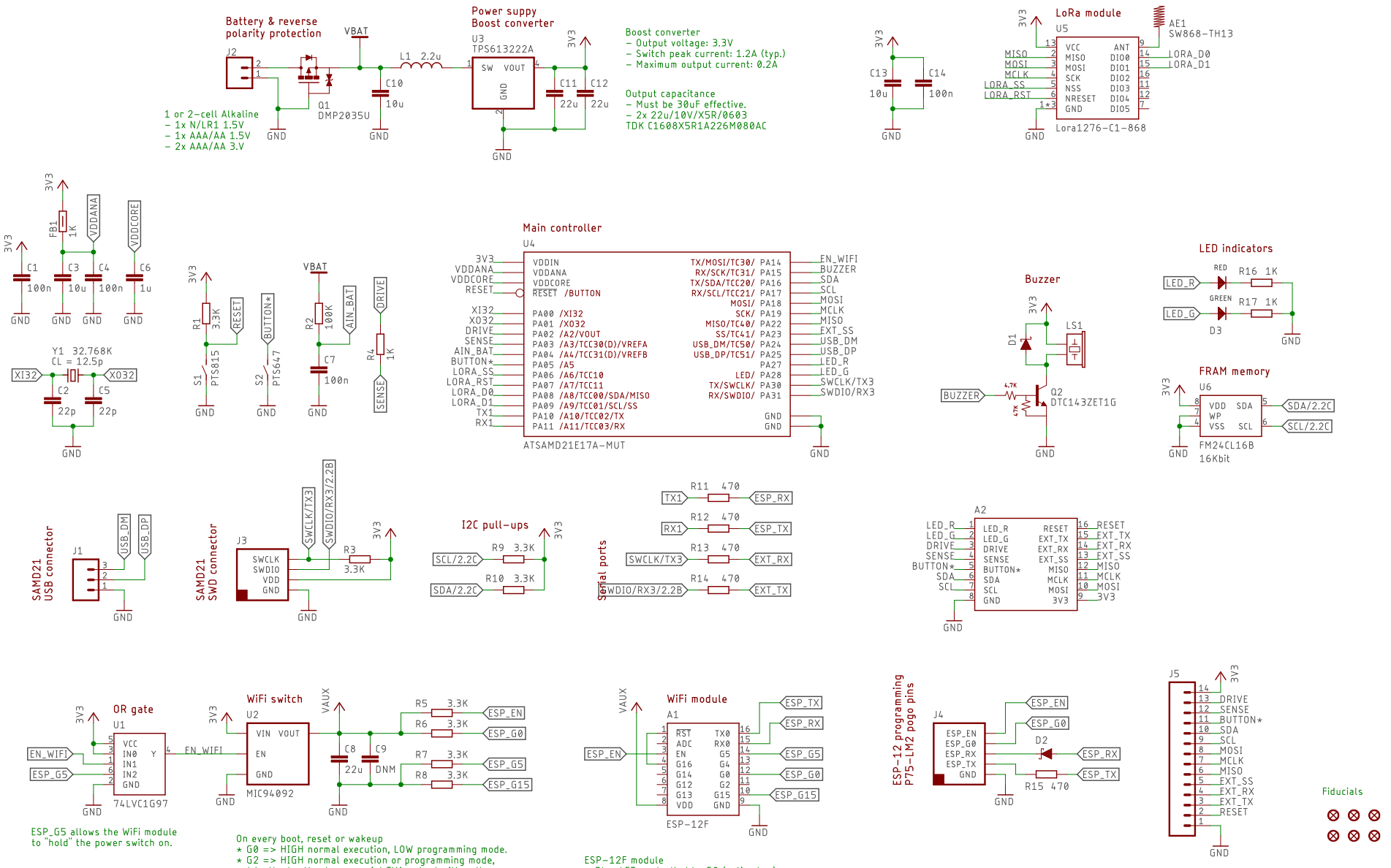
Battery & reverse polarity protection
VBAT
J2
Q1 DMP2035U
L1 2.2u
C10 10u
1 or 2-cell Alkaline
- 1x N/LR1 1.5V
- 1x AAA/AA 1.5V
- 2x AAA/AA 3.V
Power suppy Boost converter
U3 TPS613222A
SW VOUT GND
C11 22u
C12 22u
3V3
Boost converter
- Output voltage: 3.3V
- Switch peak current: 1.2A (typ.)
- Maximum output current: 0.2A
Output capacitance
- Must be 30uF effective.
- 2x 22u/10V/X5R/0603
TDK C1608X5R1A226M080AC
C13 10u
C14 100n
LoRa module
U5
AE1 SW868-TH13
MISO MOSI MCLK LORA_SS LORA_RST
LORA_D0 LORA_D1
Lora1276-C1-868
C1 100n
C3 10u
C4 100n
C6 1u
FB1 1K
VDDANA
VDDCORE
Y1 32.768K
CL = 12.5p
C2 22p
C5 22p
XI32 XO32
R1 3.3K
RESET
S1 PTS815
BUTTON*
S2 PTS647
R2 100K
AIN_BAT
C7 100n
R4 1K
DRIVE
SENSE
Main controller
U4
ATSAMD21E17A-MUT
Buzzer
D1
LS1
BUZZER
4.7K
Q2 DTC143ZET1G
LED indicators
LED_R
LED_G
RED
GREEN
R16 1K
R17 1K
D3
FRAM memory
U6
VDD WP VSS SDA SCL
SDA/2.2C
SCL/2.2C
FM24CL16B
16Kbit
SAMD21 USB connector
J1
USB_DM
USB_DP
SAMD21 SWD connector
J3
SWCLK
SWDIO
VDD
GND
SWCLK/TX3
SWDIO/RX3/2.2B
R3 3.3K
I2C pull-ups
R9 3.3K
R10 3.3K
Serial ports
R11 470
R12 470
R13 470
R14 470
TX1 RX1 SWCLK/TX3 SWDIO/RX3/2.2B
ESP_RX ESP_TX EXT_RX EXT_TX
A2
LED_R LED_G DRIVE SENSE BUTTON* SDA SCL
RESET EXT_TX EXT_RX EXT_SS MISO MCLK MOSI 3V3
OR gate
U1
74LVC1G97
EN_WIFI
ESP_G5
WiFi switch
U2
MIC94092
VIN VOUT EN GND
VAUX
C8 22u
C9 DNM
R5 3.3K
R6 3.3K
R7 3.3K
R8 3.3K
ESP_EN ESP_G0 ESP_G5 ESP_G15
ESP_G5 allows the WiFi module to "hold" the power switch on.
On every boot, reset or wakeup
* G0 => HIGH normal execution, LOW programming mode.
* G2 => HIGH normal execution or programming mode, set by the bootloader as serial TX1 output with pull-up.
* G15 => LOW normal execution or programming mode.
Reset and sleep
* Both nRST and EN can be used to reset the controller.
* G16 outputs a LOW active pulse at the time of wakeup.
WiFi module
A1
ESP-12F
RST ADC EN G16 G14 G12 G13 VDD
TX0 RX0 G5 G4 G0 G2 G15 GND
ESP_TX ESP_RX ESP_G5 ESP_G0 ESP_G15
ESP-12F module
- Blue LED controlled by G2 (active low).
- 12K pull-up resistor on nRST pin.
Power
- During boot => pulses of 436 mA for 40 ms.
- WiFi radio => pulses of 300 mA for 700 us.
ESP-12 programming P75-LM2 pogo pins
J4
ESP_EN ESP_G0 ESP_RX ESP_TX GND
D2
R15 470
J5
DRIVE SENSE BUTTON* SDA SCL MOSI MCLK MISO EXT_SS EXT_RX EXT_TX RESET
Fiducials
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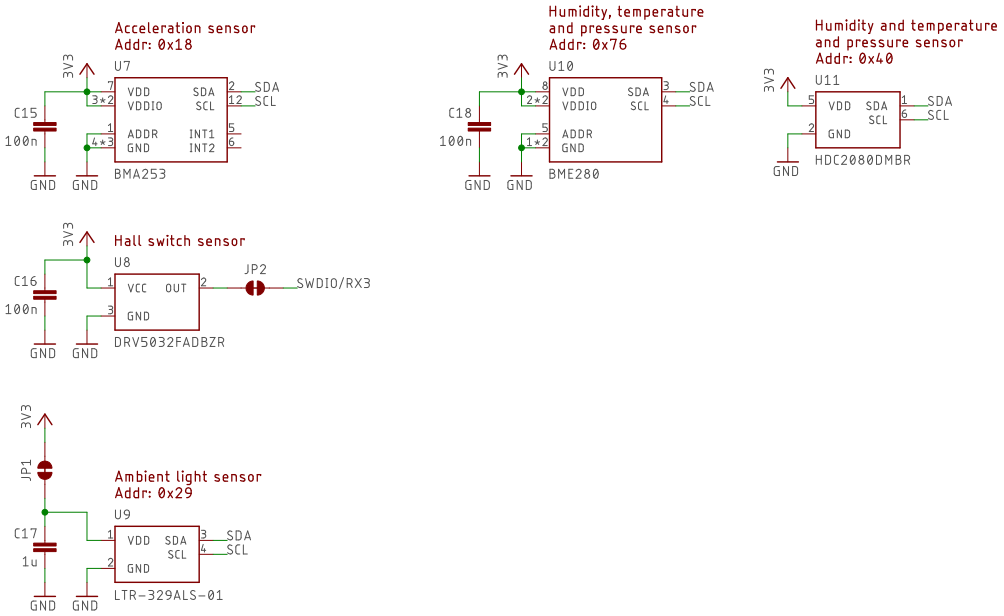
2019-07-03
Sheet: 1/2



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