ELECTRONICA EUTIMIO

CHARGER V15	
1. REVISION	2.2
2. DATE	06/06/2022
3. AUTHOR	Ignacio Diz Castro
4. APPROVED BY	

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AN1, AN2	POWER TREE, HSI

REVISION HISTORY		
REVISION	**DATE**	**DESCRIPTION**
v1.1	08/02/2023	Added 1x SMAJ20CA for each Battery Connection Pad
v1.1	08/02/2023	Modified all voltage divider factors (V CHANNEL[5:1] and I CHANNEL [5:1])
v1.1	08/02/2023	Current Shunt Resistors From 0.1R to 0.05R
v1.2	08/02/2023	Revoved CH2:5 Buck Converters
v1.2	08/02/2023	Added Blocking Diode After All Channel P-MOS
v1.3	14/02/2023	Charging Ports P-MOSFETs, New Part Number DMP2123L-7, 20V 3A
v1.4	14/02/2023	Reduced VGS diviger for All 5x DMP2123L downto 5.4V
v1.5	14/02/2023	Modified VGS divider for Q2
v1.6	23/05/2023	Added Depletion Mode NMOS for Constant Current Regulation
v1.6	24/05/2023	PMOS Load Switch Q25, Q26, Q27, Q28, Q29 replaced by IRF7416TRPBF
v1.6	24/05/2023	PMOS Load Switch Q25, Q26, Q27, Q28, Q29 replaced by IRF7416TRPBF
v1.6	24/05/2023	Placed U20 5A Converter with TPS54541
v1.7	24/05/2023	Placed ESP32 and ARM Programming Connectors
v1.7	24/05/2023	Revoved Window Comparator Circuitry for DC-Input
v1.7	24/05/2023	Charging Ports P-MOS VGS Divider 'R1' changed to 7.68K For VGS 4.9V @19V
v1.7	24/05/2023	Q2 P-MOS VGS Divider 'R1' changed to 34K For VGS 10V @24V
v1.7	24/05/2023	Changed VPSU Voltage Divider Factor due to ADC Impedance Issues
v1.7	24/05/2023	Changed Channel Voltage Divider Factor due to ADC Impedance Issues
v1.7	24/05/2023	Added Voltage Sensing for 19V PSU at P014, G1_SW moved to P409
v1.8	26/05/2023	Fixed Schematic Off-Grids
v1.8	26/05/2023	Added 2X 100uF Bulk Capacitance After Q2 50PEV100M10X10
v1.9	27/05/2023	Added C77 for Q2 Inrush Control
v1.9	27/05/2023	Added Serial Resistors to UART0 nd UART2 (MS)
v2.0	27/05/2023	Added 0R Labyrinth for MS UART selection between MCU and ESP32
v2.1	28/05/2023	Removed C75 100uF, Inserted Power On Switch MS Connection Pads

Title:	[00] - COVER SHEET.SchDoc		
Project:	CHARGER V15	Rev:	*
Author:	Ignacio Diz Castro	Size:	A3
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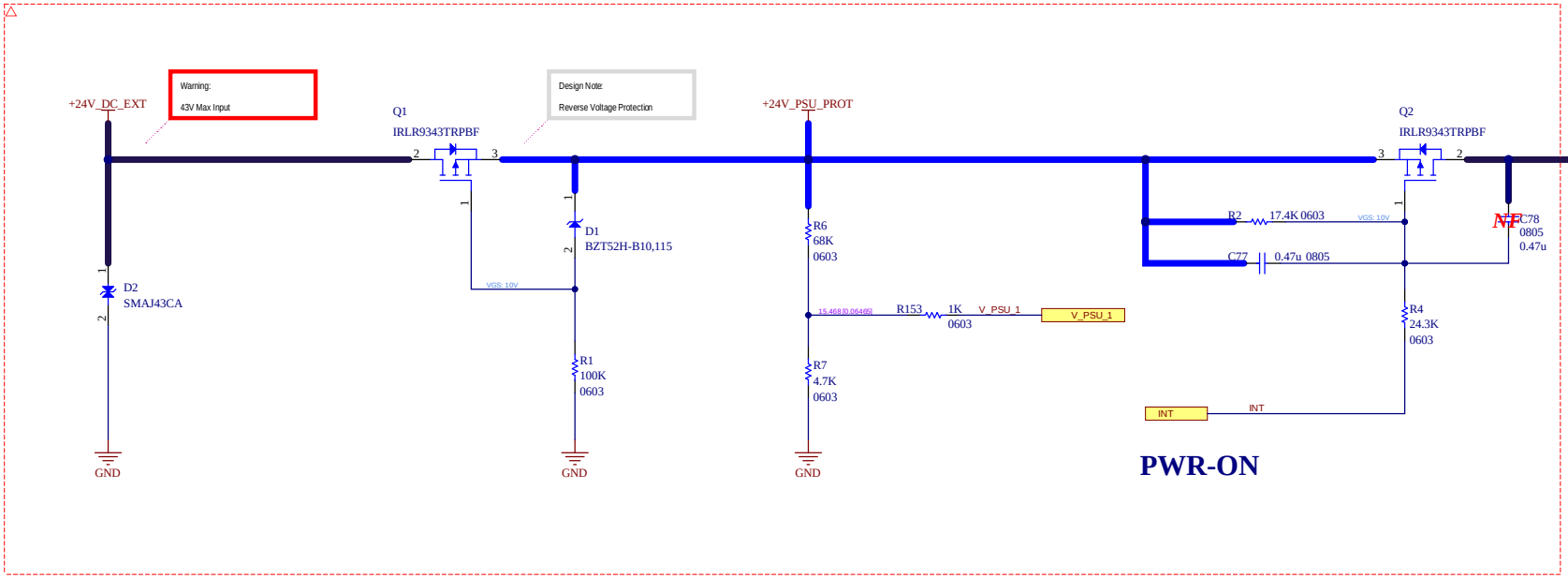
File:	C:\Users\Pablo\Documents\Altium\ELECTRONICA EUTIMIO\CHARGER V15_2\[00] - COVER SHEET.SchDoc		

ELECTRONICA EUTIMIO

POWER IN

Fit If Master Board



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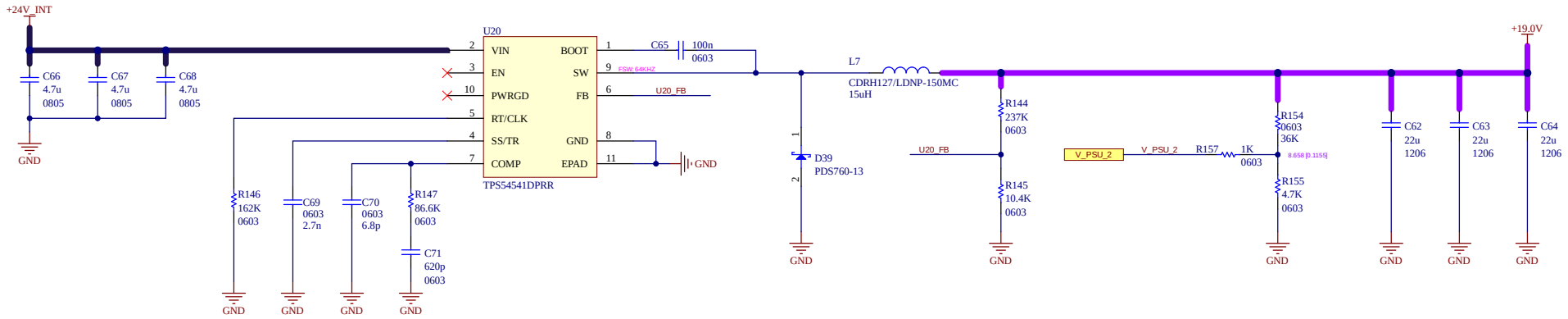
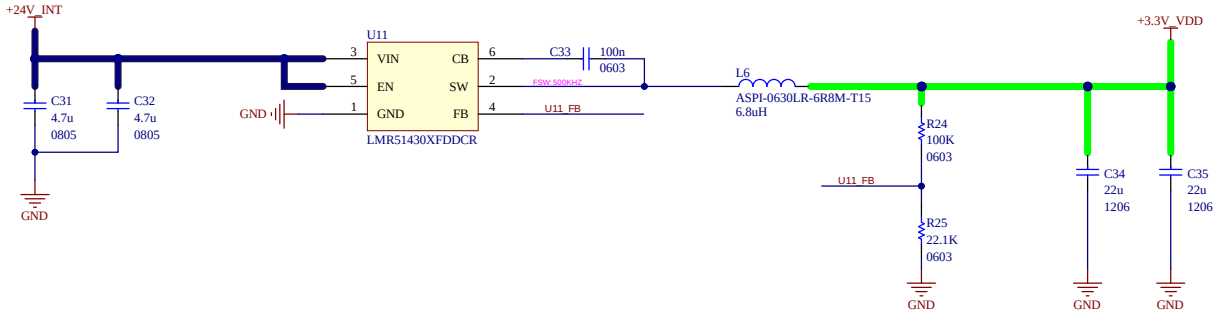
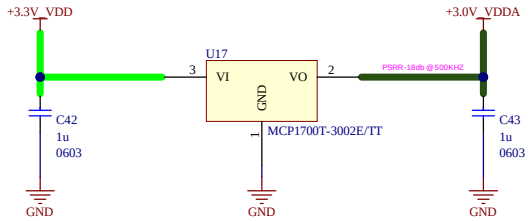
POWER







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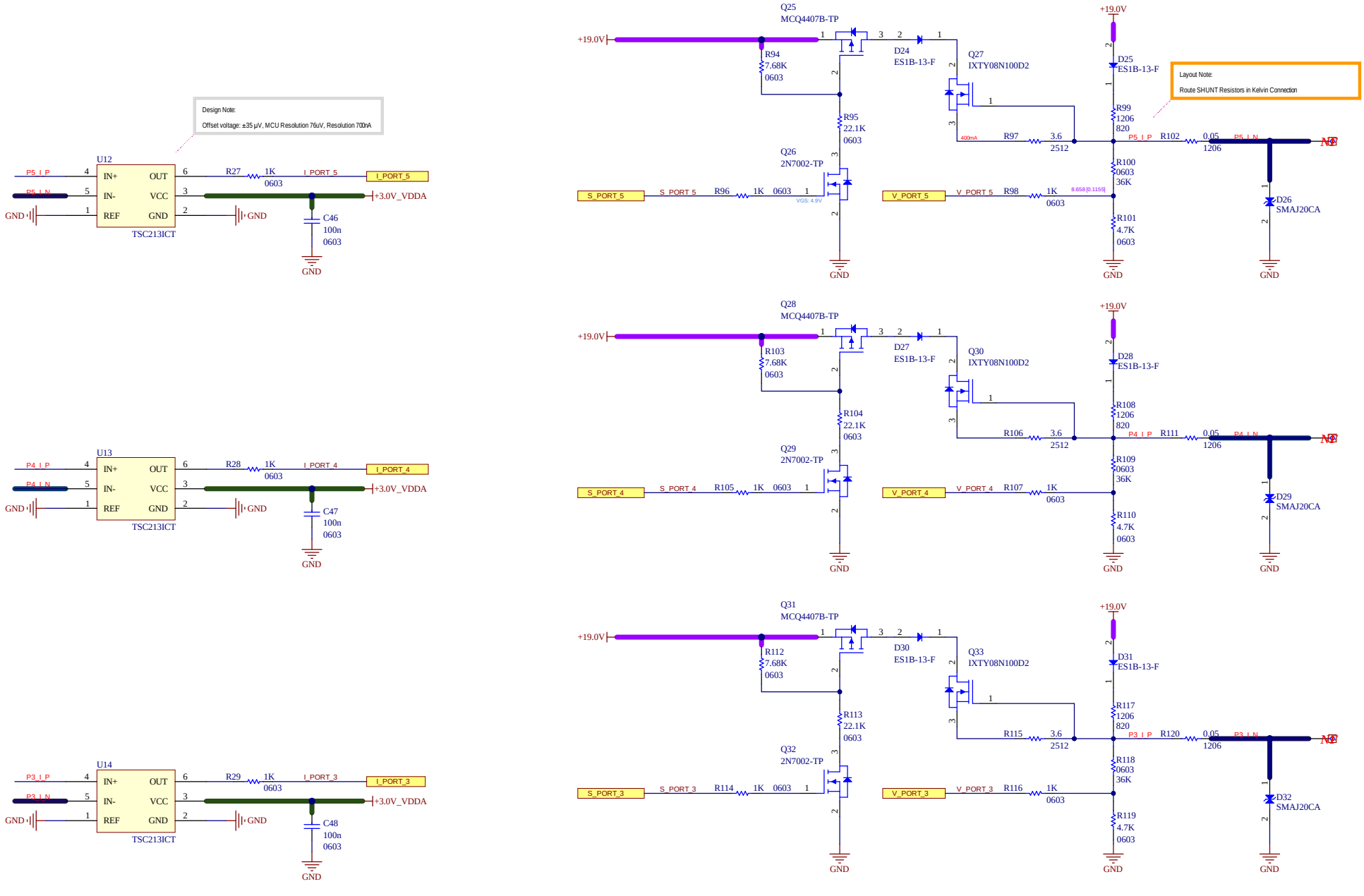
CHARGE PORTS A



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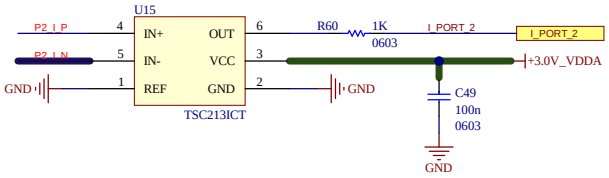
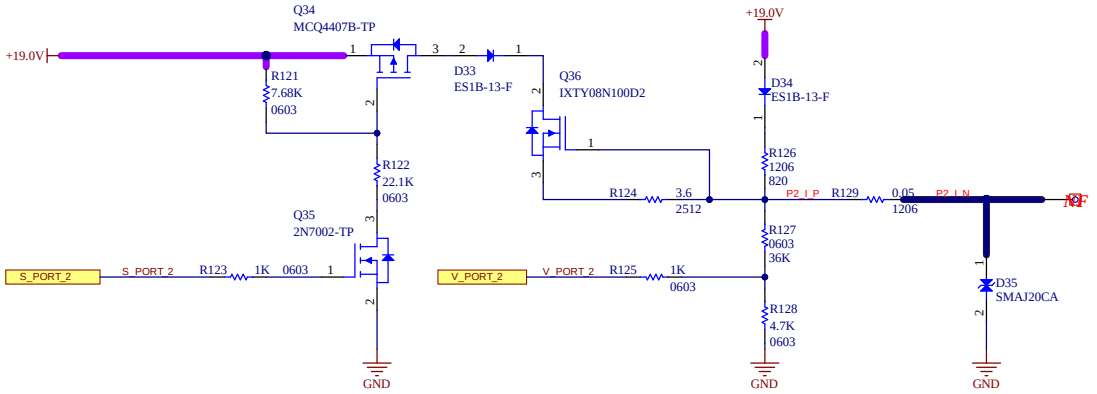
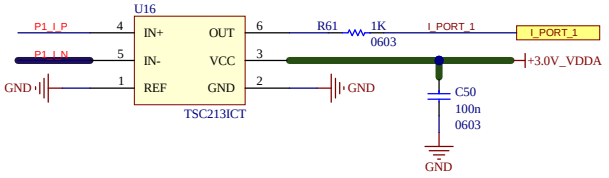
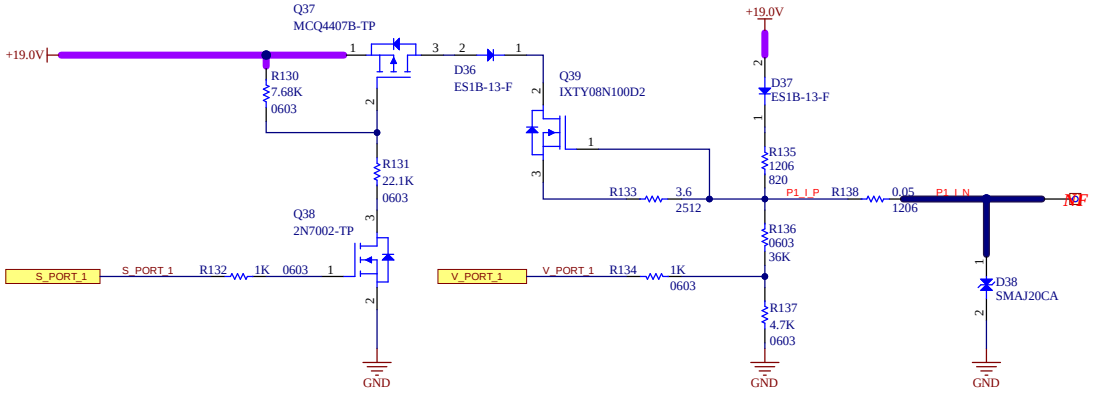
CHARGE PORTS B









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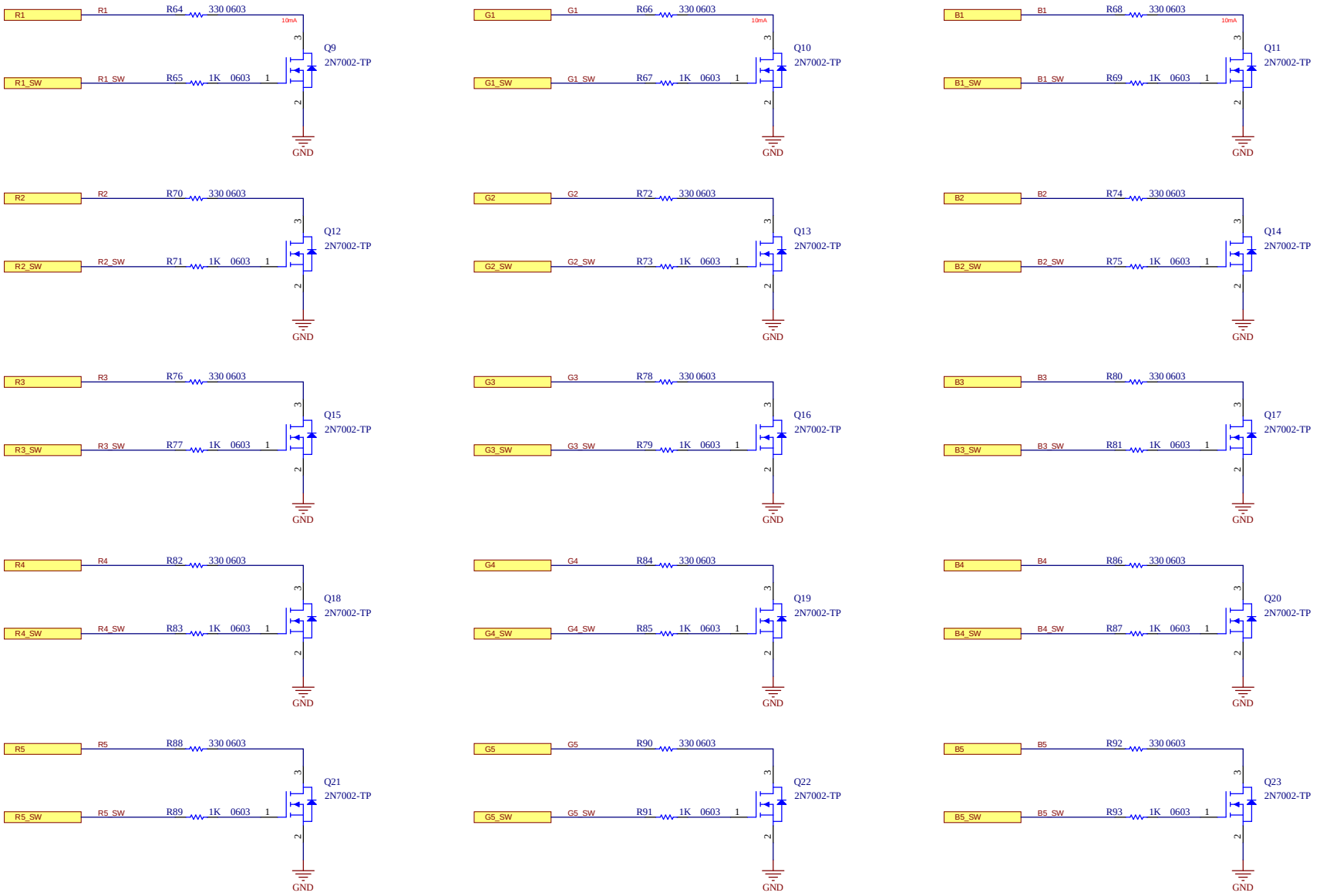
LED PORTS



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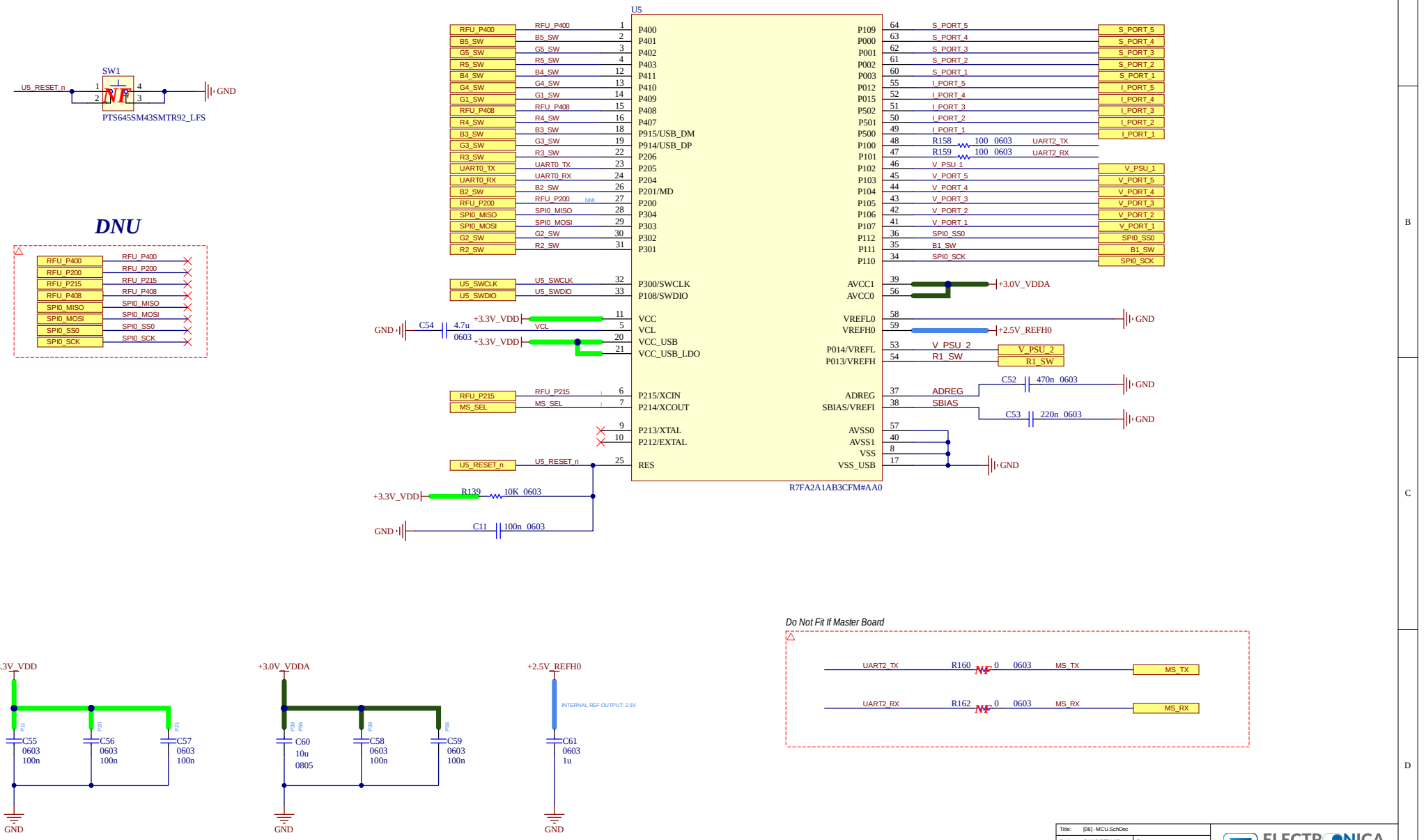
MCU



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Date:	22/02/2023
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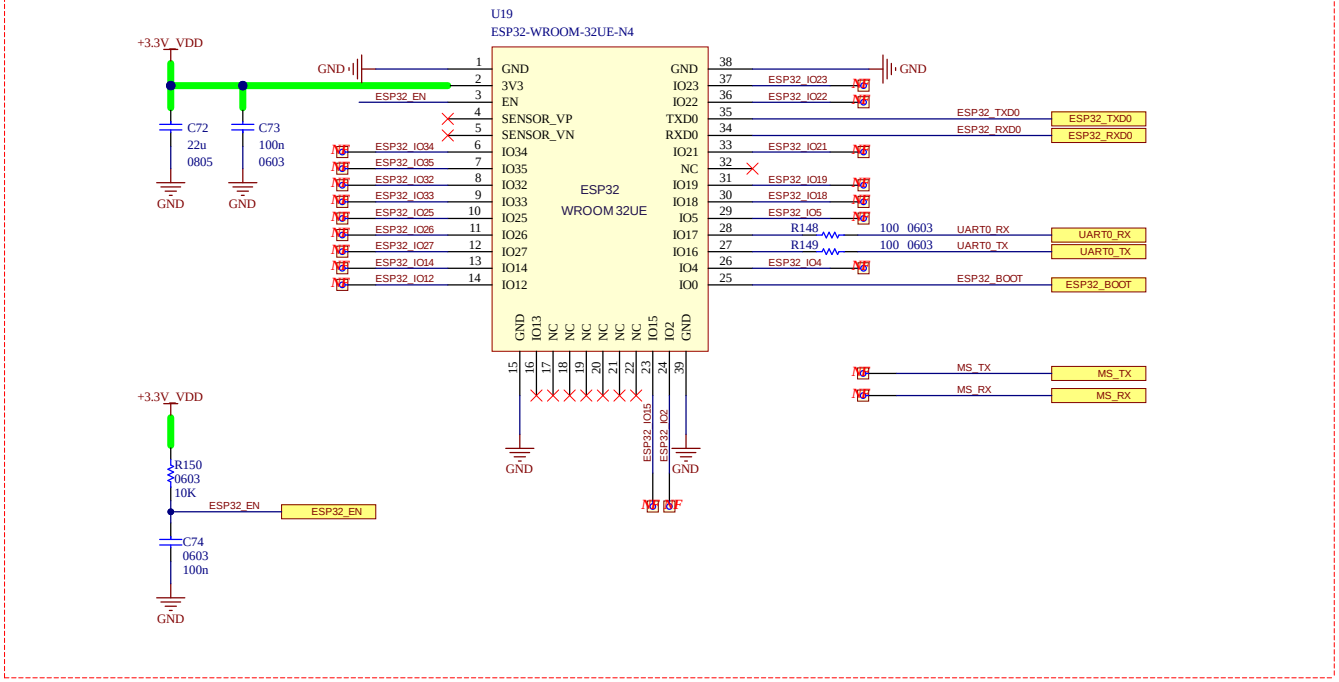
ESP32

Fit If Master Board



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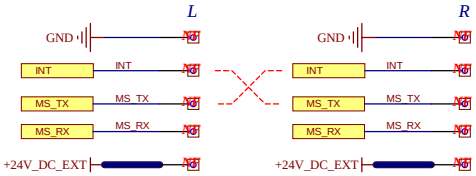
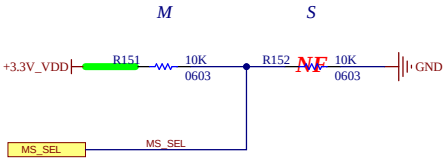
CONNECTORS

DC Power Input

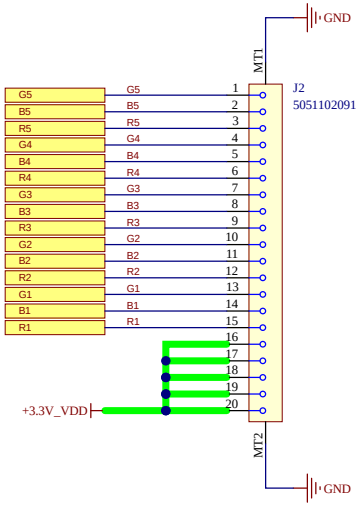
Board 2 Board Interconn



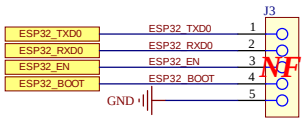
Master-Slave Configuration



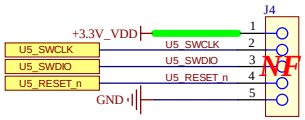
LED Panel Connector



ESP32 Flash Connector



ARM JTAG Connector



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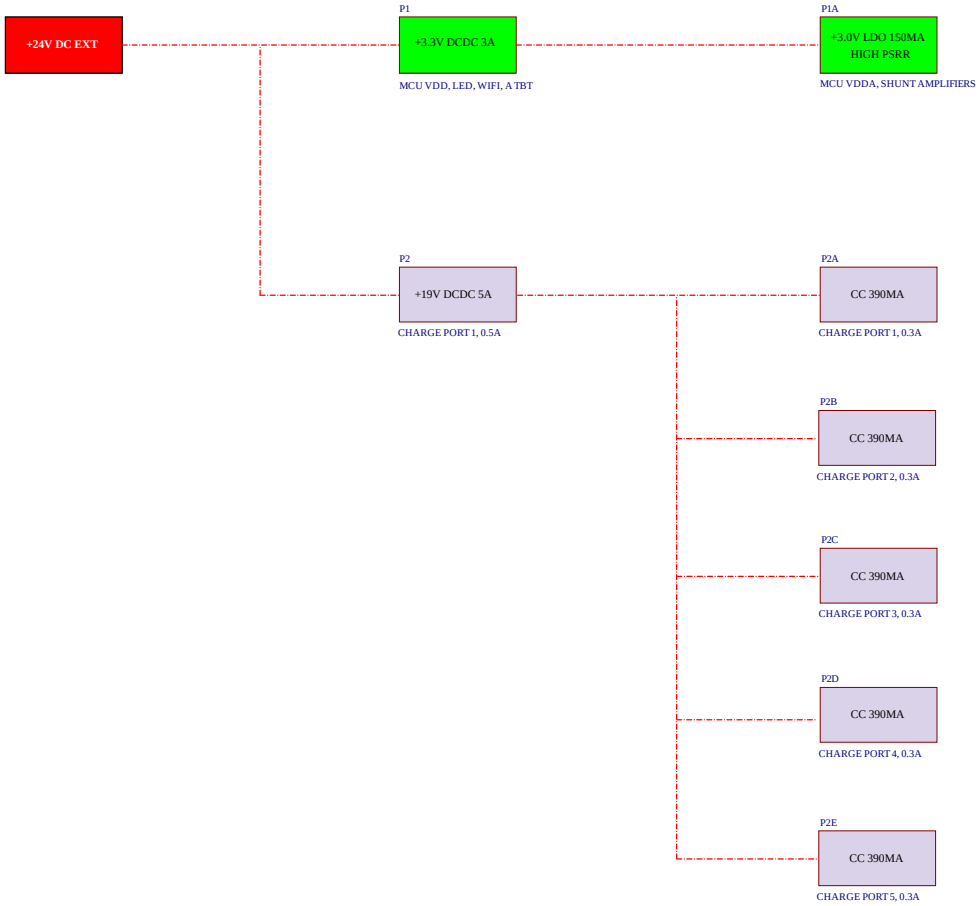
POWER TREE



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ELECTRONICA EUTIMIO

HSI

HARDWARE - SOFTWARE INTERFACE

R7FA2A1AB3CFM#AA0

Pin Number	Name	Alternative Function	Description	Use	End Application
1	P400	P400	Digital Input, IRQ Capable	GPIO / IN	RFU
2	P401	P401	Digital Output	GPIO / OUT	LED B5 SW
3	P402	P402	Digital Output	GPIO / OUT	LED G5 SW
4	P403	P403	Digital Output	GPIO / OUT	LED R5 SW
5	VCL	POWER	POWER	PWR	
6	P215	P215	Digital Input Only	GPIO / IN	RFU
7	P214	P214	Digital Input Only	GPIO / IN	RFU
8	VSS	POWER	POWER	PWR	
9	P213	XTAL	12 Mhz Quartz External	OSC	XTAL
10	P212	EXTAL	12 Mhz Quartz External	OSC	XTAL
11	VCC	POWER	POWER	PWR	
12	P411	P411	Digital Output	GPIO / OUT	LED B4 SW
13	P410	P410 / SS2	Digital Output	GPIO / OUT	LED G4 SW
14	P409	IIC0 SCL	I2C0 SCL N-CH Open Drain	I2C0 SCL	I2C0 SCL
15	P408	IIC0 SDA	I2C0 SDAL N-CH Open Drain	I2C0 SDA	I2C0 SDA
16	P407	P407	Digital Output	GPIO / OUT	LED R4 SW
17	VSS_USB	POWER	POWER	PWR	
18	P915	P915	Digital Output	GPIO / OUT	LED B3 SW
19	P914	P914	Digital Output	GPIO / OUT	LED G3 SW
20	VCC_USB	POWER	POWER	PWR	
21	VCC_USB_LDO	POWER	POWER	PWR	
22	P206	P206	Digital Output	GPIO / OUT	LED R3 SW
23	P205	SCI0 TXD	UART 0 TX	UART 0 TX	UART 0 TX
24	P204	SCI0 RXD	UART 0 RX	UART 0 RX	UART 0 RX
25	RESET	RESET	DEBUG	RESET	RESET
26	P201	P201	Digital Output	GPIO / OUT	LED B2 SW
27	P200	P200	Digital Input Only NMI	GPIO / IN	RFU
28	P304	SPI0 MISO	SPI0 MISO	SPI0 MISO	SPI0 MISO
29	P303	SPI0 MOSI	SPI0 MOSI	SPI0 MOSI	SPI0 MOSI
30	P302	P302	Digital Output	GPIO / OUT	LED G2 SW
31	P301	P301	Digital Output	GPIO / OUT	LED R2 SW
32	P300	SWCLK	DEBUG	DEBUG	SWCLK
33	P108	SWDIO	DEBUG	DEBUG	SWDIO
34	P110	SPI0 RSPCK	SPI0 RSPCK	SPI0 SCK	SPI0 SCK
35	P111	GPIO	Digital Output	GPIO / OUT	LED B1 SW
36	P112	SPI0 SSL0	SPI0 SSL0	SPI0 SS0	SPI0 SS0
37	ADREG	POWER	POWER	PWR	
38	VREFI_SBIAS	POWER	POWER	PWR	
39	AVCC1	POWER	POWER	PWR	
40	AVSS1	POWER	POWER	PWR	
41	P107	AN23	ADC Input 23	Port 1 Voltage	Port 1 Voltage
42	P106	AN22	ADC Input 22	Port 2 Voltage	Port 2 Voltage
43	P105	AN21	ADC Input 21	Port 3 Voltage	Port 3 Voltage
44	P104	AN20	ADC Input 20	Port 4 Voltage	Port 4 Voltage
45	P103	AN19	ADC Input 19	Port 5 Voltage	Port 5 Voltage
46	P102	AN18	ADC Input 18	PSU Voltage	PSU Voltage
47	P101	SCI9 RXD	UART 9 RX	UART 9 RX	UART 9 RX
48	P100	SCI9 TXD	UART 9 TX	UART 9 TX	UART 9 TX
49	P500	AN00	ADC Input 0	Port 1 Current	Port 1 Current
50	P501	AN01	ADC Input 1	Port 2 Current	Port 2 Current
51	P502	AN02	ADC Input 2	Port 3 Current	Port 3 Current
52	P015	AN03	ADC Input 3	Port 4 Current	Port 4 Current
53	P014	P014	Digital Output	GPIO / OUT	LED G1 SW
54	P013	P013	Digital Output	GPIO / OUT	LED R1 SW
55	P012	AN08	ADC Input 8	Port 5 Current	Port 5 Current
56	AVCC0	POWER	POWER	PWR	
57	AVSS0	POWER	POWER	PWR	
58	VREFL0	POWER	POWER	PWR	
59	VREFH0	POWER	POWER	PWR	
60	P003	P003	Digital Output	GPIO / OUT	Port 1 Switch
61	P002	P002	Digital Output	GPIO / OUT	Port 2 Switch
62	P001	P001	Digital Output	GPIO / OUT	Port 3 Switch
63	P000	P000	Digital Output	GPIO / OUT	Port 4 Switch
64	P109	P109	Digital Output	GPIO / OUT	Port 5 Switch

Title:	[ANZ] - HSI.SchDoc		
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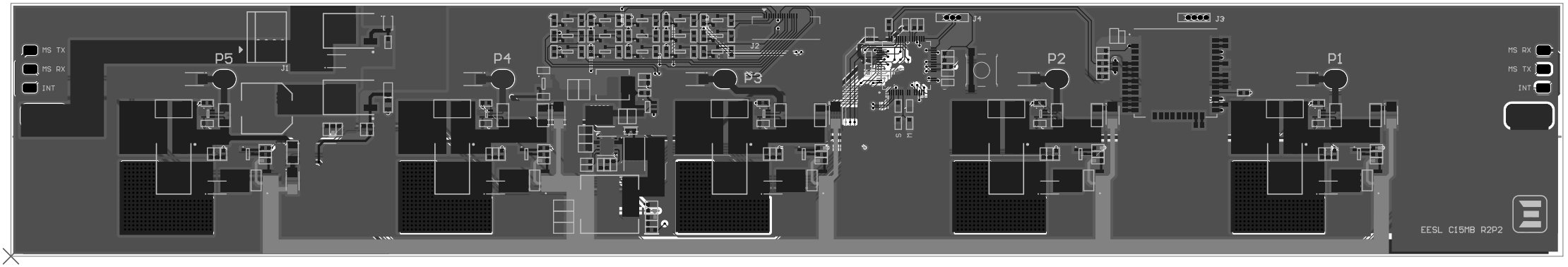
ELECTRONICA EUTIMIO

	Layer	Name	Material	Thickness	Constant	Board Layer Stack
		Top Overlay				
		Top Solder	Solder Resist	0,010mm	3.5	
SIGNAL	1	[L1] - TOP LAYER	CF-004	0,035mm		
		Dielectric 1	PP-006	0,175mm	4.1	
PLANE	2	[L2] - GND	CF-004	0,035mm		
		Core	FR-4	1,130mm	4.8	
SIGNAL	3	[L3] - POWER	CF-004	0,035mm		
		Dielectric 2	PP-006	0,175mm	4.1	
SIGNAL	4	[L4] - BOTTOM LAYER	CF-004	0,035mm		
		Bottom Solder	Solder Resist	0,010mm	3.5	
		Bottom Overlay				
	Total board thickness:			1,640mm		

Minumum Clearance: 0.20mm Minumum Drill: 0.25mm Minumum Trace Width: 0.2mm



Board Stack Report