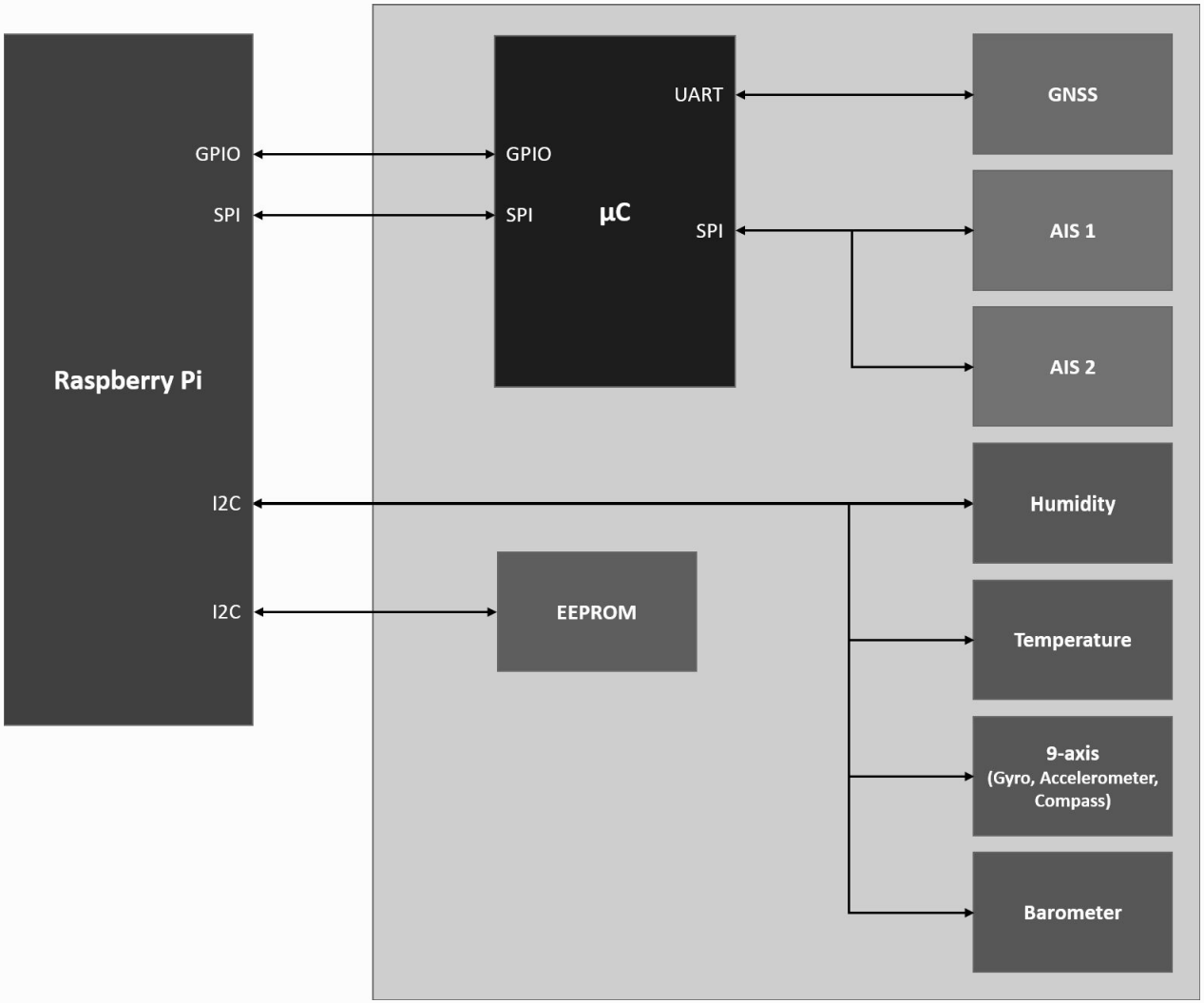
Project Name:	Rooco Moitesssier HAT
Drawing Number:	P770010E05-Xx-SH-x
Revision:	E05
Drawn by:	Thomas POMS
Variant:	X1



OPENPLOTTER

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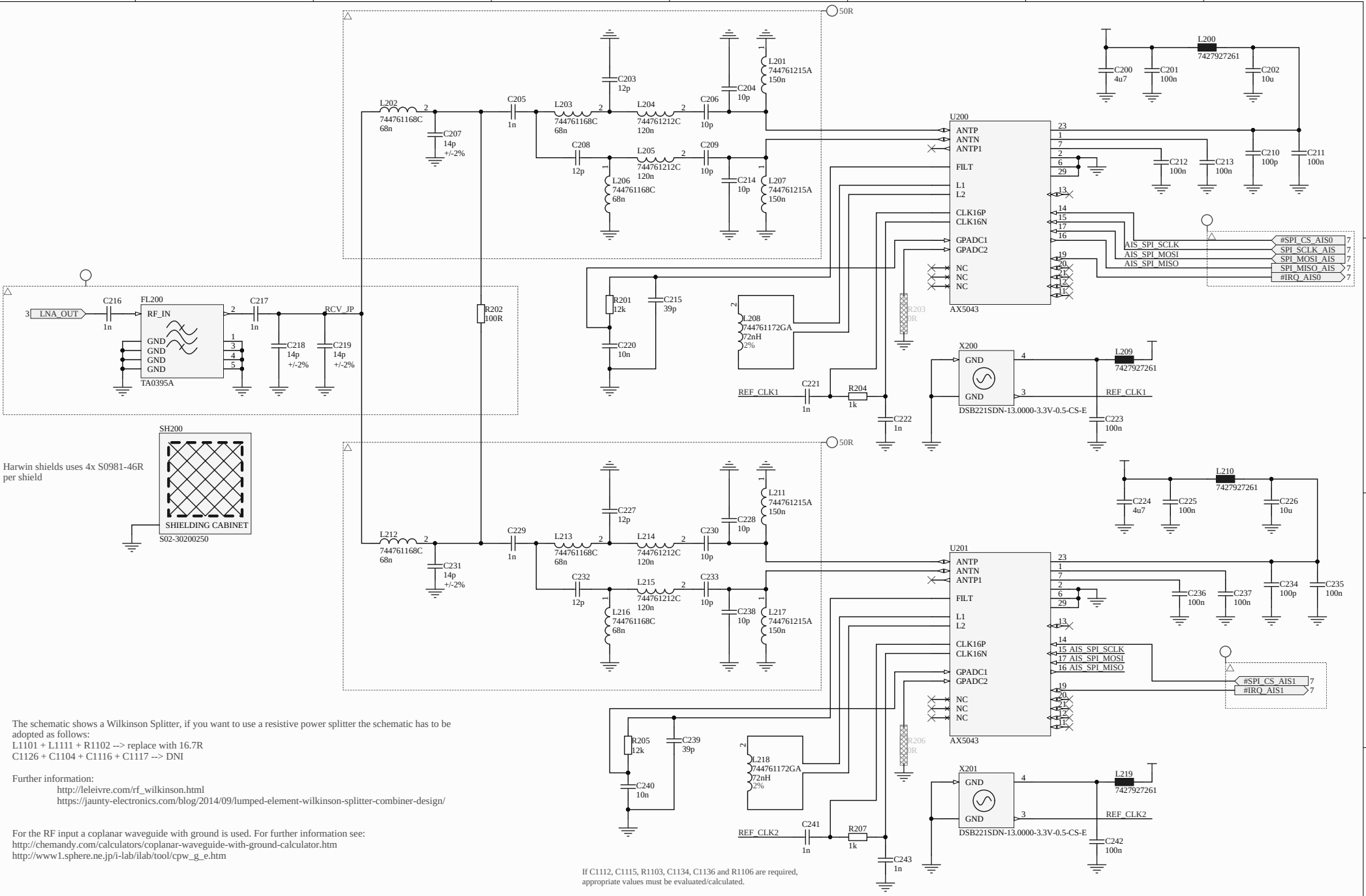
rooco

Size: A3	Sheet 1 of 7
Date: 19.07.2021	Time: 08:23:20



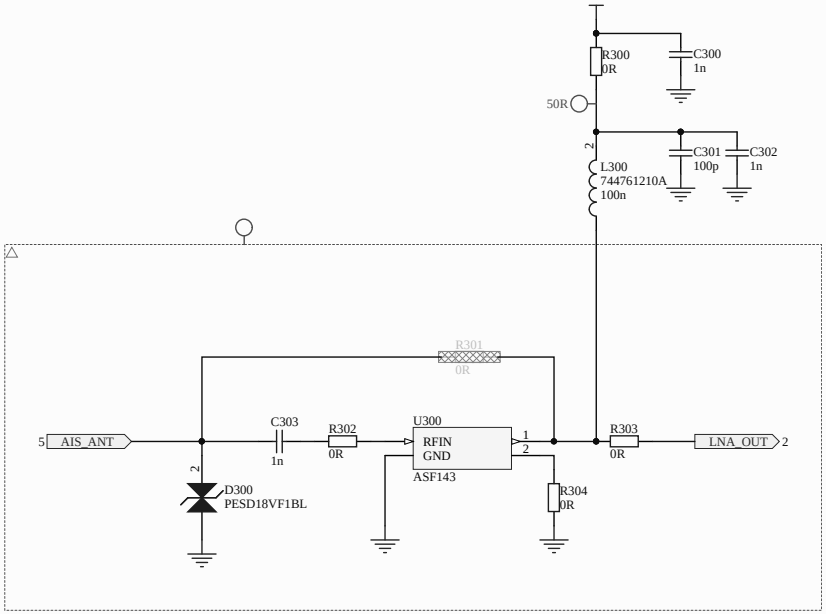
The schematic shows a Wilkinson Splitter, if you want to use a resistive power splitter the schematic has to be adopted as follows:
L1101 + L1111 + R1102 --> replace with 16.7R
C1126 + C1104 + C1116 + C1117 --> DNI

Further information:
http://leleivre.com/rf_wilkinson.html
https://jaunty-electronics.com/blog/2014/09/lumped-element-wilkinson-splitter-combiner-design/

For the RF input a coplanar waveguide with ground is used. For further information see:
http://chemandy.com/calculators/coplanar-waveguide-with-ground-calculator.htm
http://www1.sphere.ne.jp/i-lab/ilab/tool/cpw_g_e.htm

If C1112, C1115, R1103, C1134, C1136 and R1106 are required, appropriate values must be evaluated/calculated.

AIS			*csoft - Web and IT Solutions* *Wiener Straße 2* *A-8665 Langenwang* www.csoft-it.at
Drawing Number: P770010E05-Xx-SH-x	Rooco Moitesssier HAT		
Size: A3	Number: 2	Revision: E05	
Drawn by: Thomas POMS	Approved by:		
Date: 19.07.2021 Time: 08:23:22	Sheet 2 of 7	Variant X1	
File: P770010E05-Xx-SH-2_AIS.SchDoc			



R302 and R303 might be used for impedance matching purpose.

If no LNA is required R301 is installed and C303, R302, U300, R303, R304, L300, R300, C300, C301 and C302 are not assembled.

Alternate parts:
BGA427 --> R304 = 2p2, reverse pinning compared to ASF143
BGA612
BGA616
ASF143 --> R304 = 0R, reverse pinning compared to BGA427

LNA			
Drawing Number: P770010E05-Xx-SH-x		Rooco Moitesssier HAT	
Size: A3	Number: 3	Revision: E05	
Drawn by: Thomas POMS		Approved by:	
Date: 19.07.2021 Time: 08:23:22	Sheet 3 of 7	Variant X1	
File: P770010E05-Xx-SH-3_LNA.SchDoc			

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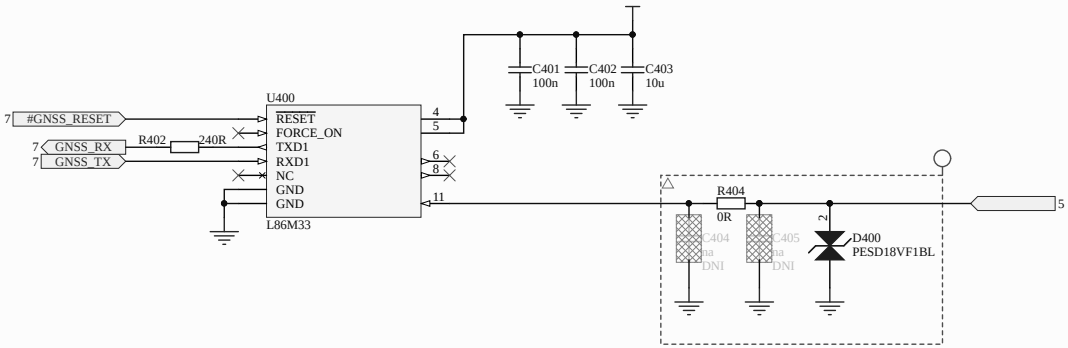
#GNSS_RESET must not actively driven high. The microcontroller should use open collector output.



If C404 and C405 are required, appropriate values must be evaluated/calculated.

GNSS			
Drawing Number: P770010E05-Xx-SH-x		Rooco Moitesssier HAT	
Size: A3	Number: 4	Revision: E05	
Drawn by: Thomas POMS		Approved by:	
Date: 19.07.2021 Time: 08:23:23	Sheet 4 of 7	Variant X1	
File: P770010E05-Xx-SH-4_GNSS.SchDoc			

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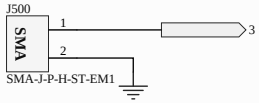
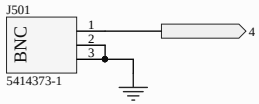
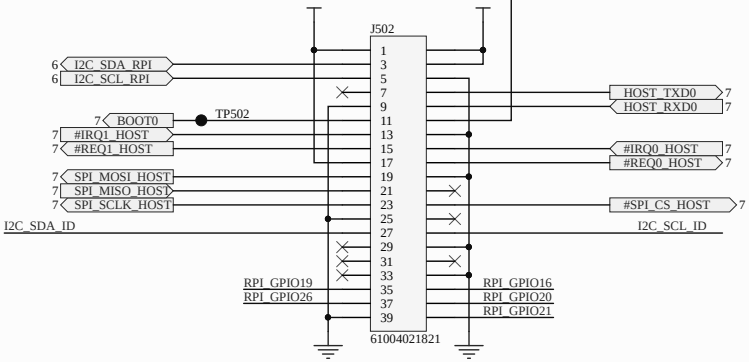
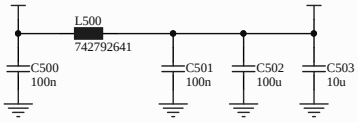
Alternate parts:
RF Solutions CON-SMA-EDGE-S
Cinch 142-0711-821
RS Pro 526-5785

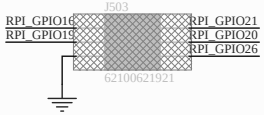


Alternate parts:
0731000105







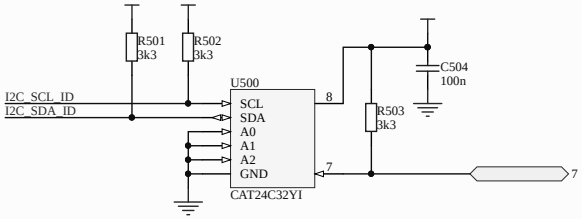


Raspberry Pi 3 GPIO Header

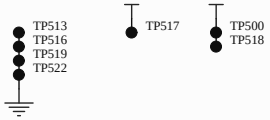
Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I²C)		DC Power 5v	04
05	GPIO03 (SCL1 , I²C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I²C ID EEPROM)		(I²C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

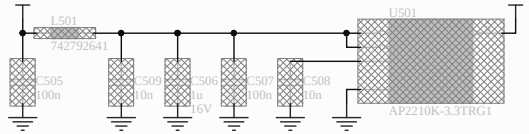
Rev. 2
29/02/2016

www.element14.com/RaspberryPi



REF500
PCB_Reference_Point
REF501
PCB_Reference_Point
REF502
PCB_Reference_Point





Connector			
Drawing Number: P770010E05-Xx-SH-x		Rooco Moitesssier HAT	
Size: A3	Number: 5	Revision: E05	
Drawn by: Thomas POMS		Approved by:	
Date: 19.07.2021 Time: 08:23:23		Sheet 5 of 7	Variant X1
File: P770010E05-Xx-SH-5_Connector.SchDoc			

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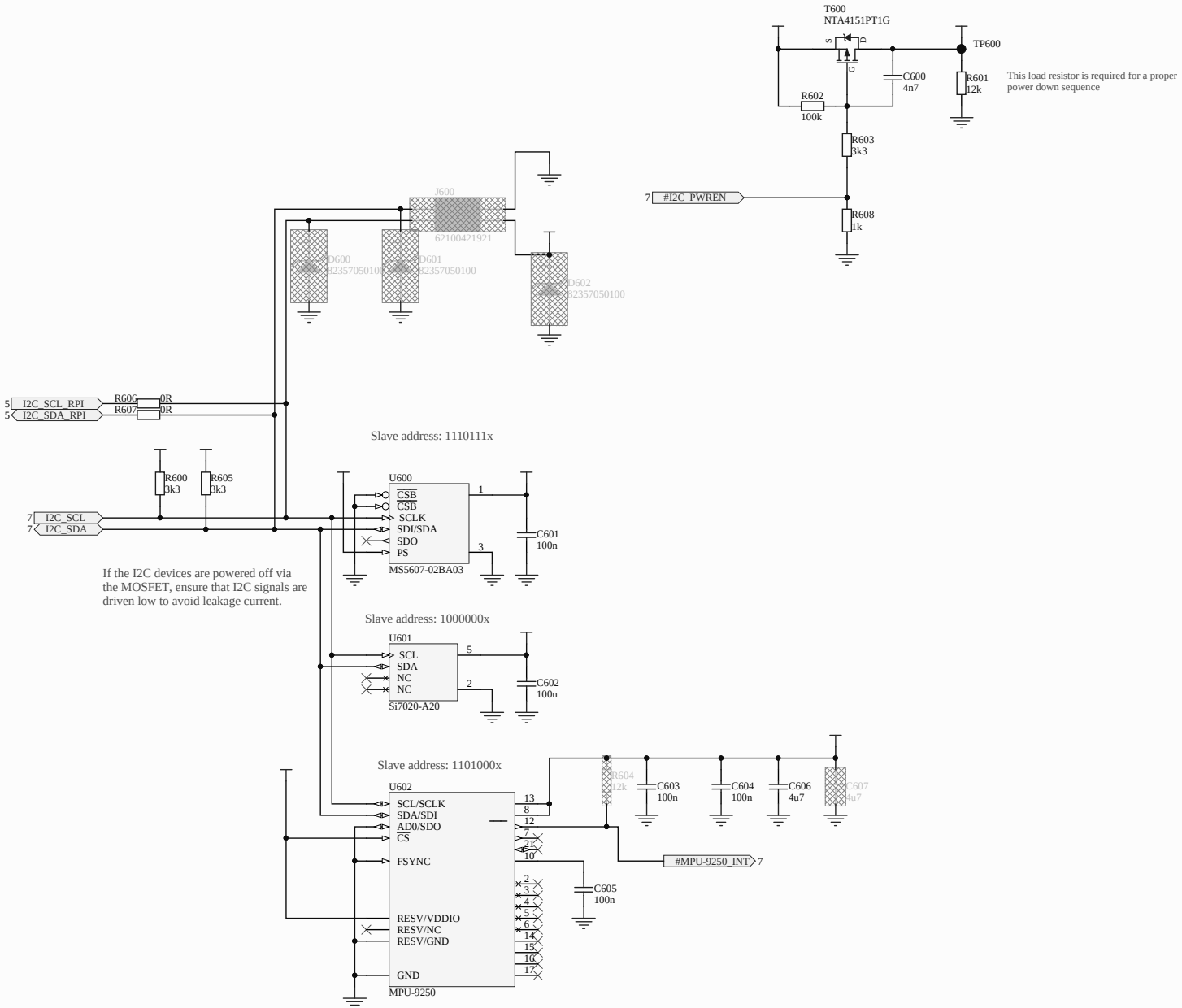

Sensors			
Drawing Number: P770010E05-Xx-SH-x		Rooco Moitesssier HAT	
Size: A3	Number: 6	Revision: E05	
Drawn by: Thomas POMS		Approved by:	
Date: 19.07.2021	Time: 08:23:24	Sheet 6 of 7	Variant X1
File: P770010E05-Xx-SH-6_Sensors.SchDoc			

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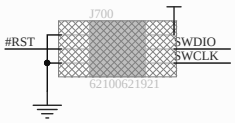
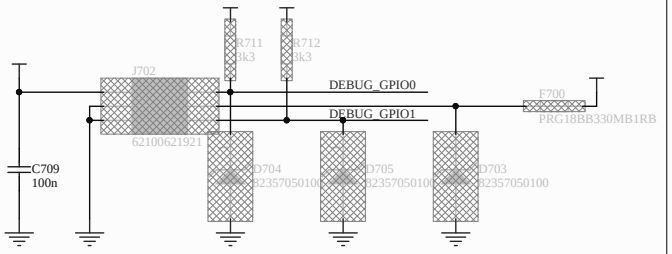
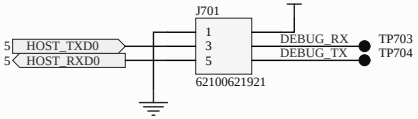


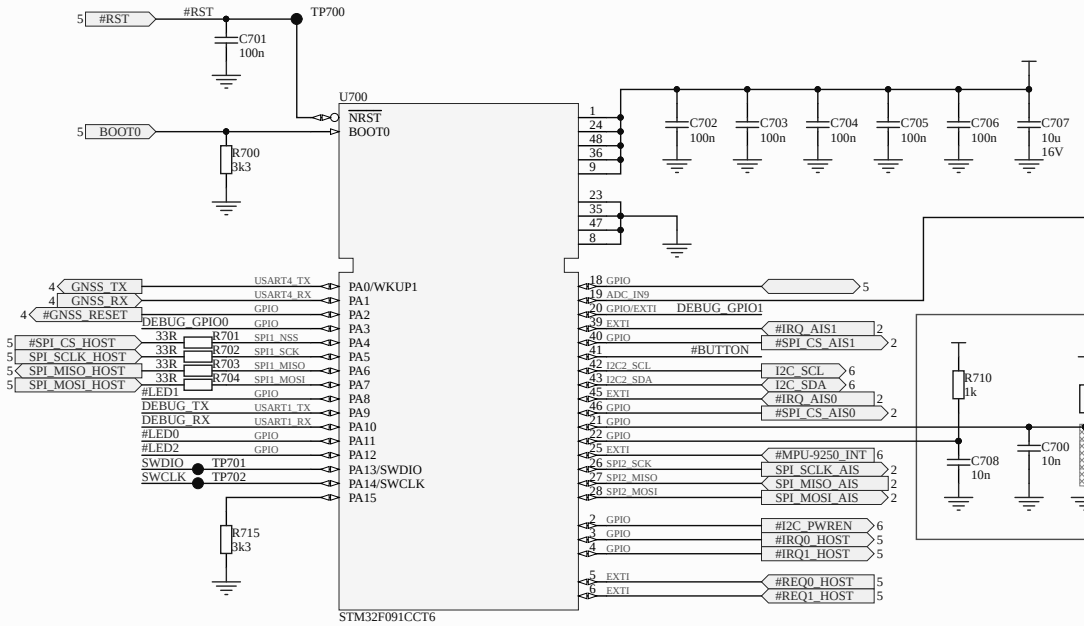
counterpart: Würth, 62000621821

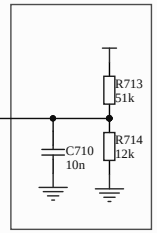
BOOT0	Boot Mode	Note
0	main flash memory	
1	system memory	embedded bootloader

boot configuration bits nBOOT1 and BOOT_SEL must be set to 1 in the user option byte





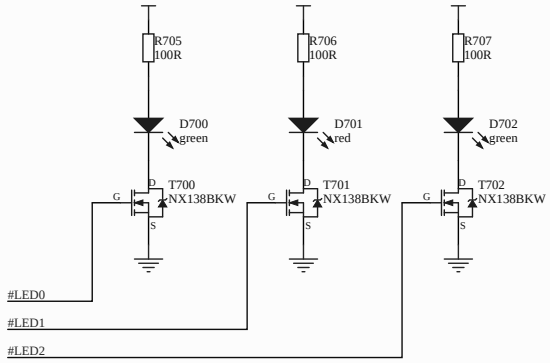




Revision:
- 253mV: E03 12k/1k
- 448mV: E04 21k/3k3
- 628mV: E05 51k/12k

Enable pull-up on PA15 and check if logic '0' --> revision can be read with analog input. If logic '1' --> board is either E01 or E02.

if both inputs (PB10 and PB11) are high, the HAT is attached to the Raspberry Pi, otherwise it is running in standalone mode



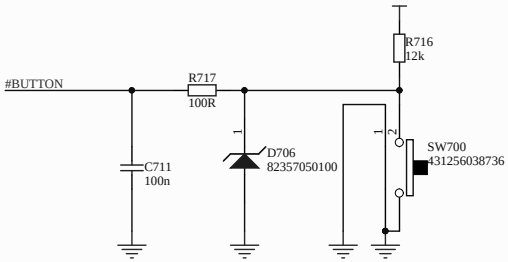
Common interrupt service routines:
- EXTI0_1_IRQn
- EXTI2_3_IRQn
- EXTI4_15_IRQn

EXTI0_1_IRQn
- EXTI0_IRQn --> #REQ0_HOST
- EXTI1_IRQn --> #REQ1_HOST

EXTI2_3_IRQn
- EXTI2_IRQn --> DEBUG_GPIO1
- EXTI3_IRQn --> #IRQ_AIS1

EXTI4_15_IRQn
- EXTI4_IRQn -->
- EXTI5_IRQn -->
- EXTI6_IRQn -->
- EXTI7_IRQn -->
- EXTI8_IRQn --> #IRQ_AIS0
- EXTI9_IRQn -->
- EXTI10_IRQn -->
- EXTI11_IRQn -->
- EXTI12_IRQn --> #MPU-9250_INT
- EXTI13_IRQn -->
- EXTI14_IRQn -->
- EXTI15_IRQn -->

Alternate parts:
- STM32F030CC, Cortex-M0, 48 MHz, 256 kB FLASH, 32 kB RAM
- STM32F091CB, Cortex-M0, 48 MHz, 128 kB FLASH, 32 kB RAM
- STM32F091CC, Cortex-M0, 48 MHz, 256 kB FLASH, 32 kB RAM
- STM32F071CB, Cortex-M0, 48 MHz, 128 kB FLASH, 32 kB RAM



Microcontroller

Drawing Number: P770010E05-Xx-SH-x	Rooco Moitesssier HAT	
Size: A3	Number: 7	Revision: E05
Drawn by: Thomas POMS	Approved by:	
Date: 19.07.2021 Time: 08:23:25	Sheet 7 of 7	Variant X1
File: P770010E05-Xx-SH-7_Microcontroller.SchDoc		

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