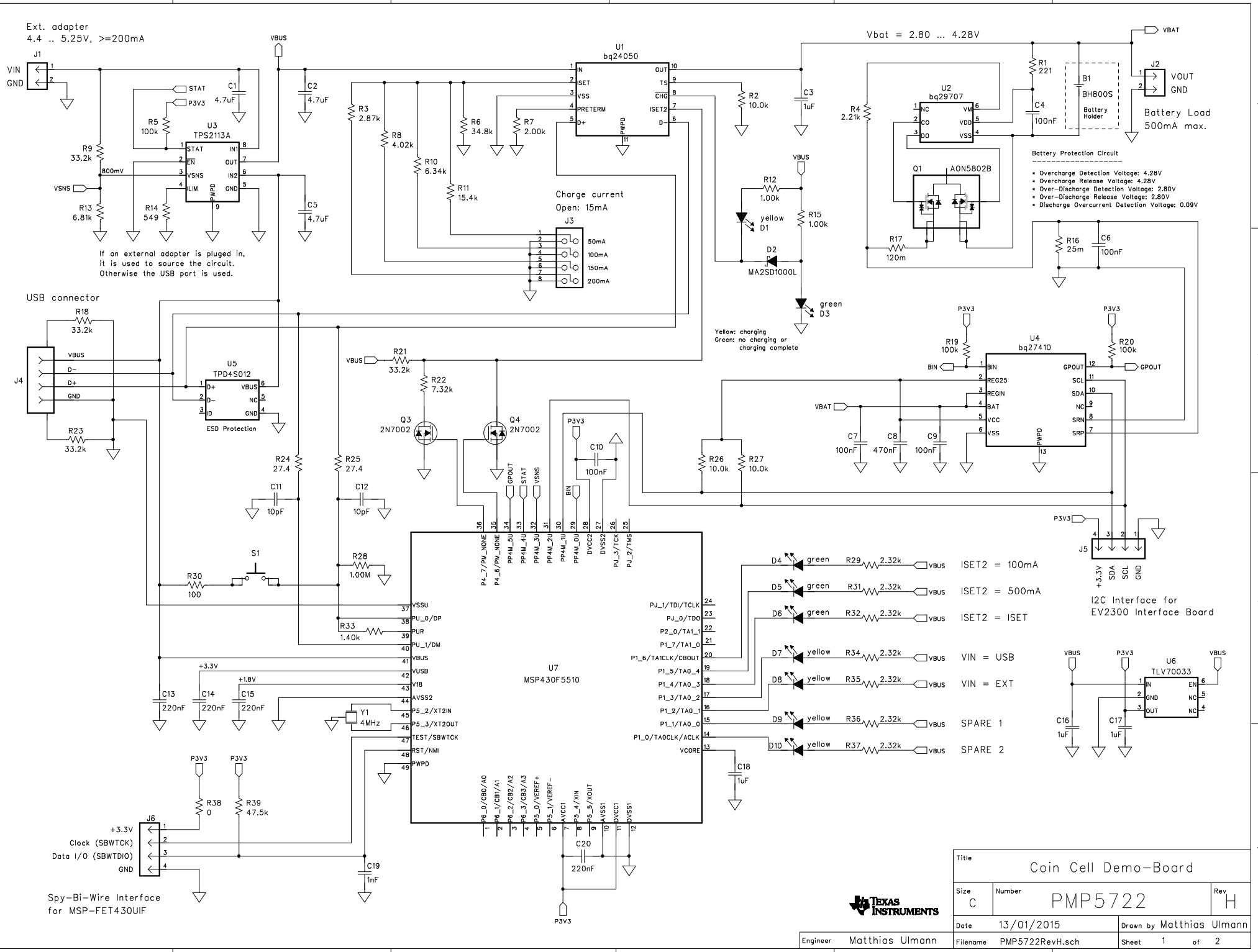
Ext. adapter
4.4 .. 5.25V, >=200mA
J1
VIN
GND
VBUS
C1 4.7uF
C2 4.7uF
C5 4.7uF
U3
TPS2113A
STAT
P3V3
EN
VSNS
ILIM
IN1
IN2
OUT
GND
PWPD
R5 100k
R9 33.2k
800mV
R13 6.81k
R14 549
If an external adapter is pluged in,
it is used to source the circuit.
Otherwise the USB port is used.
U1
bq24050
IN
ISET
VSS
PRETERM
D+
OUT
TS
CHG
ISET2
D-
PWPD
R3 2.87k
R8 4.02k
R10 6.34k
R11 15.4k
R6 34.8k
R7 2.00k
R2 10.0k
C3 1uF
Charge current
Open: 15mA
J3
50mA
100mA
150mA
200mA
Vbat = 2.80 ... 4.28V
VBAT
R1 221
C4 100nF
B1
BH800S
Battery Holder
J2
VOUT
GND
Battery Load
500mA max.
U2
bq29707
NC
CO
DO
VM
VDD
VSS
R4 2.21k
Q1
AON5802B
R17 120m
R16 25m
C6 100nF
Battery Protection Circuit
* Overcharge Detection Voltage: 4.28V
* Overcharge Release Voltage: 4.28V
* Over-Discharge Detection Voltage: 2.80V
* Over-Discharge Release Voltage: 2.80V
* Discharge Overcurrent Detection Voltage: 0.09V
R12 1.00k
yellow
D1
R15 1.00k
D2
MA2SD1000L
green
D3
Yellow: charging
Green: no charging or
charging complete
USB connector
J4
VBUS
D-
D+
GND
R18 33.2k
R23 33.2k
U5
TPD4S012
D+
D-
ID
VBUS
NC
GND
ESD Protection
R21 33.2k
R22 7.32k
Q3
2N7002
Q4
2N7002
R24 27.4
R25 27.4
C11 10pF
C12 10pF
P3V3
C10 100nF
U4
bq27410
BIN
REG25
REGIN
BAT
VCC
VSS
GPOUT
SCL
SDA
NC
SRN
SRP
PWPD
R19 100k
R20 100k
C7 100nF
C8 470nF
C9 100nF
R26 10.0k
R27 10.0k
J5
+3.3V
SDA
SCL
GND
I2C Interface for
EV2300 Interface Board
S1
R28 1.00M
R30 100
R33 1.40k
U7
MSP430F5510
VSSU
PU_0/DP
PUR
PU_1/DM
VBUS
VUSB
V18
AVSS2
P5_2/XT2IN
P5_3/XT2OUT
TEST/SBWTCK
RST/NMI
PWPD
P4_7/PM_NONE
P4_6/PM_NONE
PP4M_5U
PP4M_4U
PP4M_3U
PP4M_2U
PP4M_1U
PP4M_0U
DVCC2
DVSS2
PJ_3/TCK
PJ_2/TMS
PJ_1/TDI/TCLK
PJ_0/TDO
P2_0/TA1_1
P1_7/TA1_0
P1_6/TA1CLK/CBOUT
P1_5/TA0_4
P1_4/TA0_3
P1_3/TA0_2
P1_2/TA0_1
P1_1/TA0_0
P1_0/TA0CLK/ACLK
VCORE
P6_0/CB0/A0
P6_1/CB1/A1
P6_2/CB2/A2
P6_3/CB3/A3
P5_0/VEREF+
P5_1/VEREF-
AVCC1
P5_4/XIN
P5_5/XOUT
AVSS1
DVCC1
DVSS1
+3.3V
+1.8V
C13 220nF
C14 220nF
C15 220nF
Y1
4MHz
C18 1uF
C19 1nF
C20 220nF
D4 green R29 2.32k VBUS ISET2 = 100mA
D5 green R31 2.32k VBUS ISET2 = 500mA
D6 green R32 2.32k VBUS ISET2 = ISET
D7 yellow R34 2.32k VBUS VIN = USB
D8 yellow R35 2.32k VBUS VIN = EXT
D9 yellow R36 2.32k VBUS SPARE 1
D10 yellow R37 2.32k VBUS SPARE 2
U6
TLV70033
IN
GND
OUT
EN
NC
C16 1uF
C17 1uF
J6
+3.3V
Clock (SBWTCK)
Data I/O (SBWTDIO)
GND
R38 0
R39 47.5k
Spy-Bi-Wire Interface
for MSP-FET430UIF
Title
Coin Cell Demo-Board
Size
C
Number
PMP5722
Rev
H
Date
13/01/2015
Drawn by
Matthias Ulmann
Engineer
Matthias Ulmann
Filename
PMP5722RevH.sch
Sheet
1
of
2
TEXAS INSTRUMENTS

bq24050 – Battery Charger

Temperature sense – Pin 9 / TS
---
* Connect NTC (10kOhm @ 25 deg) from battery pack
* Connect 10kOhm when temp. sensing is not needed
* Pull high/float: disable temp. monitoring, timers & termination
  -> puts IC in TTDM
* Pull low: disable IC
* Connect 250kOhm to prevent TTDM when battery pack
  with NTC is removed

Charge current – Pin 2 / ISET
---
* I_LOAD = K_ISET / R_ISET
* K_ISET = 350..520..680 @ I_LOAD = 10..25mA
  K_ISET = 480..527..600 @ I_LOAD = 25..50mA
  K_ISET = 510..540..570 @ I_LOAD = 50..800mA
* R_ISET = 34.8kOhm @ 15mA
  R_ISET = 10.7kOhm @ 50mA
  R_ISET = 5.36kOhm @ 100mA
  R_ISET = 3.57kOhm @ 150mA
  R_ISET = 2.67kOhm @ 200mA

Pre-charge current/Current termination threshold – Pin 4 / PRETERM
---
* Setting termination level: R_PRETERM = KTERM * % ISET
* KTERM = 200
* Pre-charge current = 2x Termination current level
* R_PRETERM = 1.00k @ 5% of ISET
  R_PRETERM = 2.00k @ 10% of ISET
  R_PRETERM = 4.00k @ 20% of ISET

Charging indictor – Pin 8 / CHG
---
* YELLOW – Charging (low)
* GREEN: No charging or charging complete (high)

Input current limit – Pin 7 / ISET2
---
* Sets the input current limit when a charging adapter
  is detected during startup (D+ and D– shorted)
  – Pull low: ISET max.
  – Float: 100mA max.
  – Pull high: 500mA max.
* When a USB host is detected, the current limit is set to 100mA.
* To change the current limit from 100mA on an USB host, the state
  of pin ISET2 has to be changed after startup.
  When the change was detected, the control of the current limit
  is given back to pin ISET2 (ISET/100mA/500mA).

bq29707 – Battery Protection

* Overcharge detection: 4.280V
* Overcharge release voltage: 4.280V
* Over-discharge detection voltage: 2.80V
* Over-discharge release voltage: 2.80V
* Discharge overcurrent detection voltage: 0.09V
  – Sense resistance: 0.09V/0.5A = 180mOhm
  – 17..23..30mOhm per FET
  – Sense resistor: 120mOhm
  – Current limit: 500..542..584mA

Battery

Battery
---
* VARTA CP1254: 50mAh, 4.20V, 50mA charge current
* VARTA CP1654: 100mAh, 4.20V, 100mA charge current

Notes
---
* Built on PMP5722 Rev.F
* REWORK NEEDED FOR REV.H
  Add connection VBAT between battery and Pin 4 (VBAT) of U4 (bq27410)

Title	Coin Cell Demo-Board		
Size C	Number PMP5722		Rev H
Date	13/01/2015	Drawn by	Matthias Ulmann
Engineer	Matthias Ulmann	Filename	PMP5722RevH.sch
		Sheet	2 of 2

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