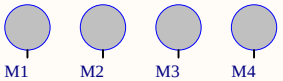
Rev	Description	Date	Author
1.0	Initial Release.	01/07/20	Yan C. de Azeredo

Revision History

Fiducials

Mechanical Holes

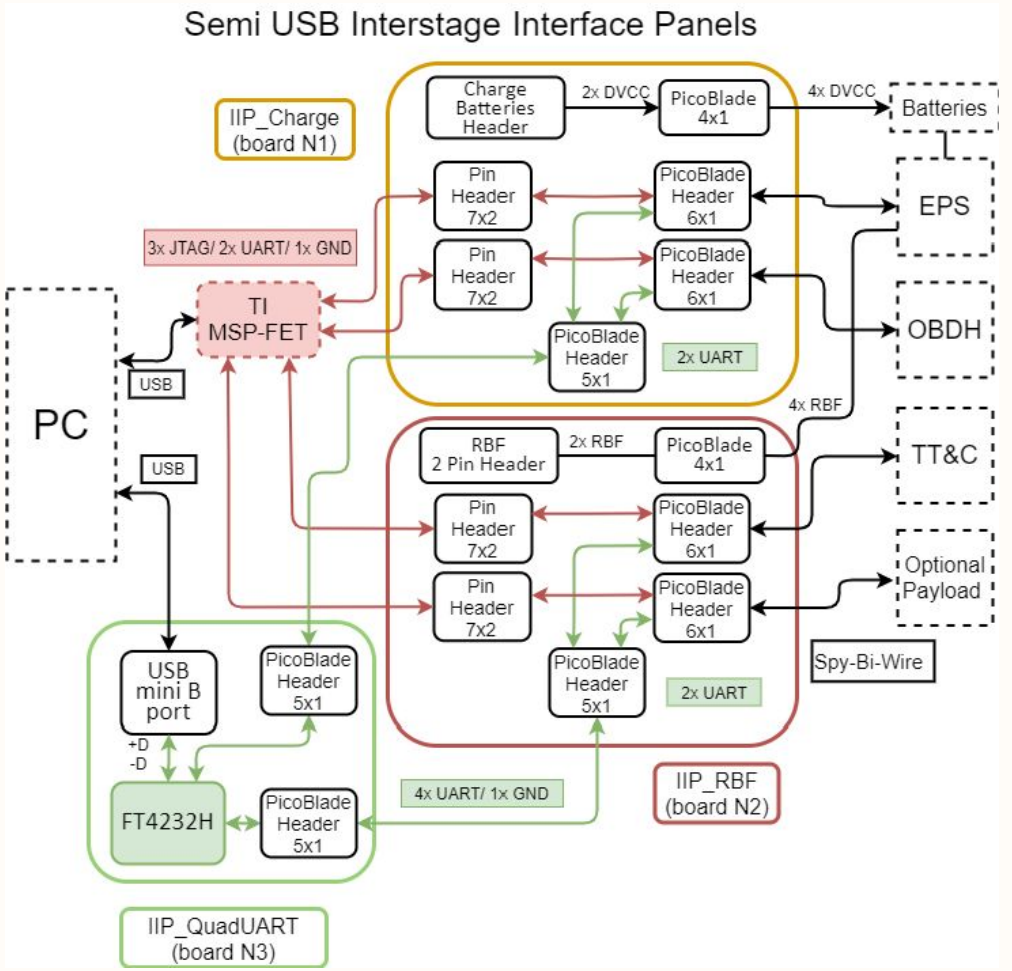


PCB Elements

Semi USB Insterstage Interface Panels of FloripaSat-2 2U CubeSat

- Drawn by: Yan Castro de Azeredo
- Reviewers: Gabriel M. Marcelino and André M. P. Mattos
- Support: Gabriel M. Marcelino, André M. P. Mattos and Kleber Gouveia
- Mechanical validation: Edemar Morsch Filho

Project Information



Full System Block Diagram

SpaceLab - Federal University of Santa Catarina			
Project: *3_iip_quad_uart.PrjPCB / [No Variations]*			
Title: *IIP Hardware Architecture*			
Designed by: *Yan Castro de Azeredo*			Project Code: *IIP*
Date: 11/29/2020	Revision: *1.0*	Sheet *1* of *2*	Size: A4

Low pass LC filters for VPLL and VPHY

3.3V — FB1 47R 100MHz 500mA — VPLL — TP1
C1 50V 100nF, C2 25V 4.7uF
FB2 47R 100MHz 500mA — VPHY — TP3
C4 50V 100nF, C5 25V 4.7uF
GND

USB VBUS Filter

Ferrite Bead 47 Ohms 500mA-100MHz FB3 47R 100MHz 500mA
C8 50V 10nF, C9 50V 100nF, C10 25V 4.7uF
5V, GND

Linear Voltage Regulator for VREGIN (LDO)

LDO specifications:
- DBV Package
- Fixed configuration
- Voltage Input (Min): 2.7 V
- Voltage Input (Max): 5.5V
- Voltage Output (Min): 3.3V
- Current Output: 200mA
- Dropout Voltage 112 mV at 200 mA

Capacitors configuration:
- Cin: 0.1uF (100nF)
- Cinr: 10nF
- Cff: 0F (fixed regulator)
- Cout: 4.7uF (recommended >2.2uF)

5V — TPS79333DBVR (IN, EN, GND, OUT, NR) — U2 — 3.3V
3V3 test point TP7
C13 50V 100nF, C12 25V 4.7uF, C14 50V 10nF
GND

Decoupling Capacitors

I/O power (VCCIO)

3.3V
C17 50V 100nF, C18 50V 100nF, C19 50V 100nF, C20 50V 100nF
GND

FT4232H core power (VCORE)

1.8V
C21 50V 100nF, C22 50V 100nF, C23 50V 100nF
GND

USB VBUS Filter

Cann: Vcc, D-, D+, ID, GND, Housing
Mini B USB 2.0 CN2
USB_SHIELD, GND
R4 DNP 0805

USB_TX_N, USB_TX_P
R1 10R USB_RX_N
R2 10R USB_RX_P

Optional zero-ohm resistor for a DC path, or capacitor for a high-frequency path between shield and signal ground to minimize signal noise and provide EMC compatibility (to be tested if required).

U1 — FT4232HL-REEL

VREGIN, VREGOUT
VPHY, VPLL
VCORE, VCORE, VCORE
VCCIO, VCCIO, VCCIO, VCCIO
ADBUS0–ADBUS7 (TX1, RX1)
BDBUS0–BDBUS7 (TX2, RX2)
CDBUS0–CDBUS7 (TX3, RX3)
DDBUS0–DDBUS7 (TX4, RX4)
DM, DP, REF, RESET#
EECS, EECLK, EEDATA
OSCI, OSCO, TEST
PWREN#, SUSPEND#
AGND, GND

3.3V — Built-in 1V8 test point TP2 — 1.8V
C3 50V 100nF, C6 25V 4.7uF, C7 50V 100nF
GND

R3 12kR — TP4
R5 10k — TP5
C11 50V 100nF
GND

From FT4232H datasheet:
"If no EEPROM is connected (or the EEPROM is blank), the FT4232H will default to serial ports. The device uses its built-in default VID (0403), PID (6011) Product Description and Power Descriptor Value."

TP6, R6 10k, TP9, TP8, R7 10k
3.3V
C15 50V 12pF, C16 50V 12pF
XTAL1 12MHz
GND

Picoblade header for board N.1

5 pin PicoBlade
GND, RX2, TX2, RX1, TX1
CN1

Picoblade header for board N.2

5 pin PicoBlade
GND, RX4, TX4, RX3, TX3
CN3

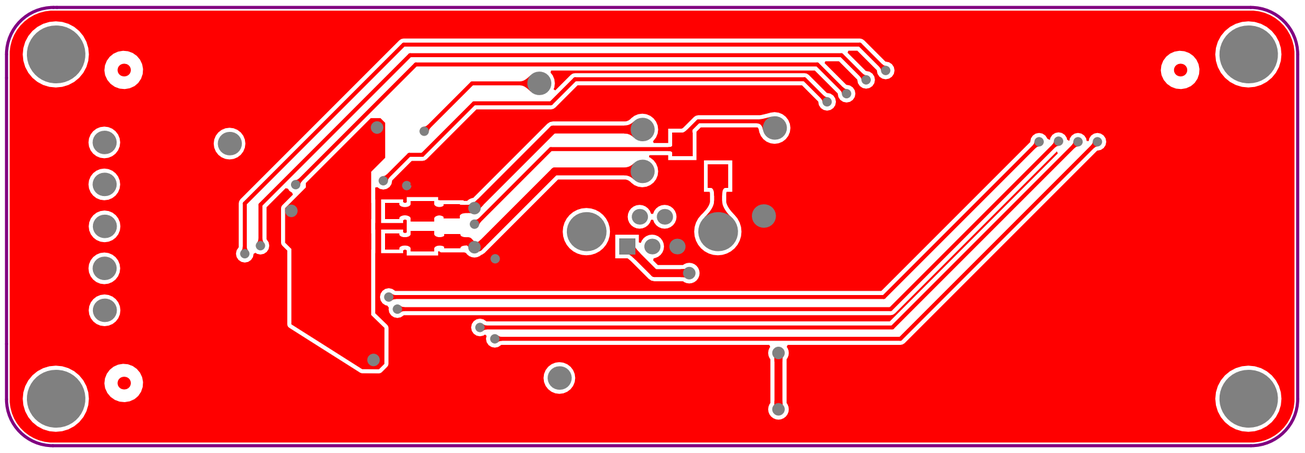
Testpoints for debugging IC

PWREN# = 0: Normal operation.
PWREN# =1: USB SUSPEND mode or device has not been configured.
SUSPEND#: Active low when USB is in suspend mode.

TP10, TP11, TP12

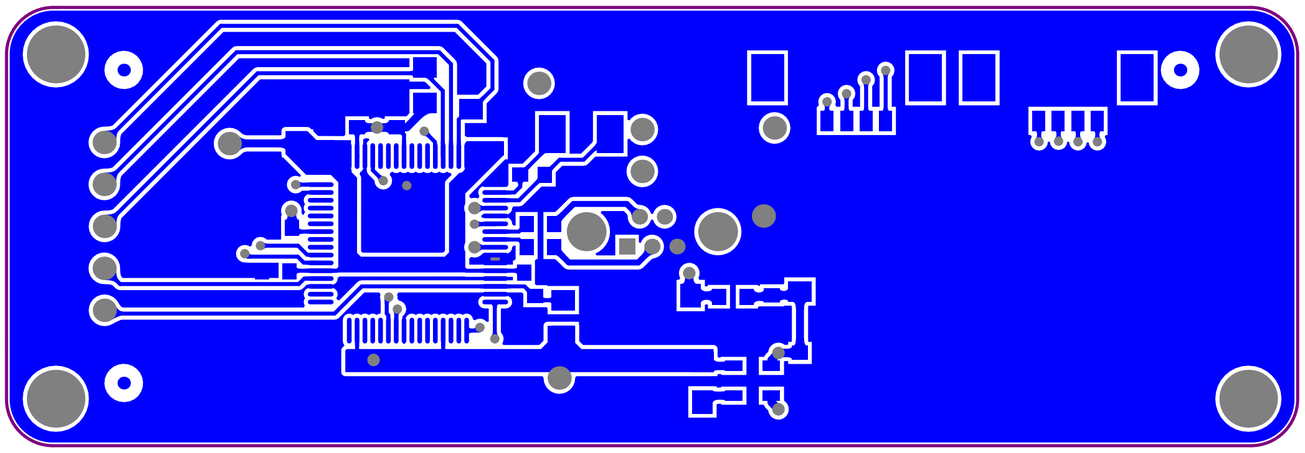
SpaceLab - Federal University of Santa Catarina			
Project: *3_iip_quad_uart.PrjPCB / [No Variations]*			
Title: *IIP N3 Board Interfaces and FT4232 Circuit*			
Designed by: *Yan Castro de Azeredo*			Project Code: *IIPN3*
Date: 11/29/2020	Revision: *1.0*	Sheet *2* of *2*	Size: A4

Layer	Name	Material	Thickness	Constant	Board Layer Stack
	Top Overlay				
	Top Solder	Solder Resist	0.40mil	3.8	
1	Top Layer	Copper	1.40mil		
	Dielectric 1	FR-4	59.06mil	4.5	
2	Bottom Layer	Copper	1.40mil		
	Bottom Solder	Solder Resist	0.40mil	3.8	
	Bottom Overlay				



TITLE: IIP N.3 BOARD QUAD UART		REV: 1.0	DATE: 15/07/2020
MATERIAL: FR4	Silkscreen color: white	Project: IIP	
Board Thickness: 1.6mm	Layers: 02	Space Technology Research Laboraty Federal University of Santa Catarina	
PCB Surface: HASL	Drawing: Yan C. de Azeredo	**SpaceLab UFSC**	

Layer	Name	Material	Thickness	Constant	Board Layer Stack
	Top Overlay				
	Top Solder	Solder Resist	0.40mil	3.8	
1	Top Layer	Copper	1.40mil		
	Dielectric 1	FR-4	59.06mil	4.5	
2	Bottom Layer	Copper	1.40mil		
	Bottom Solder	Solder Resist	0.40mil	3.8	
	Bottom Overlay				



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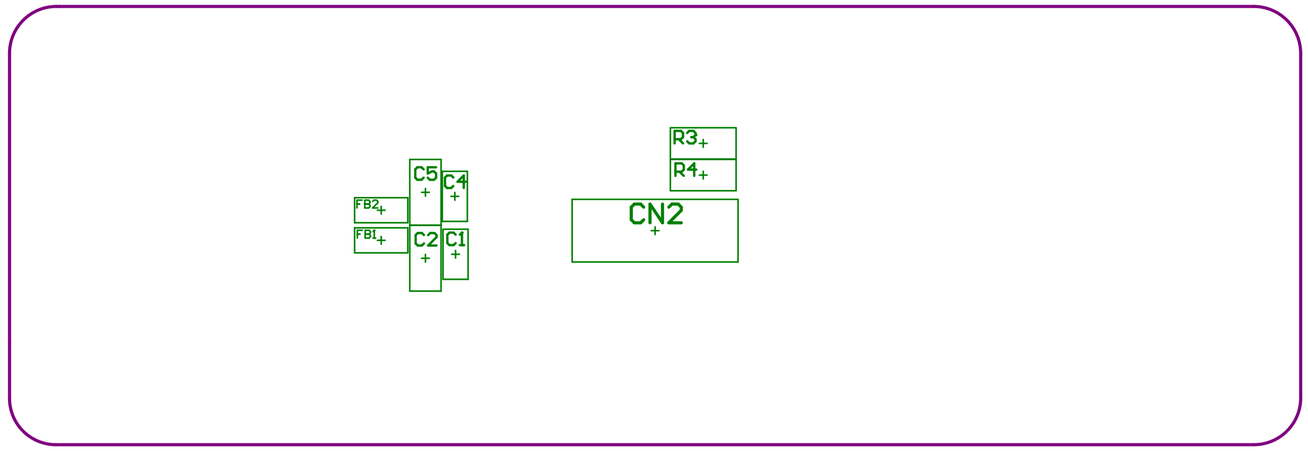
	Bottom Overlay				



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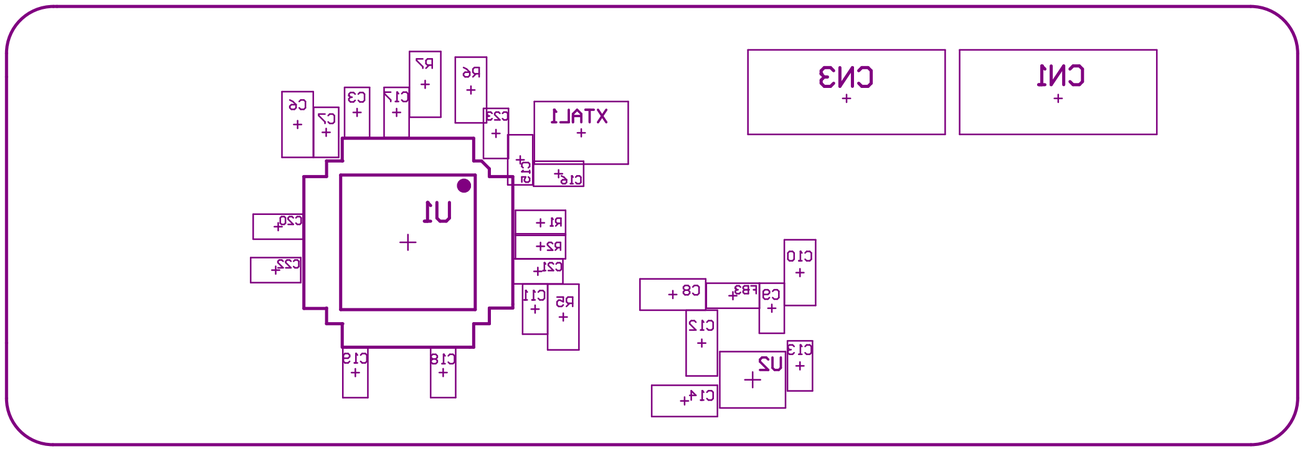

TITLE: IIP N.3 BOARD QUAD UART		REV: 1.0	DATE: 15/07/2020
MATERIAL: FR4	Silkscreen color: white	Project: IIP	
Board Thickness: 1.6mm	Layers: 02	Space Technology Research Laboraty Federal University of Santa Catarina	
PCB Surface: HASL	Drawing: Yan C. de Azeredo	**SpaceLab UFSC**	

Bill of Materials

Source Data From:	3_iip_quad_uart.PrjPCB
Project:	3_iip_quad_uart.PrjPCB
Variant:	None
Project Code:	IIPN3
Report Date:	11/29/2020 11:35 PM
Print Date:	29/11/2020 23:35:17

#	Designator	Quantity	Manufacturer	Manufacturer Part Number	#Column Name Error:' Partnumber	Description	lumn Name Error:' P	Footprint	Mount	Fitted
1	11, C13, C17, C18, C19	14	TDK	C1608X7R1H104K080AA		TDK - C1608X7R1H104K080AA - SMD Multilayer Ceramic Capacitor, 0.1 µF, 50 V, 0603 [1608 Metric], ± 10%, X7R, C Series		C0603_MD	Surface Mount	Fitted
2	C2, C5, C6, C10, C12	5	TDK	C2012X7R1E475K125AB		Ceramic Capacitor SMD Multilayer, 0805 [2012 Metric], 4.7 uF, 25 V, 10%, X7R, C Series		C0805_MD	Surface Mount	Fitted
3	FB1, FB2, FB3	3	Wurth Electronics	742792608		WURTH ELEKTRONIK 742792608 FERRITE BEAD, 0.1 OHM, 0.5A, 0603		L0603	Surface Mount	Fitted
4	R5, R6, R7	3	Vishay Dale	CRCW080510K0FKEA		RES 10.0K OHM 1/8W 1% 0805 SMD		R0805_MD		Fitted
5	C8, C14	2	Kyocera AVX	08055C103KAT4A		AVX - 08055C103KAT4A - SMD Multilayer Ceramic Capacitor, 10000 pF, 50 V, 0805 [2012 Metric], ± 10%, X7R		C0805_MD	Surface Mount	Fitted
6	CN1, CN3	2	Molex	53398-0571		Wire-To-Board Connector, Vertical, PicoBlade 53398 Series, Surface Mount, Header, 5, 1.25 mm		PICO BLADE 0533980571	Surface Mount	Fitted
7	C15, C16	2	Samsung	CL10C120JB8NNNC		Cap Ceramic 12pF 50VDC C0G 5% SMD 0603 Paper T/R		C0603_MD	Surface Mount	Fitted
8	R1, R2	2	Yageo	RC0603FR-0710RL		YAGEO (PHYCOMP) - RC0603FR-0710RL - RES, THICK FILM, 10R, 1%, 0.1W, 0603		R0603_MD		Fitted
9	CN2	1	Wurth Electronics	6.51005E+11		WURTH ELEKTRONIK - 651005136421 - Conector USB, Mini USB Tipo B, USB 2.0, Receptáculo, 5 Vías, Montaje de Agujero Pasante, Vertical		MINI USB B 180GRAUS WE	Through Hole,Vertical	Fitted
10	XTAL1	1	TXC	AA-12.000MAGE-T		Crystals 12.000MHz 30ppm 12pF -40C to 85C		TXC 7A Series	Surface Mount	Fitted
11	R4	1	Vishay	CRCW080500000Z0EA		VISHAY - CRCW080500000Z0EA - SMD Chip Resistor, Jumper, 0805 [2012 Metric], 0 ohm, CRCW e3 Series, 150 V, Thick Film, 125 mW		R0805_MD		Fitted
12	U1	1	FTDI	FT4232HL-REEL		FTDI - FT4232HL-REEL - USB-UART/MPSSE, 4232, QUAD, 64LQFP		LQFP-64	Surface Mount	Fitted
13	R3	1	Stackpole Electronics	RMCF0805FT12K0		Resistor, SMT, 0805, 12K Ohm, +/-1%, +/-100ppm, Thk Film, T/R Marked		R0805_MD	Surface Mount	Fitted
14	U2	1	Texas Instruments	TPS79333DBVR		TEXAS INSTRUMENTS - TPS79333DBVR - IC, V REG, LINEAR, 0.2A, SOT-23-5		SOT23-5		Fitted