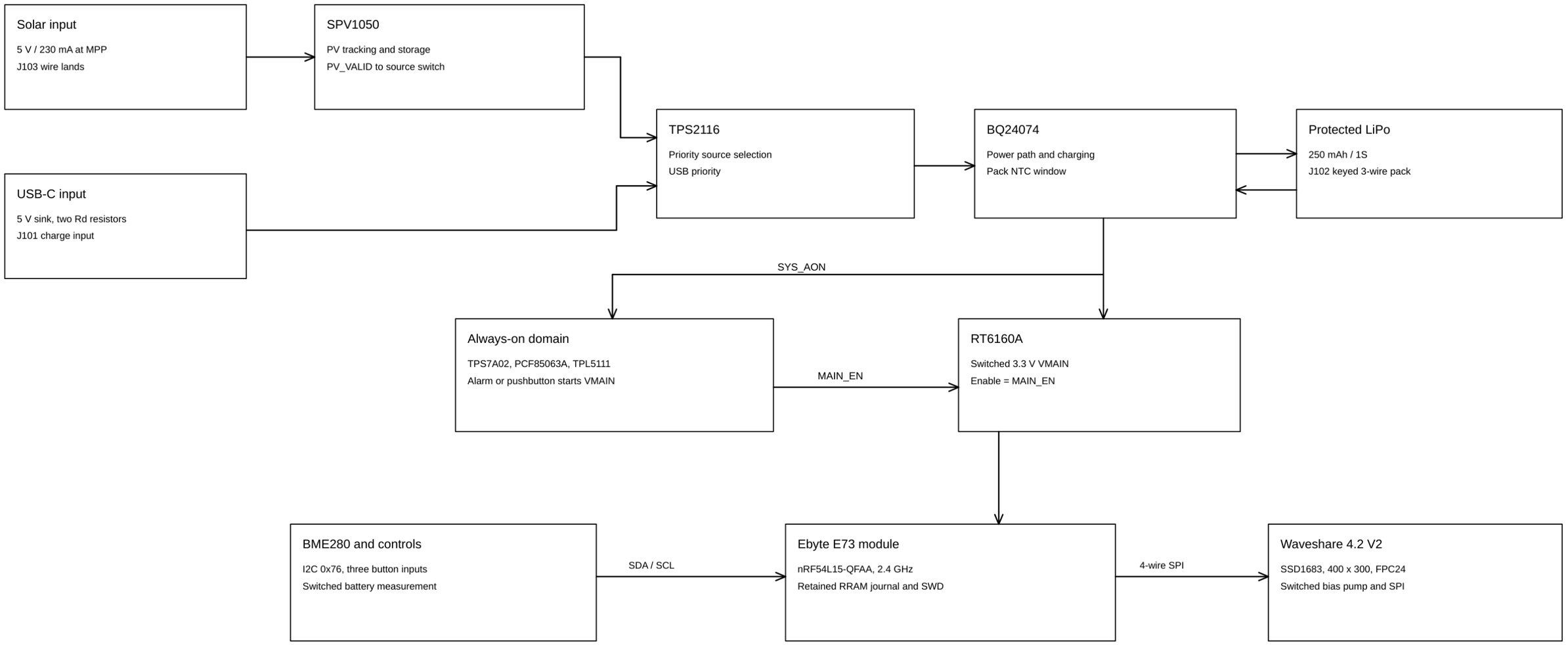
Solar e-ink weather station

System architecture



Wake sequence

Read RTC, keys and BME280. Restore both controller image planes for a valid differential update.

A failed or interrupted optical update requires a full refresh. Commit the new state before asserting TIMER_DONE.

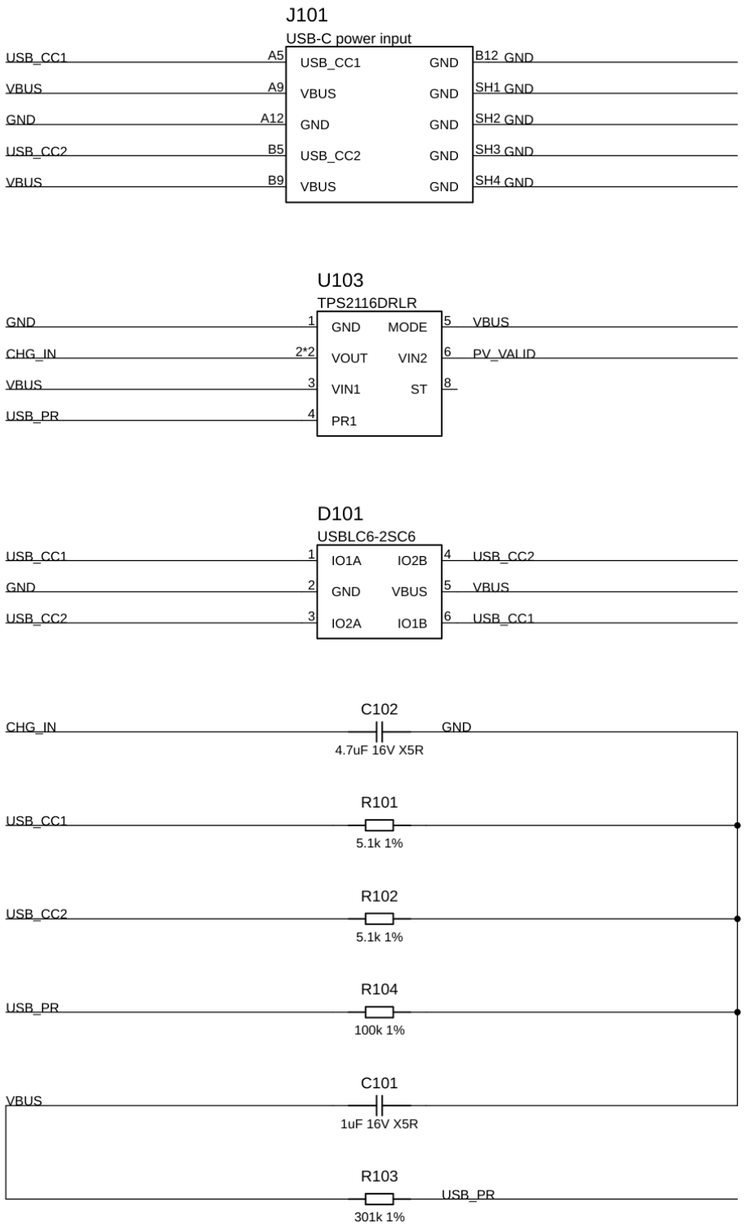
Sheet index

2-3 Energy harvesting and power path | 4 Radio and programming | 5 Electrophoretic display | 6-7 Timekeeping, sensing and controls

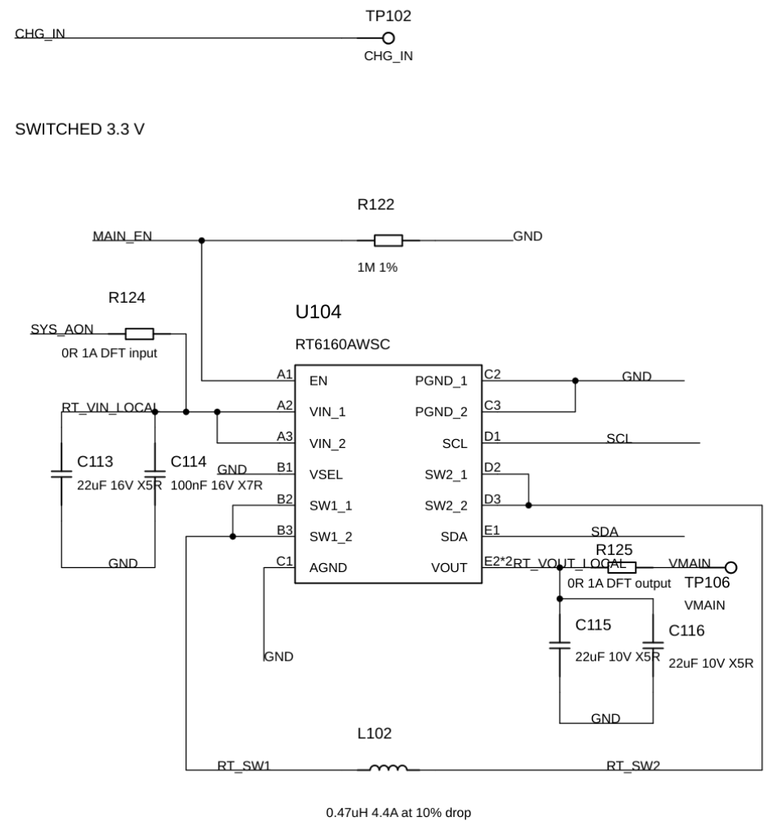
USB-C, battery charging and system rail

USB priority, protected LiPo power path and switched 3.3 V

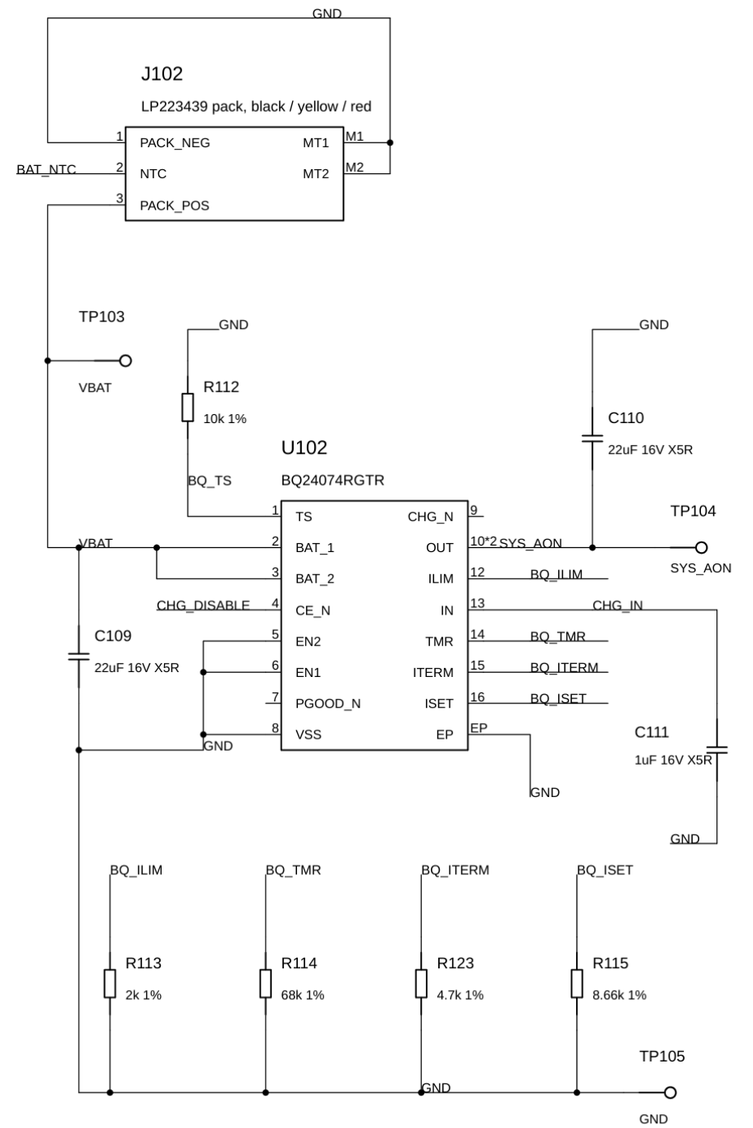
USB-C AND INPUT SELECTION



USB-C AND INPUT SELECTION



PROTECTED CELL CHARGER

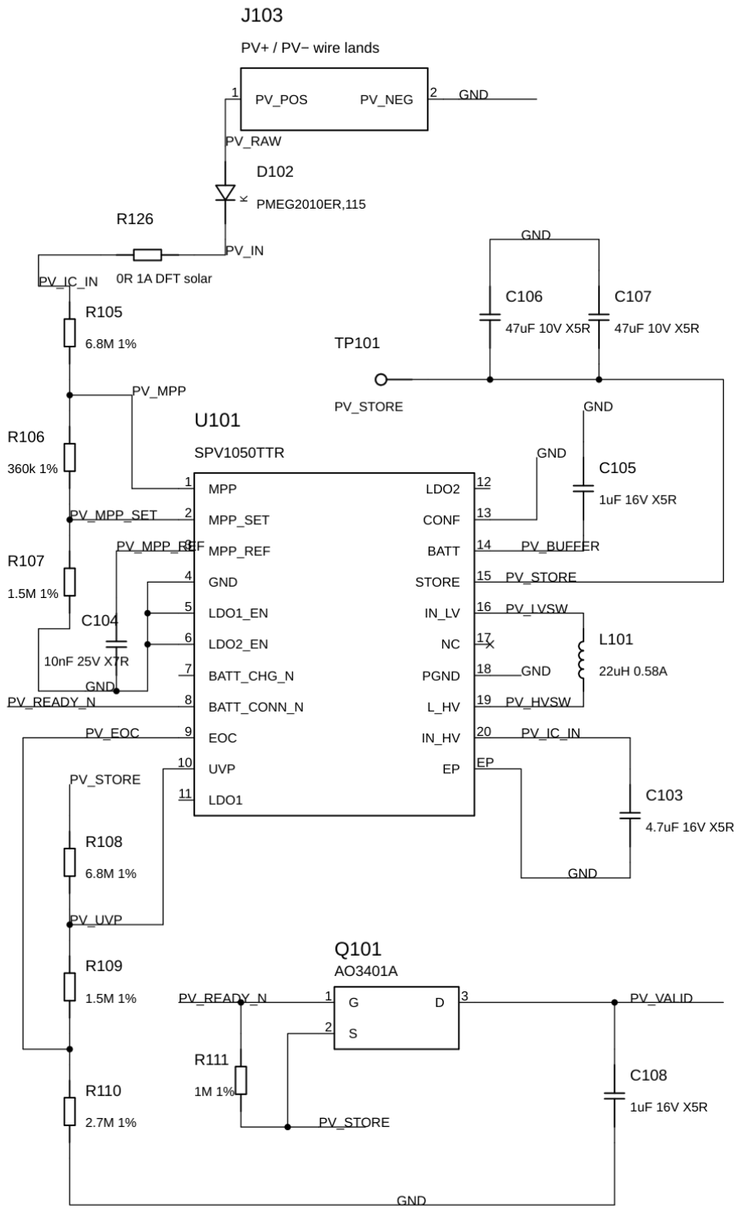


Identical net labels connect across sheets. | Pin numbers refer to the top-side package.

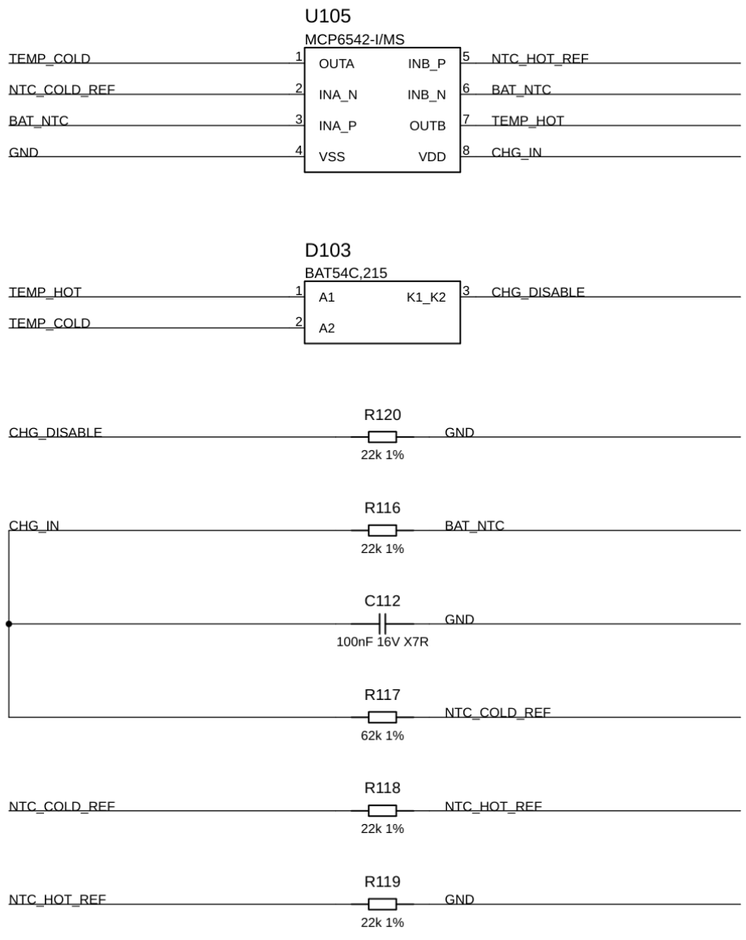
Solar harvesting and pack temperature

SPV1050 reservoir, maximum-power-point setting and pack temperature window

SOLAR MPPT



PACK TEMPERATURE WINDOW



Identical net labels connect across sheets. | Pin numbers refer to the top-side package.

Radio and programming

2.4 GHz radio, host connections and SWD access

2.4 GHZ RADIO AND PROCESSOR

U201
nRF54L15-QFAA + 2.4 GHz PCB antenna

VBAT_MEAS_EN	1	P1.09	P2.02	21	EPD_MOSI
	2	P1.10	P2.03	22	EPD_RST
SCL	3	P1.11	P2.06	23	
SDA	4	P1.12	P2.08	24	
	5	P1.13	P2.10	25	
	6	P1.14	P0.01	26	
VBAT_SENSE	7	P1.04_AIN0	P2.04	27	EPD_BUSY
	8	P1.02	P2.05	28	EPD_CS
VMAIN	9	VDD	P0.00	29	TIMER_DONE
GND	10	GND_10	GND_30	30	GND
SWCLK	11	SWCLK	GND_31	31	GND
SWDIO	12	SWDIO	P0.02	32	
	13	P1.03	P0.04	33	
BTN2	14	P1.06	P0.03	34	
BTN1	15	P1.05	P2.09	35	
BTN3	16	P1.07	P2.07	36	
	17	P1.08	GND_37	37	GND
EPD_DC	18	P2.00	GND_38	38	GND
NRST	19	NRESET	GND_39	39	GND
EPD_SCK	20	P2.01	GND_40	40	GND

POGO PROGRAMMING AND TIMER OVERRIDE

J201
7-pad SWD fixture

GND	1	GND	NRESET	5	NRST
VMAIN	2	VTREF_SENSE	WAKE_MDRV	6	WAKE_MDRV
SWCLK	3	SWCLK	VAON	7	VAON
SWDIO	4	SWDIO			

RADIO SUPPLY BYPASS

C201
VMAIN — 100 nF — GND

C202
1 µF

RADIO RESET FILTER

C203
NRST — 33 pF — GND

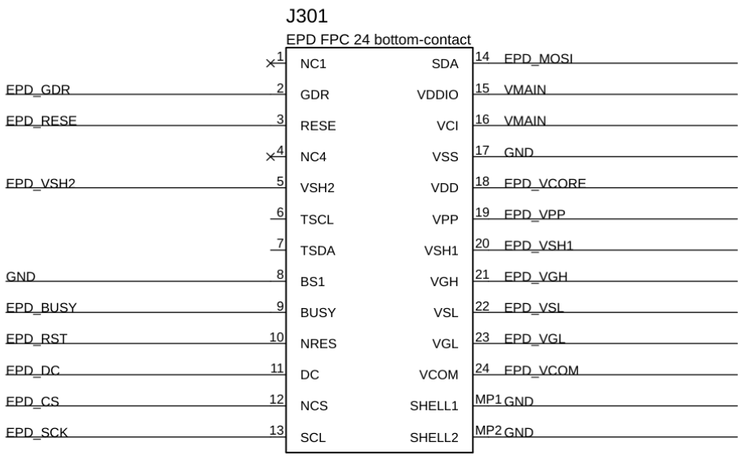
R201
VMAIN — 10 kΩ — NRST

Identical net labels connect across sheets. | Pin numbers refer to the top-side package.

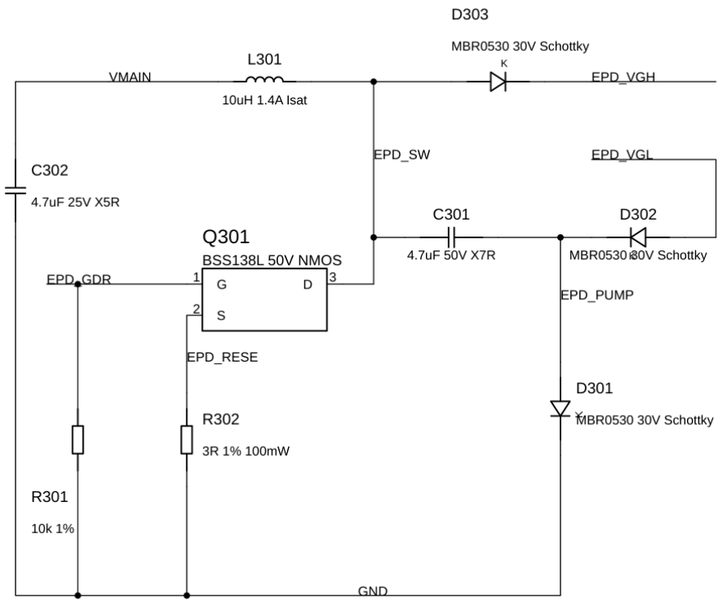
Electrophoretic display

24-contact panel interface, switched boost loop and panel bias supplies

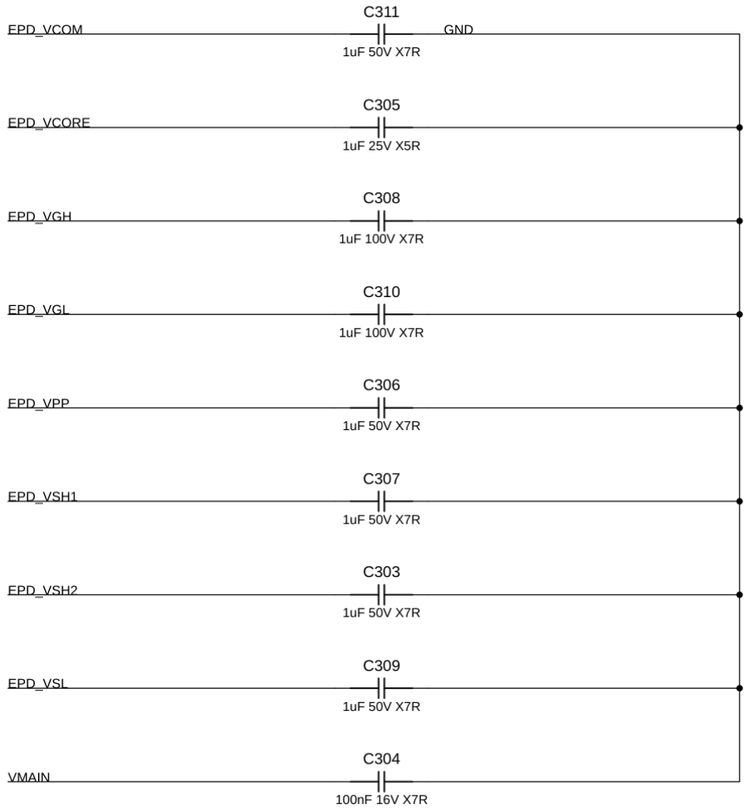
PANEL CONNECTOR



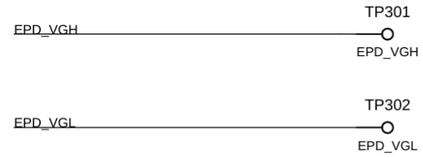
BIPOLAR BOOST



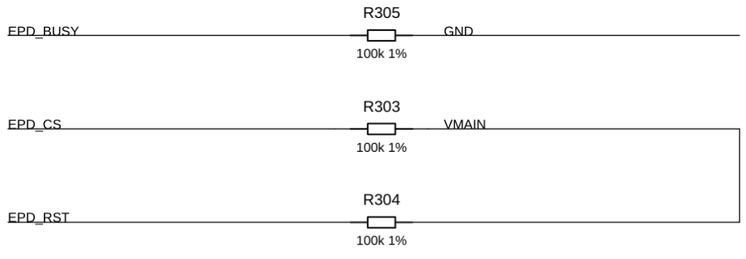
PANEL CAPACITORS



TEST ACCESS



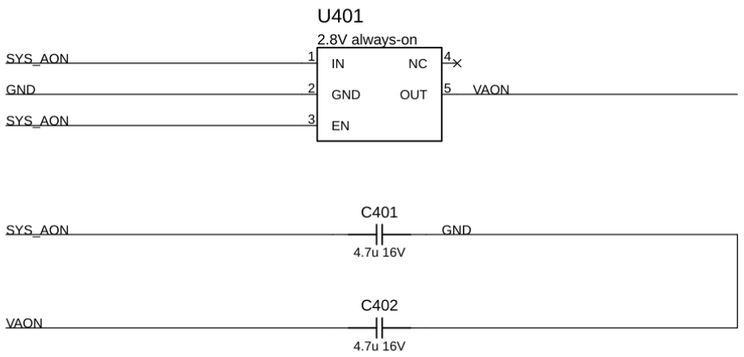
DIGITAL INTERFACE



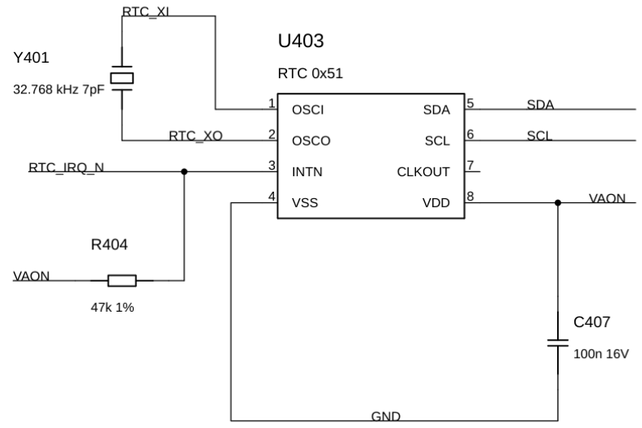
Wake timing, clock and ambient sensor

Always-on timer, calendar alarm, environmental sensor and wake pulse

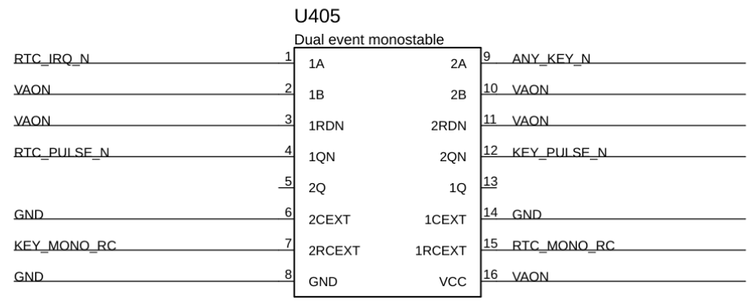
ALWAYS-ON SUPPLY



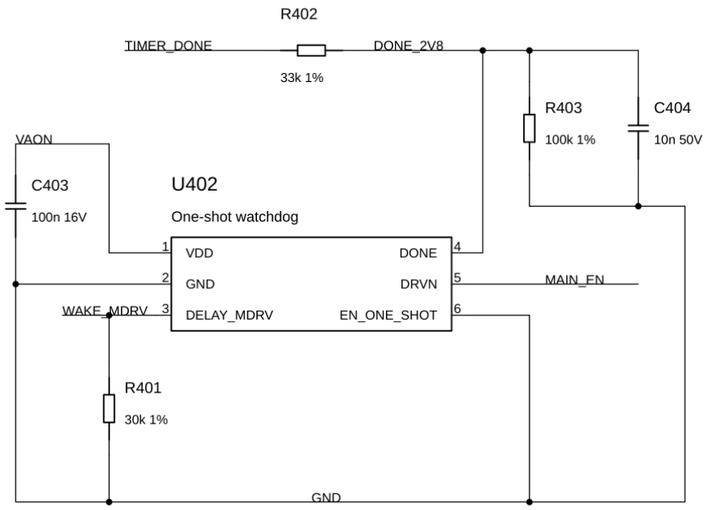
CLOCK AND ALARM



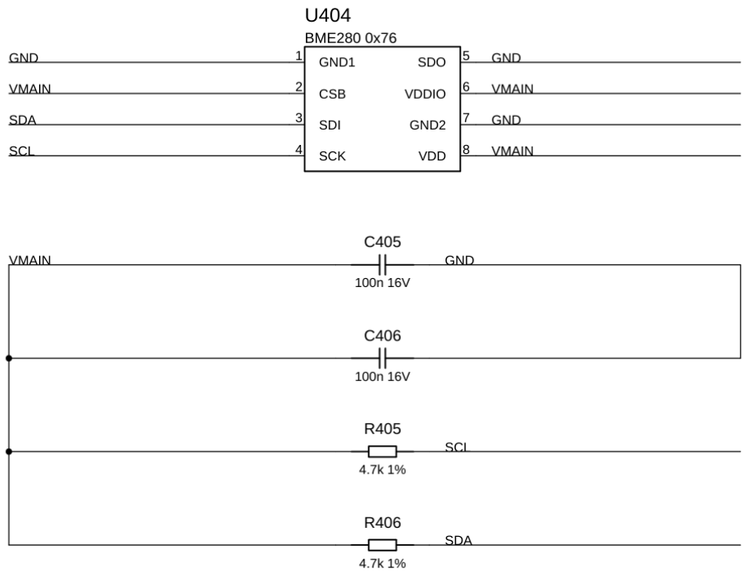
WAKE PULSE

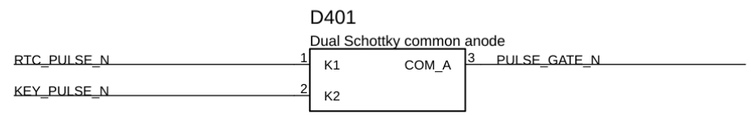


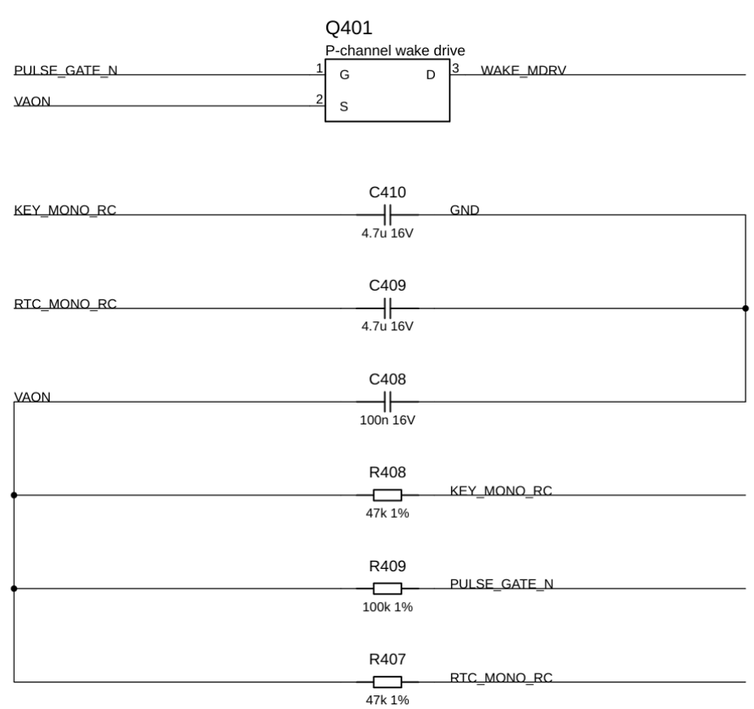
WAKE TIMER



AMBIENT SENSOR



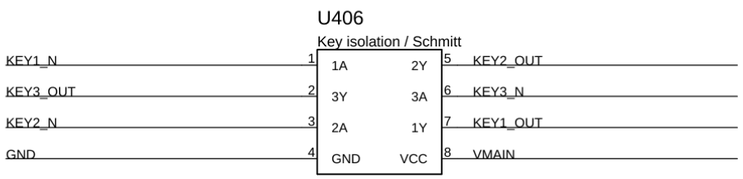


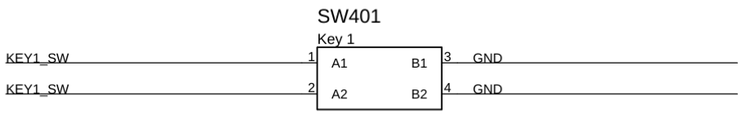


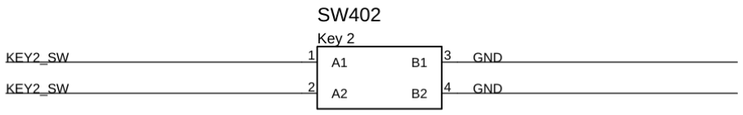
User controls and battery measurement

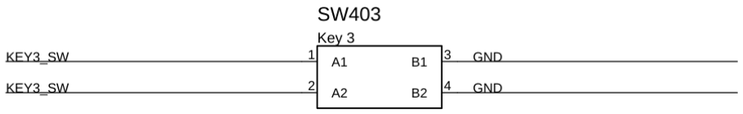
Three wake keys, key decoding and the switched battery divider

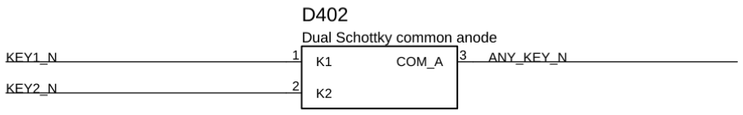
USER KEYS

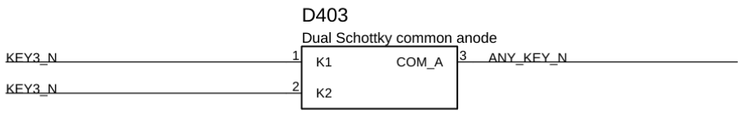




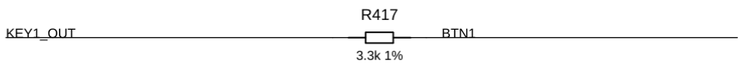












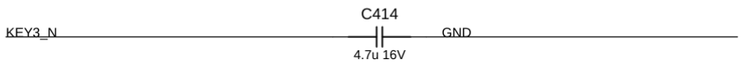
USER KEYS

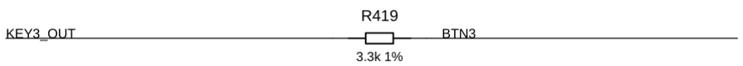


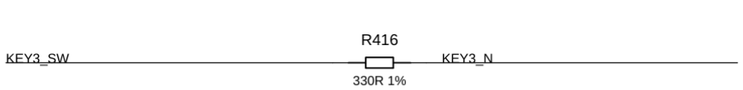


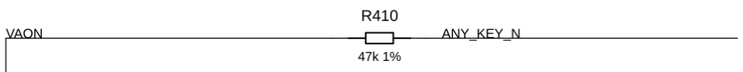


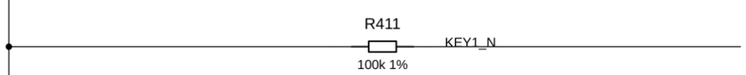




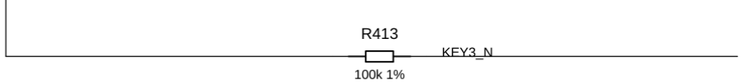


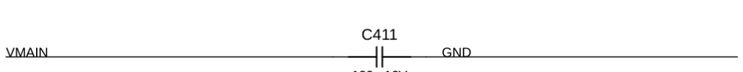




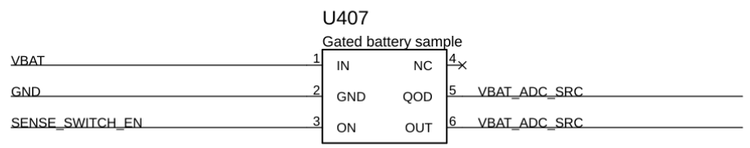


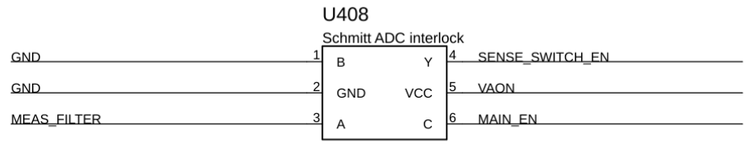


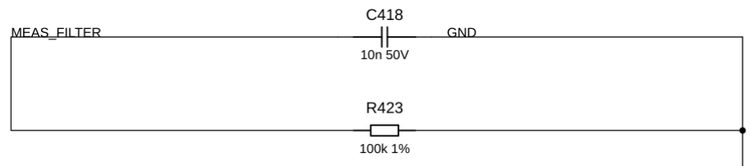


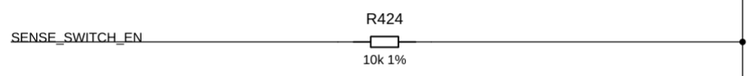


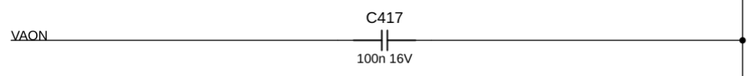
BATTERY ADC

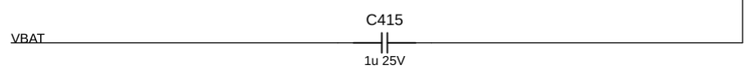


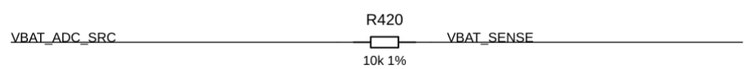


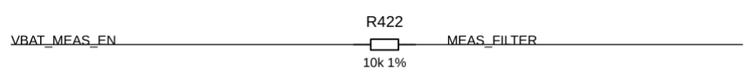


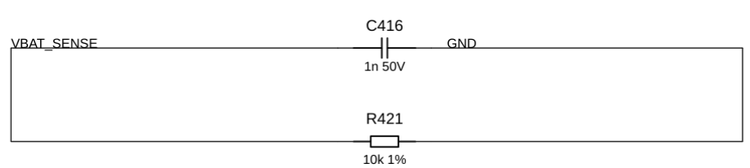












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