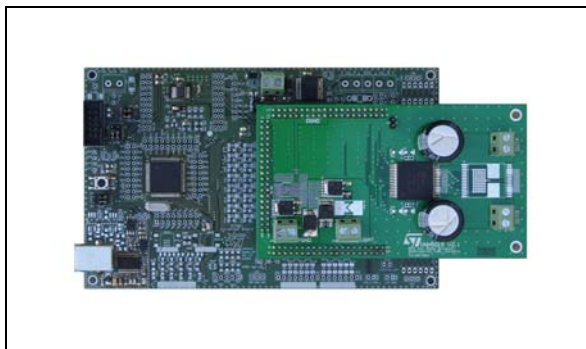


Motor driver evaluation board based on VNH5019A

Data brief



Features

Type	$R_{DS(on)}$	I_{out}	$V_{CC(max)}$
VNH5019A-E	18 mΩ typ (per leg)	30 A	41 V

- Handling up to 30 A of maximum motor current output
- Undervoltage and overvoltage shutdown
- Device thermal protection
- Cross-conduction protection
- Very low standby power consumption
- Programmable PWM operation (up to 20 kHz)
- Protection against loss of ground and loss of V_{CC}
- Motor current monitoring (thanks to VNH5019A current sense output)
- On-board charge pump output for reverse polarity protection
- Device output protected against short to ground and short to V_{CC}
- Graphic User Interface (GUI)

Description

STEVAL-VNH5019A offers dedicated power stage and controls suitable for electric DC motor driving. This evaluation board comes pre-assembled with VNH5019A H-bridge belonging to the VNH Motor Driver series based on VIPower® proprietary technology. Typical applications are Windows Lift, Sliding Door, Seat regulation.

This Evaluation Board consists of a motherboard (STM8 Universal Board) and a daughterboard.

The motherboard, based on STM8 microcontroller, provides the logic section for monitoring and driving the VNH5019A assembled in the daughterboard.

With the aim to make simpler the board usage and settings, ST provides a dedicated and user-friendly software with a Graphic User Interface (GUI). This enables the user to set VNH5019A parameters (PWM, Motor direction...) and at the same time it shows real time device diagnostic information like current output evolution, battery voltage monitoring, board temperature and much more.

Table 1. Device summary

Order code	Reference
STEVAL-VNH5019A	VNH5019A evaluation board

1.1 VNH5019A daughterboard

Figure 1. VNH5019A daughterboard top layer

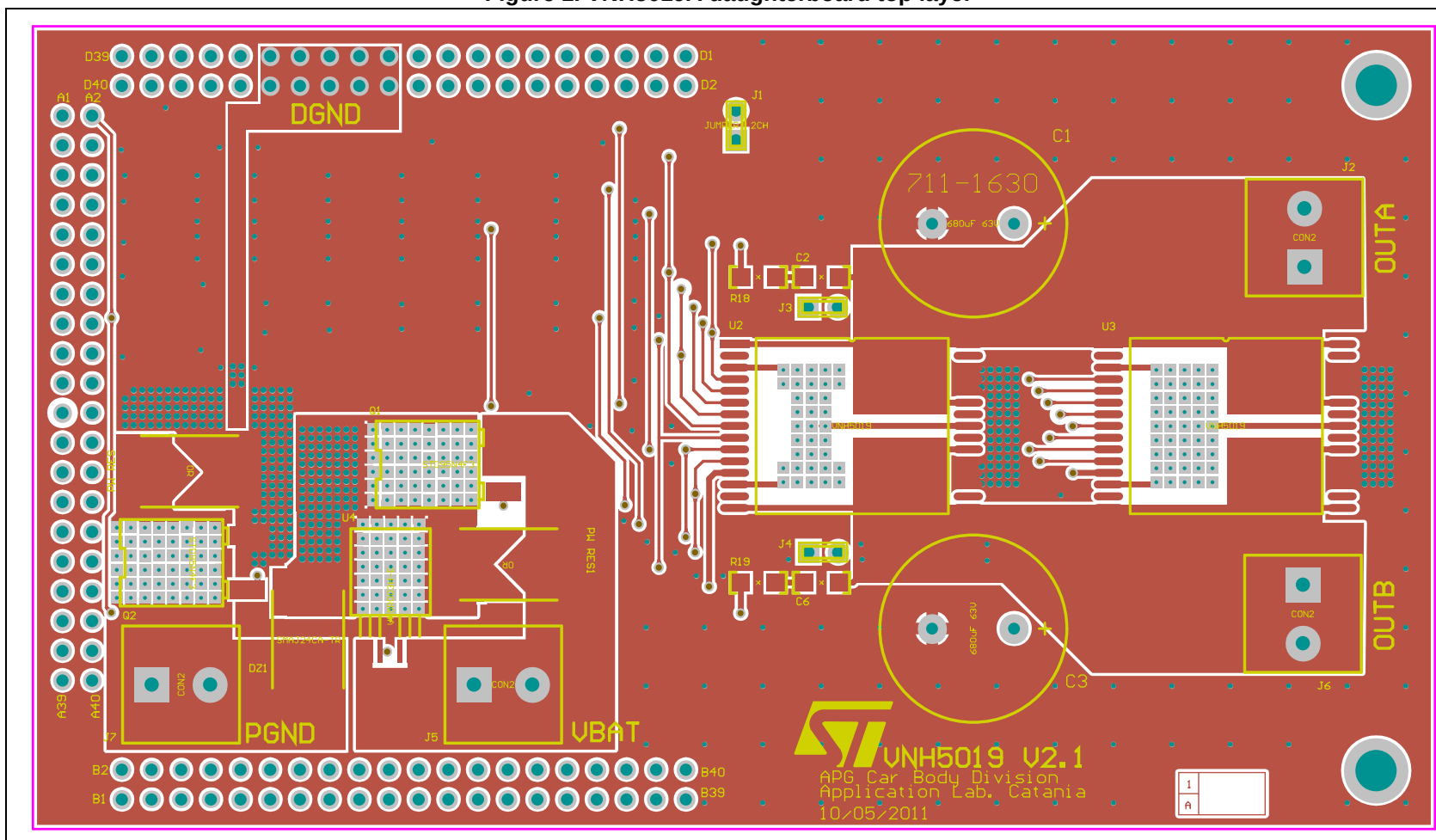
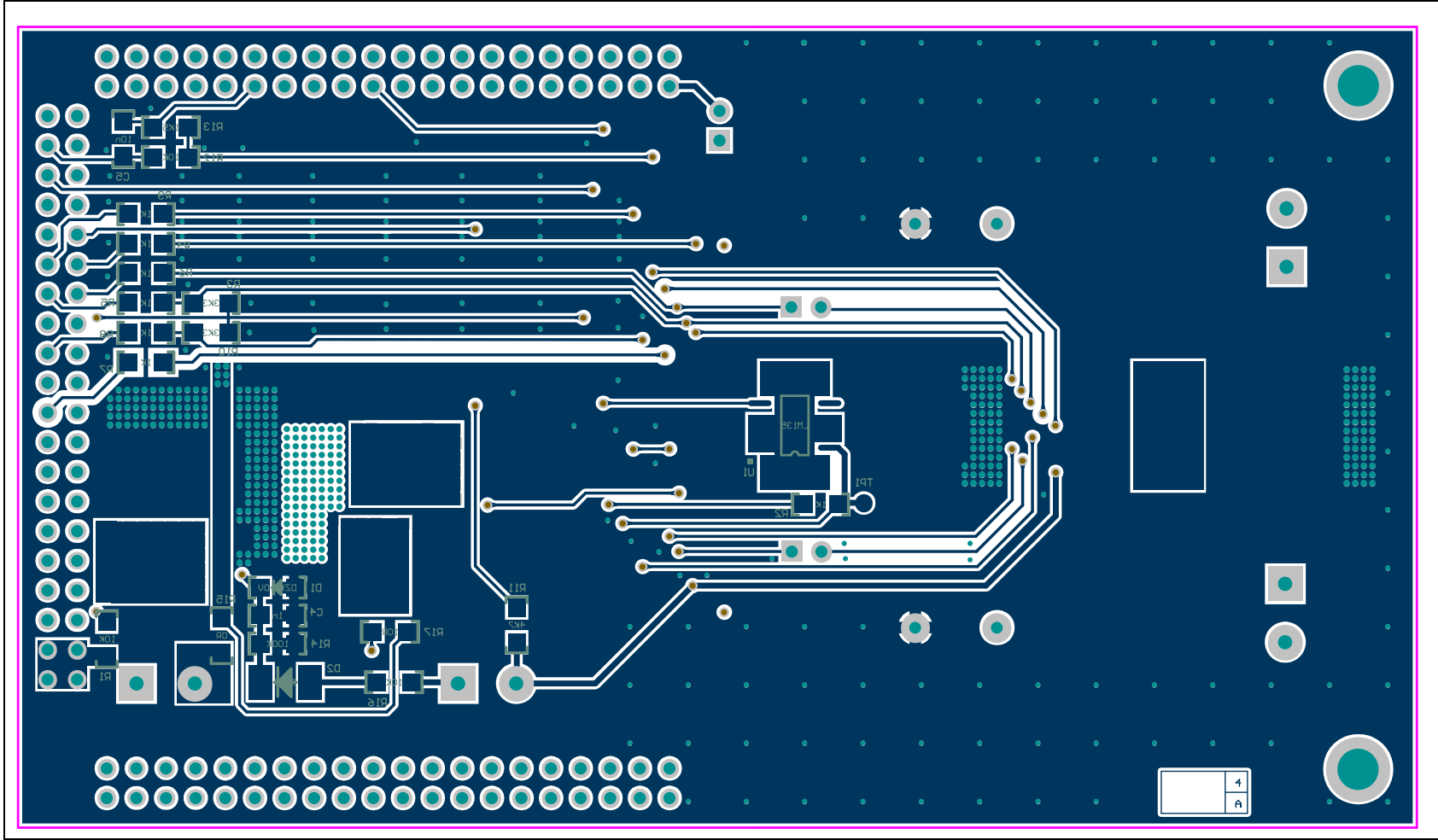


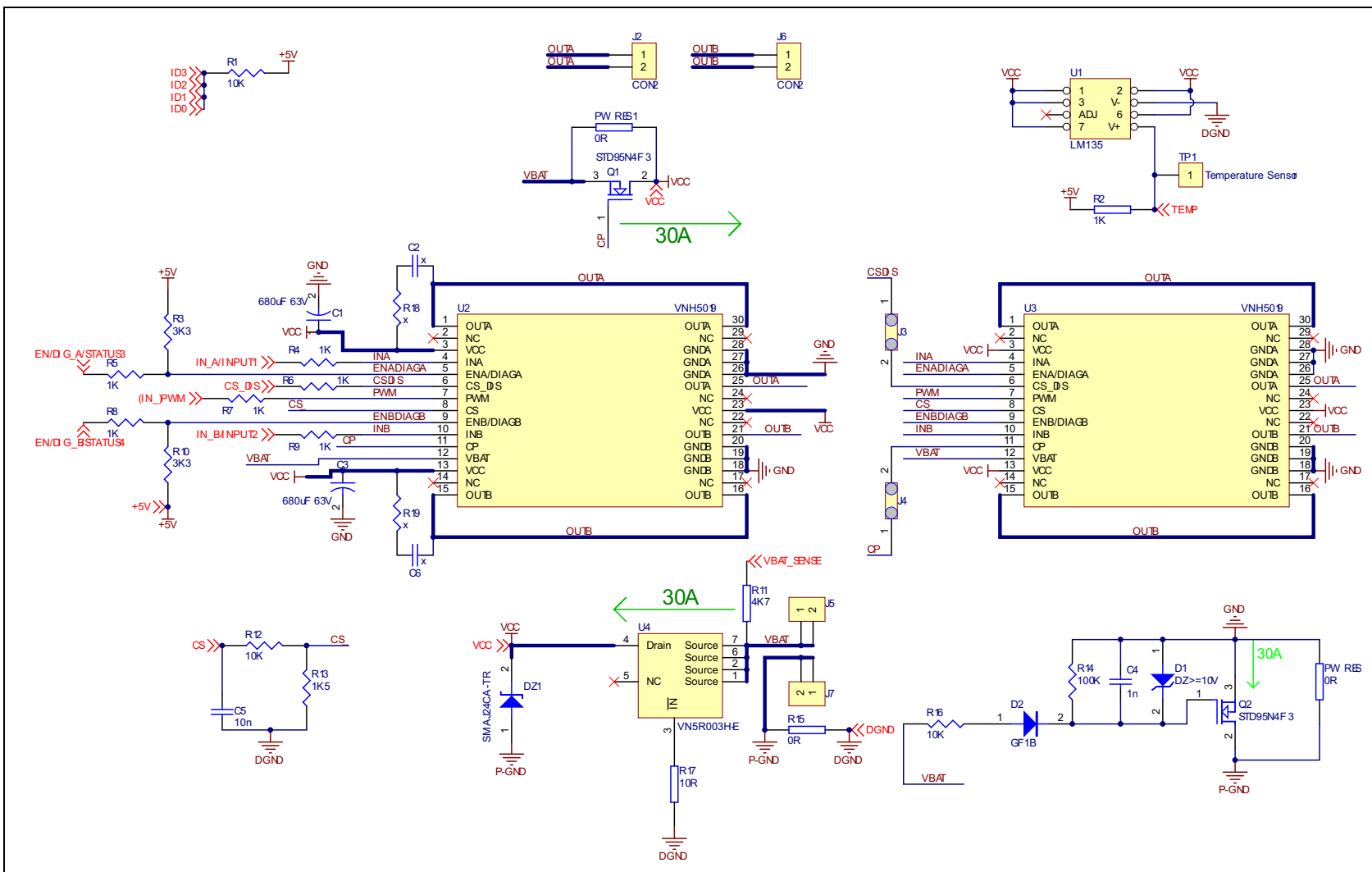
Figure 2. VNH5019A daughterboard bottom layer



Pinout diagram for the STM8UB_DBG1 daughterboard. The diagram shows a 40-pin header on the left and a 2-pin header on the right. The 40-pin header pins are labeled with various signals including power (V5V_DB, V5V_Perm), I/O (PB0/AI_N0/TI_M1_NCC1, etc.), and control signals (NRESET, PA6/USART_CX, etc.). The 2-pin header is labeled J1 and connects to VCC and GND. A legend at the top right shows a yellow circle for VCC and a blue circle for GND.

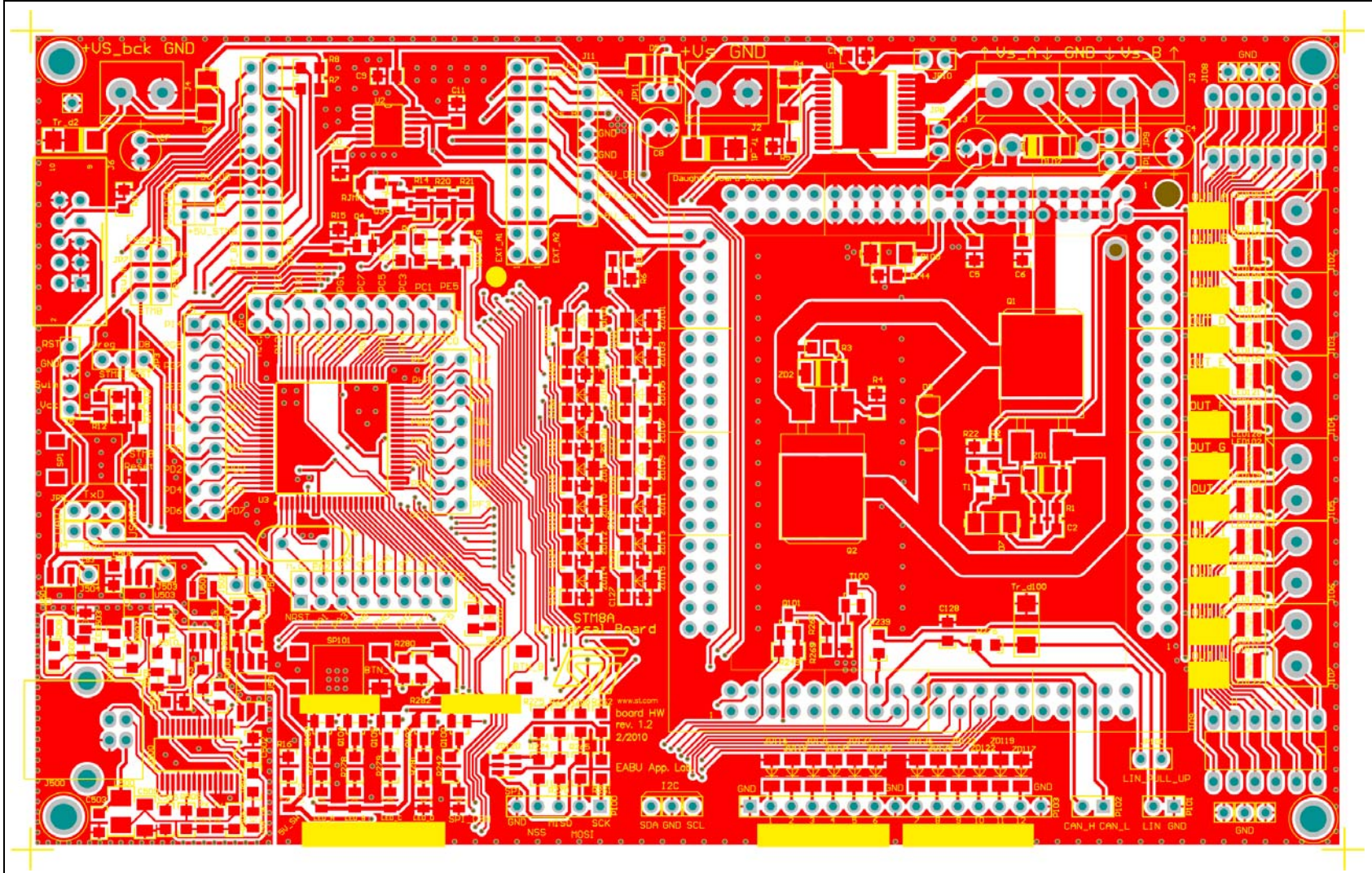
Pin	Signal	Pin	Signal
1	+5V_DB	21	GND
2	+5V_Perm	22	GND
3	PB0/AI_N0/TI_M1_NCC1	23	GND
4	PB1/AI_N1/TI_M1_NCC2	24	GND
5	PB2/AI_N2/TI_M1_NCC3	25	GND
6	PB3/AI_N3	26	GND
7	PB4/AI_N4	27	GND
8	PB5/AI_N5	28	GND
9	PB6/AI_N6	29	GND
10	PB7/AI_N7	30	GND
11	PE7/AI_N8	31	GND
12	PE6/AI_N9	32	GND
13	PF0/AI_N10	33	GND
14	PF3/AI_N11	34	GND
15	PF4/AI_N12	35	GND
16	PF5/AI_N13	36	GND
17	PF6/AI_N14	37	GND
18	PF7/AI_N15	38	GND
19	PA3/TI_M2_CC3	39	GND
20	PC0/ADC_ETR	40	GND
21	PC1(HS)/TI_M1_CC1		
22	PC2(HS)/TI_M1_CC2		
23	PC3(HS)/TI_M1_CC3		
24	PC4(HS)/TI_M1_CC4		
25	PD0(HS)/TI_M3_CC2		
26	PD2(HS)/TI_M3_CC1		
27	PD3(HS)/TI_M2_CC2		
28	PD4(HS)/TI_M2_CC1		
29	PD7/TL_I		
30	PE0/CL_K_CCO		
31	PE3/TI_M1_BK_IN		
32	PE4		
33	PH7/TI_M1_NCC1		
34	PH6/TI_M1_NCC2		
35	PH5/TI_M1_NCC3		
36	PH4/TI_M1_ETR		
37	PH3		
38	PH2		
39	PH1(HS)		
40	PH0(HS)		
		41	NRESET
		42	PA6/USART_CX
		43	PA5/USART_TX
		44	PA4/USART_RX
		45	PD5/LINUART_TX
		46	PD6/LINUART_RX
		47	PG0/CAN_TX
		48	PG1/CAN_RX
		49	PE5/SPI_NSS
		50	PC5/SPI_SCK
		51	PC6/SPI_MOSI
		52	PC7/SPI_MISO
		53	PE1/I2C_SCL
		54	PE2/I2C_SDA
		55	LIN
		56	LIN_PU
		57	USB_C82
		58	USB_C83
		59	CAN_H0
		60	CAN_H1
		61	CAN_L0
		62	CAN_L1
		63	+5V_SW
		64	BTN_COM
		65	BTN_A
		66	BTN_B
		67	LED1
		68	LED2
		69	LED3
		70	LED4
		71	B29
		72	IO_CON1
		73	IO_CON2
		74	IO_CON3
		75	IO_CON4
		76	IO_CON5
		77	IO_CON6
		78	IO_CON7
		79	IO_CON8
		80	IO_CON9
		81	IO_CON10
		82	IO_CON11
		83	IO_CON12

Figure 4. VNH5019A daughterboard application schematic (part 2)



1.2 STM8 motherboard

Figure 5. STM8 motherboard top layer



The image shows a custom PCB layout for a microcontroller-based system. The board is populated with various components including a microcontroller, memory chips, and peripheral ICs. The layout features a complex network of blue and white traces, with labels for components like LEDs, switches, and connectors. A large section of the board is dedicated to a grid of components, likely for a display or input/output interface.

Figure 7. STM8 motherboard - I/O & Body application schematic

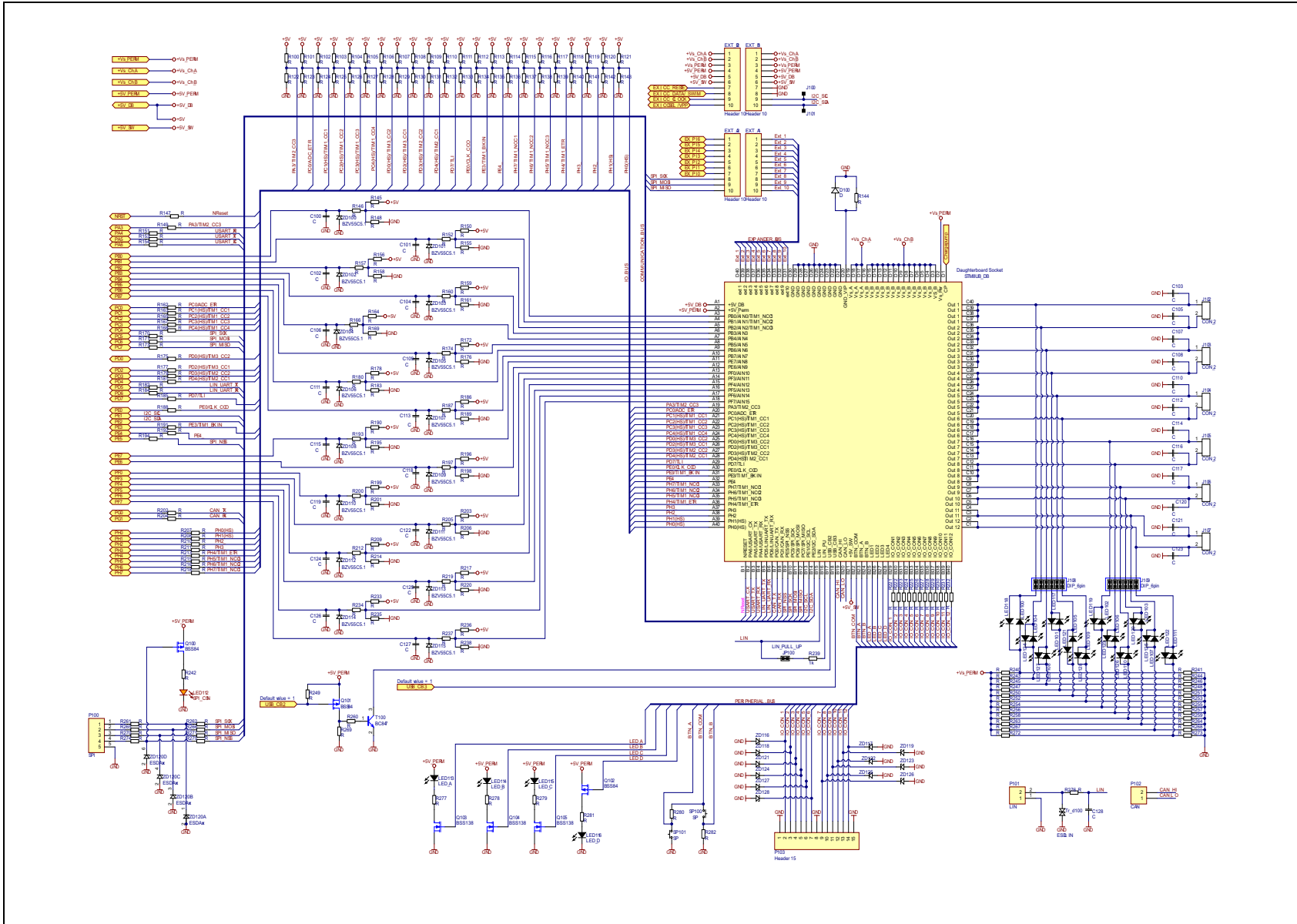


Figure 8. STM8 motherboard - STM8 & Supply application schematic

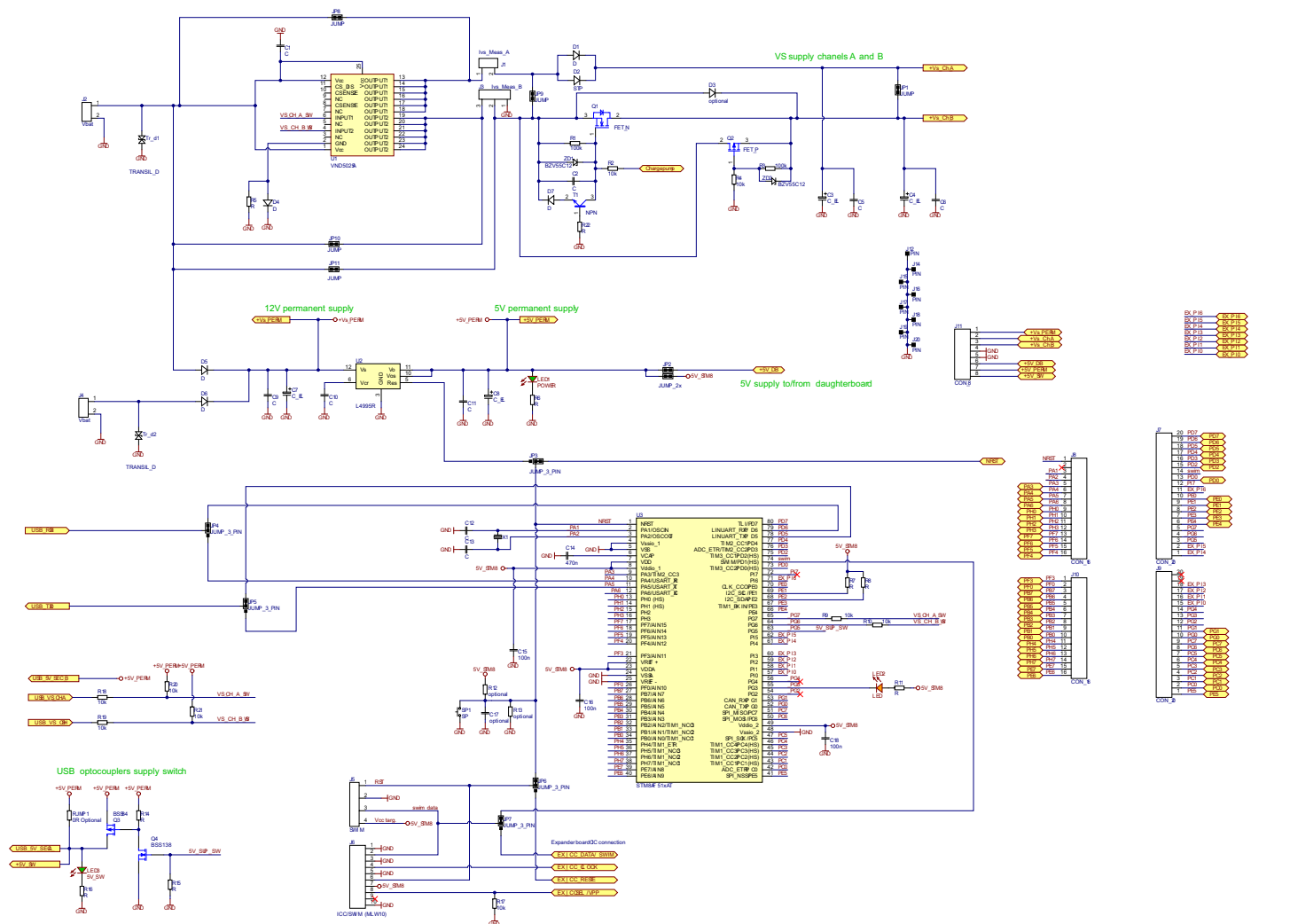
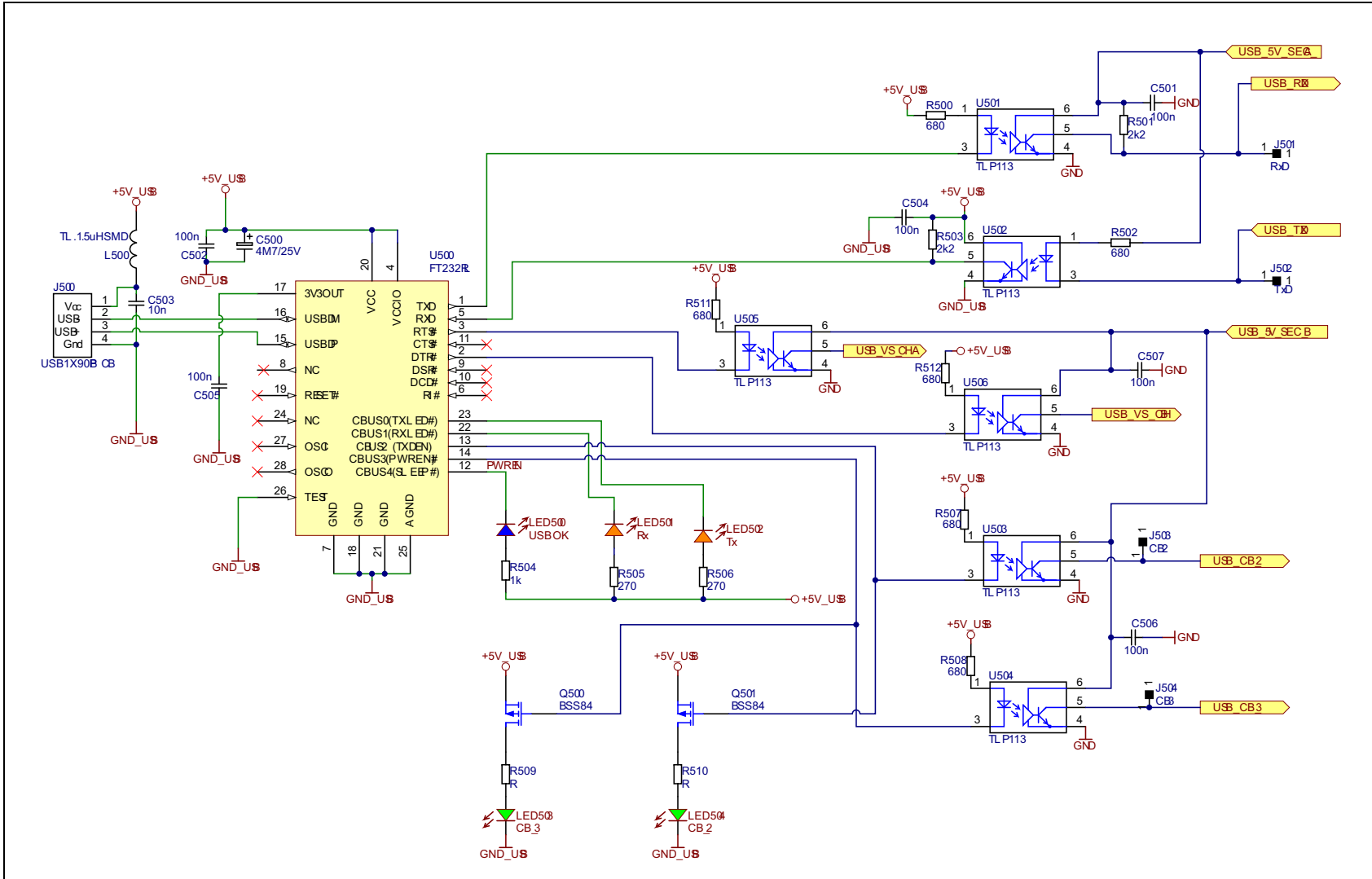


Figure 9. STM8 motherboard - USB Interface application schematic



2 Revision history

Table 2. Document revision history

Date	Revision	Changes
22-Jul-2013	1	Initial release.
06-Sep-2013	2	Updated Section 1.2: STM8 motherboard
16-Sep-2013	3	Updated disclaimer.

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