INPUT SWITCHING

TP1 VIN_CUT
+3V30 VIN0 VBAT+ VIN
Q1 HSSK8811
S1 D1
S2 G1
D2 G2
S2
PMOS
D1 B5819WS
R1 100k
Q2 BSS138PW,115
R2 100k
VIN_CUT
GND

```
STATE            VCUT  VIN
VBAT>VIN0   x    VBAT
VBAT<VIN0   0    VIN0
VBAT<VIN0   1    VBAT

*x = don't care
```

BATTERY CHARGER

VIN VIN VBAT+
U3 CN3165
LED1 Blue
LED2 Green
C5 10u
R5 1k
FB
VIN BAT
CHRG# ISET
DONE# TEMP
GND EP
C4 1u
R6 2.2k
GND GND GND GND

```
Ichrg=1188/Rset
Rset=2.2K
Ichrg=0.5A
```

REGULATOR (LDO1): SOC MODULE

VIN VIN VIN +3V30
U1 RT9078-33GJ5
C1 1u
R3 1k
VIN VOUT
GND
EN NC
GND GND
LDO always ON

BATTERY PROTECTION

VBAT+
R7 100
U4 DW01A
Q3 SL8205S
CN1 JST-PH, 2P
C6 100n
R8 1k
NC CO
VDD VM
GND DO
G2 S2
D1/D2 D1/D2
G1 S1
VBAT- GND VBAT- GND

REGULATOR (LDO2): PERIPHERAL

VIN TP2 LDO_EN VIN +3V3
U2 RT9013-33GB
C2 1u
R4 1k
LDO_EN
VIN VOUT
GND
EN NC
C3 220u, 6.3V
GND GND GND GND
Output controllable

BATTERY LEVEL GAUGE

VBAT+ VBAT+
C7 1u
U5 LC709203FQH-01TWG
I2C_SCL
R9 1k
VDD SCL
VSS SDA
TEST TSENSE
ALARMB TSW
EP
I2C_SDA
LED3 Orange
BAT_ALARM
GND GND
BAT_ALARM

SOC MODULE

U6 ESP32-WROOM-32U/UE
+3V30
C8 10u
C9 100n
GND
+3V30
R10 10k
R11 10k
RST
BOOT

```
1  GND            GND  38
2  3V3            IO23  37   SPI_MOSI
3  EN             IO22  36   I2C_SCL
4  SENSOR_VP      TXD0  35   UART0_TX
5  SENSOR_VN      RXD0  34   UART0_RX
6  IO34           IO21  33   I2C_SDA
7  IO35           NC    32
8  IO32           IO19  31   SPI_MISO
9  IO33           IO18  30   SPI_SCK
10 IO25           IO5   29   SPI_SS
11 IO26           IO17  28   IO17
12 IO27           IO16  27   IO16
13 IO14           IO4   26   RGB_DIN
14 IO12           IO0   25   BOOT
```

GND
I36
I39
I35
IO32
IO33
IO25
IO26
PWR_CFG
JTAG_TMS
JTAG_TDI

IO23
IO22
IO34
IO35
IO32
IO25
IO27
IO14
IO13

BTN1 RST
C10 100n
BTN2 BOOT
RST
BOOT
GND

Q4 UMH3N
RTS RST
DTR RTS
BOOT DTR
Programmer auto-reset

RTC

+3V3 +3V3 +3V3
TP3 32K
R12 10k
R13 10k
U7 DS3231MZ+
I2C_SCL
I2C_SDA
32kHz
SCL 32K
SDA
RST# INT#/SQW BOOT
VBAT
VCC GND
+3V3
C11 100n
BAT1 CR1220
Open-drain output
GND GND GND

MICROSD

+3V3 +3V3
R14 10k
R15 10k
R16 10k
R17 10k
CARD1 HYC80-TF08-375
SPI_SS DAT2
CD/DAT3
SPI_MOSI CMD
VDD +3V3
SPI_SCK CLK
VSS
SPI_MISO DAT0
DAT1
SHELL
SHELL
C12 100n
GND GND

USER LED

+3V3 +3V3 +3V3
R18 1k
C13 100n
LED5 EC20-SK6812
VDD DIN
DOUT GND
RGB_DIN
LED4 White
TP4 RGB_DOUT
LED
GND GND

POWER CONFIG

R19 0 (NC)
PWR_CFG VIN_CUT
VCUT
R20 0
PWR_CFG LDO_EN
LDO_IO
R21 0 (NC)
+3V30 LDO_EN
LDO_AON

```
LDO_IO  LDO_AON  VCUT  RESULT
0       0        x     LDO2 disabled
0       1        x     LDO2 always on
1       0        0     LDO2 enabled by GPIO
1       0        1     LDO2 active & VIN0 cut
1       1        x     Invalid

x = don't care
```

MOUNTING HOLE

H1 M2-MOUNT-HOLE
H2 M2-MOUNT-HOLE
H3 M2-MOUNT-HOLE
H4 M2-MOUNT-HOLE
GND

I/O

P1 I/O Port

```
1   VIN0         1VIN
2   VBAT+        2VBAT+
3   VBAT-        3VBAT-
4   +3V30        4+3V30 (Always ON)
5   +3V3         5+3V3 (Configurable)
6   GND          6GND
7   GND          7GND
8   DTR          8DTR
9   RTS          9RTS
10  RST          10RST
11  UART0_RX     11IO3/UART0_RX
12  UART0_TX     12IO1/UART0_TX
13  SPI_SCK      13IO18/VSPI_SCK
14  SPI_MISO     14IO19/VSPI_MISO
15  SPI_MOSI     15IO23/VSPI_MOSI
16  SPI_SS       16IO5/VSPI_SS
17  I2C_SCL      17IO22/I2C_SCL
18  I2C_SDA      18IO21/I2C_SDA
```

P2 I/O Port

```
1   BOOT         19 IO0/BOOT/RTC_WAKE
2   LED          20 IO2/LED
3   RGB_DIN      21 IO4/RGB_DIN
4   JTAG_TDI     22 IO12/HSPI_MISO
5   JTAG_TCK     23 IO13/HSPI_MOSI
6   JTAG_TMS     24 IO14/HSPI_SCK
7   JTAG_TDO     25 IO15/HSPI_SS
8   IO16         26 IO16/UART2_RX
9   IO17         27 IO17/UART2_TX
10  IO25         28 IO25/DAC1
11  IO26         29 IO26/DAC2
12  PWR_CFG      30 IO27/PWR_CFG
13  IO32         31 IO32/32K_XP
14  IO33         32 IO33/32K_XN
15  I34          33 I34 (Input Only)
16  I35          34 I35 (Input Only)
17  I39          35 I39/VN (Input Only)
18  I36          36 I36/VP (Input Only)
```

P3 JTAG

```
1  JTAG_TCK   37 IO12/JTAG_TDI
2  JTAG_TDI   38 IO13/JTAG_TCK
3  JTAG_TMS   39 IO14/JTAG_TMS
4  JTAG_TDO   40 IO15/JTAG_TDO
```

TITLE: CORE BOARD WROOM-32U (ESP32-EMBED)
REV: 2.0
Company: SENTSOR
Sheet: 1/1
Date: 2020-12-17
Drawn By: adamalfath