

Block	Component	Description/Conditions	Units	Supply voltage (V)	Current consumption per unit (µA)		Total dissipated power (µW)		Notes
					Typical	Maximum	Typical	Maximum	
MCU	ESP32-WROOM-32D	MCU + wireless comm. Module	1	3.3	500 mA		1.7 W		Current spikes during wireless TX
Power rails	AP3429	DC/DC Buck converter IC	1	4.2	90 µA		378 µW		
	NCP562SQ18T1G	Low-Dropout regulator IC	1	3.3	3 µA		9.9 µW		
	150 kΩ + 33 kΩ voltage divider	FB pin feedback. Fixed consumption	1	3.3	18 µA		59.4 µW		
	[Optional] bypass voltage divider	Assuming 3V3/2 with 10 kΩ resistors	1	3.3	165 µA		544.5 µW		Consider only if populated
	Generic 0805 green LED	Assuming Vf = 3V & 39 Ω series resistor	1	3.3	7.7 mA		25.4 mW		Consider only if populated
Battery & current sense	INA219	Voltage & current sense IC	1	4.2	0.7 mA	1 mA	3 mW	4.2 mW	
	Generic 0805 green LED	Assuming Vf = 3V & 220 Ω series resistor	1	5.5	11.4 mA		62.5 mW		Consider only if populated
	Generic 0805 red LED	Assuming Vf = 2V & 470 Ω series resistor	1	5.5	7.5 mA		41 mW		Consider only if populated
	I2C pull-up resistor	Assuming line level is LOW, with 4.7kΩ resistors	2	3.3	0.7 mA		4.6 mW		
[Optional] NiMH charger	LTC4060EFE	NiMH/NiCd charger IC	1	5.5	2.9 mA	4.3 mA	16 mW	23.7 mW	Consider only if populated. For charging ICs and BJT: consider only when charging the battery (else they are off). In this case power consumption comes from external supply not from the internal battery.
	MDJ201	Power PNP BJT. Ice=0.95 A, Ibe=120mA, Vce=1.8V, Vbe=0.7 V	1	--	--		1.71 W + 84 mW ≈ 1.8 W		
	4.42 kΩ + NTC voltage divider	NTC pin. Assuming NTC at 50°C (3.54 kΩ)	1	5.5	691 µA		3.8 mW		
[Optional] Li-Ion/Li-Po charger	TP4056	Li-Ion/LiPo charger IC, Vbus-Vbat=1.8 V, Ibat=1 A	1	5.5	150 µA	500 µA	1.8W + 2.8 mW ≈ 1.8 W		
	DW01A	Battery protection IC	1	4.2	3 µA	6 µA	12.6 µW	25.6 µW	
	FS825A	Dual power NMOS, Rds(on)=25 mΩ, Ibat=1 A	1	--	--		50 mW (both NMOS)		
USB connector	USBLC6-2SC6	USB ESD protection IC	1	5.5	10 nA	150 nA	55 nW	825 nW	Consider only when USB is plugged
Programming	CH340C	USB to UART converter IC	1	3.3	12 mA	30 mA	39.6 mW	99 mW	Worst case when programming
	2N7002	G.P. NMOS. Ib=0 A, Vds=3.3 V, Ids=330 µA (during conmutation)	2	--	--		1 mW		Consider only when programming
	Generic 0805 green LED	Assuming Vf = 3V & 39 Ω series resistor	2	3.3	7.7 mA		50.8 mW		Consider when programming, using UART and if populated.
	Generic 0805 red LED	Assuming Vf = 2V & 150 Ω series resistor	2	3.3	8.7 mA		57.4 mW		
Buttons	Pull-up resistors	Assuming line level is LOW, 10kΩ resistors	5	3.3	0 (not pushed)	330 µA	0 (not pushed)	5.4 mW	Worst case: all pressed at once
Power-up button	BSS84AK	G.P. PMOS. Rsd(on) = 7.5 Ω, Ib=0, Isd = 77 µA	1	--	--		45 nW		
	1N4148W	Small signal diode. Vf=0.7 V, If=26 µA	2	--	--		36.4 µW		Worst case: both ON
	100 kΩ pull-up resistor	100 kΩ pull-up resistor	1	4.2	42 µA		176.4 µW		
TFT LCD display	LCD TFT ILI9341 module	320x240p LCD (Measured)	1	3.3					Worst case: all pixels white, 60 FPS
Signal conditioning	LMV358DGKR	General purpose dual OpAmp, with no load	1	3.3	140 µA	340 µA	462 µW	1.1 mW	Both OpAmps, high Z load
	1N4148W	Small signal diode. Vf=0.7 V, If= µA (Measured)	4	--					Consider only when measuring
Load cell amplifier	HX711	Load cell amplifier & ADC IC	1	3.3	1.4 mA		4.6 mW		Enters sleep if the data clock stops
	BC858	General purpose PNP BJT. Vce=1.8V, Ice=? µA (Measured)	1	--					Consider only when HX711 is awake
	22 kΩ + 10 kΩ voltage divider	VFB pin feedback for AVDD=1.82 V regulation.	1	1.82	57 µA		103.7 µW		Consider only when HX711 is awake