

Sheet: Mosaic

ANT\_1  
ANT\_2  
VANT  
GND  
TXCO\_REF  
Using the internal TCXO.  
TXCO\_2V8  
PPS0\_1V8  
EventA\_1V8  
EventB\_1V8  
GP1  
GP2  
LED\_GP  
+3V3  
C1  
22u  
10V  
GND  
MSC\_RST  
MSC\_RDY  
+1V8  
R1  
10k

ANT\_1  
ANT\_2  
VANT  
RTX\_XTALI  
RTXC\_XTALO  
REF\_I  
REF\_O  
2V8\_IN  
2V8\_OUT  
PPS0  
EVENTA  
EVENTB  
GP1  
GP2  
GPLED  
VDD\_3V3  
VDD\_BAT  
ONOFF  
RST\_IN  
QPMIC\_ON\_REQ  
QMODULE\_RDY  
1V8\_OUT  
SYNC

COM1\_RX  
COM1\_TXD  
COM1\_RTS  
COM1\_CTS  
COM2\_RX  
COM2\_TXD  
COM2\_RTS  
COM2\_CTS  
COM3\_RX  
COM3\_TXD  
COM3\_RTS  
COM3\_CTS  
COM4\_RX  
COM4\_TX  
RMII\_CLK  
EtherMSC.CLK  
MDIO  
EtherMSC.MDC  
MDIO  
EtherMSC.RXD1  
RMII\_RXD0  
EtherMSC.RXD0  
RMII\_RXER  
EtherMSC.RXER  
RMII\_TXD1  
EtherMSC.TXD1  
RMII\_TXD0  
EtherMSC.TXD0  
RMII\_TXEND  
EtherMSC.TXEN  
RMII\_CRSDV  
EtherMSC.CRSDV  
RST\_LAN  
EtherMSC.RST  
USB\_YBUS  
+5V  
MSC\_USB\_N  
MSC\_USB\_P  
SD\_CLK  
SD\_CMD  
SD\_CARD  
SD\_CARD  
LOG\_BUTTON  
LOG\_LED

SerialMSC.RX  
SerialMSC.TX  
SerialAXM.RX  
SerialAXM.TX  
SerialAXM.RTS  
SerialAXM.CTS  
SerialPXH.RX  
SerialPXH.TX  
SerialPXH.RTS  
SerialPXH.CTS  
COM4\_RX  
COM4\_TX  
EtherMSC.MDC  
EtherMSC.RXD1  
EtherMSC.RXD0  
EtherMSC.RXER  
EtherMSC.TXD1  
EtherMSC.TXD0  
EtherMSC.TXEN  
EtherMSC.CRSDV  
EtherMSC.RST  
MSC\_USB\_N  
MSC\_USB\_P  
SDcard.CLK  
SDcard.CMD  
SDcard.DATA  
LOG\_BUTTON  
LOG\_LED

File: subsys\_mosaic.sch

[illegible]

The diagram shows the SN74AUP1T97 2-input AND gate. The gate is represented by a yellow box with pins 1 through 8. Pin 1 is labeled VCCA and is connected to +1V8. Pin 2 is labeled VCCB and is connected to +3V3. Pin 3 is labeled DIR and is connected to GND. Pin 4 is labeled GND and is connected to GND. Pin 5 is labeled BtoA Input and is connected to GND. Pin 6 is labeled GND and is connected to GND. Pin 7 is labeled A1 and is connected to EventA\_1V8. Pin 8 is labeled B1 and is connected to EventA\_3V3. The output of the gate is pin 9, which is connected to +3V3. The gate is labeled U2 SN74LVC2T45DCU.

Sheet: USB\_HUB

VBUS_USB	◇ VBUS_USB
SerialU0_TX	◇ USBX_RX
SerialU0_RX	◇ USBX_TX
ESP_EN	◇ ESP_EN
ESP_BOOT	◇ ESP_I00
MSC_USB_P	◇ USB_M_P
MSC_USB_N	◇ USB_M_N

File: subsys\_usb.sch

The diagram shows two components, SW1A and SW1B, each with a 6-pin connector. SW1A is labeled 'SW1A CAS-D20B1 TTL\_SW'. Its pins are connected as follows: Pin 1 to +3V3, Pin 2 to PWR\_FLAG, Pin 3 to +5V, and Pin 4 to +3V3. SW1B is labeled 'SW1B PWR\_FLAG'. Its pins are connected as follows: Pin 4 to +3V3, Pin 5 to PWR\_FLAG, and Pin 6 to +5V. The PWR\_FLAG signal is shown as a green line with a green diamond symbol at the connection point. The TTL\_MSC and TTL\_ESP signals are shown as green lines with green diamond symbols at the connection points. The entire diagram is enclosed in a blue dashed border.

Sheet: Power	
VBUS_MSC	MSC
VBUS_ESP	ESP
VBUS_PXH	PXH
VBUS_AXM	AXM
VBUS_ARS	ARS
VBUS_USB	USB

File: subsys\_power.sch

VBUS_MSC	PWR_FLAG
VBUS_ESP	PWR_FLAG
VBUS_PXH	PWR_FLAG
VBUS_AXM	PWR_FLAG
VBUS_ARS	PWR_FLAG
VBUS_USB	PWR_FLAG
GND	PWR_FLAG

**Sheet: Connectors**

**JST. Mosaic**

- SerialMSC.RX → MSC\_RX
- SerialMSC.TX → MSC\_TX
- EventA\_3V3 → EventA
- PP50\_3V3 → PP50

**JST Wrover**

- SerialU1.RX → ESP\_RX
- SerialU1.TX → ESP\_TX
- SerialU1.RTS → ESP\_RTS
- SerialU1.CTS → ESP\_CTS

**JST Pixhawk**

- SerialPXH.RX → PXH\_RX
- SerialPXH.TX → PXH\_TX
- SerialPXH.RTS → PXH\_RTS
- SerialPXH.CTS → PXH\_CTS

**VBUS**

- VBUS.MSC → QVBUS\_JSTM
- VBUS.ESP → QVBUS\_JSTM
- VBUS.PXH → QVBUS\_JSTM
- VBUS.AXM → QVBUS\_JSTM

**Advanced**

- M\_RSTD → MSC\_RST
- EventBD → EventB\_3V3
- LOG\_BUTD → LOG\_BUT
- GP1C → GP1
- GP2C → GP2

**Sensor**

- SEN\_VPD → Sensor.VP
- SEN\_VND → Sensor.VN
- SEN\_SCLC → Sensor.SCL
- SEN\_SDAC → Sensor.SDA

**AstreRx only**

- AXM\_RXD → SerialAXM.RX
- AXM\_TXC → SerialAXM.TX
- AXM\_RTSC → SerialAXM.RTS
- AXM\_CTSD → SerialAXM.CTS
- LED\_GPC → LED\_GP
- LOG\_LED → LOG\_LED
- MSC\_RDYC → MSC\_RDY

**TTL ref.**

- TTL\_MSCC → TTL\_MSC
- TTL\_ESPC → TTL\_ESP

File: subsys\_connectors.sch

Sheet: Ethernet

ME Pin	PHY Pin	PHY Pin	EE Pin	External Pin
ME_RST	PHY	PHY	EE_RST	EtherESP_RST
ME_MDIO	PHY	PHY	EE_MDIO	EtherESP_MDIO
ME_MDC	PHY	PHY	EE_MDC	EtherESP_MDC
ME_RMII_RXD1	PHY	PHY	EE_RMII_RXD1	EtherESP_RXD1
ME_RMII_RXD0	PHY	PHY	EE_RMII_RXD0	EtherESP_RXD0
ME_RMII_RXER	PHY	PHY		
ME_RMII_TXD1	PHY	PHY	EE_RMII_TXD1	EtherESP_TXD1
ME_RMII_TXD0	PHY	PHY	EE_RMII_TXD0	EtherESP_TXD0
ME_RMII_TXEN	PHY	PHY	EE_RMII_TXEN	EtherESP_TXEN
ME_RMII_CLK	PHY	PHY	EE_RMII_CLK	EtherESP_CLK
ME_RMII_CRS_DV	PHY	PHY	EE_RMII_CRS_DV	EtherESP_CRSDV

File: subsys\_ethernet.sch

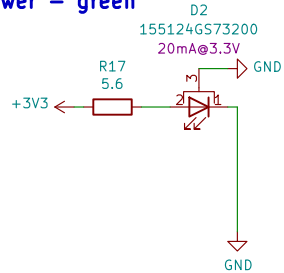
The diagram illustrates the FID sensor assembly layout. It shows six FID tubes arranged in a 3x2 grid, labeled FID1 through FID6. Each tube is connected to a monitoring point (MH1-MH4) and grounded (GND). The connections are as follows:

- FID1** (Fidu) is connected to **MH1** and **M3**.
- FID2** (Fidu) is connected to **MH2** and **M3**.
- FID3** (Fidu) is connected to **MH1** and **M3**.
- FID4** (Fidu) is connected to **MH3** and **M3**.
- FID5** (Fidu) is connected to **MH2** and **M3**.
- FID6** (Fidu) is connected to **MH1** and **M3**.

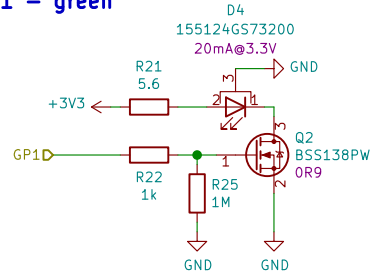
The schematic diagram shows the U4 FEMCxxxGTT module, a yellow rectangular component with pins labeled A6 through K5. The module is connected to various components and signals:

- Power and Ground Connections:**
  - +3V3:** Connected to pins K5, A3, and A4.
  - GND:** Connected to pins A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A33, A34, A35, A36, A37, A38, A39, A40, A41, A42, A43, A44, A45, A46, A47, A48, A49, A50, A51, A52, A53, A54, A55, A56, A57, A58, A59, A60, A61, A62, A63, A64, A65, A66, A67, A68, A69, A70, A71, A72, A73, A74, A75, A76, A77, A78, A79, A80, A81, A82, A83, A84, A85, A86, A87, A88, A89, A90, A91, A92, A93, A94, A95, A96, A97, A98, A99, A100, A101, A102, A103, A104, A105, A106, A107, A108, A109, A110, A111, A112, A113, A114, A115, A116, A117, A118, A119, A120, A121, A122, A123, A124, A125, A126, A127, A128, A129, A130, A131, A132, A133, A134, A135, A136, A137, A138, A139, A140, A141, A142, A143, A144, A145, A146, A147, A148, A149, A150, A151, A152, A153, A154, A155, A156, A157, A158, A159, A160, A161, A162, A163, A164, A165, A166, A167, A168, A169, A170, A171, A172, A173, A174, A175, A176, A177, A178, A179, A180, A181, A182, A183, A184, A185, A186, A187, A188, A189, A190, A191, A192, A193, A194, A195, A196, A197, A198, A199, A200, A201, A202, A203, A204, A205, A206, A207, A208, A209, A210, A211, A212, A213, A214, A215, A216, A217, A218, A219, A220, A221, A222, A223, A224, A225, A226, A227, A228, A229, A230, A231, A232, A233, A234, A235, A236, A237, A238, A239, A240, A241, A242, A243, A244, A245, A246, A247, A248, A249, A250, A251, A252, A253, A254, A255, A256, A257, A258, A259, A260, A261, A262, A263, A264, A265, A266, A267, A268, A269, A270, A271, A272, A273, A274, A275, A276, A277, A278, A279, A280, A281, A282, A283, A284, A285, A286, A287, A288, A289, A290, A291, A292, A293, A294, A295, A296, A297, A298, A299, A300, A301, A302, A303, A304, A305, A306, A307, A308, A309, A310, A311, A312, A313, A314, A315, A316, A317, A318, A319, A320, A321, A322, A323, A324, A325, A326, A327, A328, A329, A330, A331, A332, A333, A334, A335, A336, A337, A338, A339, A340, A341, A342, A343, A344, A345, A346, A347, A348, A349, A350, A351, A352, A353, A354, A355, A356, A357, A358, A359, A360, A361, A362, A363, A364, A365, A366, A367, A368, A369, A370, A371, A372, A373, A374, A375, A376, A377, A378, A379, A380, A381, A382, A383, A384, A385, A386, A387, A388, A389, A390, A391, A392, A393, A394, A395, A396, A397, A398, A399, A400, A401, A402, A403, A404, A405, A406, A407, A408, A409, A410, A411, A412, A413, A414, A415, A416, A417, A418, A419, A420, A421, A422, A423, A424, A425, A426, A427, A428, A429, A430, A431, A432, A433, A434, A435, A436, A437, A438, A439, A440, A441, A442, A443, A444, A445, A446, A447, A448, A449, A450, A451, A452, A453, A454, A455, A456, A457, A458, A459, A460, A461, A462, A463, A464, A465, A466, A467, A468, A469, A470, A471, A472, A473, A474, A475, A476, A477, A478, A479, A480, A481, A482, A483, A484, A485, A486, A487, A488, A489, A490, A491, A492, A493, A494, A495, A496, A497, A498, A499, A500, A501, A502, A503, A504, A505, A506, A507, A508, A509, A510, A511, A512, A513, A514, A515, A516, A517, A518, A519, A520, A521, A522, A523, A524, A525, A526, A527, A528, A529, A530, A531, A532, A533, A534, A535, A536, A537, A538, A539, A540, A541, A542, A543, A544, A545, A546, A547, A548, A549, A550, A551, A552, A553, A554, A555, A556, A557, A558, A559, A560, A561, A562, A563, A564, A565, A566, A567, A568, A569, A570, A571, A572, A573, A574, A575, A576, A577, A578, A579, A580, A581, A582, A583, A584, A585, A586, A587, A588, A589, A590, A591, A592, A593, A594, A595, A596, A597, A598, A599, A600, A601, A602, A603, A604, A605, A606, A607, A608, A609, A610, A611, A612, A613, A614, A615, A616, A617, A618, A619, A620, A621, A622, A623, A624, A625, A626, A627, A628, A629, A630, A631, A632, A633, A634, A635, A636, A637, A638, A639, A640, A641, A642, A643, A644, A645, A646, A647, A648, A649, A650, A651, A652, A653, A654, A655, A656, A657, A658, A659, A660, A661, A662, A663, A664, A665, A666, A667, A668, A669, A670, A671, A672, A673, A674, A675, A676, A677, A678, A679, A680, A681, A682, A683, A684, A685, A686, A687, A688, A689, A690, A691, A692, A693, A694, A695, A696, A697, A698, A699, A700, A701, A702, A703, A704, A705, A706, A707, A708, A709, A710, A711, A712, A713, A714, A715, A716, A717, A718, A719, A720, A721, A722, A723, A724, A725, A726, A727, A728, A729, A730, A731, A732, A733, A734, A735, A736, A737, A738, A739, A740, A741, A742, A743, A744, A745, A746, A747, A748, A749, A750, A751, A752, A753, A754, A755, A756, A757, A758, A759, A760, A761, A762, A763, A764, A765, A766, A767, A768, A769, A770, A771, A772, A773, A774, A775, A776

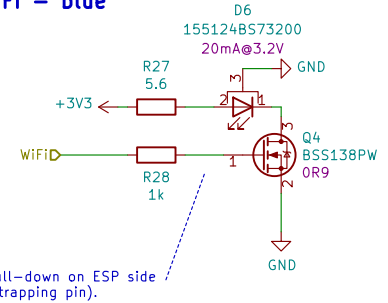
## 1: Power – green



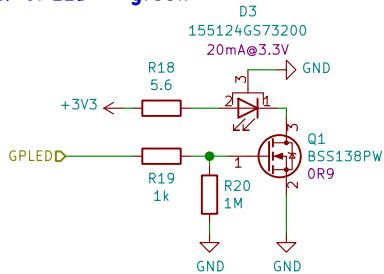
## 3: GP1 – green



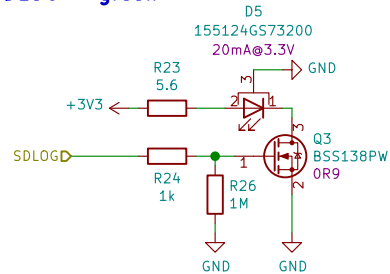
## 5: WiFi – blue



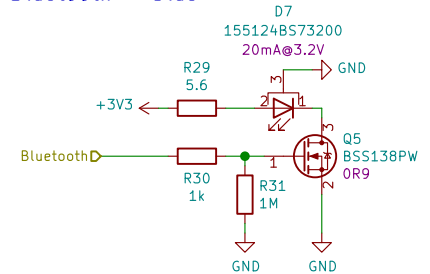
## 2: GPLED – green



## 4: SDLOG – green



## 6: Bluetooth – blue



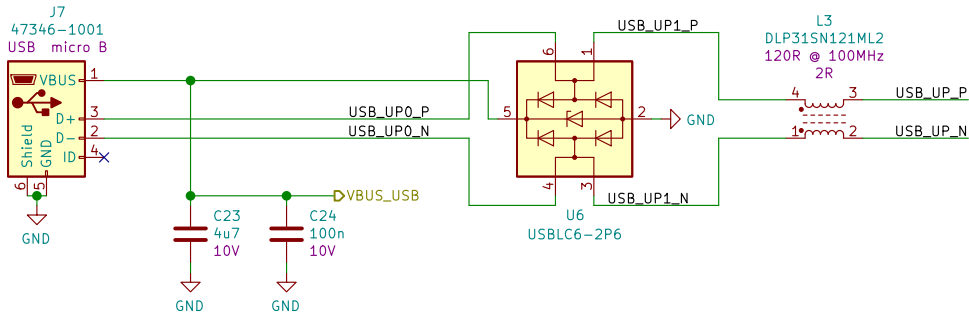
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Size: User Date: 2021-08-10  
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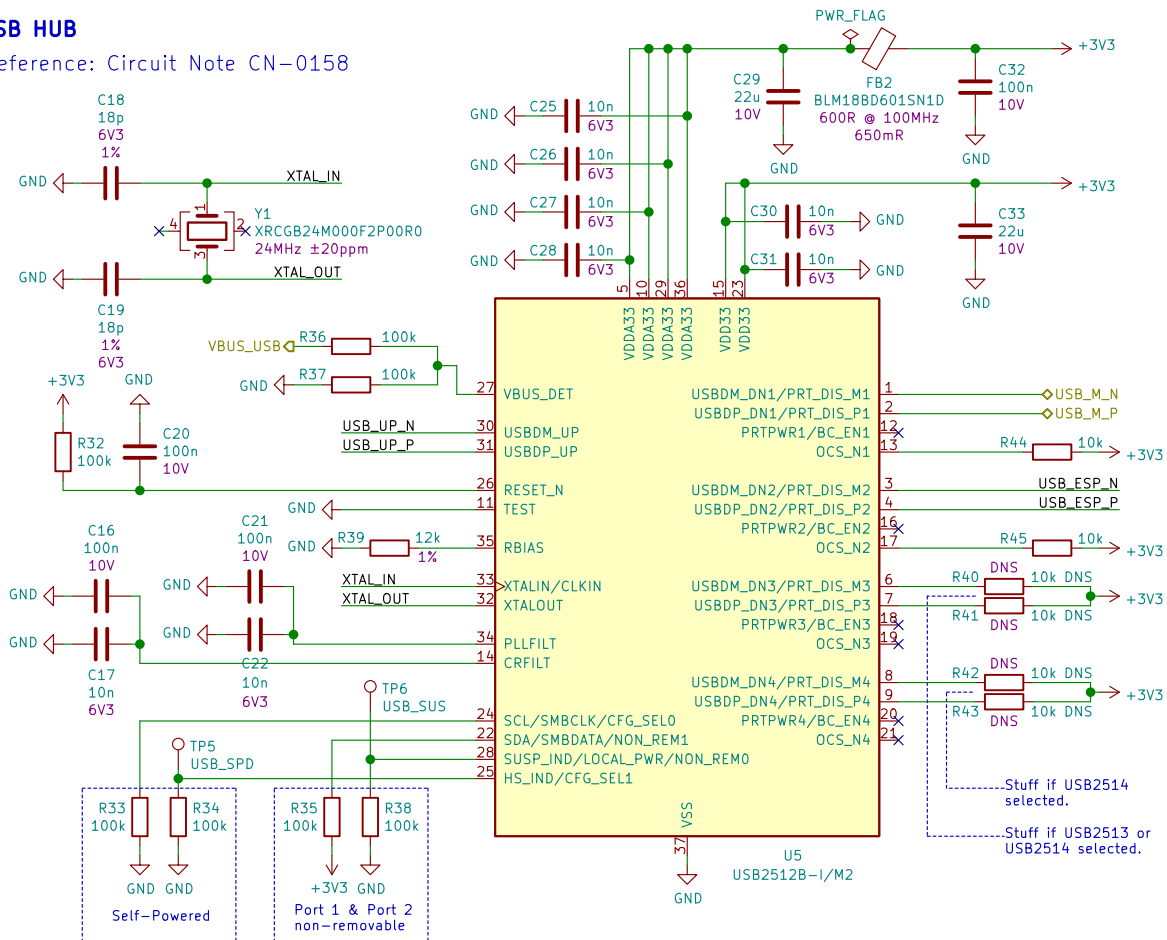
**Rev: v1.0**  
Id: 2/7

## USB connector



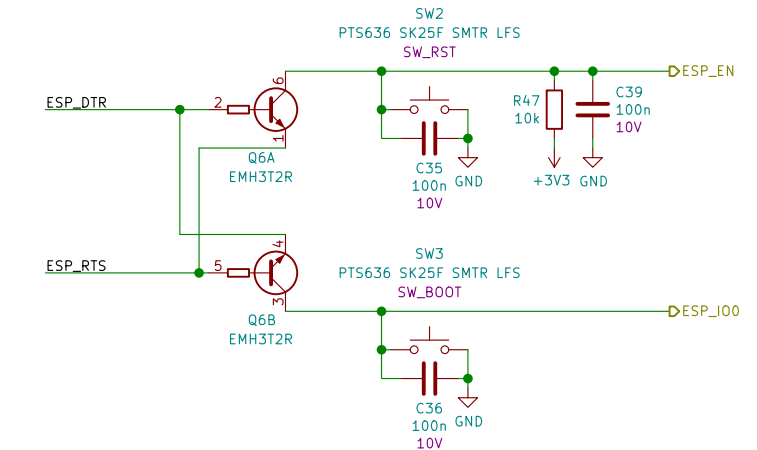
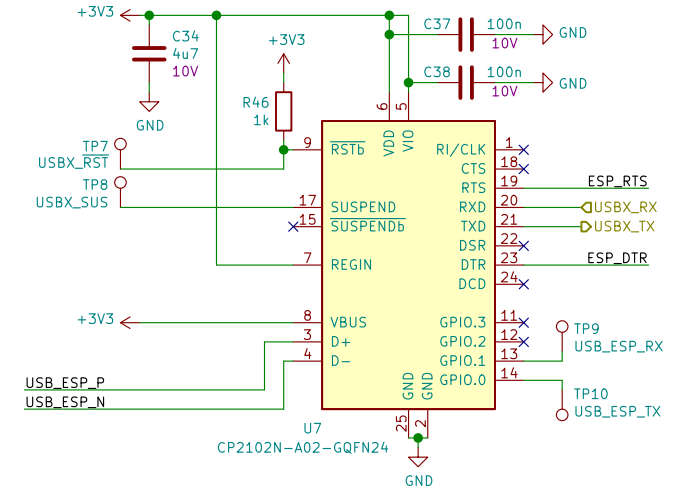
## USB HUB

Reference: Circuit Note CN-0158



## USB to Serial and auto program of ESP32 Wrover

Reference: ESP32\_DevKitC\_V4



Referenced set-up circuitry using two SS8050 devices with base resistors replaced with a single component EMH3.

Sheet: /USB\_HUB/  
File: subsys\_usb.sch

Title: mowi

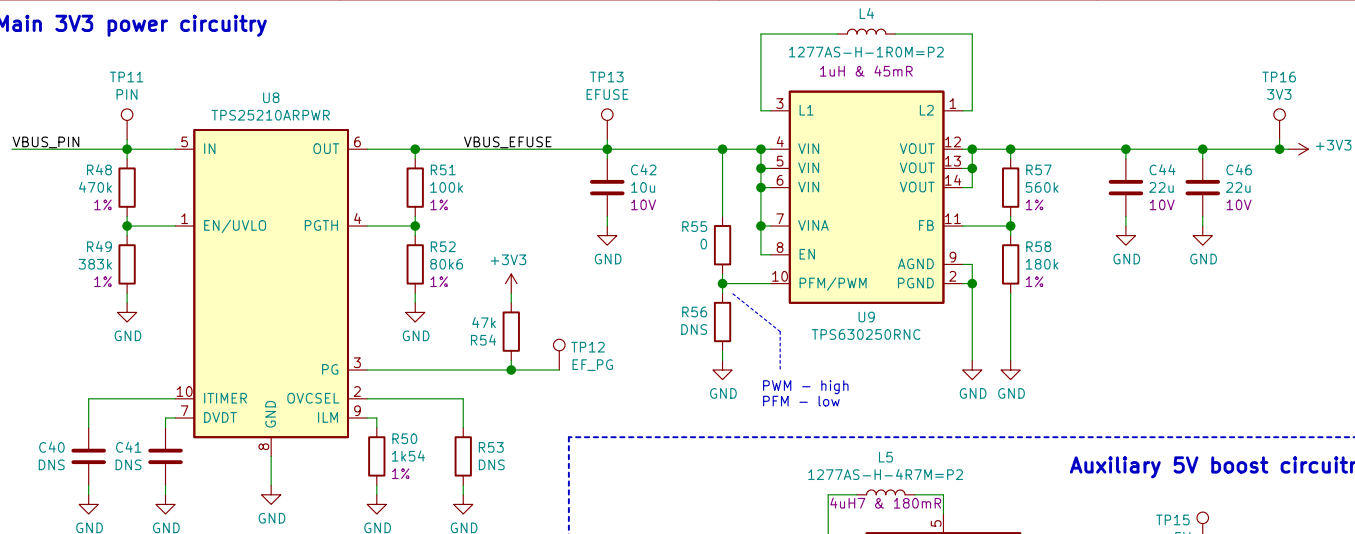
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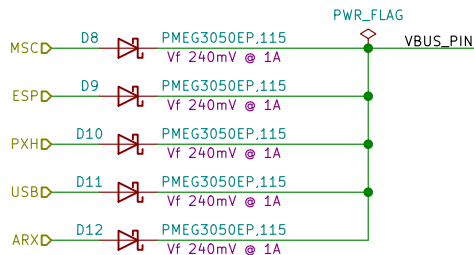
Rev: v1.0

Id: 3/7

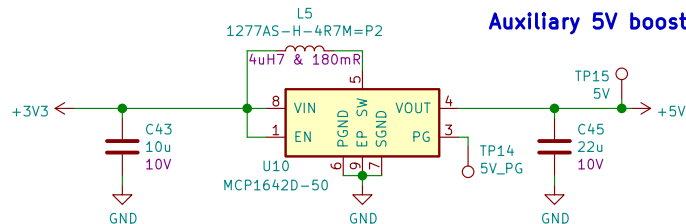
## Main 3V3 power circuitry



## Power inputs multiplexer



### Auxiliary 5V boost circuitry



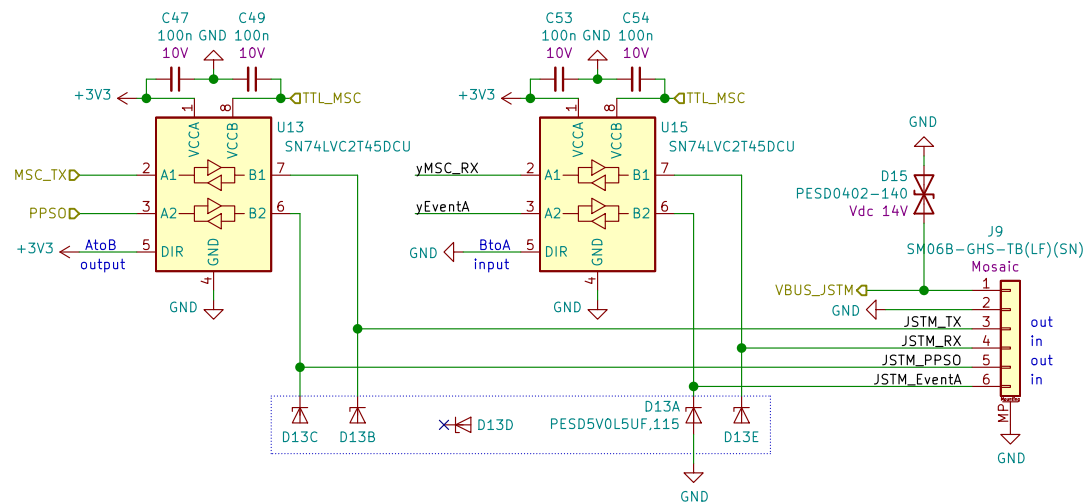
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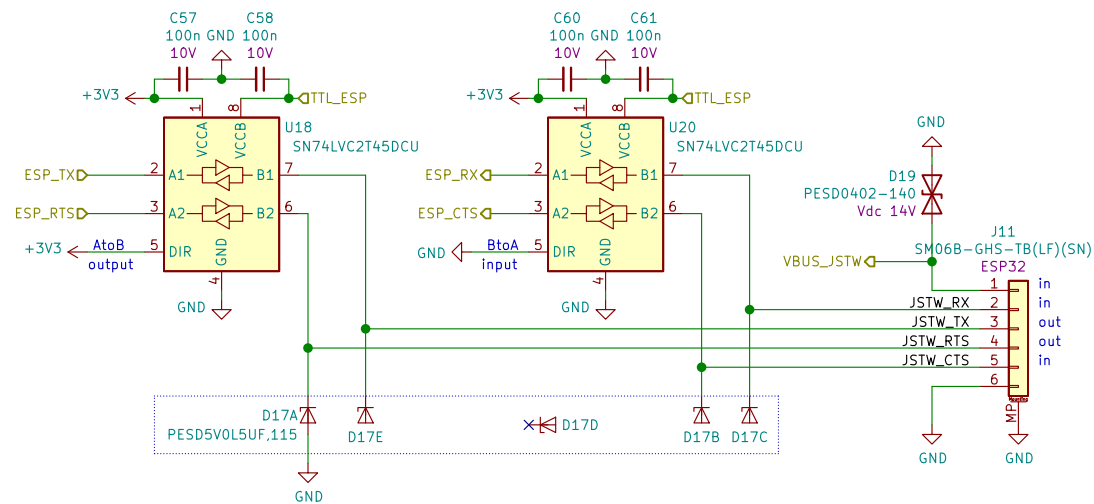
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Rev: v1.0
Id: 4/7

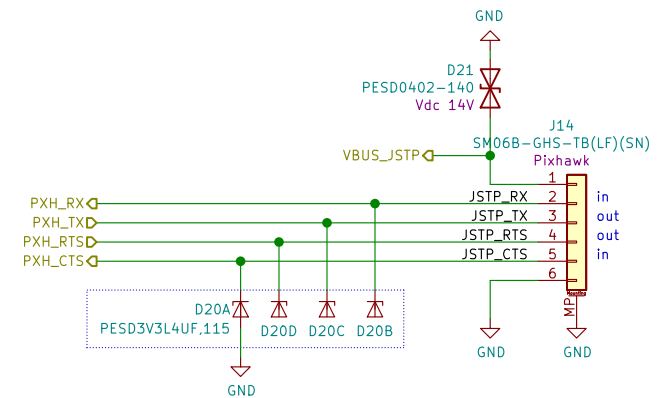
## JST connector for Mosaic – \*JSTM\*



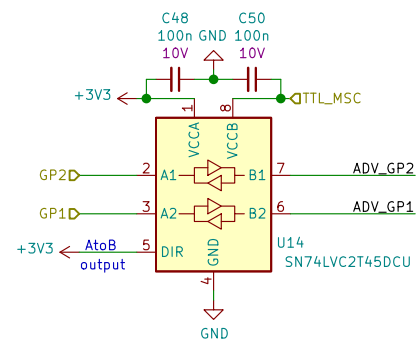
## JST connector for Wrover – \*JSTW\*



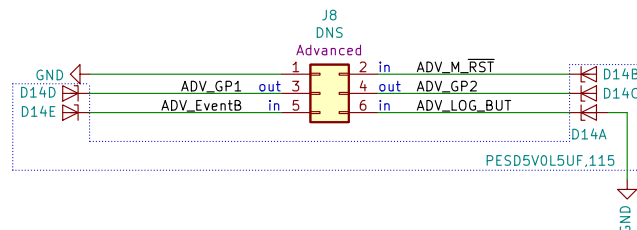
## JST connector for Pixhawk – \*JSTP\*



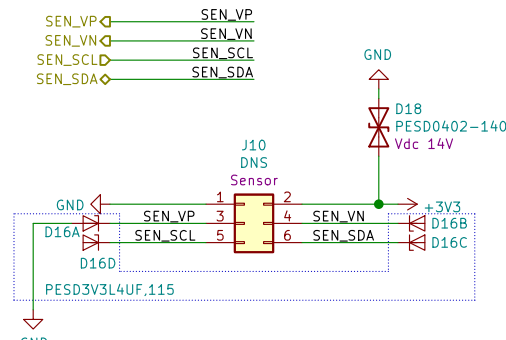
## Advanced connector – 2x3 2.54mm header



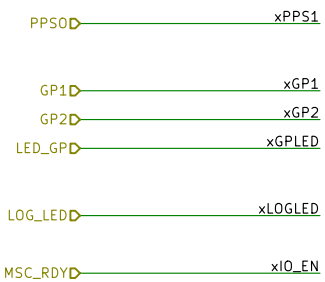
Connectors J8 and J10 are labeled as DNS. However their footprints can be sourced with a standard 02x03 2.54mm pitch socket / header.



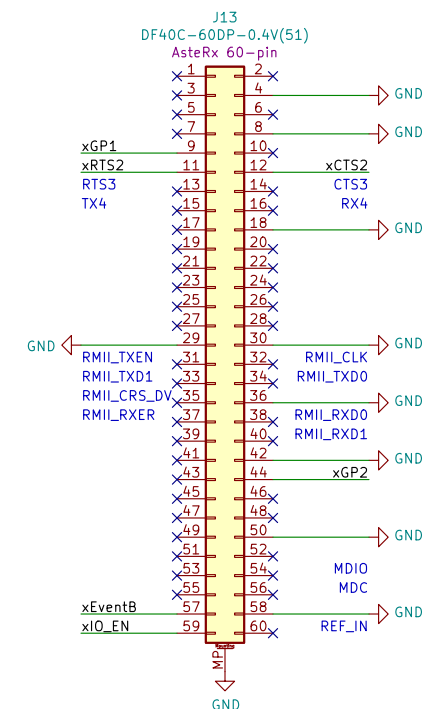
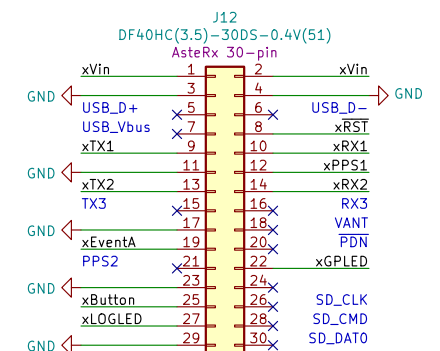
## Sensor connector – 2x3 2.54mm header



## Outputs only

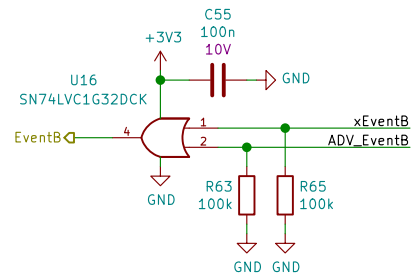
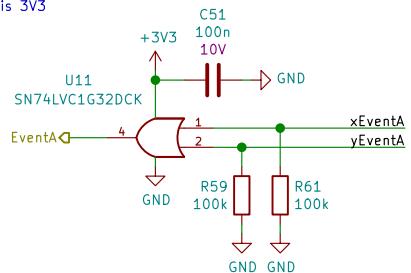


## AsteRx connectors



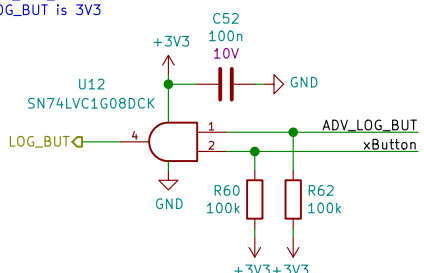
## EventA and EventB handling

Including voltage translation:  
– xEvent is 3V3  
– yEvent is 3V3 or 5V  
– Event is 3V3



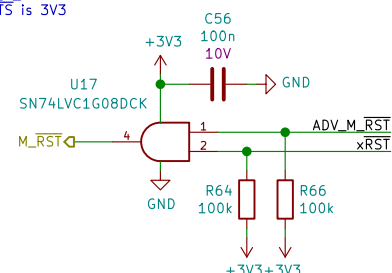
## LOG button handling

Including voltage translation:  
– xButton is 3V3  
– ADV\_LOG\_BUT is 3V3 or 5V  
– LOG\_BUT is 3V3

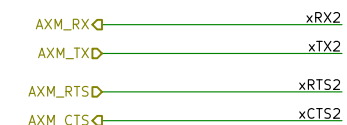
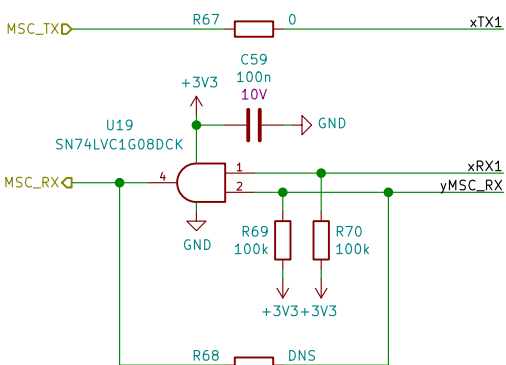


## Mosaic RST handling

Including voltage translation:  
– xRST is 3V3  
– ADV\_M\_RST is 3V3 or 5V  
– M\_RST is 3V3



## Serial COM mating



Resistors R67 and R68 can be used to enable/disable serial communication with AsteRx-platform modules.

## AsteRx power input

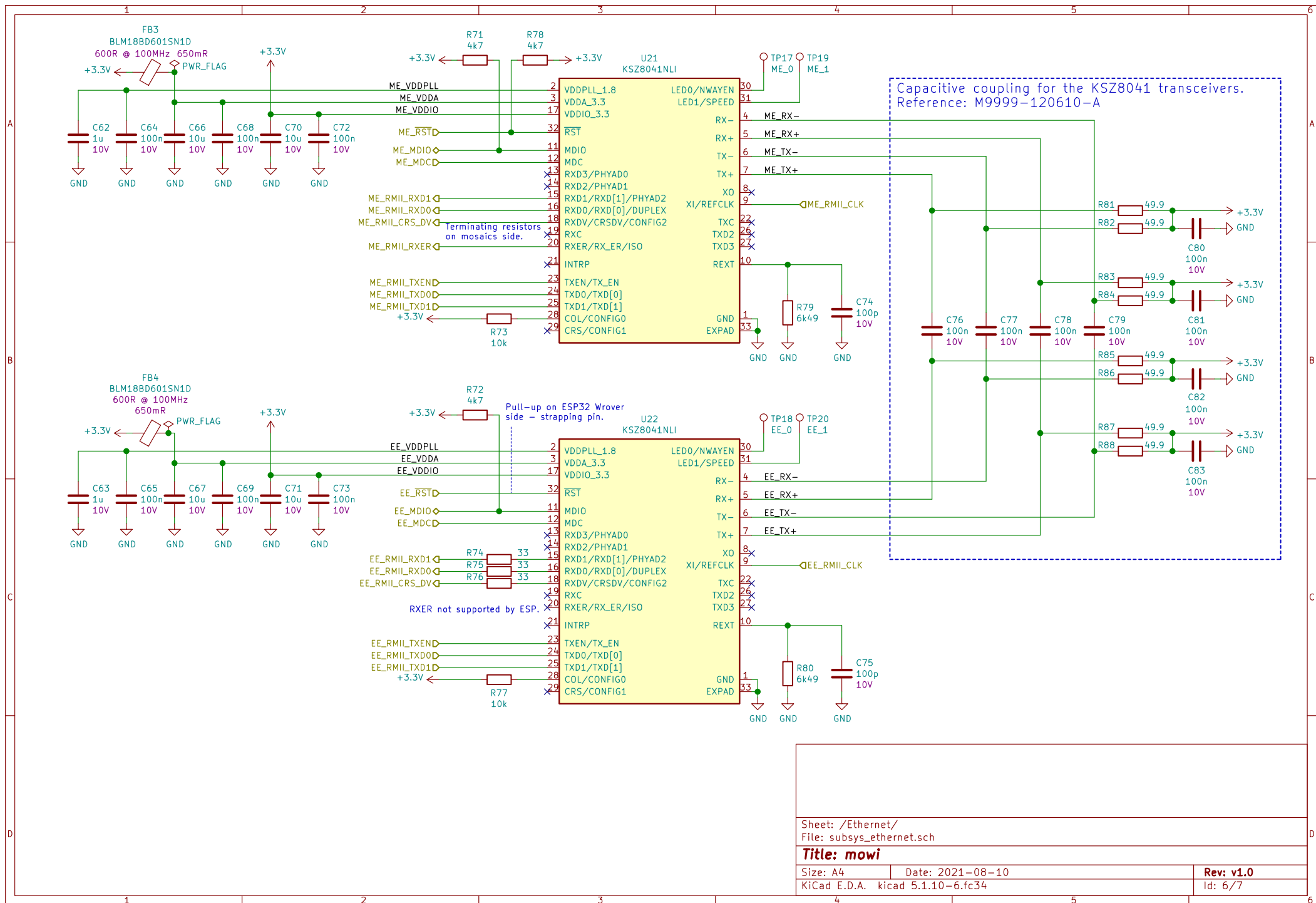


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Title: mowi

Size: A3 Date: 2021-08-10  
KiCad E.D.A. kicad 5.1.10-6.fc34

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Id: 5/7



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**Title: mowi**

Size: A4 Date: 2021-08-10  
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**Rev: v1.0**  
Id: 6/7

