FPGA with embedded PSRAM

U7
GW2AR-18-144P

BANK 5

ADC_DI2_P	38	IOB5A/DQ4
ADC_DI2_M	39	IOB5B/DQ4
ADC_DI3_P	40	IOB6A/LVDS/DQ4
ADC_DI3_M	41	IOB6A/LVDS/DQ4
ADC_DI4_P	42	IOB7A/DQ4
ADC_DI4_M	43	IOB7B/DQ4
ADC_DI5_P	44	IOB12A/LVDS/DQ5
ADC_DI5_M	45	IOB12B/LVDS/DQ5
ADC_DI6_P	46	IOB14A/LVDS/DQ5
ADC_DI6_M	47	IOB14B/LVDS/DQ5
ADC_DI7_P	48	IOB17A/DQ5
ADC_DI7_M	49	IOB17B/DQ5
ADC_DCLK_P	50	IOB20A/LVDS/DQ5
ADC_DCLK_M	51	IOB20B/LVDS/DQ5
ADC_OR_M	52	IOB22A/LVDS/DQ5
ADC_OR_P	54	IOB22B/LVDS/DQ5

BANK 6

ADC_DID5_P	25	IOL29A/GCLKT_6/LVDS/DQ2
ADC_DID5_M	26	IOL29B/GCLKC_6/LVDS/DQ2
ADC_DID4_P	23	IOL32A/DQ2
ADC_DID4_M	24	IOL32B/DQ2
ADC_DID6_P	27	IOL33A/LVDS/DQ2
ADC_DID6_M	28	IOL33B/LVDS/DQ2
ADC_DID7_P	29	IOL36A/DQS2
ADC_DID7_M	30	IOL36B/DQS2
ADC_DI0_P	32	IOL42A/LVDS/DQ2
ADC_DI0_M	33	IOL42B/LVDS/DQ2
ADC_DI1_P	34	IOL45A/LPLL2_T_IN/DQ2
ADC_DI1_M	35	IOL45B/LPLL2_C_IN/DQ2

BANK 7

ADC_DID0_P	3	IOL2A/LVDS/DQ0
ADC_DID0_M	4	IOL2B/LVDS/DQ0
ADC_DID1_P	6	IOL7A/LPLL1_T_IN/DQ0
ADC_DID1_M	7	IOL7B/LPLL1_C_IN/DQ0
ADC_DID2_P	9	IOL22A/LVDS/DQS1
ADC_DID2_M	10	IOL22B/LVDS/DQS1
ADC_DID3_P	11	IOL27A/GCLKT_7/DQ1
ADC_DID3_M	12	IOL27B/GCLKC_7/DQ1

DEDICATED PINS

MODE0	144	MODE0
MODE1	142	MODE1
MODE2	143	MODE2
EXTR	75	EXTR

POWER SUPPLY

F1V1

	8	VCCPLLL0
	104	VCCPLLR0
	81	VCCPLLR1
	1	VCC/VCCPLLL1
	36	VCC/VCCPLLL1
	73	VCC/VCCPLLL1
	108	VCC/VCCPLLL1

F3V3

	127	VCCO0
	109	VCCO1
	77	VCCO3
	91	VCCO3
	55	VCCO4
	37	VCCO5
	31	VCCX/VCCO4/VCCO6

F1V9

	5	VCCX/VCCO2/VCCO6/VCCO7
	19	VCCX/VCCO2/VCCO6/VCCO7
	103	VCCX/VCCO2/VCCO6/VCCO7
	2	VSS
	17	VSS
	53	VSS
	74	VSS
	89	VSS
	107	VSS

GND

BANK 0

IOT2B/LVDS/DQ15	141	DAC_CLK
IOT4A/LVDS/DQ15	140	DAC_D1
IOT4B/LVDS/DQ15	139	DAC_D2
IOT6A/LVDS/DQ15	138	DAC_D3
IOT6B/LVDS/DQ15	137	DAC_D4
IOT7A/DQ15	136	DAC_D5
IOT7B/DQ15	135	DAC_D6
IOT12A/LVDS/DQ14	134	DAC_D7
IOT12B/LVDS/DQ14	133	DAC_D8
IOT14A/LVDS/DQ14	132	DAC_D9
IOT14B/LVDS/DQ14	131	DAC_D10
IOT17A/DQ14	130	DAC_D11
IOT17B/DQ14	129	DAC_D12
IOT19A/DQ14	128	POWER_HEART_BEAT
IOT22A/LVDS/DQ14	125	KEY_SCAN_RESET
IOT23A/DQ14	126	KEY_SCAN_DATA
IOT23B/DQ14	124	KEY_SCAN_CLOCK
IOT27A/GCLKT_0/DQ14	123	FPGA_CLK_24MHZ
IOT27B/GCLKC_0/DQ14	122	LED_CLOCK

BANK 1

IOT30A/GCLKT_1/LVDS/DQ13	121	LED_LOAD
IOT30B/GCLKC_1/LVDS/DQ13	120	LED_DATA
IOT38A/LVDS/DQ13	119	K4_LED
IOT38B/LVDS/DQ13	118	I2C_SDA
IOT40A/LVDS/DQ13	117	I2C_SCL
IOT40B/LVDS/DQ13	116	EXT_TRIG
IOT42A/LVDS/DQ13	115	PROBE_CALIBRATION
IOT42B/LVDS/DQ13	114	CS_CLK
IOT48A/LVDS/DQS12	113	CS_LOAD
IOT48B/LVDS/DQS12	112	CS_DATA
IOT50A/LVDS/DQ12	111	CHANNEL2_OFFSET_PWM
IOT50B/LVDS/DQ12	110	CHANNEL1_OFFSET_PWM

BANK 2

IOR7A/RPLL1_T_IN/DQ11	106	ADC_CLK_P
IOR7B/RPLL1_C_IN/DQ11	105	ADC_CLK_M
IOR20A/LVDS/DQ10	102	ADC_DQD0_P
IOR20B/LVDS/DQ10	101	ADC_DQD0_M
IOR22A/LVDS/DQS10	100	ADC_DQD1_P
IOR22B/LVDS/DQS10	99	ADC_DQD1_M
IOR25A/TDO/DQ10	18	TDO
IOR25B/TMS/DQ10	13	TMS
IOR26A/TCK/LVDS/DQ10	14	TCK
IOR26B/TDI/LVDS/DQ10	16	TDI
IOR27A/GCLKT_2/DQ10	98	ADC_DQD2_P
IOR27B/GCLKC_2/DQ10	97	ADC_DQD2_M

BANK 3

IOR31B/RECONFIG_N/LVDS/DQ9	20	FPGA_RECONFIG
IOR32A/READY/DQ9	22	FPGA_READY
IOR32B/DONE/DQ9	21	FPGA_DONE
IOR33A/MI/D7/LVDS/DQ9	96	ADC_DQD3_P
IOR33B/MO/D6/LVDS/DQ9	95	ADC_DQD3_M
IOR34A/MCS_N/D5/DQ9	94	ADC_DQD4_P
IOR34B/MCLK/D4/DQ9	93	ADC_DQD4_M
IOR35A/FASTRD_N/D3/LVDS/DQ9	92	TP92
IOR35B/SSI/D2/LVDS/DQ9	90	FPGA_SPI_MOSI
IOR36A/SSO/D1/DQS9	88	FPGA_SPI_MISO
IOR36B/SCS/D0/DQS9	87	FPGA_SPI_CS
IOR38A/DIN/LVDS/DQ9	86	TP86
IOR38B/DOUT/LVDS/DQ9	85	TP85
IOR39A/SCLK/DQ9	15	FPGA_SPI_CLK
IOR42A/LVDS/DQ9	84	ADC_DQD5_P
IOR42B/LVDS/DQ9	83	ADC_DQD5_M
IOR45A/RPLL2_T_IN/DQ9	82	TP82
IOR49A/LVDS/DQ8	80	ADC_DQD6_P
IOR49B/LVDS/DQ8	79	ADC_DQD6_M
IOR50A/DQS8	78	ADC_DQD7_P
IOR50B/DQS8	76	ADC_DQD7_M

BANK 4

IOB30A/GCLKT_4/LVDS/DQ6	56	ADC_DQ7_M
IOB30B/GCLKC_4/LVDS/DQ6	57	ADC_DQ7_P
IOB33A/DQ6	58	ADC_DQ6_M
IOB33B/DQ6	59	ADC_DQ6_P
IOB34A/LVDS/DQ6	60	ADC_DQ5_M
IOB34B/LVDS/DQ6	61	ADC_DQ5_P
IOB38A/LVDS/DQ6	62	ADC_DQ4_M
IOB38B/LVDS/DQ6	63	ADC_DQ4_P
IOB40A/LVDS/DQ6	64	ADC_DQ3_M
IOB40B/LVDS/DQ6	65	ADC_DQ3_P
IOB42A/LVDS/DQ6	66	ADC_DQ2_M
IOB42B/LVDS/DQ6	67	ADC_DQ2_P
IOB48A/LVDS/DQ6	68	ADC_DQ1_M
IOB48B/LVDS/DQ6	69	ADC_DQ1_P
IOB53A/DQ7	70	ADC_DQ0_M
IOB53B/DQ7	71	ADC_DQ0_P
IOB55B/DQ7	72	

R84 10K

GND

Pull Up's

3V3

R101 4K7 — FPGA_DONE
R278 4K7 — FPGA_RECONFIG
R277 4K7 — FPGA_READY
R73 4K7 — MODE0

Pull Down's

MODE1
MODE2
EXTR

R80 10K
R75 4K7
R76 4K7

GND

PD
CAL
PDQ
REXT

R935 10K
R936 10K
R937 10K
R938 10K

GND

Test Pads

PAD1 — JTAG_PADS

1	TDO
2	TDI
3	TCK
4	TMS

PAD2 — FPGA_TEST_PADS

1	TP82
2	TP85
3	TP86
4	TP92

TP25

1	CALRUN

ADC

D1V9 A1V9

U38
ADC08D500

	1	GND
	2	VA
MODE2	3	OUTV/SCLK
MODE1	4	OUTEDGE/DDR/SDATA
	5	VA
	6	GND
VCMO	7	VCMO
CHANNEL1_IN_M	8	VA
	9	GND
C38	10	VINI-
	11	VINI+
CHANNEL1_IN_P	12	GND
	13	VA
	14	FSR/ECE
	15	DCLK_RST
C439	16	VA
ADC_CLK_P	17	VA
C440	18	CLK+
ADC_CLK_M	19	CLK-
	20	VA
	21	GND
CHANNEL2_IN_P	22	VINQ+
	23	VINQ-
C49	24	GND
	25	VA
	26	PD
CHANNEL2_IN_M	27	GND
PD	28	VA
PDQ	29	PDQ
CAL	30	CAL
	31	VBG
REXT	32	REXT
	33	VA
	34	TDIODE_P
	35	TDIODE_N
ADC_DQD0_P	36	DQD0+
ADC_DQD0_M	37	DQD0-
ADC_DQD1_P	38	DQD1+
ADC_DQD1_M	39	DQD1-
	40	VDR
	41	GND
	42	DRGND
ADC_DQD2_P	43	DQD2+
ADC_DQD2_M	44	DQD2-
ADC_DQD3_P	45	DQD3+
ADC_DQD3_M	46	DQD3-
ADC_DQD4_P	47	DQD4+
ADC_DQD4_M	48	DQD4-
ADC_DQD5_P	49	DQD5+
ADC_DQD5_M	50	DQD5-
	51	VDR
	52	NC
	53	DRGND
ADC_DQD6_P	54	DQD6+
ADC_DQD6_M	55	DQD6-
ADC_DQD7_P	56	DQD7+
ADC_DQD7_M	57	DQD7-
ADC_DQ0_P	58	DQ0+
ADC_DQ0_M	59	DQ0-
ADC_DQ1_P	60	DQ1+
ADC_DQ1_M	61	DQ1-
	62	VDR
	63	NC
	64	DRGND

R47 10K

GND

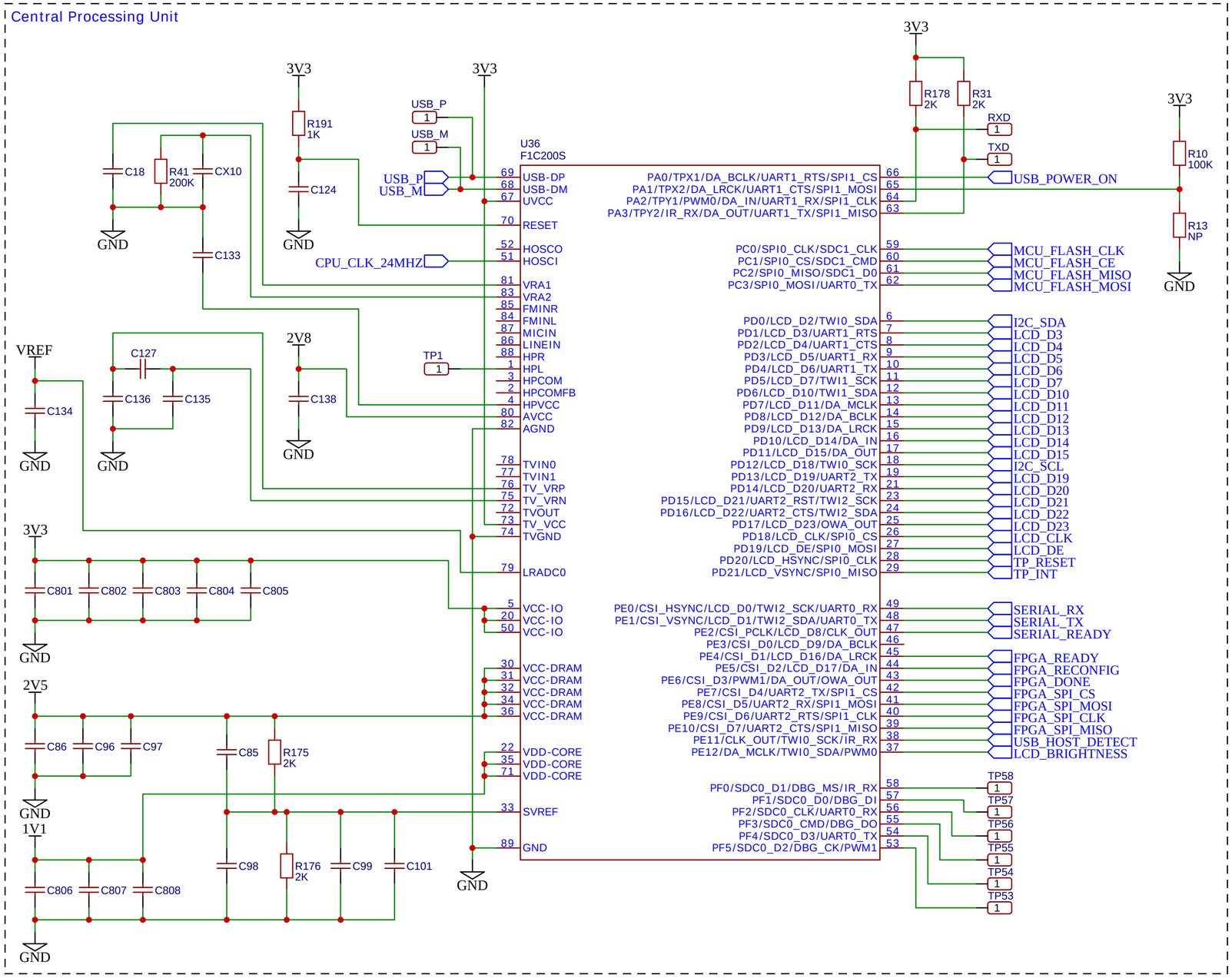
A1V9 D1V9

	129	EP
	128	VA
	127	CALDLY/DES/SCS#
MODE0	126	CALRUN
CALRUN	125	DID0+
ADC_DID0_P	124	DID0-
ADC_DID0_M	123	DID1+
ADC_DID1_P	122	DID1-
ADC_DID1_M	121	VDR
	120	NC
	119	DRGND
ADC_DID2_P	118	DID2+
ADC_DID2_M	117	DID2-
ADC_DID3_P	116	DID3+
ADC_DID3_M	115	DID3-
ADC_DID4_P	114	DID4+
ADC_DID4_M	113	DID4-
ADC_DID5_P	112	DID5+
ADC_DID5_M	111	DID5-
	110	VDR
	109	NC
	108	DRGND
ADC_DID6_P	107	DID6+
ADC_DID6_M	106	DID6-
ADC_DID7_P	105	DID7+
ADC_DID7_M	104	DID7-
ADC_DID0_P	103	DI0+
ADC_DI0_M	102	DI0-
ADC_DI1_P	101	DI1+
ADC_DI1_M	100	DI1-
	99	VDR
	98	NC
	97	DRGND
ADC_DI2_P	96	DI2+
ADC_DI2_M	95	DI2-
ADC_DI3_P	94	DI3+
ADC_DI3_M	93	DI3-
ADC_DI4_P	92	DI4+
ADC_DI4_M	91	DI4-
ADC_DI5_P	90	DI5+
ADC_DI5_M	89	DI5-
	88	VDR
	87	DRGND
ADC_DI6_P	86	DI6+
ADC_DI6_M	85	DI6-
ADC_DI7_P	84	DI7+
ADC_DI7_M	83	DI7-
ADC_DCLK_P	82	DCLK+
ADC_DCLK_M	81	DCLK-
ADC_OR_M	80	OR-
ADC_OR_P	79	OR+
ADC_DQ7_M	78	DQ7-
ADC_DQ7_P	77	DQ7+
ADC_DQ6_M	76	DQ6-
ADC_DQ6_P	75	DQ6+
	74	DRGND
	73	VDR
ADC_DQ5_M	72	DQ5-
ADC_DQ5_P	71	DQ5+
ADC_DQ4_M	70	DQ4-
ADC_DQ4_P	69	DQ4+
ADC_DQ3_M	68	DQ3-
ADC_DQ3_P	67	DQ3+
ADC_DQ2_M	66	DQ2-
ADC_DQ2_P	65	DQ2+

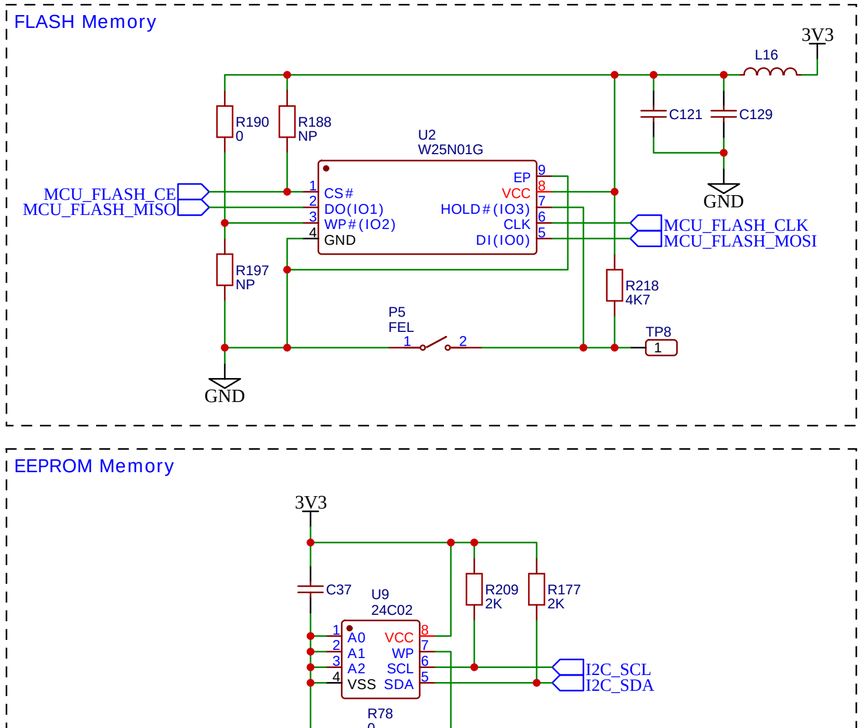
GND

TITLE: Main Board (FPGA ADC)		REV: 1.0
	Company:	Sheet: 2/8
	Date: 2022-06-21 Drawn By:	

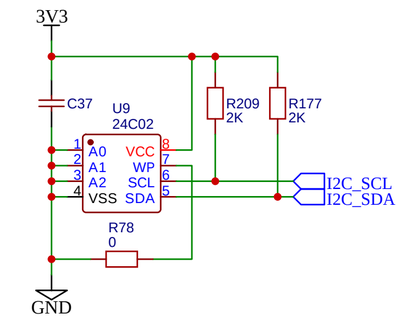
Central Processing Unit



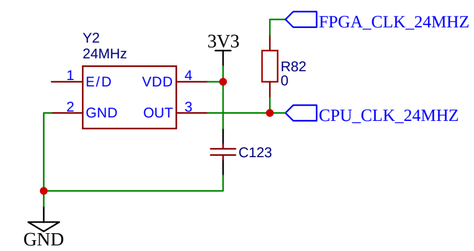
FLASH Memory



EEPROM Memory

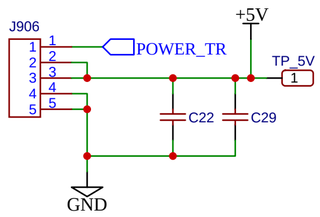


System Clock Generation

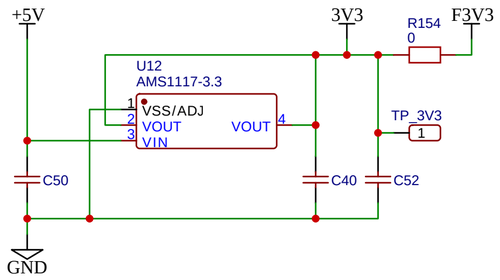


TITLE: Main Board (Processor)		REV: 1.0
	Company:	Sheet: 1/8
	Date: 2022-06-23 Drawn By:	

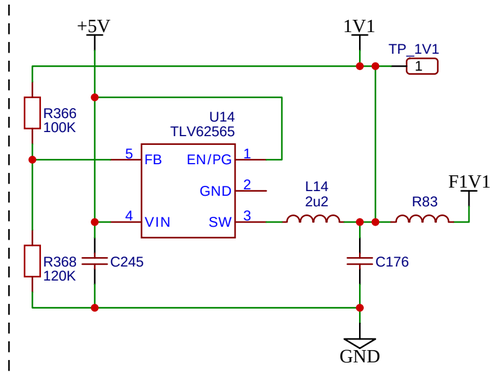
Digital Power In



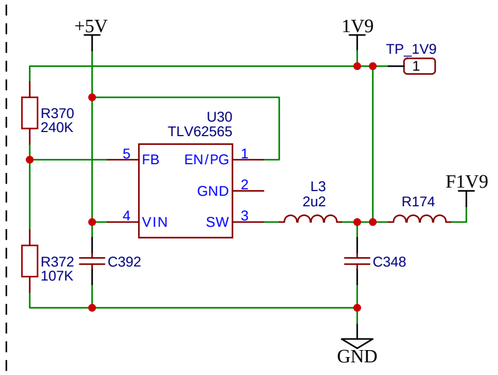
Digital Logic 3V3 Power Supply



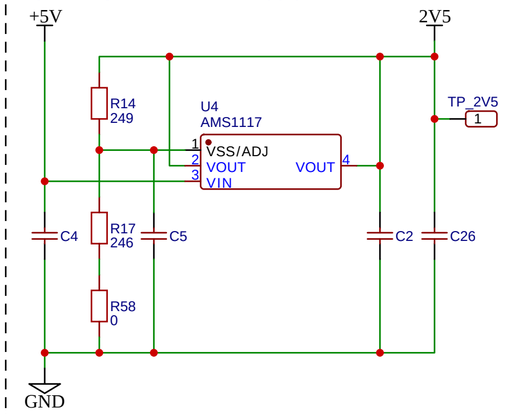
Digital Logic 1V1 Power Supply



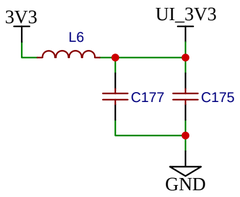
Digital Logic 1V9 Power Supply



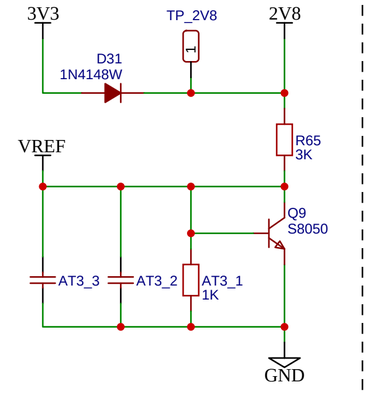
Digital Logic 2V5 Power Supply



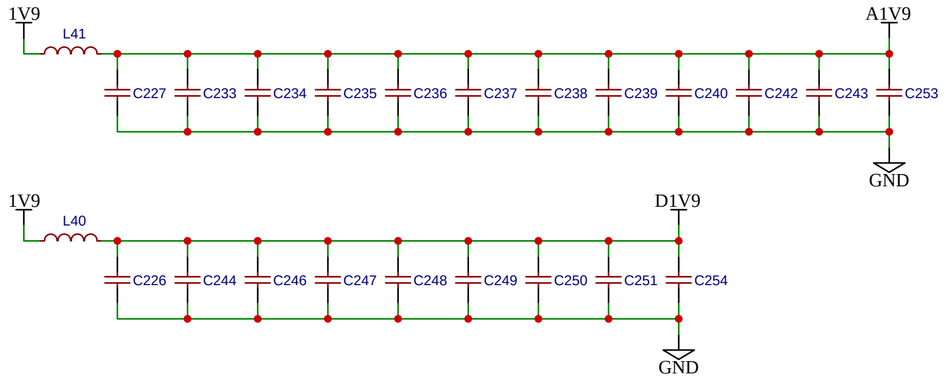
User Interface Power Filter



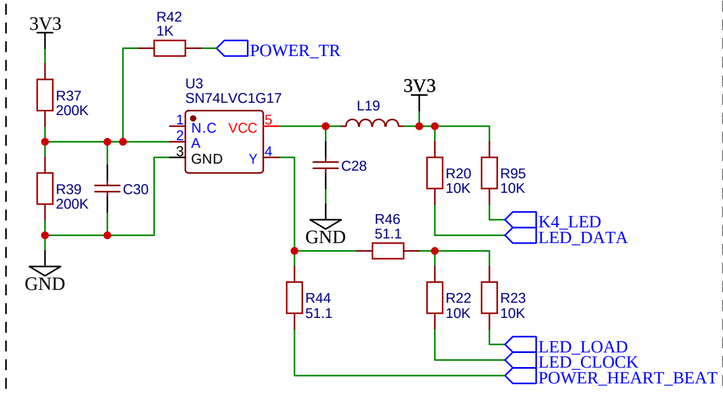
MCU Reference Voltage



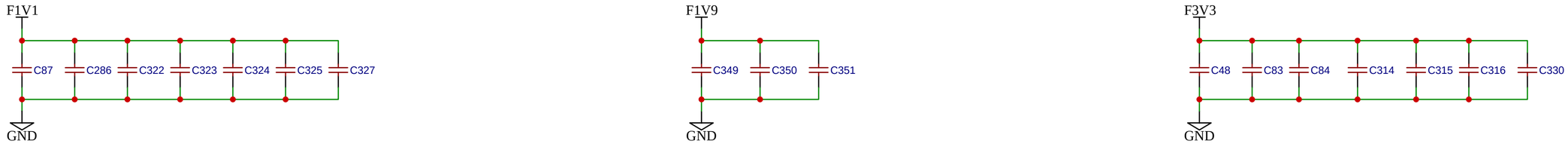
ADC Power Supply



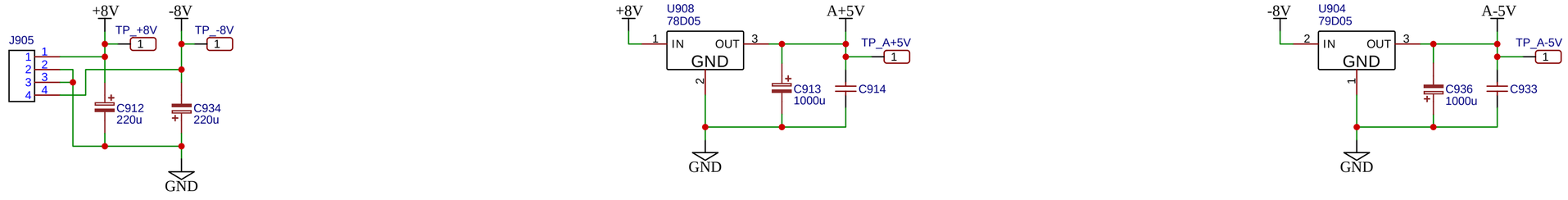
Power Heart Beat Circuit



FPGA Power Filtering

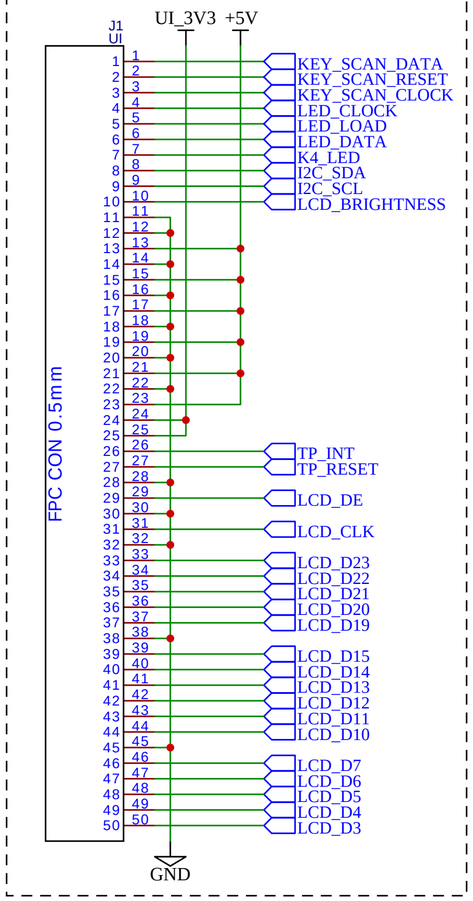


Analog Power Supply

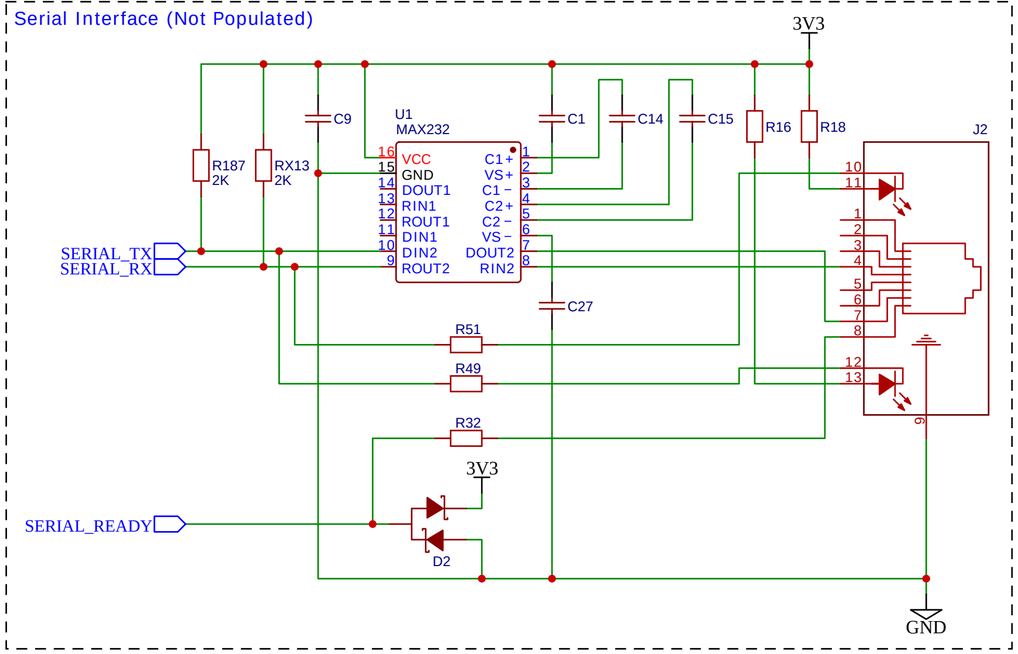


TITLE: Main Board (Power Supply)		REV: 1.0
	Company:	Sheet: 8/8
	Date: 2022-06-26 Drawn By:	

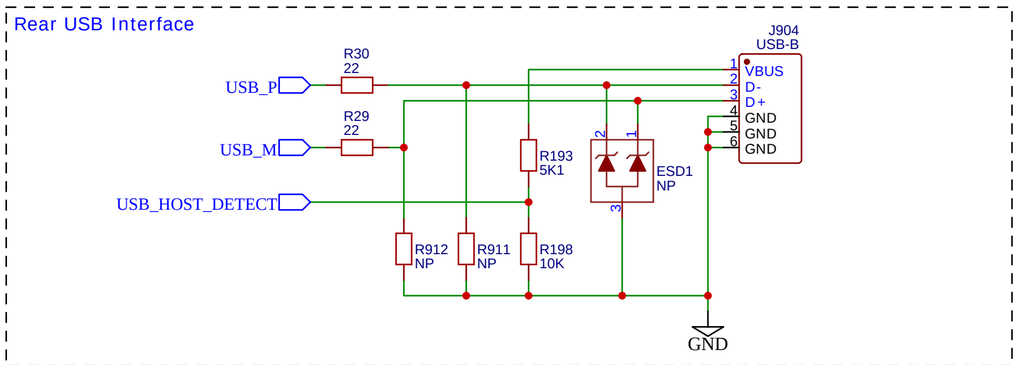
User Interface Board Connector



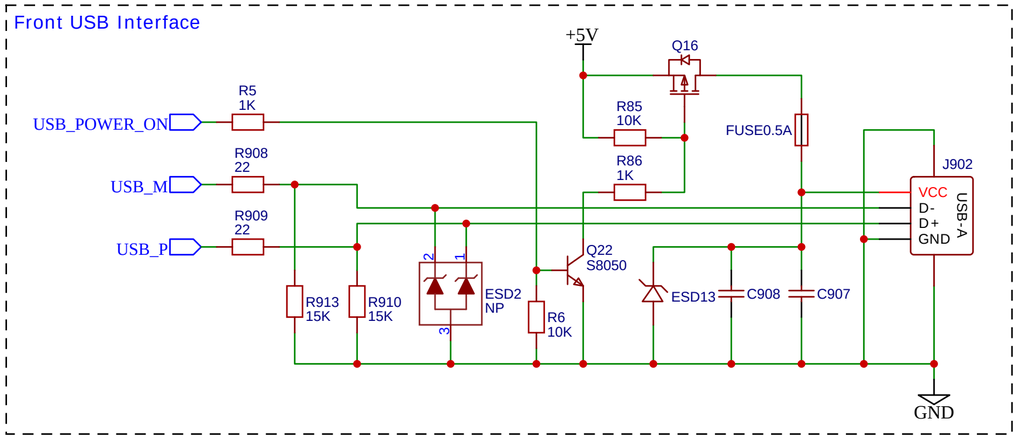
Serial Interface (Not Populated)



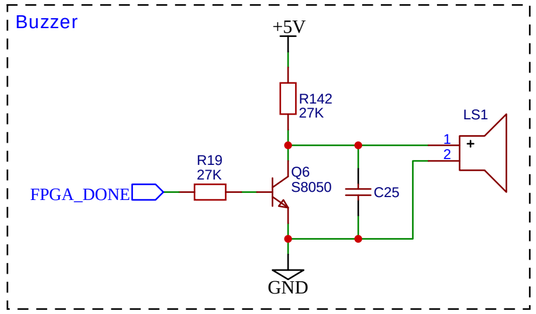
Rear USB Interface



Front USB Interface

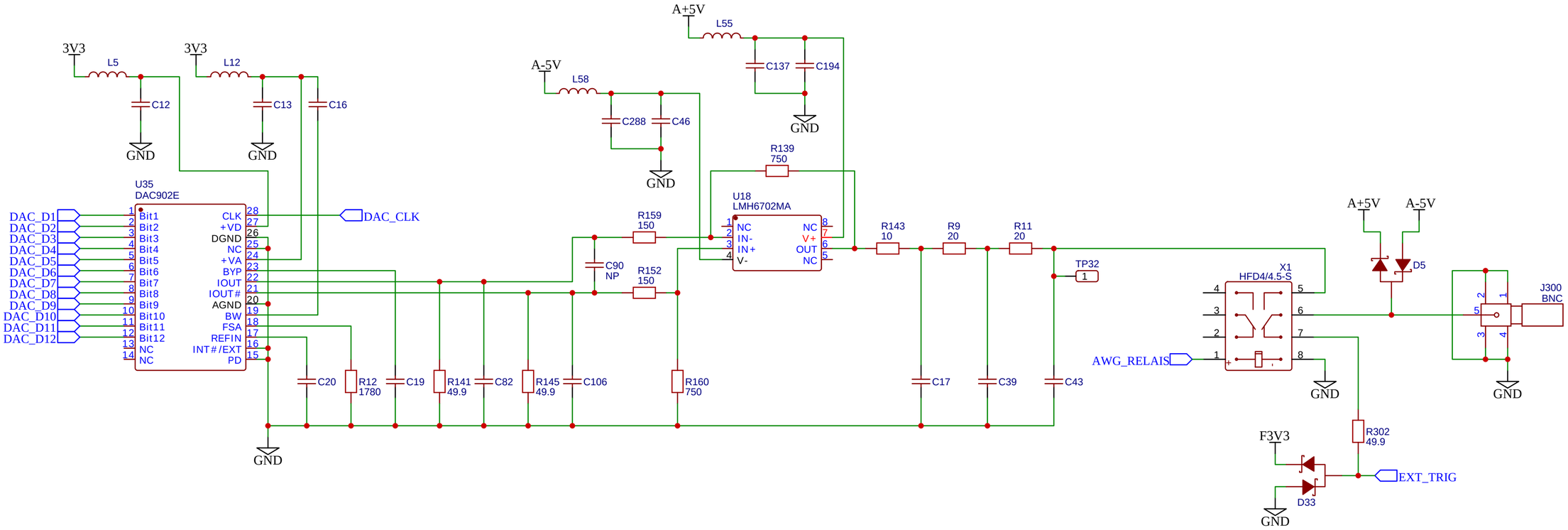


Buzzer

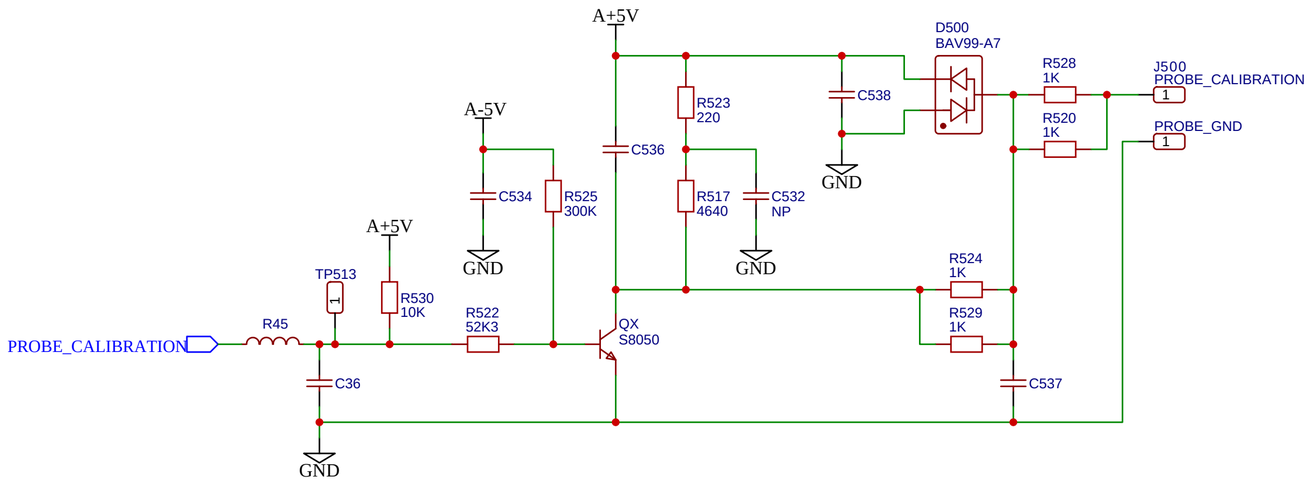


TITLE: Main Board (External Interfaces)		REV: 1.0
	Company:	Sheet: 7/8
	Date: 2022-06-29 Drawn By:	

Waveform Generator And Trigger Input

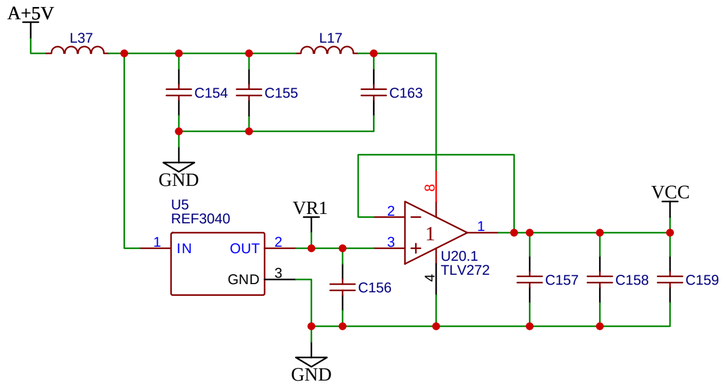


Probe Calibration Signal

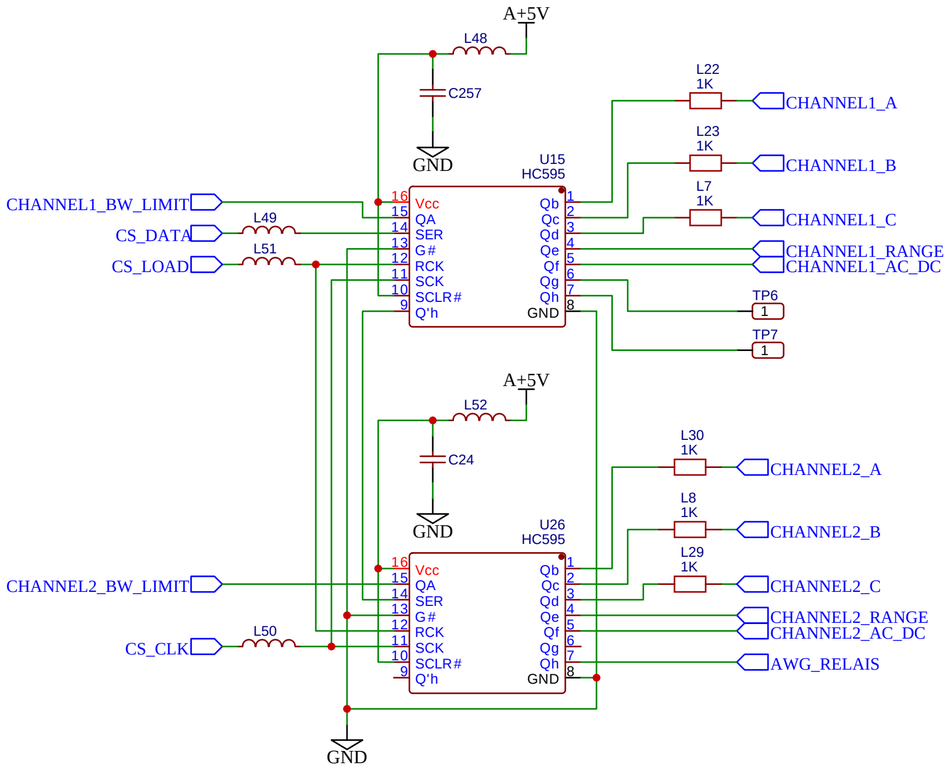


TITLE: Main Board (Wavefrom Generator)		REV: 1.0
	Company:	Sheet: 6/8
	Date: 2022-06-29 Drawn By:	

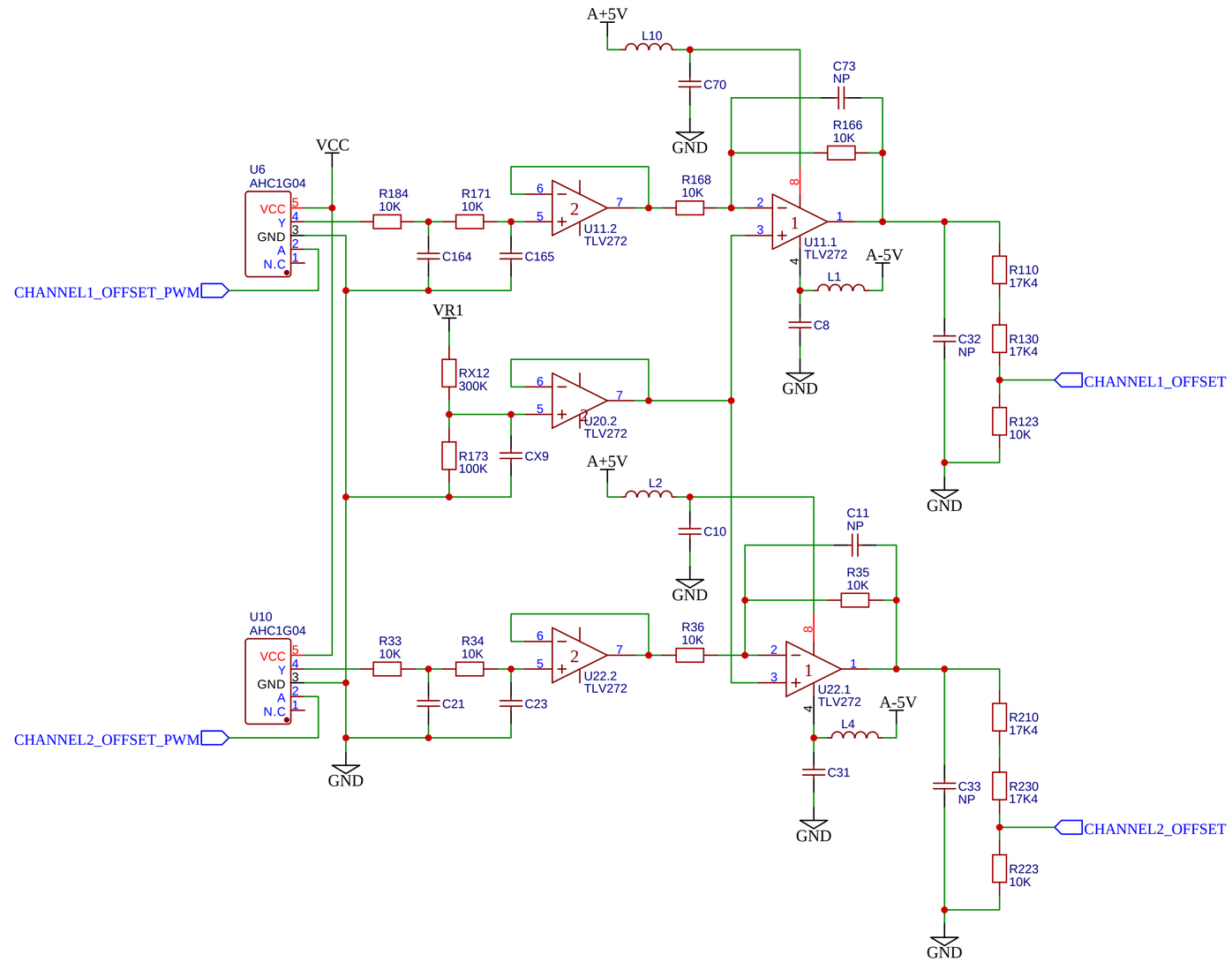
Offset Signal Buffers Power Supply



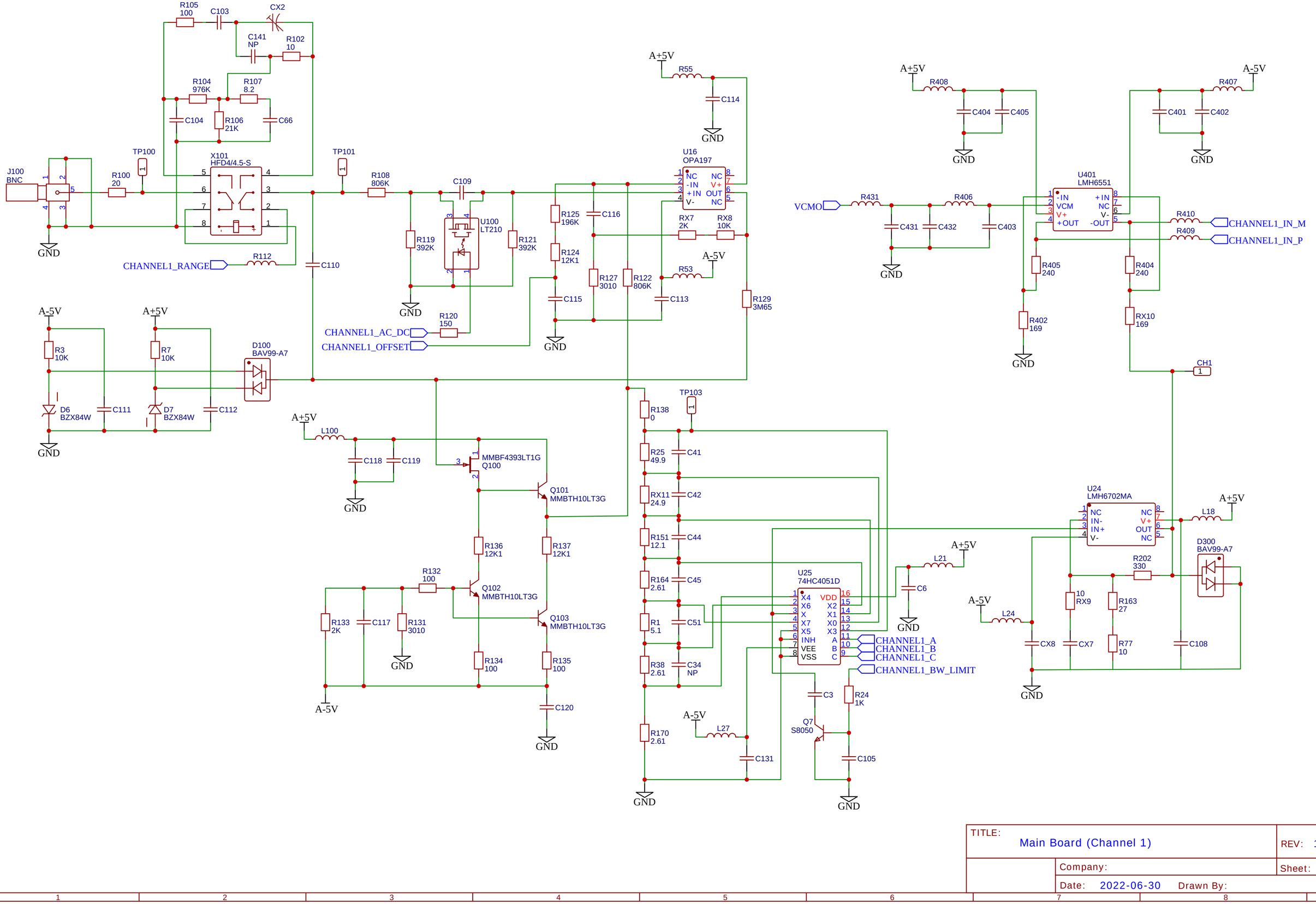
Channel Control Signals



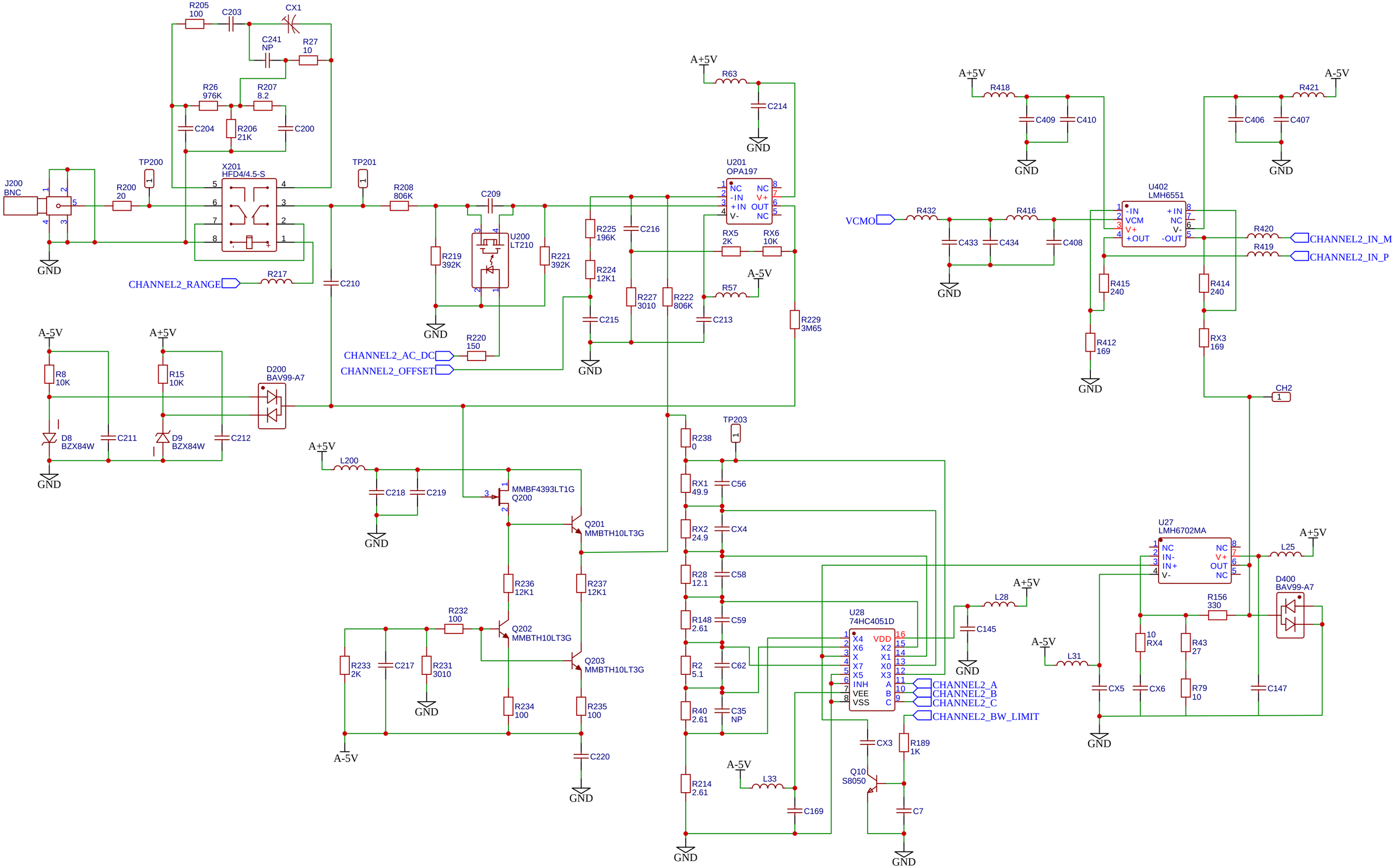
Offset Signals



TITLE: Main Board (Control Signals)		REV: 1.0
	Company:	Sheet: 3/8
	Date: 2022-06-29 Drawn By:	



TITLE: Main Board (Channel 1)		REV: 1.0
	Company:	Sheet: 4/8
	Date: 2022-06-30 Drawn By:	



TITLE: Main Board (Channel 2)		REV: 1.0
	Company:	Sheet: 5/8
	Date: 2022-07-04 Drawn By:	