

[illegible]

### Target SWD/JTAG port with ESD protection

**DESIGN NOTE:**  
For SWD + SWO, SPI1 + USART1 is used  
For JTAG, SPI2 is used (SWO not available)

**DESIGN NOTE:**  
T\_VCC is read before  
enabling 3.3V power.

**Target Board Connections:**

Target Board Pin	Target Board Label	Connection
1	1A	SPI2_MISO
2	2A	SPI2_CLK
3	3A	SPI1_MISO
4	4A	RESET
5	5A	SPI1_CLK
6	6A	USART2_RX
7	7A	USART2_TX
8	8A	SPI2_MOSI
16	16	T_SWO_TDO
15	15	T_SWDIO_TMS
14	14	T_GNDDetect
13	13	T_RESET
12	12	T_SWDCLK_CCLK
11	11	T_VCP_TX
10	10	T_VCP_RX
9	9	T_TDI
17	17	GND

**Power and Signal Connections:**

Power/Signal	Target Board Pin	Target Board Label
+5V	1	5V
T_VCC	2	V_PROBE
T_VCC	3	T_VCC
GND	5	GND
GND	7	GND
T_GNDDetect	11	T_GNDDetect
T_SWDIO_TMS	4	T_TMS/T_SWDIO
T_SWDCLK_CCLK	6	T_JCLK/T_SWCLK
T_SWO_TDO	8	T_TDO/T_SWO
T_TDI	9	T_JRCLK
T_RESET	10	T_TDI
T_RESET	12	T_NRST
T_VCP_RX	13	T_VCP_RX
T_VCP_TX	14	T_VCP_TX

**Target Board Labels:** U4 (NUF8401MNT4G), U5 (STDC14)

# Board-edge castellated vias

MCU I/O

**U1A**  
hs-probe-stm32

PA0-WKUP	N3	X
PA1	N2	X
PA2	P2	X
PA3/ADC1_IN3	R2	T_VCC_MEAS
PA4	N4	X
PA5	P4	X
PA6	R3	X
PA7	F15	X
PA8	F15	FS_VBUS
PA9/USB_OTG_FS_VBUS	F15	X
PA10	D15	X
PA11/USB_OTG_FS_DM	C15	D_FS_N
PA12/USB_OTG_FS_DP	B15	D_FS_P
PA15	A13	X

**U1B**  
hs-probe-stm32

PB0	R5	X
PB1	R4	X
PB2	M6	X
PB3/SPI1_SCK	A6	SPI1_CLK
PB4/SPI1_MISO	A9	SPI1_MISO
PB5/SPI1_MOSI	A6	SPI1_MOSI
PB6/USART1_TX	B6	USART1_TX
PB7/USART1_RX	B5	USART1_RX
PB8/LED2	A5	LED2
PB9	B4	X
PB10/USB_SEL	R12	USB_SEL
PB11	R13	X
PB12	P12	X
PB13/USB_OTG_HS_VBUS	P13	HS_VBUS
PB14/USB_OTG_HS_DM	R14	D_HS_N
PB15/USB_OTG_HS_DP	R15	D_HS_P

**U1C**  
hs-probe-stm32

PC0	M2	X
PC1	M3	X
PC2	M4	X
PC3	M5	X
PC4	N5	X
PC5	P5	X
PC6	H15	X
PC7	G15	X
PC8	G14	X
PC9	F14	X
PC10/LED1	B14	LED1
PC11	B13	X
PC12	A12	X
PC13	D1	X
PC14-OSC32_IN	F1	X
PC15-OSC32_OUT	F1	X

**U1D**  
hs-probe-stm32

PD0	B12	X
PD1	C12	X
PD2	D12	X
PD3	D11	X
PD4	D10	X
PD5/USART2_TX	C11	USART2_TX
PD6/USART2_RX	B11	USART2_RX
PD7	A11	X
PD8/GPIO1	P15	X
PD9	P14	X
PD10/GPIO2	N15	X
PD11	N14	X
PD12	N13	X
PD13	M15	X
PD14	M14	X
PD15	L14	X

**U1E**  
hs-probe-stm32

PE0/LED3	A4	LED3
PE1	A3	X
PE2/T_VCC_EN	A2	T_VCC_EN
PE3	A1	X
PE4	B1	X
PE5	B2	X
PE6	B3	X
PE7	R8	X
PE8	P8	X
PE9	P9	X
PE10	R9	X
PE11	P10	X
PE12	R10	X
PE13	N11	X
PE14	P11	X
PE15	R11	X

**U1G**  
hs-probe-stm32

PG0	M7	X
PG1	M7	X
PG2	L15	X
PG3	K15	X
PG4	K14	X
PG5	K13	X
PG8	H14	X
PG9	C10	X
PG10	B10	X
PG11	B9	X
PG12	B8	X
PG13/RESET	A8	RESET
PG14/GNDDet	A7	GNDDetect
PG15	B7	X

**U1I**  
hs-probe-stm32

PI0	F14	X
PI1/SPI2_SCK	D14	SPI2_CLK
PI2/SPI2_MISO	C14	SPI2_MISO
PI3/SPI2_MOSI	C13	SPI2_MOSI
PI4	D4	X
PI5	C4	X
PI6	C3	X
PI7	C2	X
PI8	D2	X
PI9	D3	X
PI10	E3	X
PI11	F4	X

**R101**

T\_VCC\_MEAS

T\_VCC

5.1k

5.1k

**R9**

FS\_VBUS

HS\_VBUS

1k

+5V

**D1**

LTST-C19HE1WT

LED1

LED2

LED3

R5

R6

R7

1k

1k

1k

1

2

3

4

+5V

# Probe power and optional target power

USB-C port with USB MUX

Design Note: On startup the FS port is connected for access to the STM32 USB bootloader. The firmware can then switch over to the HS port.

Sheet: /		
File: hs-probe.sch		
<b>Title: Rusty High-Speed Probe</b>		
Size: A3	Date: 2020-07-19	Rev: v1.1
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