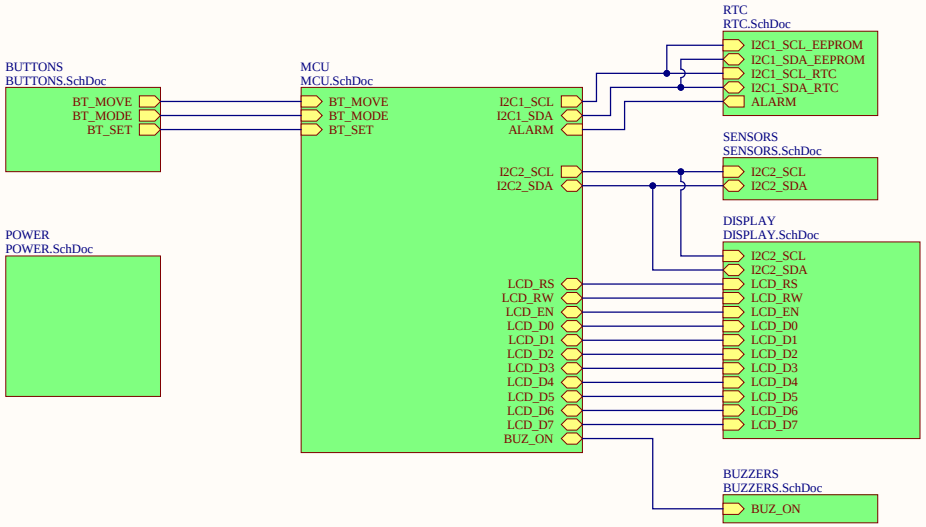

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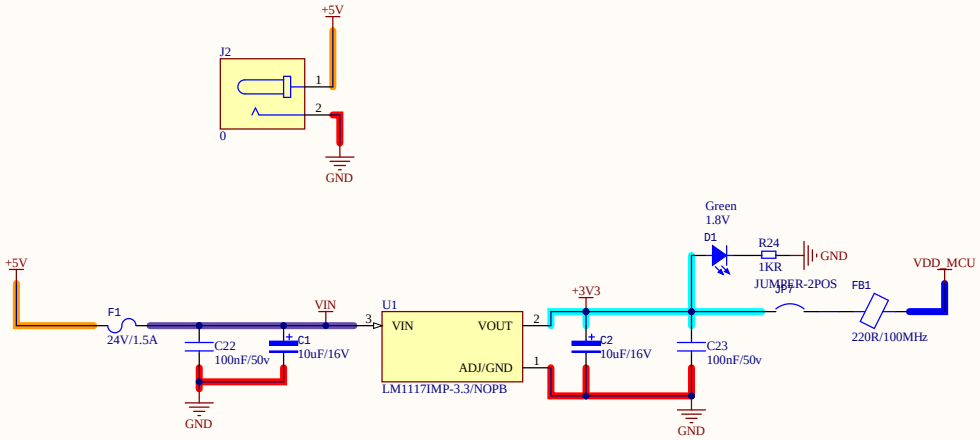

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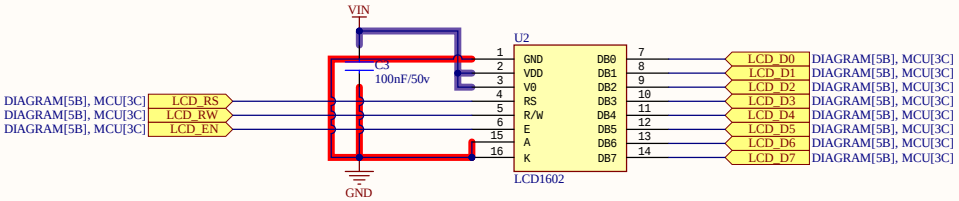

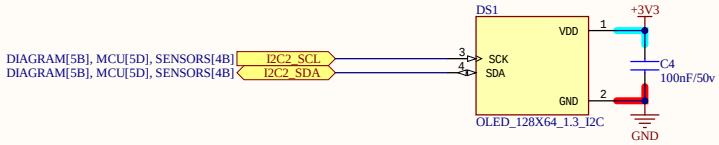

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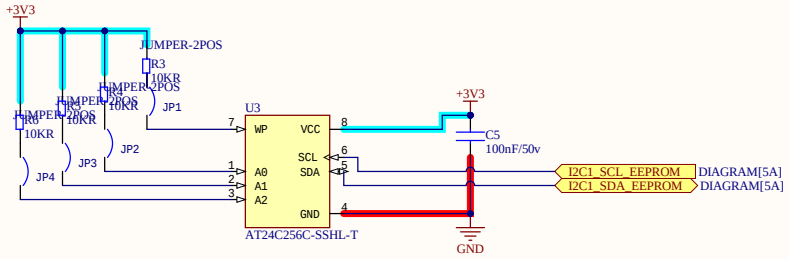
DC Characteristics

Table 4-2. DC Characteristics

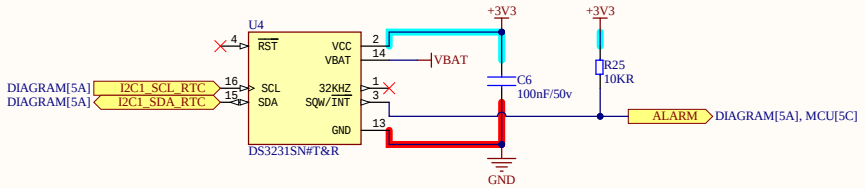
Parameter	Symbol	Minimum	Typical[1]	Maximum	Units	Test Conditions
Supply Voltage	V_{CC1}	1.7	—	5.5	V	
Supply Current	I_{CC1}	—	1.0	2.0	mA	V_{CC} = 5.0V, Read at 400 kHz
Supply Current	I_{CC2}	—	2.0	3.0	mA	V_{CC} = 5.0V, Write at 400 kHz
Standby Current	I_{SB1}	—	—	1.0	µA	V_{CC} = 1.7V, V_{IN} = V_{CC} or GND
		—	—	6.0	µA	V_{CC} = 5.0V, V_{IN} = V_{CC} or GND
Input Leakage Current	I_{LI}	—	0.10	3.0	µA	V_{IN} = V_{CC} or GND; V_{CC} = 5.0V
Output Leakage Current	I_{LO}	—	0.05	3.0	µA	V_{OUT} = V_{CC} or GND; V_{CC} = 5.0V
Input Low Level	V_{IL}	-0.6	—	V_{CC} x 0.3	V	Note 2
Input High Level	V_{IH}	V_{CC} x 0.7	—	V_{CC} + 0.5	V	Note 2
Output Low Level	V_{OL1}	—	—	0.2	V	V_{CC} = 1.7V, I_{OL} = 0.15 mA
Output Low Level	V_{OL2}	—	—	0.4	V	V_{CC} = 3.0V, I_{OL} = 2.1 mA



Recommended Operating Conditions

(T_A = T_{MIN} to T_{MAX}, unless otherwise noted.) (Notes 2, 3)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage	V_{CC}		2.3	3.3	5.5	V
	V_{BAT}		2.3	3.0	5.5	V



Electrical Characteristics

(V_{CC} = 2.3V to 5.5V, V_{CC} = Active Supply (see Table 1), T_A = T_{MIN} to T_{MAX}, unless otherwise noted.) (Typical values are at V_{CC} = 3.3V, V_{BAT} = 3.0V, and T_A = +25°C, unless otherwise noted.) (Notes 2, 3)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Active Supply Current	I_{CCA}	(Notes 4, 5)	V_{CC} = 3.63V			200	µA
			V_{CC} = 5.5V			300	
Standby Supply Current	I_{CCS}	I²C bus inactive, 32kHz output on, SQW output off (Note 5)	V_{CC} = 3.63V			110	µA
			V_{CC} = 5.5V			170	
Temperature Conversion Current	$I_{CCSCONV}$	I²C bus inactive, 32kHz output on, SQW output off	V_{CC} = 3.63V			575	µA
			V_{CC} = 5.5V			650	
Power-Fail Voltage	V_{PF}			2.45	2.575	2.70	V
Logic 0 Output, 32kHz, $\overline{INT}$/SQW, SDA	V_{OL}	I_{OL} = 3mA				0.4	V
Logic 0 Output, $\overline{RST}$	V_{OL}	I_{OL} = 1mA				0.4	V
Output Leakage Current 32kHz, $\overline{INT}$/SQW, SDA	I_{LO}	Output high impedance		-1	0	+1	µA
Input Leakage SCL	I_{LI}			-1		+1	µA
$\overline{RST}$ Pin I/O Leakage	I_{OL}	$\overline{RST}$ high impedance (Note 6)		-200		+10	µA
V_{BAT} Leakage Current (V_{CC} Active)	I_{BATLKG}				25	100	nA

Pin Description

PIN	NAME	FUNCTION
1	32kHz	32kHz Output. This open-drain pin requires an external pullup resistor. When enabled, the output operates on either power supply. It may be left open if not used.
2	V_{CC}	DC Power Pin for Primary Power Supply. This pin should be decoupled using a 0.1µF to 1.0µF capacitor. If not used, connect to ground.
3	$\overline{INT}$/SQW	Active-Low Interrupt or Square-Wave Output. This open-drain pin requires an external pullup resistor connected to a supply at 5.5V or less. This multifunction pin is determined by the state of the INTCN bit in the Control Register (0Eh). When INTCN is set to logic 0, this pin outputs a square wave and its frequency is determined by RS2 and RS1 bits. When INTCN is set to logic 1, then a match between the timekeeping registers and either of the alarm registers activates the $\overline{INT}$/SQW pin (if the alarm is enabled). Because the INTCN bit is set to logic 1 when power is first applied, the pin defaults to an interrupt output with alarms disabled. The pullup voltage can be up to 5.5V, regardless of the voltage on V_{CC}. If not used, this pin can be left unconnected.
4	$\overline{RST}$	Active-Low Reset. This pin is an open-drain input/output. It indicates the status of V_{CC} relative to the V_{PF} specification. As V_{CC} falls below V_{PF}, the $\overline{RST}$ pin is driven low. When V_{CC} exceeds V_{PF}, for t_{REC}, the $\overline{RST}$ pin is pulled high by the internal pullup resistor. The active-low, open-drain output is combined with a debounced pushbutton input function. This pin can be activated by a pushbutton reset request. It has an internal 50kΩ nominal value pullup resistor to V_{CC}. No external pullup resistors should be connected. If the oscillator is disabled, t_{REC} is bypassed and $\overline{RST}$ immediately goes high.
5–12	N.C.	No Connection. Must be connected to ground.
13	GND	Ground
14	V_{BAT}	Backup Power-Supply Input. When using the device with the V_{BAT} input as the primary power source, this pin should be decoupled using a 0.1µF to 1.0µF low-leakage capacitor. When using the device with the V_{BAT} input as the backup power source, the capacitor is not required. If V_{BAT} is not used, connect to ground. The device is UL recognized to ensure against reverse charging when used with a primary lithium battery. Go to www.maximintegrated.com/qa/info/ul.
15	SDA	Serial Data Input/Output. This pin is the data input/output for the I²C serial interface. This open-drain pin requires an external pullup resistor. The pullup voltage can be up to 5.5V, regardless of the voltage on V_{CC}.
16	SCL	Serial Clock Input. This pin is the clock input for the I²C serial interface and is used to synchronize data movement on the serial interface. Up to 5.5V can be used for this pin, regardless of the voltage on V_{CC}.

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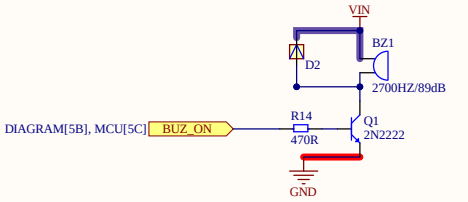

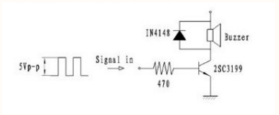

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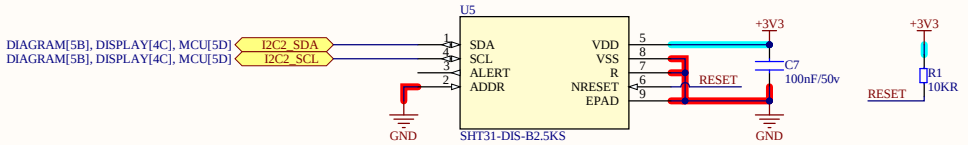
3 Pin Assignment

The SHT3x-DIS comes in a 8-pin DFN package – see Table 7.

Pin	Name	Comments
1	SDA	Serial data; input / output
2	ADDR	Address pin; input; connect to either logic high or low, do not leave floating
3	ALERT	Indicates alarm condition; output; must be left floating if unused
4	SCL	Serial clock; input / output
5	VDD	Supply voltage; input
6	nRESET	Reset pin active low; input; if not used it is recommended to be left floating; can be connected to VDD with a series resistor of R ≥2 kΩ
7	R	No electrical function; to be connected to VSS
8	VSS	Ground

arameter	Symbol	Condition	Min.	Typ.	Max.	Units	Comments
upply voltage	V_{DD}		2.15	3.3	5.5	V	

Measuring	-	600	1500	µA	Current consumption while sensor is measuring
Average	-	1.7	-	µA	Current consumption (operation with one measurement per second at lowest repeatability, single shot mode)



3.5 ALERT Pin

The alert pin may be used to connect to the interrupt pin of a microcontroller. The output of the pin depends on the value of the RH/T reading relative to programmable limits. Its function is explained in a separate application note. If not used, this pin must be left floating. The pin switches high, when alert conditions are met. The maximum driving loads are listed in Table 3. Be aware that self-heating might occur, depending on the amount of current that flows. Self-heating can be prevented if the Alert Pin is only used to switch a transistor.

Parameter	Rating	Units
Supply voltage V_{DD}	-0.3 to 6	V
Max Voltage on pins (pin 1 (SDA); pin 2 (ADDR); pin 3 (ALERT); pin 4 (SCL); pin 6 (nRESET))	-0.3 to VDD+0.3	V
Input current on any pin	±100	mA
Operating temperature range	-40 to 125	°C
Storage temperature range	-40 to 150	°C
ESD HBM (human body model)[9]	4	kV
ESD CDM (charge device model)[10]	750	V

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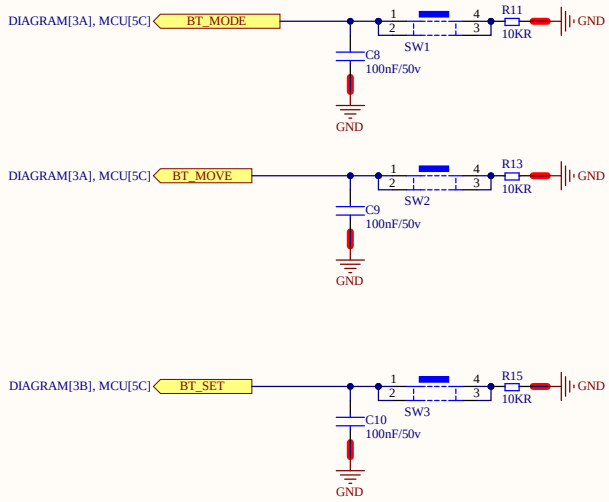

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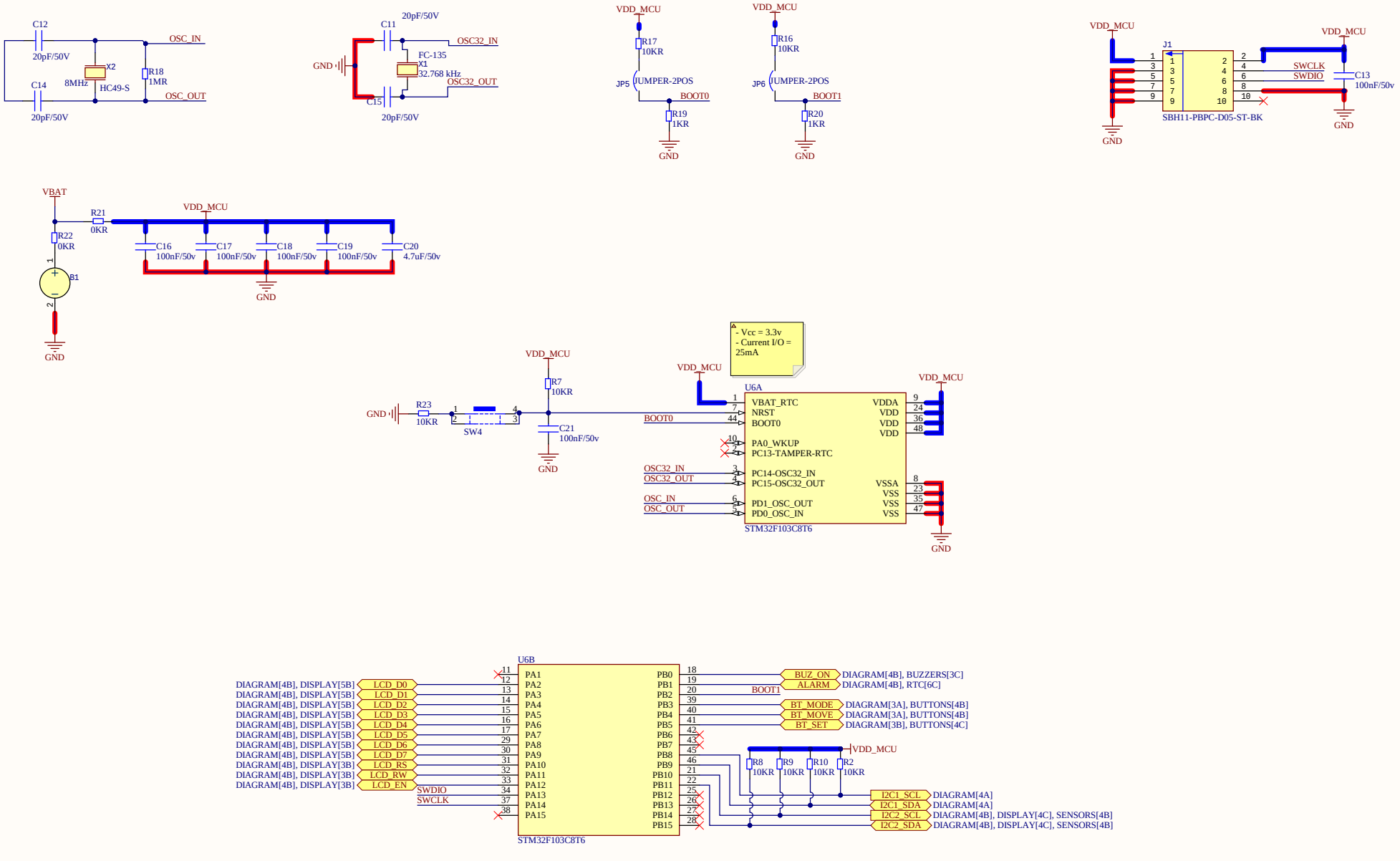

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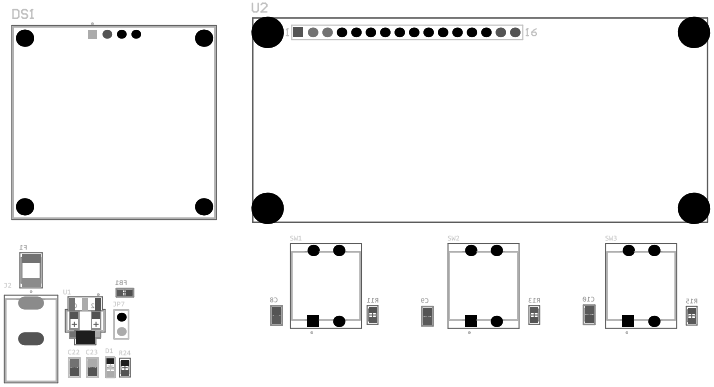
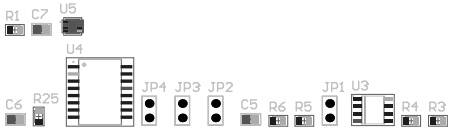
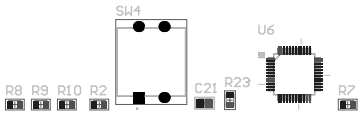
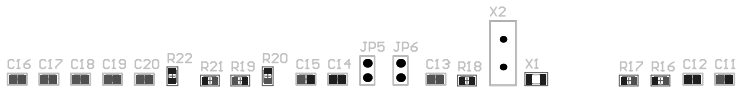
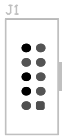
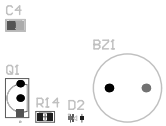

DS1
U2
SW1
SW2
SW3


R1
C7
U5
U4
C6
R25
JP4
JP3
JP2
C5
R6
R5
JP1
U3
R4
R3

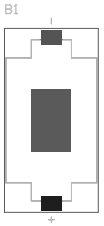

SW4
U6
R8
R9
R10
R2
C21
R23
R7


C16
C17
C18
C19
C20
R22
R21
R19
R20
C15
C14
JP5
JP6
C13
R18
X2
X1
R17
R16
C12
C11


J1


C4
BZ1
Q1
R14
D2


C3


B1