

Ultrasonic interface

The schematic diagram illustrates the pin configuration and connections for the ESP32-S2FN4R2 module. Key components and connections include:

- Power and Grounding:** 3.3V supply connected to VDDA, VDDP3, VDDP3_RTC, VDDP3_RTC_IO, VDD_SPH, and VDDP3P5_CPU. Ground connections are provided for various pins and components like capacitors C12, C18, C19, C13, C29, C8, and C9.
- Antenna and RF:** ANT1 (2.4G) connected to L1, which is connected to the LNA_IN pin.
- GPIOs:** Various GPIO pins are connected to I/O lines (I00, I01, I02, I03, I04, I05, I06, I07, I08, I09, I10, I11, I12, I13, I14, I15, I16, I17, I18, I19, I20, I21, I22, I23, I24, I25, I26, I27, I28, I29, I30, I31, I32, I33, I34, I35, I36, I37, I38, I39, I40, I41, I42, I43, I44, I45, I46, I47, I48, I49, I50, I51, I52, I53, I54, I55, I56, I57, I58, I59, I60, I61, I62, I63, I64, I65, I66, I67, I68, I69, I70, I71, I72, I73, I74, I75, I76, I77, I78, I79, I80, I81, I82, I83, I84, I85, I86, I87, I88, I89, I90, I91, I92, I93, I94, I95, I96, I97, I98, I99, I100, I101, I102, I103, I104, I105, I106, I107, I108, I109, I110, I111, I112, I113, I114, I115, I116, I117, I118, I119, I120, I121, I122, I123, I124, I125, I126, I127, I128, I129, I130, I131, I132, I133, I134, I135, I136, I137, I138, I139, I140, I141, I142, I143, I144, I145, I146, I147, I148, I149, I150, I151, I152, I153, I154, I155, I156, I157, I158, I159, I160, I161, I162, I163, I164, I165, I166, I167, I168, I169, I170, I171, I172, I173, I174, I175, I176, I177, I178, I179, I180, I181, I182, I183, I184, I185, I186, I187, I188, I189, I190, I191, I192, I193, I194, I195, I196, I197, I198, I199, I200, I201, I202, I203, I204, I205, I206, I207, I208, I209, I210, I211, I212, I213, I214, I215, I216, I217, I218, I219, I220, I221, I222, I223, I224, I225, I226, I227, I228, I229, I230, I231, I232, I233, I234, I235, I236, I237, I238, I239, I240, I241, I242, I243, I244, I245, I246, I247, I248, I249, I250, I251, I252, I253, I254, I255, I256, I257, I258, I259, I260, I261, I262, I263, I264, I265, I266, I267, I268, I269, I270, I271, I272, I273, I274, I275, I276, I277, I278, I279, I280, I281, I282, I283, I284, I285, I286, I287, I288, I289, I290, I291, I292, I293, I294, I295, I296, I297, I298, I299, I300, I301, I302, I303, I304, I305, I306, I307, I308, I309, I310, I311, I312, I313, I314, I315, I316, I317, I318, I319, I320, I321, I322, I323, I324, I325, I326, I327, I328, I329, I330, I331, I332, I333, I334, I335, I336, I337, I338, I339, I340, I341, I342, I343, I344, I345, I346, I347, I348, I349, I350, I351, I352, I353, I354, I355, I356, I357, I358, I359, I360, I361, I362, I363, I364, I365, I366, I367, I368, I369, I370, I371, I372, I373, I374, I375, I376, I377, I378, I379, I380, I381, I382, I383, I384, I385, I386, I387, I388, I389, I390, I391, I392, I393, I394, I395, I396, I397, I398, I399, I400, I401, I402, I403, I404, I405, I406, I407, I408, I409, I410, I411, I412, I413, I414, I415, I416, I417, I418, I419, I420, I421, I422, I423, I424, I425, I426, I427, I428, I429, I430, I431, I432, I433, I434, I435, I436, I437, I438, I439, I440, I441, I442, I443, I444, I445, I446, I447, I448, I449, I450, I451, I452, I453, I454, I455, I456, I457, I458, I459, I460, I461, I462, I463, I464, I465, I466, I467, I468, I469, I470, I471, I472, I473, I474, I475, I476, I477, I478, I479, I480, I481, I482, I483, I484, I485, I486, I487, I488, I489, I490, I491, I492, I493, I494, I495, I496, I497, I498, I499, I500, I501, I502, I503, I504, I505, I506, I507, I508, I509, I510, I511, I512, I513, I514, I515, I516, I517, I518, I519, I520, I521, I522, I523, I524, I525, I526, I527, I528, I529, I530, I531, I532, I533, I534, I535, I536, I537, I538, I539, I540, I541, I542, I543, I544, I545, I546, I547, I548, I549, I550, I551, I552, I553, I554, I555, I556, I557, I558, I559, I560, I561, I562, I563, I564, I565, I566, I567, I568, I569, I570, I571, I572, I573, I574, I575, I576, I577, I578, I579, I580, I581, I582, I583, I584, I585, I586, I587, I588, I589, I590, I591, I592, I593, I594, I595, I596, I597, I598, I599, I600, I601, I602, I603, I604, I605, I606, I607, I608, I609, I610, I611, I612, I613, I614, I615, I616, I617, I618, I619, I620, I621, I622, I623, I624, I625, I626, I627, I628, I629, I630, I631, I632, I633, I634, I635, I636, I637, I638, I639, I640, I641, I642, I643, I644, I645, I646, I647, I648, I649, I650, I651, I652, I653, I654, I655, I656, I657, I658, I659, I660, I661, I662, I663, I664, I665, I666, I667, I668, I669, I670, I671, I672, I673, I674, I675, I676, I677, I678, I679, I680, I681, I682, I683, I684, I685, I686, I687, I688, I689, I690, I691, I692, I693, I694, I695, I696, I697, I698, I699, I700, I701, I702, I703, I704, I705, I706, I707, I708, I709, I710, I711, I712, I713, I714, I715, I716, I717, I718, I719, I720, I721, I722, I723, I724, I725, I726, I727, I728, I729, I730, I731, I732, I733, I734, I735, I736, I737, I738, I739, I740, I741, I742, I743, I744, I745, I746, I747, I748, I749, I750, I751, I752, I753, I754, I755, I756, I757, I758, I759, I760, I761, I762, I763, I764, I765, I766, I767, I768, I769, I770, I771, I772, I773, I774, I775, I776, I777, I778, I779, I780, I781, I782

Power input and switch

The diagram illustrates the power input and switch circuit. It features a USB1 module connected to a power input section. The USB1 module has pins A1, A4, A5, A6, A7, A8, A12, B12, B9, B8, B7, B6, B5, B4, B1, B2, B3, B10, B11, B13, B14, B15, B16, B17, B18, B19, B20, B21, B22, B23, B24, B25, B26, B27, B28, B29, B30, B31, B32, B33, B34, B35, B36, B37, B38, B39, B40, B41, B42, B43, B44, B45, B46, B47, B48, B49, B50, B51, B52, B53, B54, B55, B56, B57, B58, B59, B60, B61, B62, B63, B64, B65, B66, B67, B68, B69, B70, B71, B72, B73, B74, B75, B76, B77, B78, B79, B80, B81, B82, B83, B84, B85, B86, B87, B88, B89, B90, B91, B92, B93, B94, B95, B96, B97, B98, B99, B100. The power input section includes a 6V1.5A fuse (F6), a 0.1uF25V capacitor (C2), a 1K resistor (R1), and three LEDs (LED1, LED2, LED3) connected to ESD1, ESD2, and ESD3 diodes. The LEDs are labeled GREEN, RED, and BLUE. The ESD diodes are labeled ESD5311N-2/TR. The power input is labeled VIN5V.

Serial communication automatic download

LED & Key

ULN2003 stepper motor drive circuit

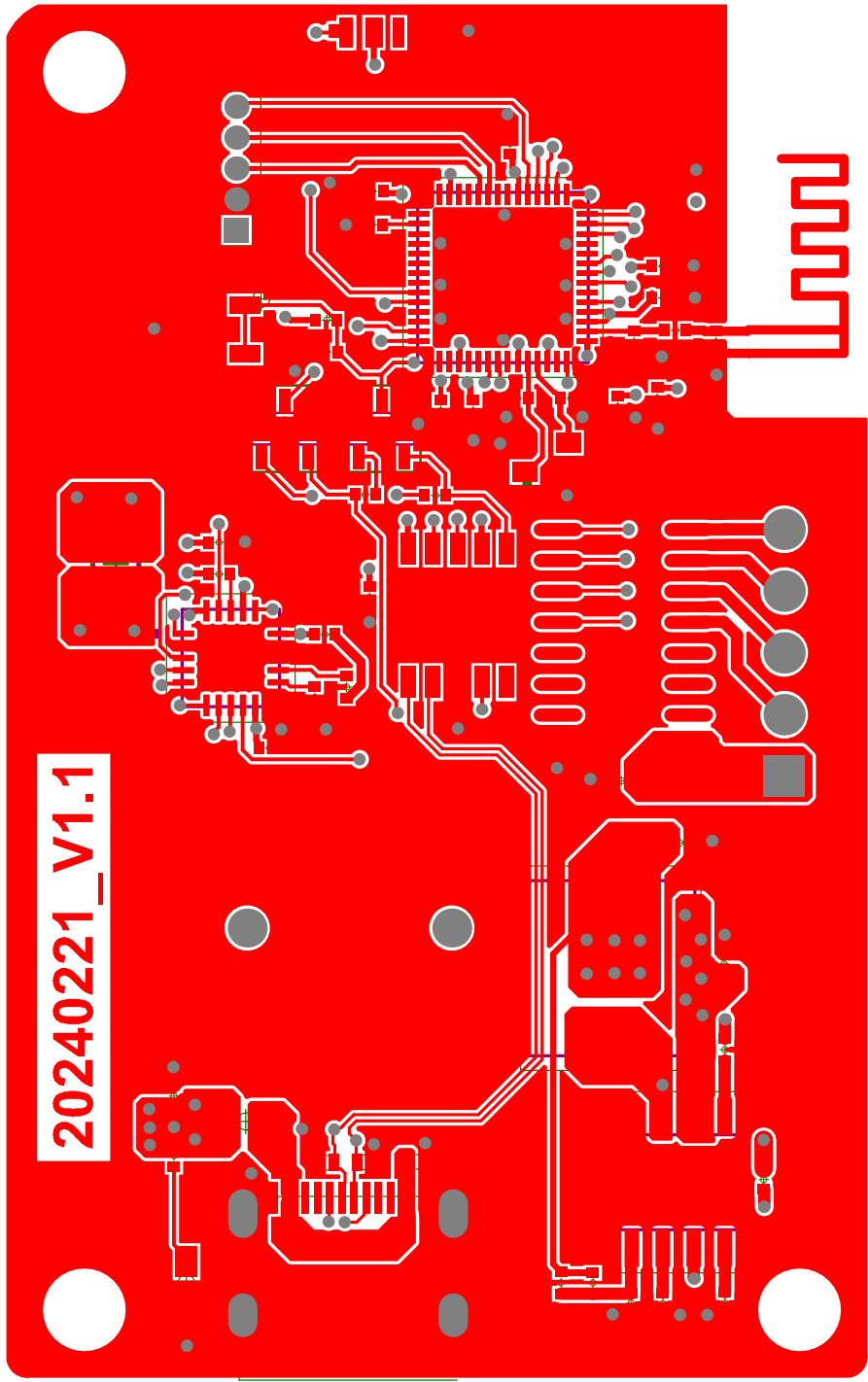
3.3V step-down circuit

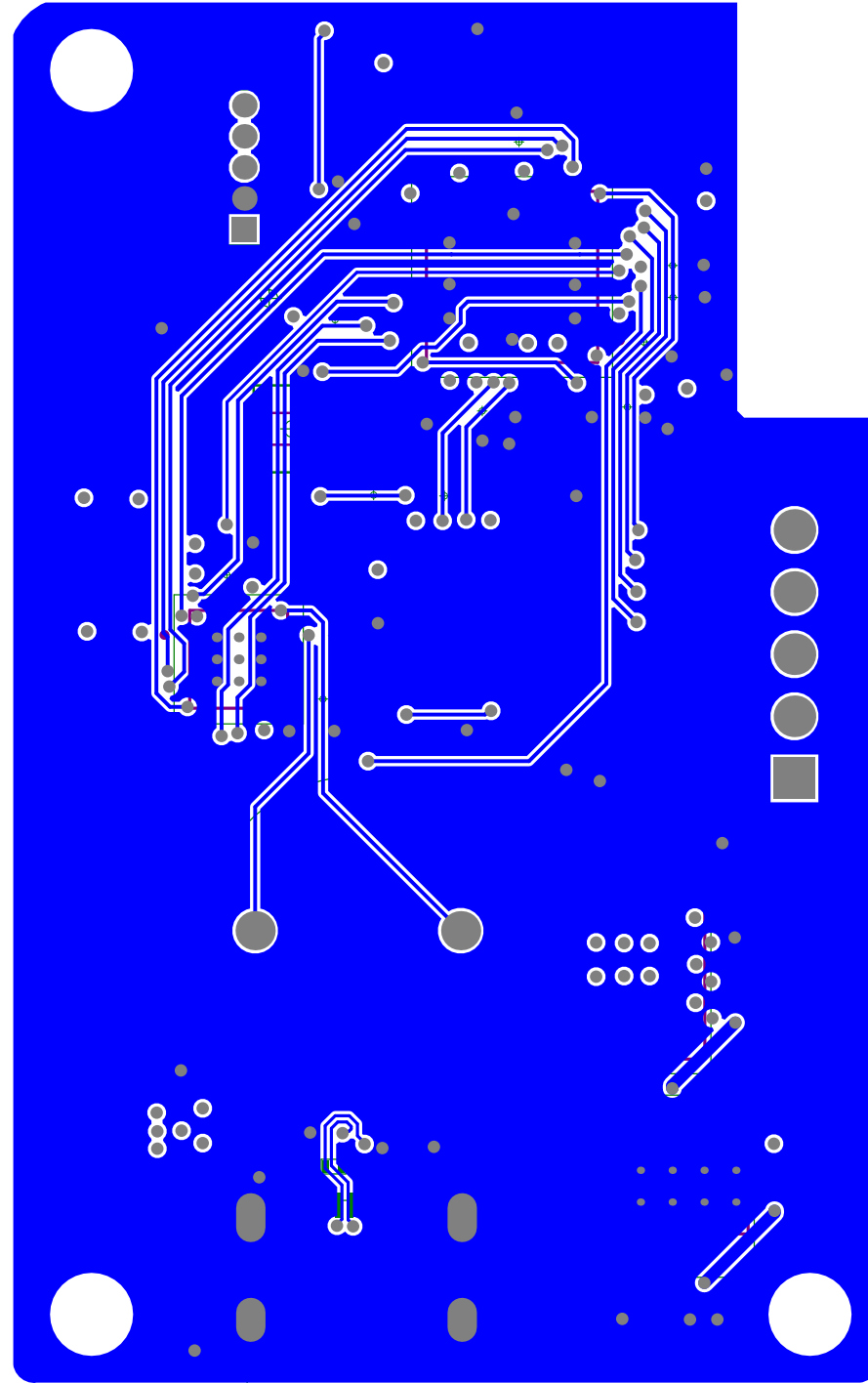
The diagram shows a 3.3V step-down circuit using the TPS54339DDA. The input voltage is 5V (VIN), and the output is 3.3V. The circuit includes a 10kΩ resistor (R2), a 10μF capacitor (C27), and a 1μF capacitor (C28). The feedback network consists of a 25.5kΩ resistor (R12) and an 84.5kΩ resistor (R3). The output filter capacitor is 22μF (C17).

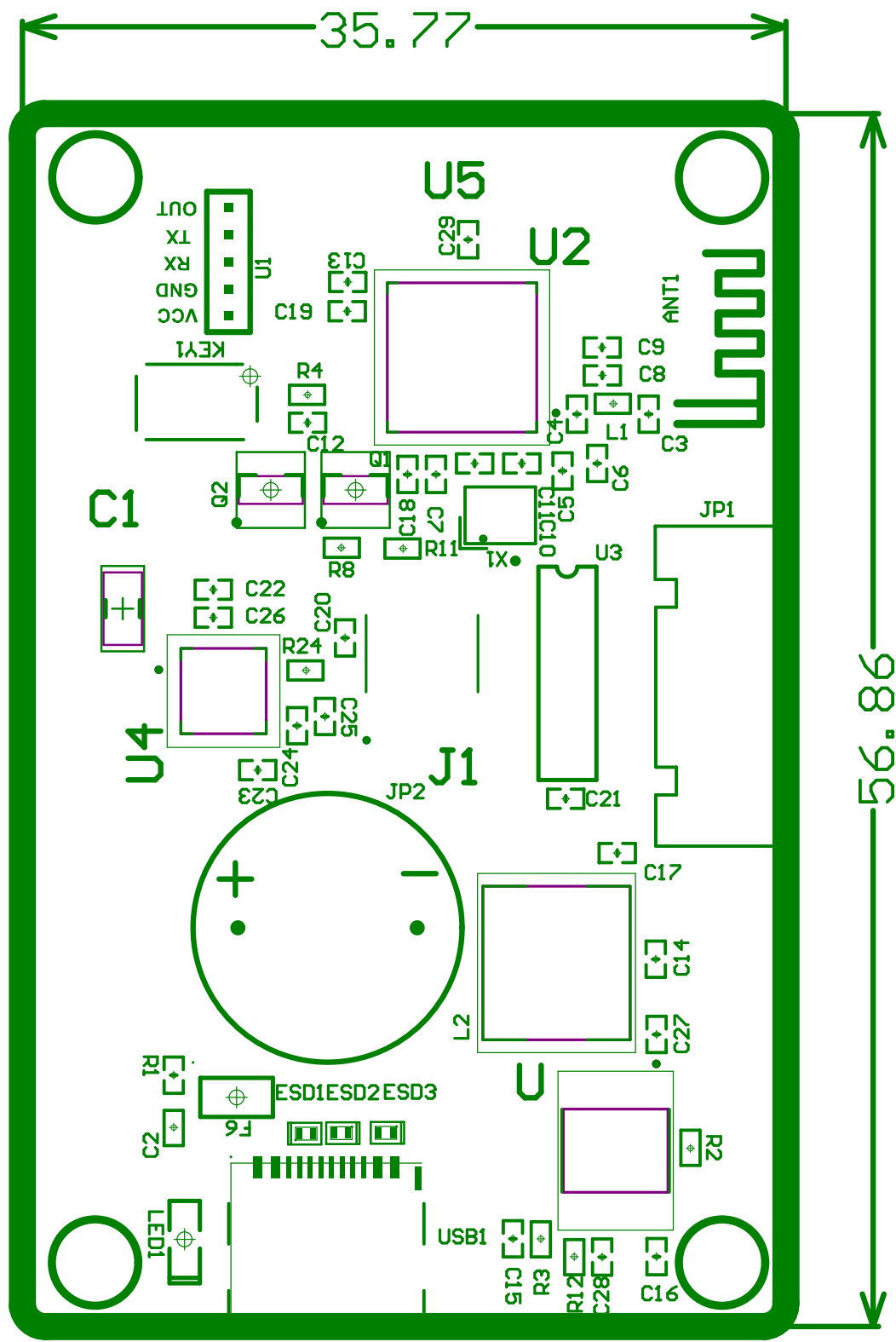
Radar interface

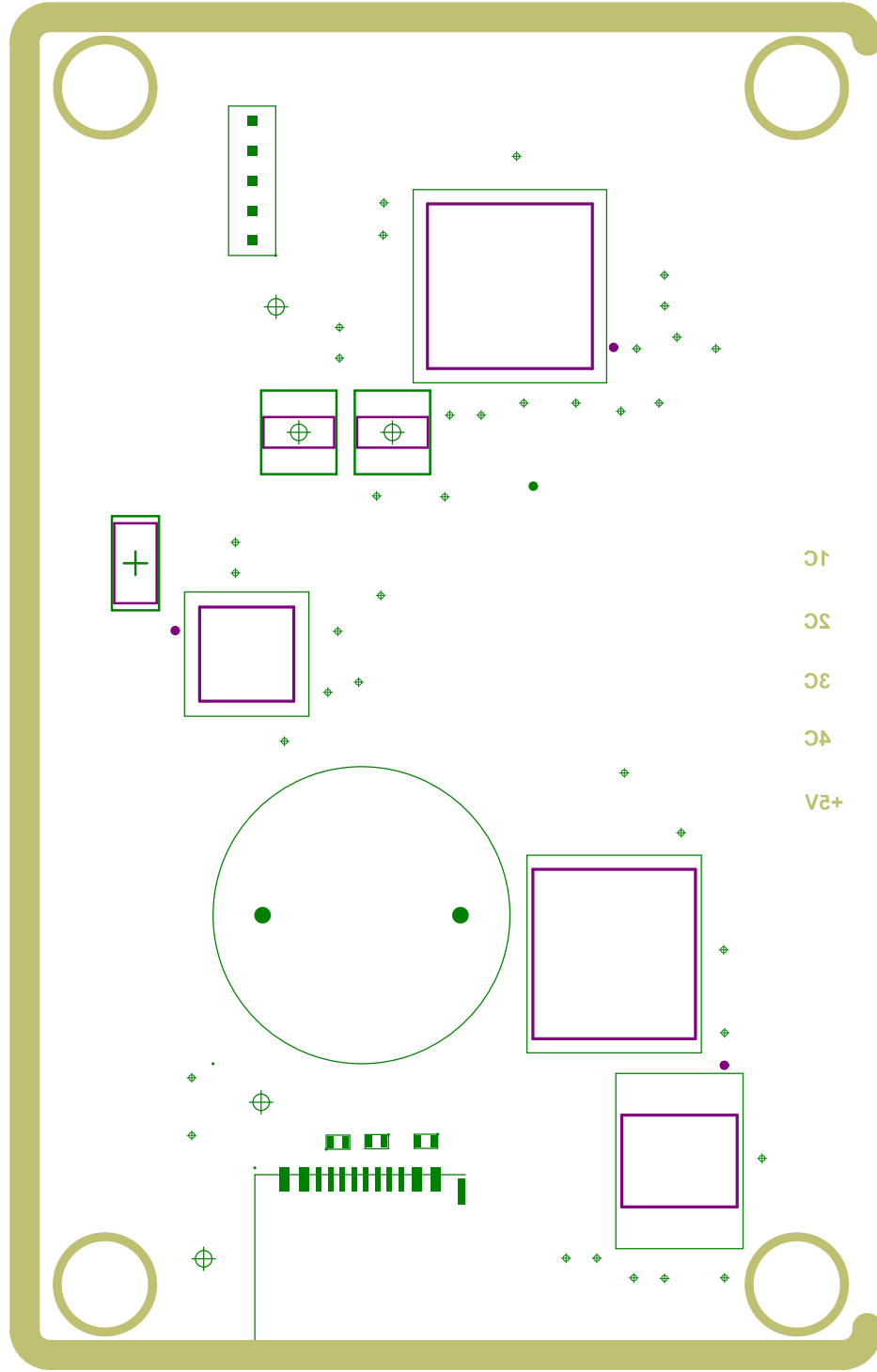
The diagram illustrates the power and data connections for the HLK-LD2410B module. The module's pins are labeled VCC, GND, RX, TX, and OUT. The RX and TX pins are connected to the RXD₊ and RXD₋ pins of the RS485 transceiver U1, respectively. The TX pin is connected to the TXD₊ pin of U1. The OUT pin is connected to the TXD₋ pin of U1. The VCC pin is connected to a 3.3V supply through a 0.1μF/25V capacitor (C7). The GND pin is connected to GND through a 0.1μF/25V capacitor (C7).

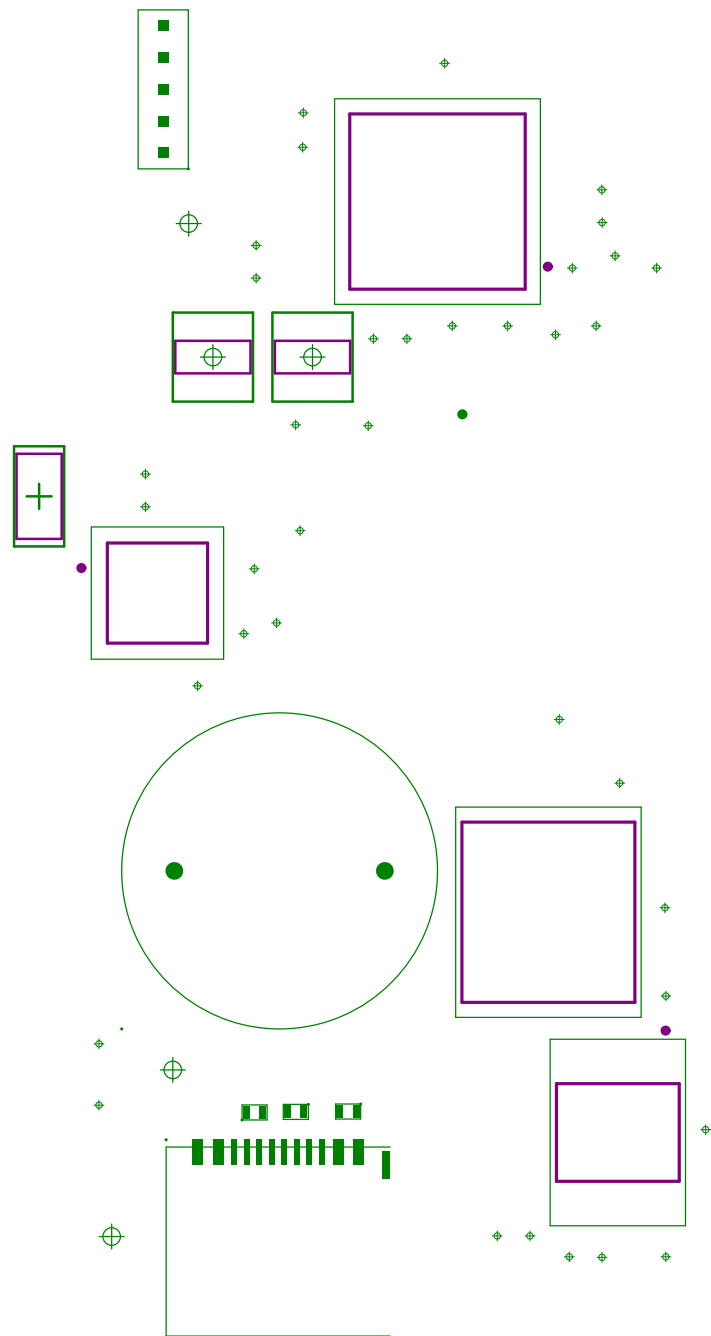
HLK-LD2410B

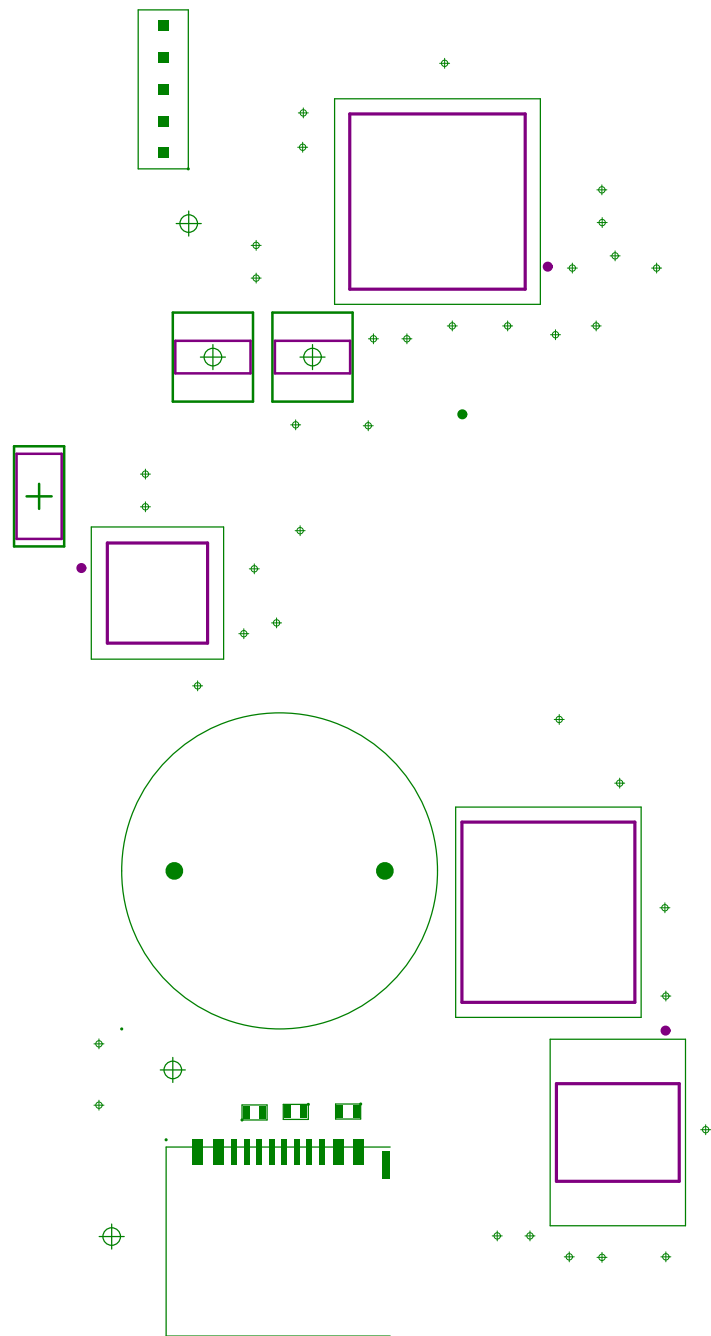


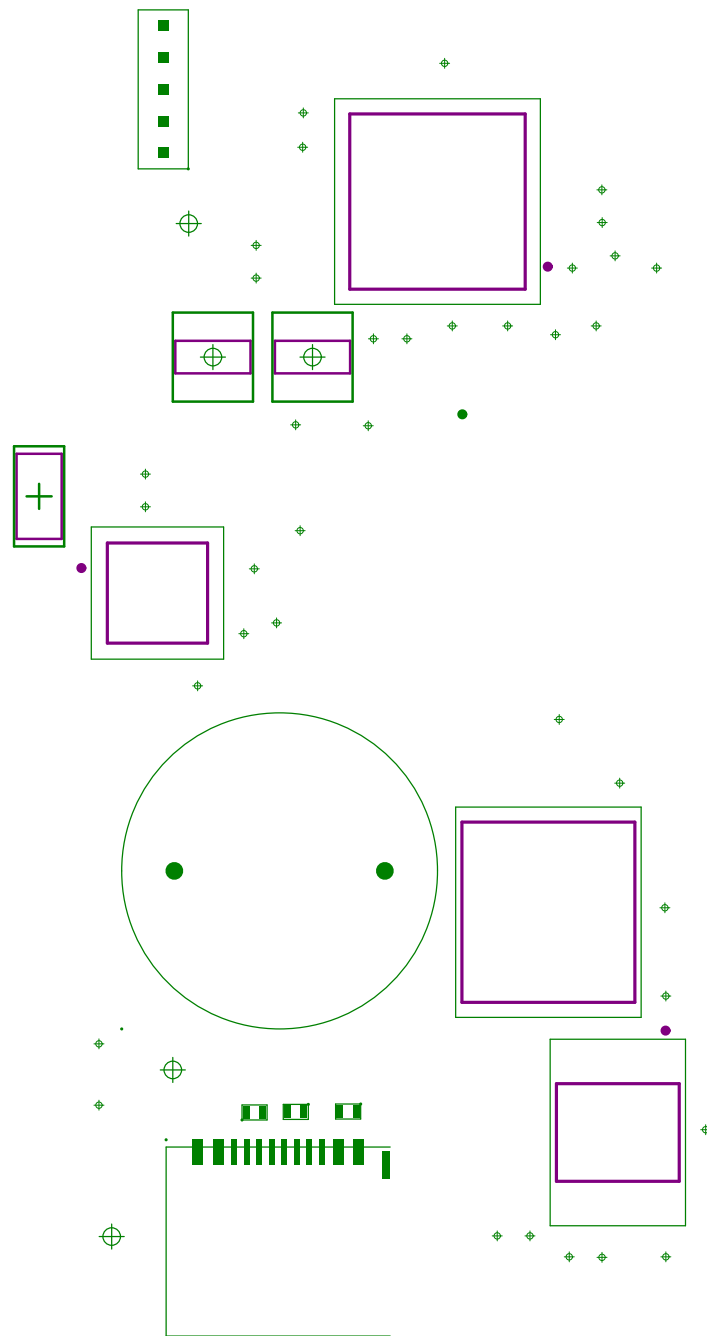


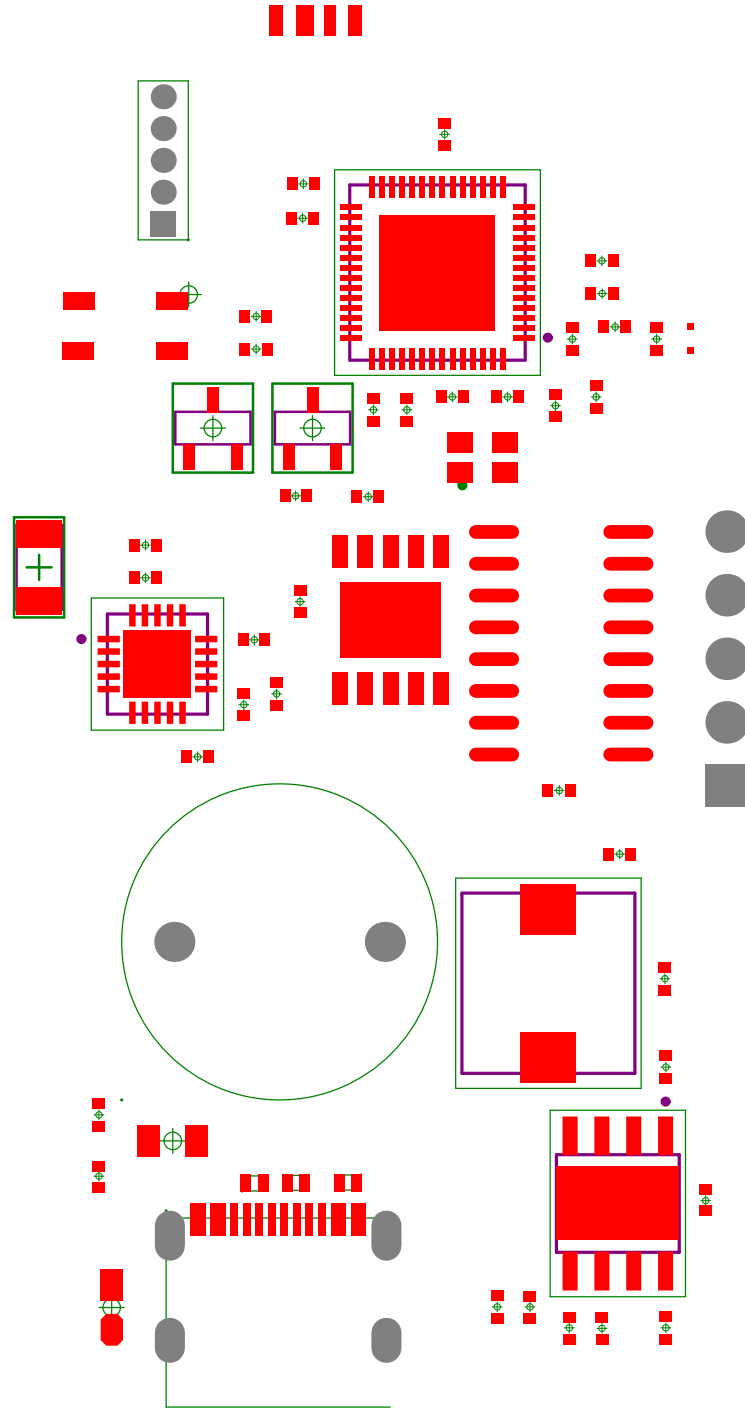


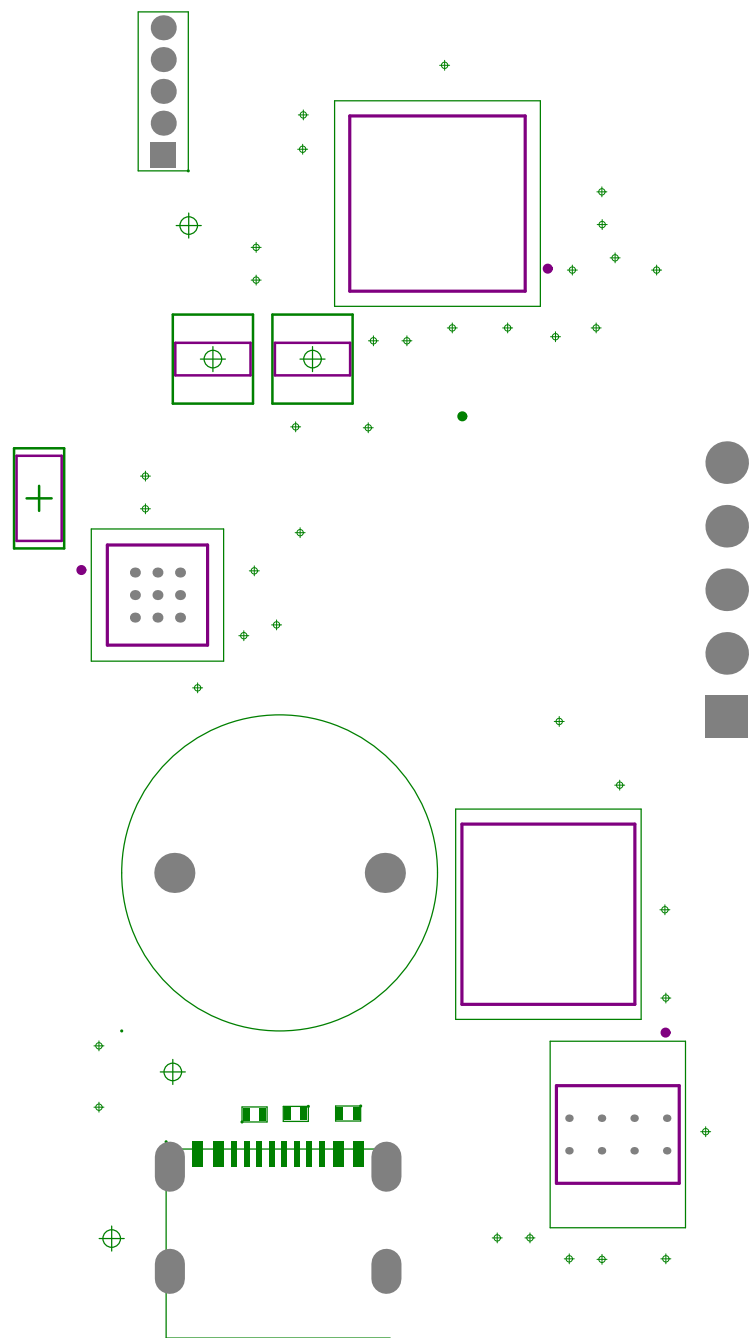


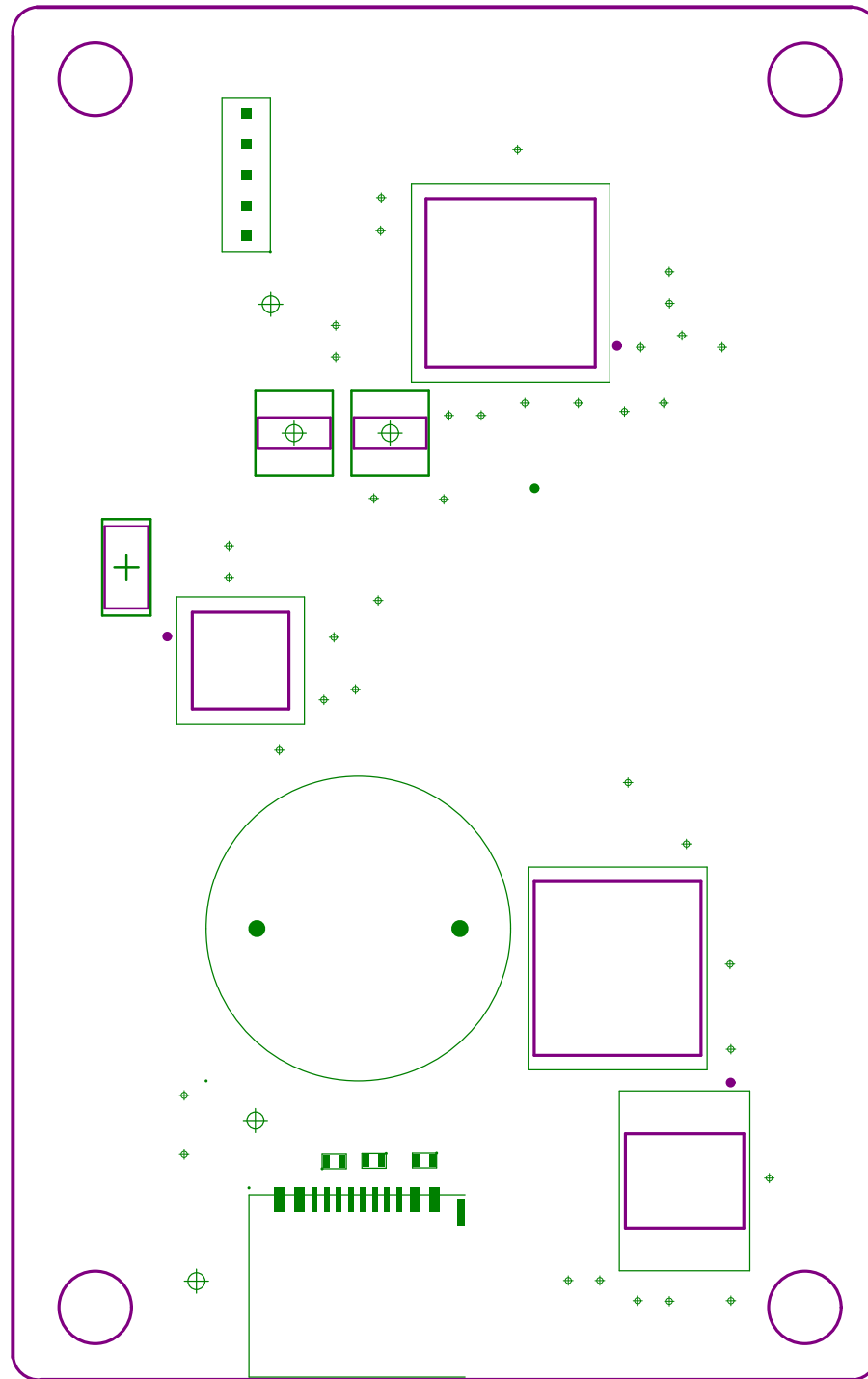


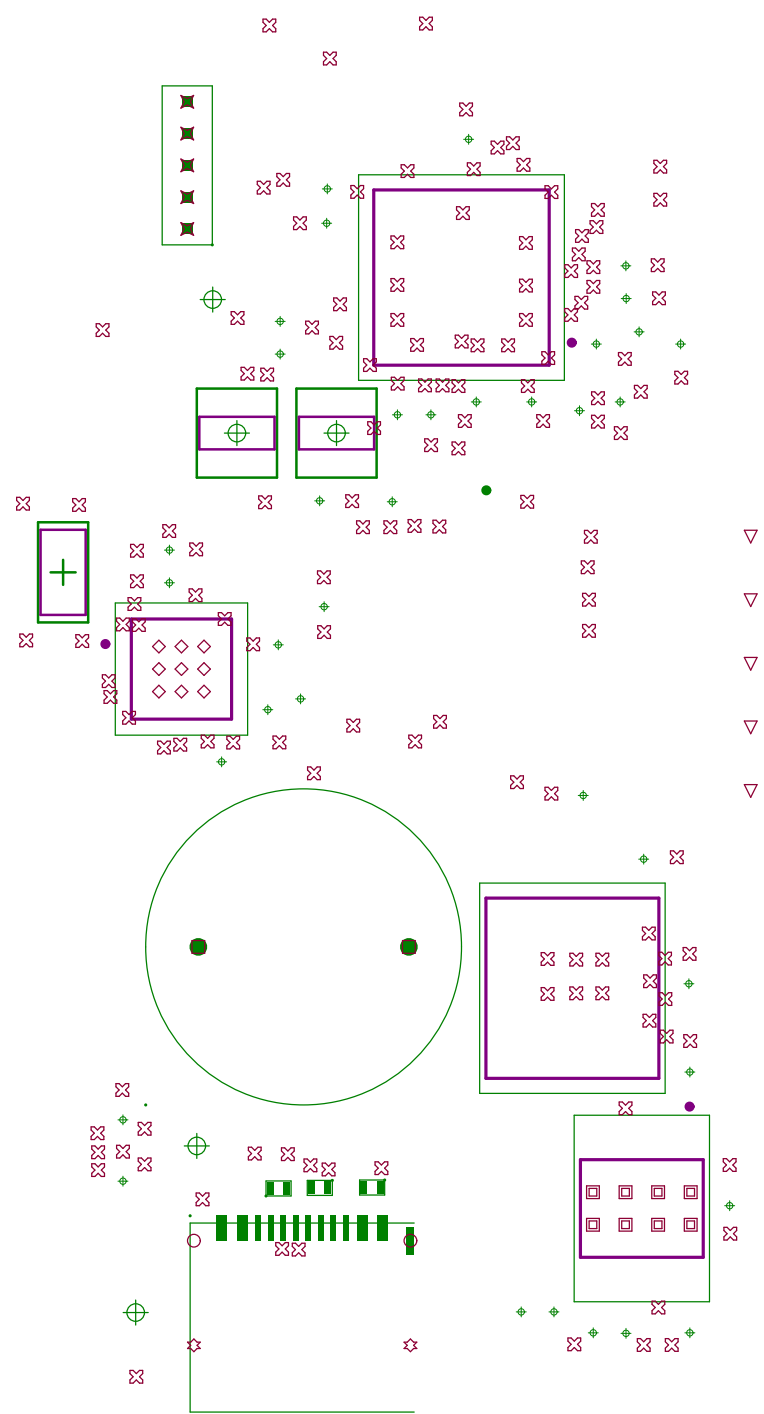


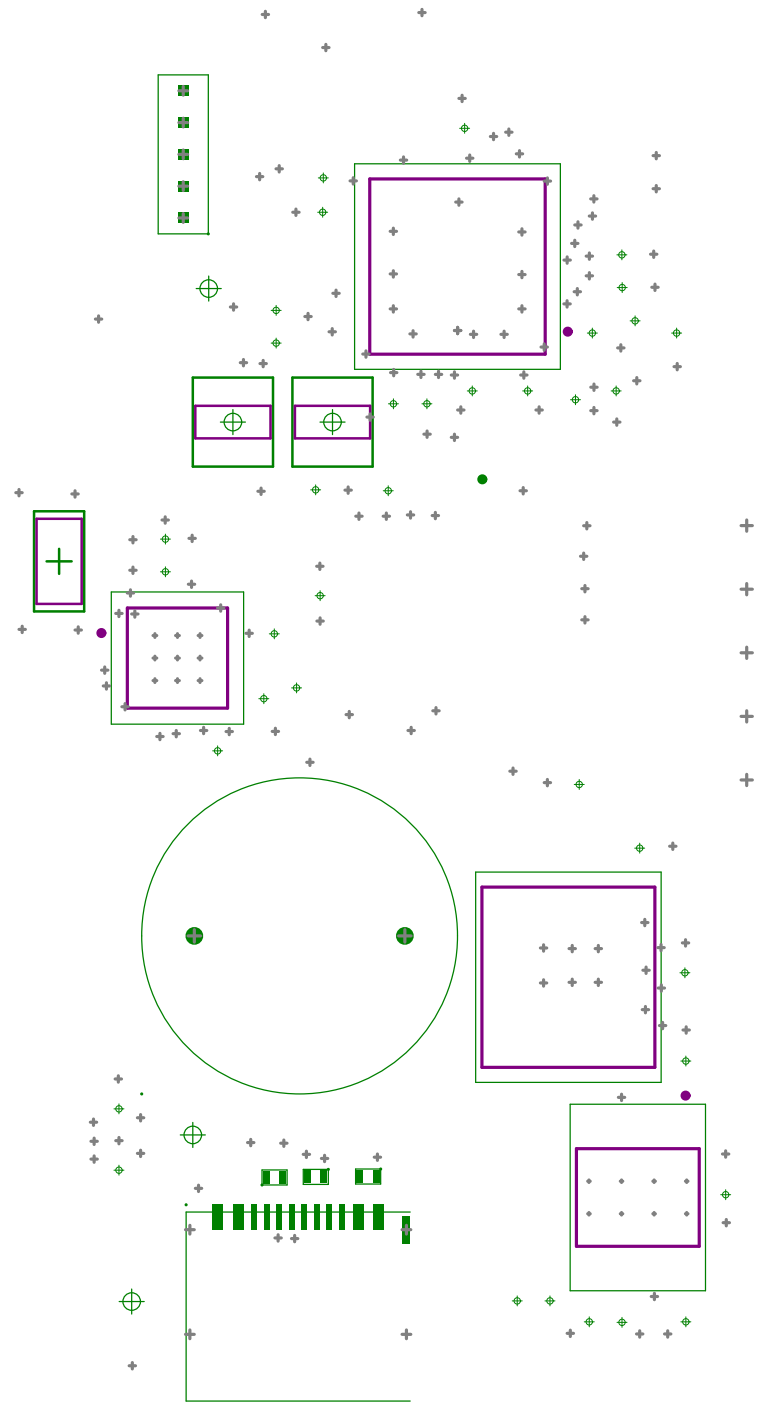


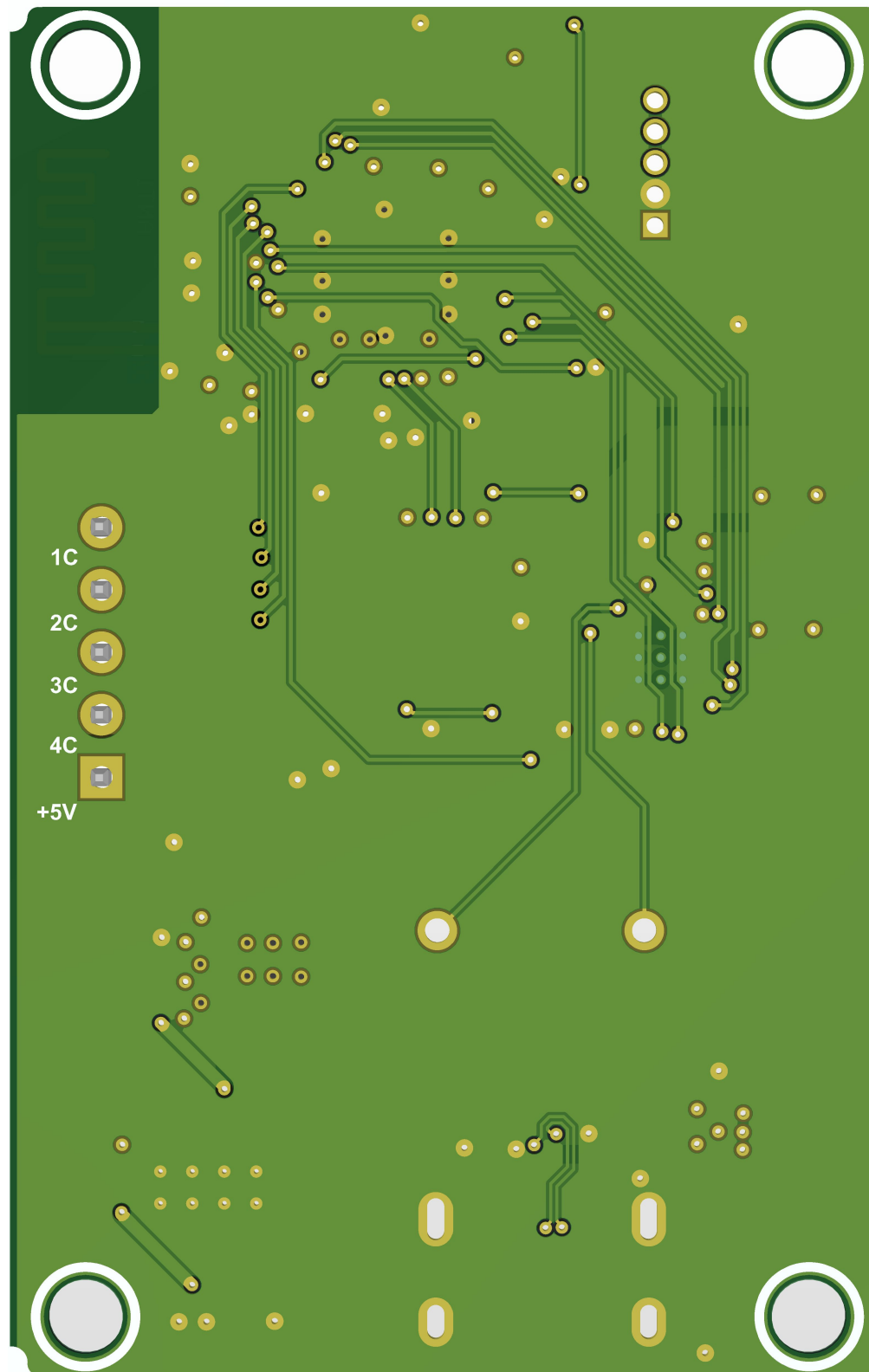












Comment	Description	Designator	Footprint	LibRef	Quantity
2.4G	PCB板载天线	ANT1	2.4GIIIB	ANT1	1
CA45A-A-25V-2.2UF-K	Polarized Capacitor (Axial)	C1	INDC3216	Cap Pol2	1
0.1uF/25V		C2, C5, C7, C9, C13, C18, C19, C20, C21, C22, C24, C29	C 0402_L	C	12
0.4pF/25V		C3, C4	C 0402_L	C	2
10uF/10V		C6, C8	C 0402_L	C	2
20pF/25V		C10, C11	C 0402_L	C	2
1uF/10V		C12	C 0402_L	C	1
22uF/10V	Capacitor	C14	C 0402_L	Cap	1
10pF/10V	Capacitor	C15	C 0402_L	Cap	1
8.2nF/25V		C16	C 0402_L	C	1
22uF/25V		C17	C 0402_L	C	1
10nF/25V		C23	C 0402_L	C	1
330nF/25V		C25	C 0402_L	C	1
15nF/25V		C26	C 0402_L	C	1
0.1uF/10V	Capacitor	C27	C 0402_L	Cap	1
1uF/25V		C28	C 0402_L	C	1
ESD5311N-2/TR		ESD1, ESD2, ESD3	X1-DFN1006-2_L1.0-W0.6-RD	tvS管	3
6V1A		F6	R 0805_L	JK-SMD0603-100L	1
CH340K	USB to Serial Port Chip	J1	*SOP100P600X160-11N	CH340K	1
HDR-1X5	5P接插件	JP1	XH2.54-LI-5P	Header 5	1
超声波探头_C242180	2P接插件	JP2	SENSOR-TH_GU12XXC40XX	Header 2	1
6*6*5	直插6x6轻触开关	KEY1	TSW SMD-6*6*5	TSW DIP-6x6	1
0R1%		L1	R 0402_L	L	1
CLF7045T-3R3N-D		L2	IND_CLF7045T-3R3N-D	L	1
GREEN	5mm草帽LED	LED1	LED 0603B	LED-SH-5MM	1
S8050		Q1, Q2	SOT23-3L	S8050	2
1K		R1	R 0402_L	Res	1
10K		R2, R4, R8, R11	R 0402_L	Res	4
84.5K		R3	R 0402_L	Res	1
25.5K		R12	R 0402_L	Res	1
200R		R24	R 0402_L	Res	1
TPS54339DDA	4.5V to 23V Input, 3A Synchronous Step-Down Converter with D-CAP2 Mode and Light Load Efficiency 85 SO PowerPAD -40 to 85	U	VREG_LM5017MR/NO PB	TPS54339EDDA	1
HLK-LD2410B		U1	HDR-TH_5P-P1.27-V-M	HLK-LD2410B	1
ESP32-S2FN4R2	RF System on a Chip - SoC SMD Wi-Fi IC ESP32-S2FN4R2, single core MCU, 4 MB flash and 2 MB PSRAM inside, QFN 56-pin, 7*7 mm	U2	QFN40P700X700X90-57N	ESP32-S2FN4R2	1
ULN2003	达林顿驱动芯片	U3	SOP16	ULN2003-2	1
TUSS4470TRTJT	ULTRASONIC SENSOR I/F FOR PARK A	U4	QFN50P400X400X80-21N	TUSS4470TRTJT	1
SK6812 SIDE-A	INTEGRATED LIGHT SOURCE INTELLIGENT CONTROL OF CHIP-ON-TOP SMD TYPE LED	U5	SK6812 SIDE-A	SK6812 SIDE-A	1
C709357		USB1	USB-C-SMD_KH-TYPE-C-16P	KH-TYPE-C-16P	1
40MHz	MC系列4脚晶振	X1	OSC 2016-4P	XTAL-MC-4P	1