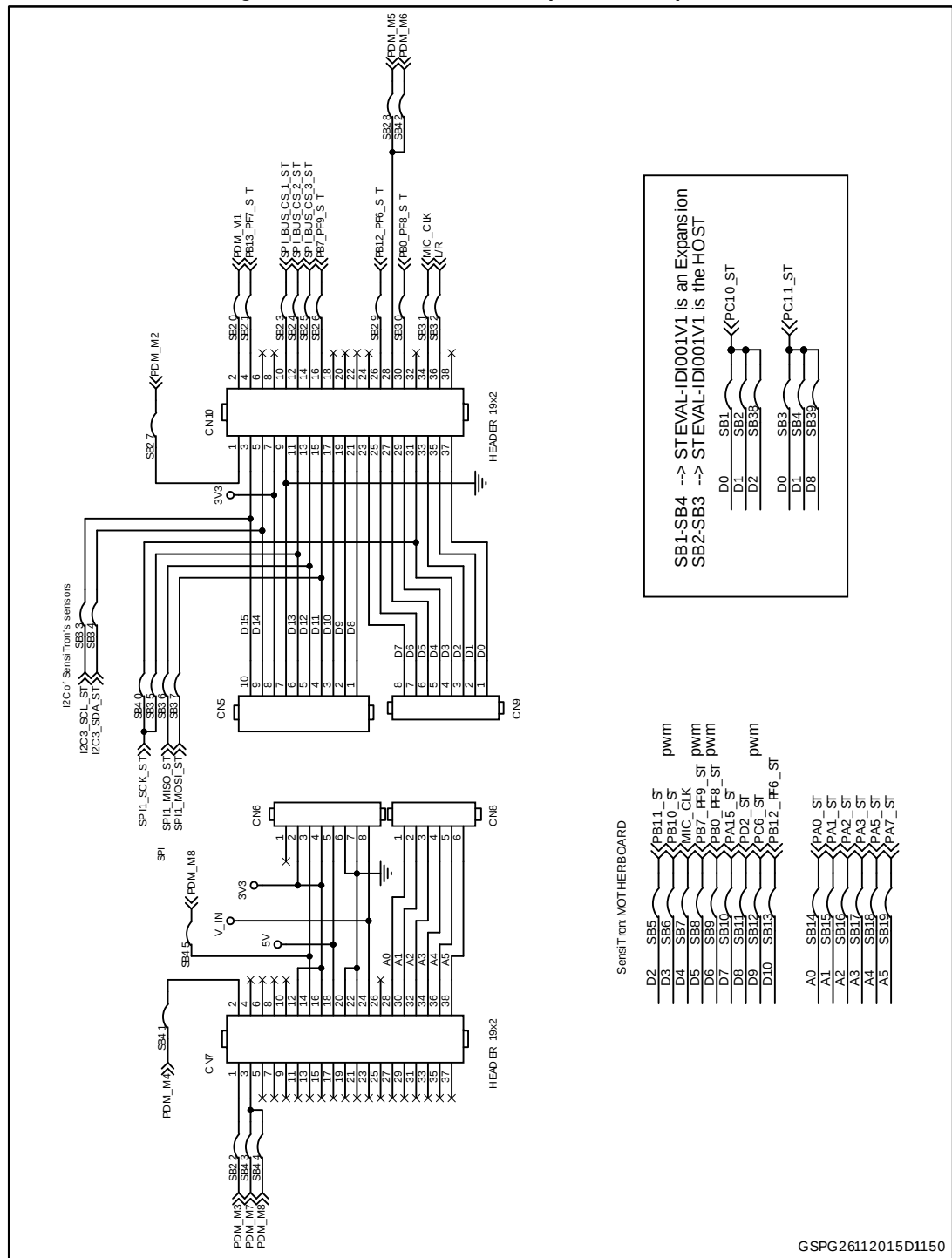


Figure 14: STEVAL-IDI001V1 - Exp schematic part 2

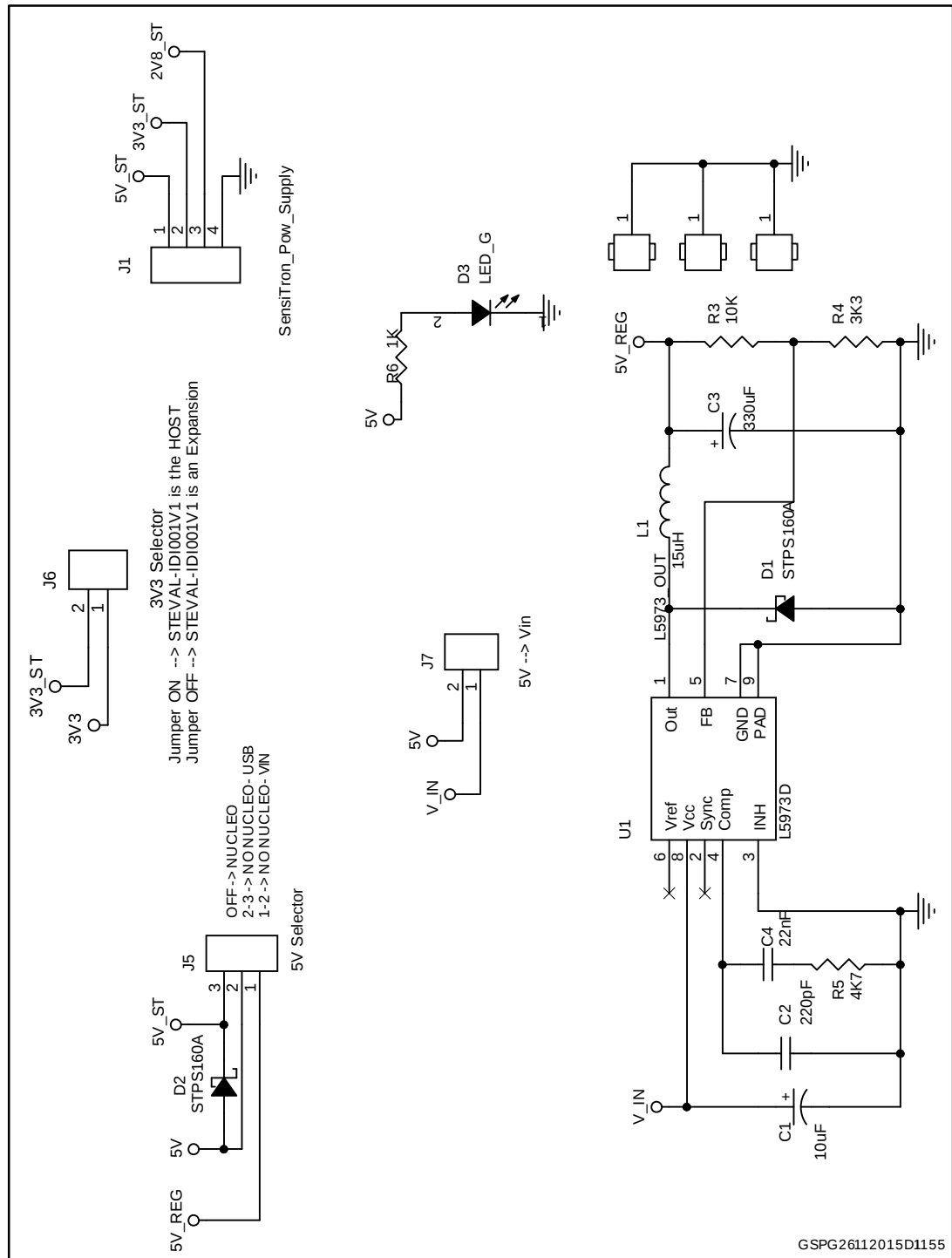
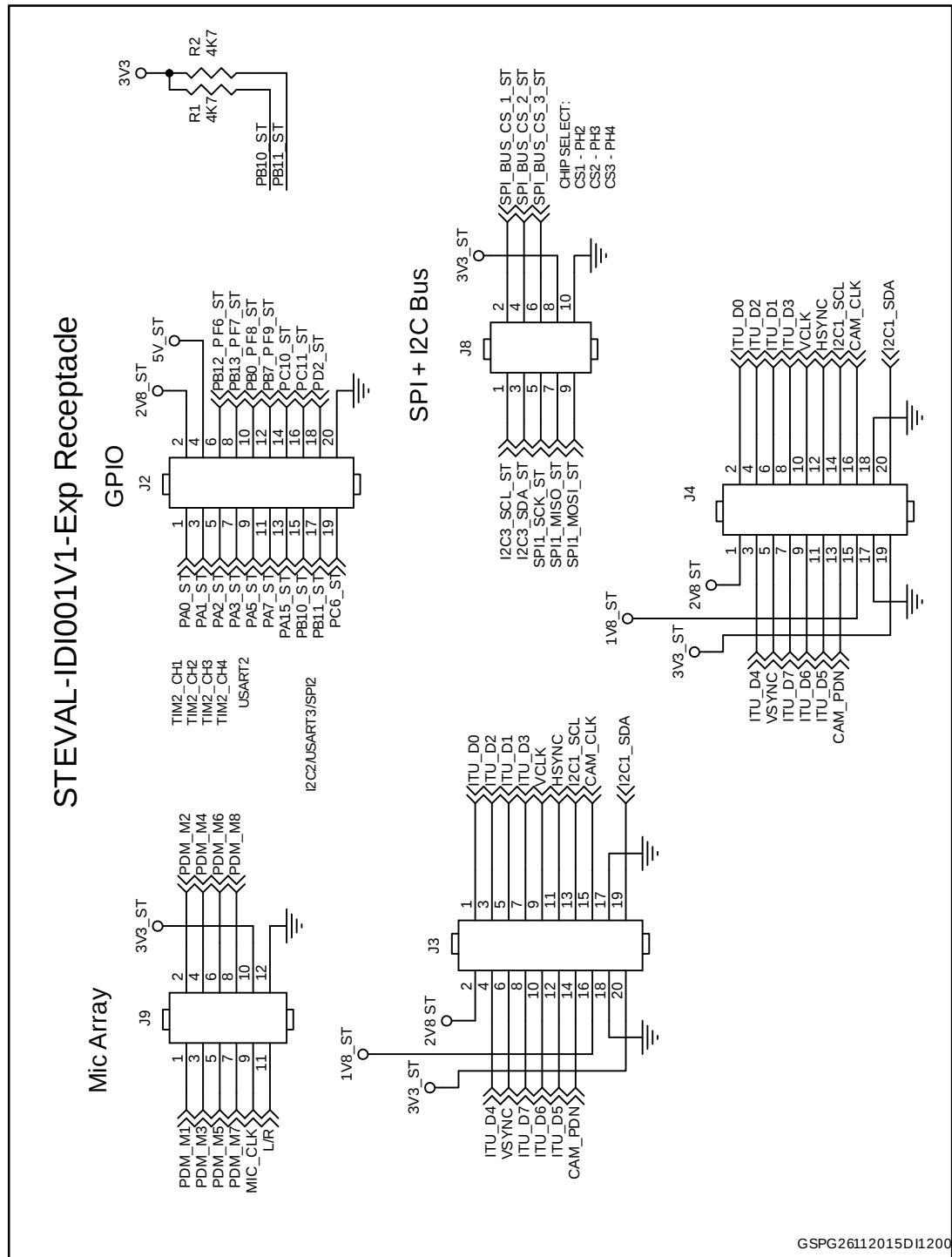


Figure 15: STEVAL-IDI001V1 - Exp schematic part 3



6.3 Layout diagram (top/bottom)

Figure 16: STEVAL-IDI001V1-Exp top side layout

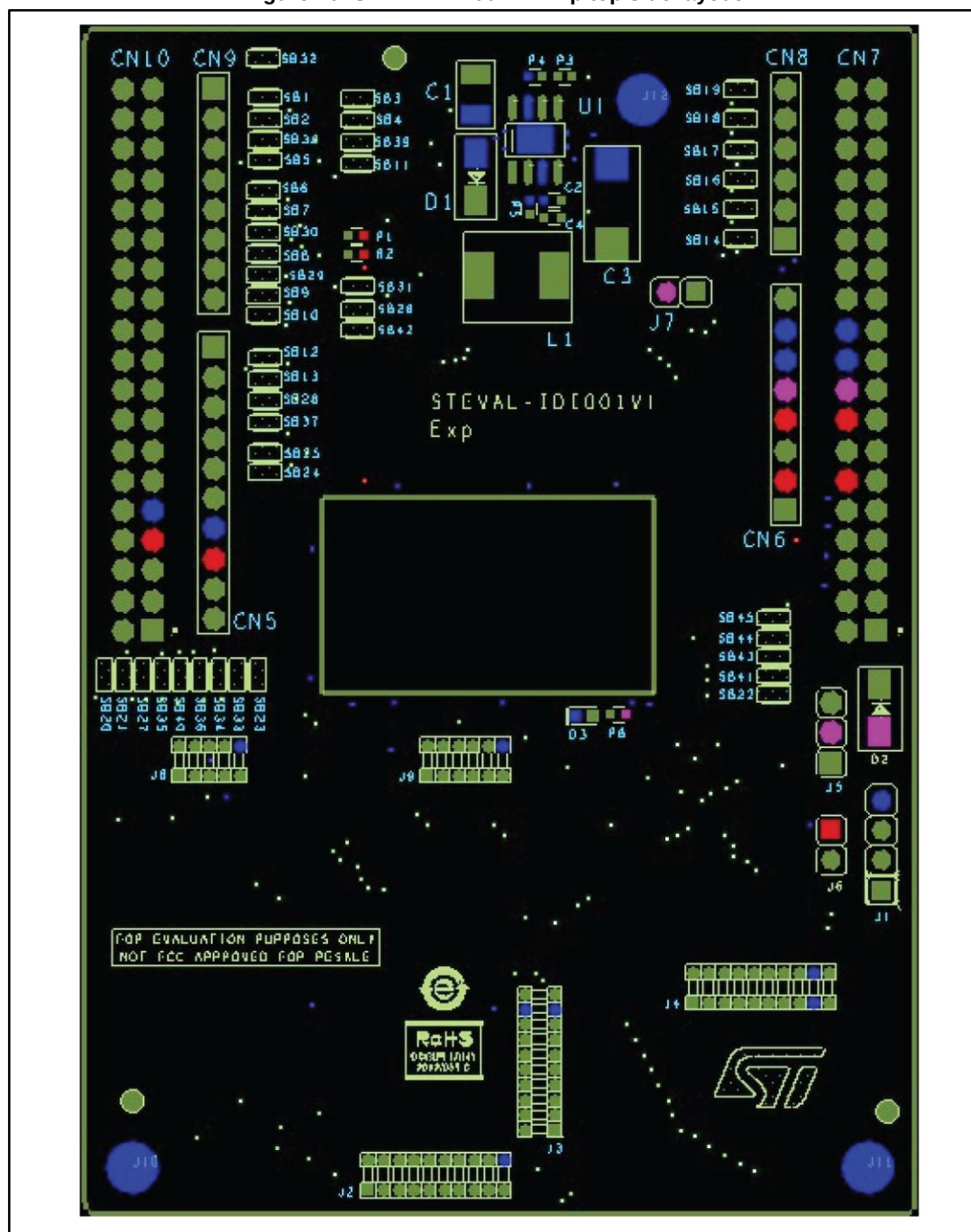
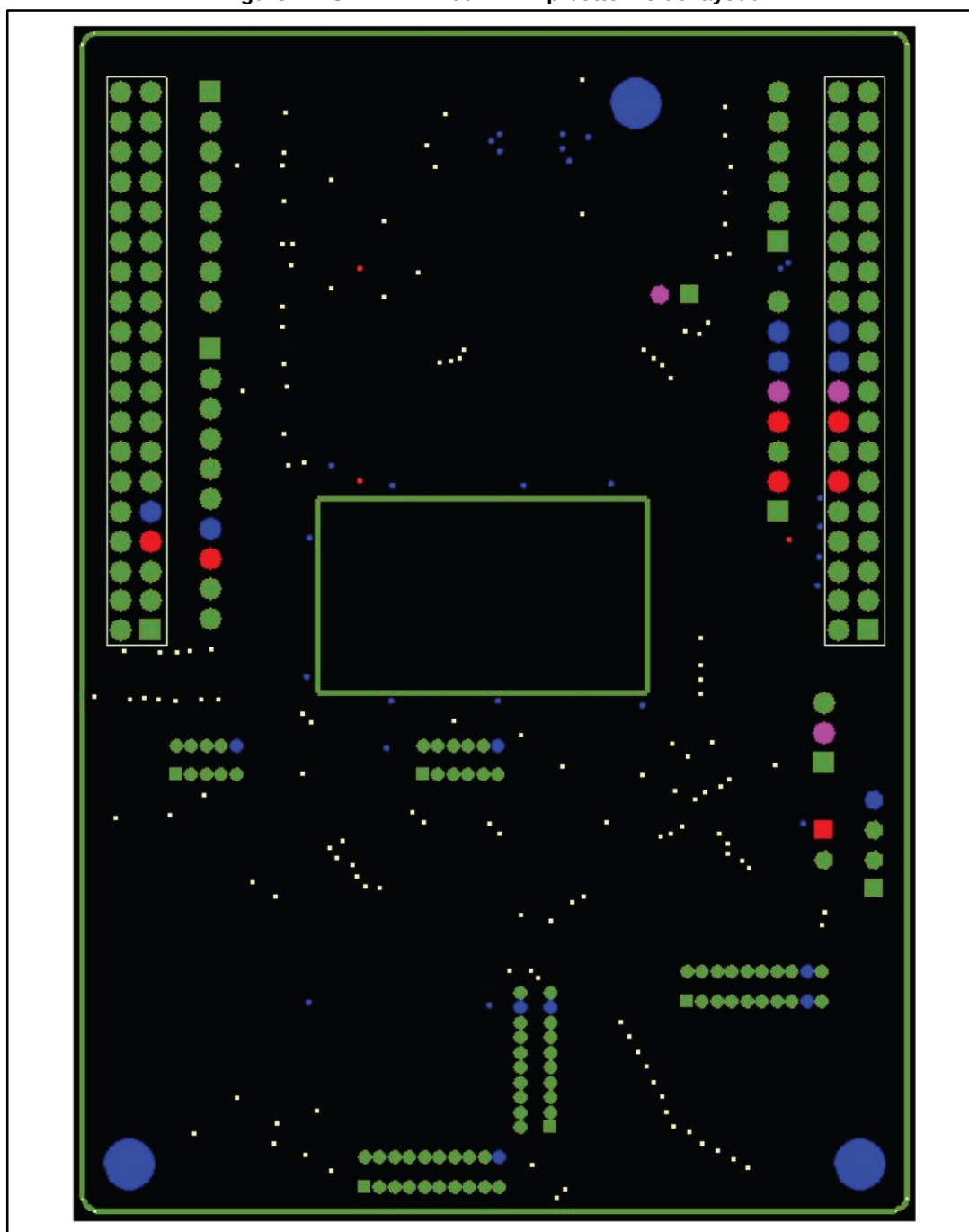


Figure 17: STEVAL-IDI001V1-Exp bottom side layout



7 Revision history

Table 9: Document revision history

Date	Version	Changes
07-Jan-2016	1	Initial release.

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