Top Sheet

Display Driver

VCC
28 VCC C7 P$9
SCL 26 SCL C6 P$8 R1
SDA 27 SDA C5 P$7 R2
C4 P$6 R3
C3 P$5 R4
C2 P$4 R5
AD/C0 C1 P$3 R6
P$2 R7

25 A2/R0 C2
24 A1/R1 C1
23 A0/R2 C3
22 R3 C5
21 R4 C4
20 R5 C7
19 R6 C6
18 R7 C8
17 R8 C10
16 R9 C9
15 R10
R11 P$14
R12 P$13
R13 P$12
R14 P$11
R15 P$10

P$1 GND

C1 100n C2 1u GND

R1 0R

24-pin: Place 0R

HT16K33A-24SSOP or HT16K33A-28SSOP

-24SSOP: Set R1 to 0R
-28SSOP: Set R1 to np

RF Antenna

https://www.ti.com/lit/an/swra416/swra416.pdf?ts=1717699652551
Page 5:
L_ANT 12nH, C_ANT 1pF for 868MHz

AGND P$1 R$1 P$2 GND
ANT 12nH L_ANT ANT_IN
1pF C_ANT
AGND

RFANT3216120A5T R2
L_ANT1 6.8nH
GND

Hall Sensor / Switch

VCC L1 SDFL2012Q2R7KTF C3 100n
IC1
HALL_O VCC GND OUT 3
OH49E-S GND

IC2
HSW_O 2 OUT VCC GND 3
HSW_V 1
UHE4913G-AE3-R GND

SOC

ESP_EN 11 EN LORA_ANT 22 ANT_IN
MOT 10 G0-A1.0-32K_XP GND3 21
SCL 9 G1-A1.1-32K_XN TXD-G21 20 TX
SDA 8 G2-A1.1-FSPIQ RXD-G20 19 RX
7 G3-A1.3-LORA_DIO1 USBDP-G19 18 G19
6 G4-A1.4-LO_BY-MTMS-FSPIHD USBDM-G18 17 G18
5 G5-A2.0-LO_RST-MTDI-FSPIWP LO_NSS-G8 16
4 G6-LO_MI-MTCK-FSPICK G9 15 ESP_G9
3 G7-LO_MO-MTDO-FSPID FSPICS0-LO_SCK-G10 14
2 GND1 GND2 13
1 2G4_ANT VDD 12

VCC C4 100n GND

G18 10k R23 GND
G19 10k R24 GND

Changelog

V2.3:
- Initial version after decision to have HT-CT62 on top board
V2.4:
- Swapped Rx and Tx Lines on CH340 (bottom board)
- Moved vias underneath HT-CT62 so they align with pads
- Added a GND via to bottom board
- Moved Pin1-whiteprint of 2.4GHz antenna to correct place
- Add version identifier
- Change antenna network

FFC & User connector

RX 1
TX 2
ESP_G9 3
ESP_EN 4
MOT 5
SCL 6
SDA 7
8
9
HSW_V 10
HSW_O 11
HALL_O 12
13
14
M1
M2

VCC
P$1 P$1
P$2 G18
P$3 G19
P$4 RX
P$5 TX
P$6 SCL
P$7 SDA
P$8
GND

GND

FFC Breakout

P$1 1
P$2 2
P$3 3
P$4 4
P$5 5
P$6 6
P$7 7
P$8 8
9
P$1 10
P$2 11
P$3 12
P$4 13
P$5 14
P$6
P$7 M1
P$8 M2

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Bottom Sheet

FFC connector

B_RX 1
B_TX 2
B_ESP_G9 3
B_ESP_FN 4
B_MOT 5
B_SCL 6
B_SDA 7
8
9
10
B_HSW_O 11
B_HALL_O 12
13
14
M1
M2

VCC +UB GND

THR Hall Sensor

VCC L2 SDFL2012Q2R7KTF C5 100n
IC8
HALL_THR VCC GND OUT 3
OH49E-S GND

Charger IC

No input: 0V
CHRG active: 1V
STBY active: 2V
Chip defect: 3V

+5V MEAS_SOC +UB
4k7 R9
4k7 R8
3k3 R6 1k R7

IC7 TP4056
1 TEMP CE 8
2 PROG CHRG 7
3 GND STDBY 6
4 VCC BAT 5
EP
9

10u C7 4k6-280mA R5 4k7 10u C8
GND

Protection & Batt. Connector

+UB 100 R4
P$2 P$2 -UB
P$1 P$1 +UB
100n C6

DW01A
GAT1 3 OC TD 4
GAT2 2 CS VCC 5
1 OD GND 6
IC4

R3 1k
Q1
1 S1 G1 6 GAT1
3 D1/D2_1 D1/D2_2 5
2 S2 G2 4 GAT2
FS8205A
GND -UB

USB to Serial & Auto-Reset & USB Connector

AC1 CH340K
DP 1 UD+ V3 10
DN 2 UD- RXD 9 B_TX
3 GND TXD 8 B_RX
DTR 4 DTR VCC 7
5 CTS RTS 6 RTS
EPAD 11
GND +5V

C9 100n
B_ESP_G9 10k R11
Q3 AO3400A
RTS
DTR
AO3400A Q4
B_ESP_EN 10k R10
100n C10
2.2uF C11

P$4 P$3 P$2 P$1
DN DP
+5V GND
C13 100n

Vib. Mot Driver + Connector

B_MOT 10k R14
+UB Q2 AO3400A GND
P$2 P$1
P$2 P$1

ADC

IC5 ADS1115IDGSR
1 ADDR SCL 10 B_SCL
2 ALERT/RDY SDA 9 B_SDA
3 GND VDD 8
4 AIN0 AIN3 7 MEAS_UB
5 AIN1 AIN2 6 MEAS_SOC

VCC R15 10k R16 10k
C17 100n
HALL_THR_FILT 1u C18
HALL_TOG_FILT 1u C19
R21 1k R20 1k
HALL_THR HALL_TOG
B_HALL_O B_HALL_O
GND

Ubat Meas

VCC +UB
R17 10k
AO3401A Q6
Q5 AO3400A
R18 3k3
10k R22 R19 6k8 MEAS_UB
100n C20
GND

3.3V Regulator & Hall Switch Inverter

+UB VCC
IC6 ME6211C33M5G-N
1 VIN NC 4
VSS 5
3 CE VOUT 2

10k R13
R12 1k
IC3 74LVC1G14GW,125
1 N.C. Y 4
A VCC 5
3 GND
B_HSW_O
10n C12
100nF shared with TP4056
100n C14
10u C16 100n C15
GND

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