Power Management

J1
USB_B_Micro

VBUS 1
D+ 3 USB_D+
D- 2 USB_D-
ID 4
Shield 6
GND 5

D1 D_Schottky

PWR_FLAG

R3 100k

U3 AP2112K-2.6
1 VIN VOUT 5 2V6
3 EN
GND 2
populate after testing power management circuit

R4 0R

U2A 74AUC2G04

GND

D2 D_Schottky

Q1 BSS83P

SW1 SW_SPST

R2 10k

BT1 4.5V

GND

2 alternative sources of power can be used:
– 3 AA batteries (4.5V)
– USB power (5.0V)

When both the power sources are connected, only the USB power will be used as the MOSFET will cut-off power from the batteries.

Micro-controller

RX_LED

2V6

MH2029-300Y
L1

GND 1uF C4

GND C3 100nF

PWR_FLAG

C1 100nF

C2 100nF

PWR_FLAG

GND GND

U5 ATSAMD21G18A-AUT

47 PB02
48 PB03
8 PB08
19 PB09
20 PB10
37 PB11
38 PB22
PB23

43 VDDCORE
6 VDDANA
44 VDDIN
17 VDDIO

GNDANA 5
GND 18
RESET 40

GND

PA00 1
PA01 2
PA02 3
PA03 4
PA04 9
PA05 10
PA06 11
PA07 12
PA08 13
PA09 14
PA10 15
PA11 16
PA12 21
PA13 23
PA14 24
PA15 25
PA16 26
PA17 27
PA18 28
PA19 29
PA20 30
PA21 31
PA22 32
PA23 33
PA24 34
PA25 39
PA27 41
PA28 45
PA30 46
PA31

IR_Emitter   IR_Receiver

SDA
SCL
USB_D-
USB_D+
LED
TX_LED

R12 10k
2V6

SW_Push SW2

GND

IR Receiver

U1 TSOP4838

DEMOD

GND 2
OUT 1
Vs 3

R1 0R 2V6
populate after testing power management circuit

GND
PWR_FLAG

IR_Receiver

VISHAY
www.vishay.com

MECHANICAL DATA
Pinning for TSOP4838
1 = OUT, 2 = GND, 3 = Vs

CARRIER FREQUENCY 38 kHz

IR Emitter

populate after testing power management circuit

R6 0R 2V6

Anode (long leg)

D3 IR LED Emitter

Cathode (short leg)

IR_Emitter R5 220R

Q2 2N2222

collector 3

base 2

emitter 1

GND

E B C

Temperature Sensor

PWR_FLAG R7 0R 2V6

SDA 1 SDA VDD 5
SCL 6 SCL
U4 Si7021-A20
GND 2 PAD 7

GND

LEDs

2V6   2V6   2V6   2V6

yellow D4 TX   yellow D5 RX   green D6 RX   blue D7 RX

470R R8   470R R9   470R R10   470R R11

TX_LED   RX_LED   GND   LED

Control aircon by monitoring temperature in other parts of the room

Hutscape

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File: Pine.sch

Title: Pine

Size: A4   Date: 2019-09-16   Rev: V1.0
KiCad E.D.A. kicad (5.1.0-0)   Id: 1/1