

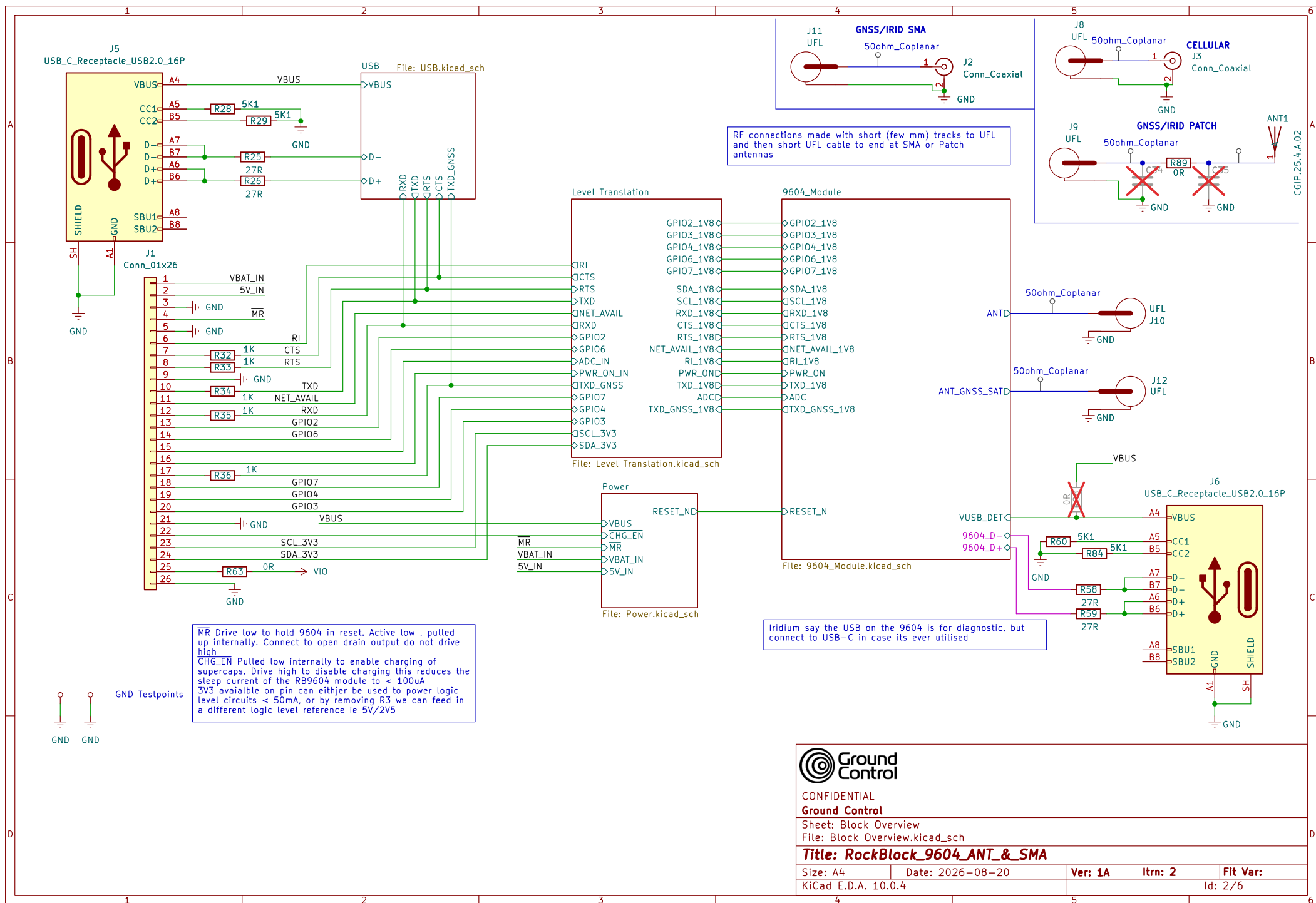
[illegible]

Battery backup for improved TTFF

[illegible][illegible]

File: Block Overview.kicad_sch





Voltages =====

V_INT = 1.8 supplied from module
V_BCKUP_GNSS = Input to module 1.65 to 3.6
VCC = 3.3 to 4.4 input

V_BCKP_GNSS can be supplied from on board 3V3 if the module is in deep sleep or powered off state. It can also be supplied from on board coin cell if power removed. CR1025 / CR927

9604 Module
=====

V_GNSS_BCKP can be left unconnected if not used
VINT = 1V8 supply out from 9604 @ 70mA

9604 Module =====

USB signals Test points recommended (See Section 3.14 HW DEV Guide)
TXD_GNSS is a 1V8 data output
SDIO Pins are for diagnostic only and TPs added(See Section 3.14 HW DEV Guide)
I2C pins internal pull-ups to 1V8
PWR_ON has internal active pull up (100K to a 1V2 rail) and should be connected to open drain output.
RESET_N has internal active pull up to 1V8, should be connected to open drain
RTC_GNSS To be connected to 32768 XTAL for improved response when powered down
ADC pin can be used to monitor input range 0.25-1.15V , potted down from 5V
ANT_DET unused can be left unconnected
UART HW supports default variant 0 RXD,TXD,CTS,RTS,DTR and RI
DTR is Input, Idle high with internal pullup, connected to GND via OR to force module ready

Power Indiciation
=====

When the module is ready this illuminates

Push push style nano sim
=====

Vpp can be left unconnected
Decoupling caps to be placed close to SIM
Sim detect switch is open when no sim and closed (shorted to GND) when sim present.
The GPIO requires inversion ie high when card inserted and low when removed this is acheved with Q3

Default GPIOs (See 3.8.1 HW manual)
=====

GPIO1 = NetAvail
GPIO5 = SD_DETECT Unused
Remaining are user selectable

All 1V8 Levels



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Ground Control

Sheet: 9604_Module

File: 9604_Module.kicad_sch

Title: RockBlock_9604_ANT_&_SMA

Size: A4

Date: 2026-08-20

Ver: 1A

Itrn: 2

Fit Var:

KiCad E.D.A. 10.0.4

Id: 3/6

Level Translation

=====

1V8 to 3V6 configurable by providing VIO
 TXD input, idle high, active low with internal active pullup
 RXD output, push-pull, idle high, active low
 RTS input, idle high, active low with internal active pull up,
 pulled low in HW by OR link
 CTS output, push-pull, idle high, active low
 TXD_GNSS, push-pull
 RI output, push-pull, idle high, active low

DIR L = B to A
 DIR H = A to B

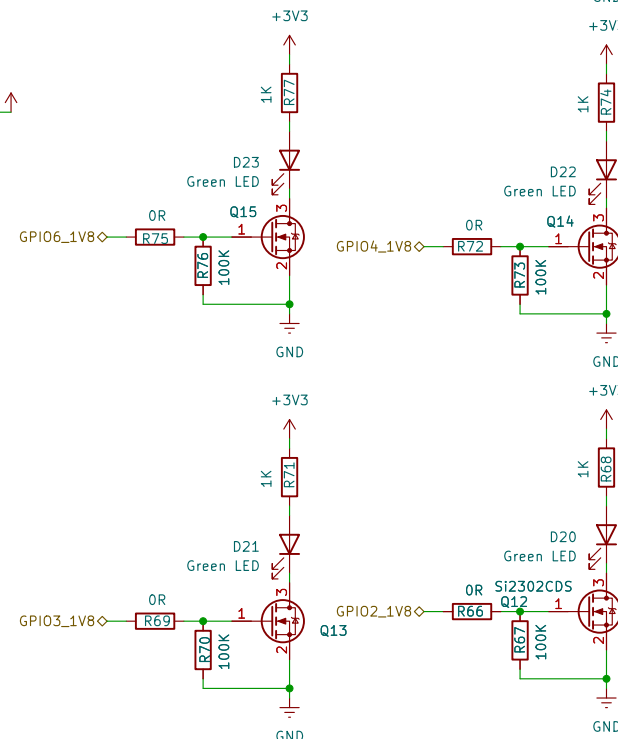
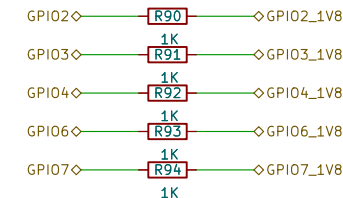
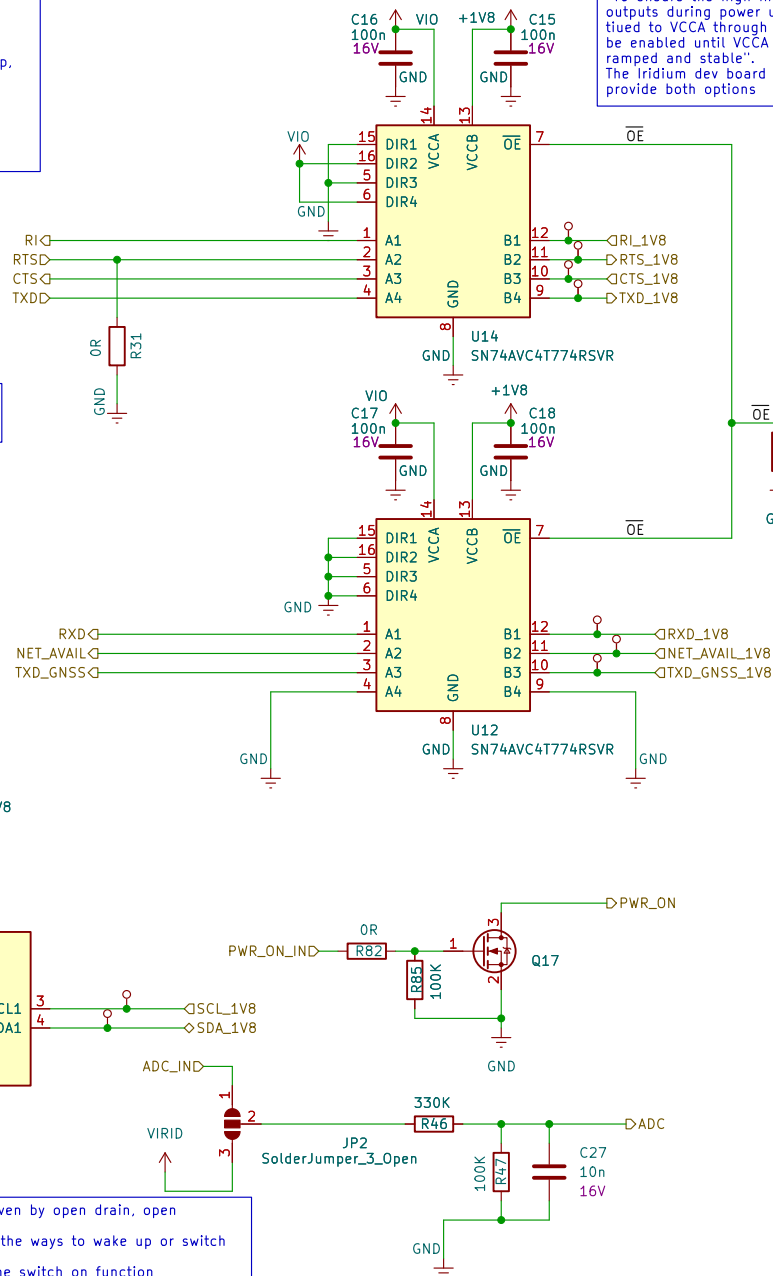
"To ensure the high impedance state of the outputs during power up or down nOE must be tied to VCCA through a pullup and must not be enabled until VCCA and VCCB are fully ramped and stable".
 The Iridium dev board just pulls nOE low so provide both options

Option for module GPIO to drive LEDs or go to connector through resistor links. User to provide further level translation on daughterboard if needed

SDA_1V8 and SCL_1V8 pull ups are internal to 9604

PWR_ON signal. It is intended for this pin to be driven by open drain, open collector or contact switch.
 A low on this pin for a valid time period is one of the ways to wake up or switch on the module.
 Q17 inverts so the input is logic high to perform the switch on function

The ADC only accepts a range of 1.15 to 0.25V.
 The 100K//330K potential divider scales this from a 5V input or can monitor VIRID



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 Ground Control

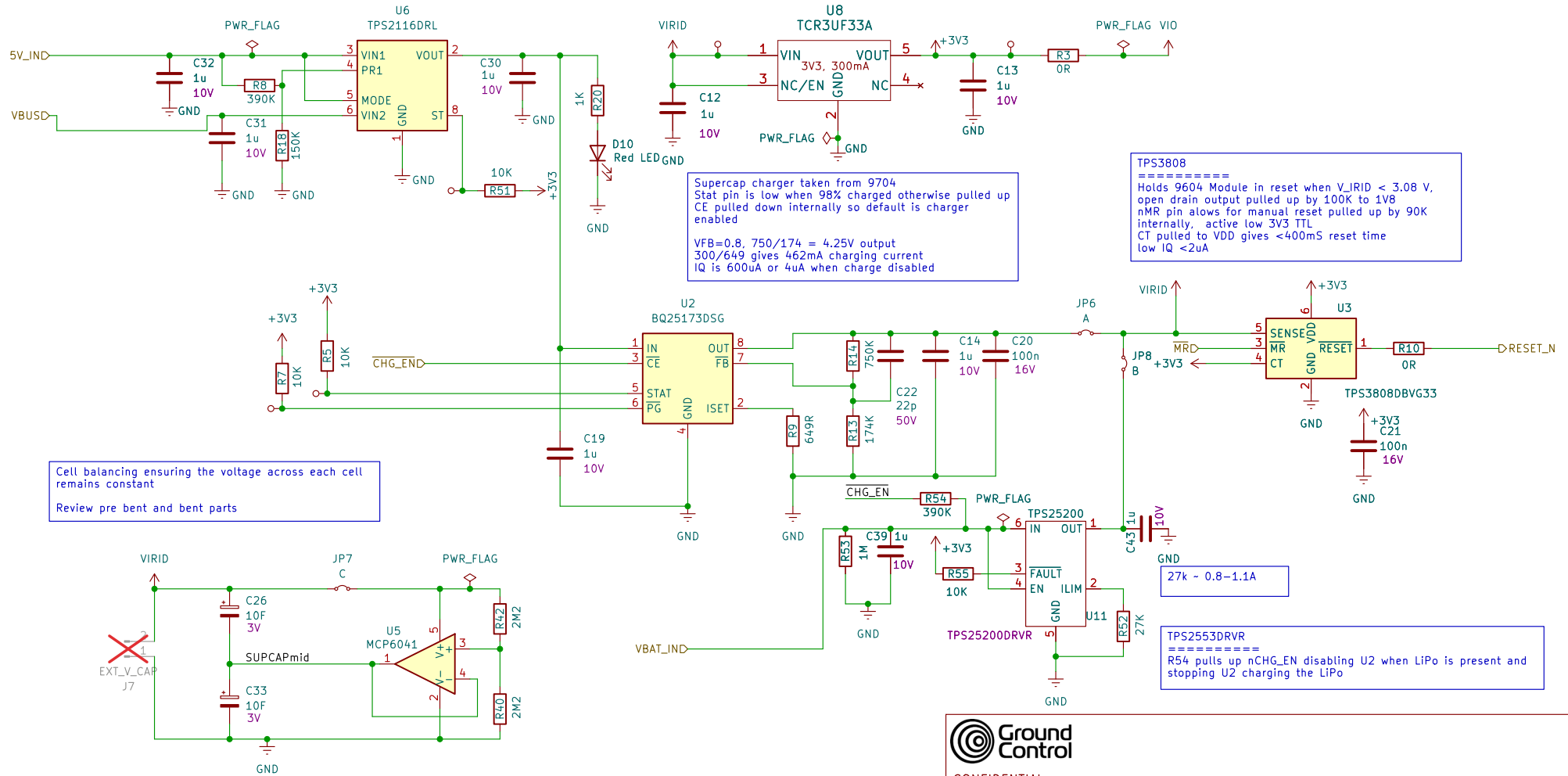
Sheet: Level Translation
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Title: RockBlock_9604_ANT_&_SMA

Size: A4	Date: 2026-08-20	Ver: 1A	Itrn: 2	Fit Var:
KiCad E.D.A. 10.0.4		Id: 4/6		

When VIN1 rises above 3.6V this VIN1 takes priority
ST goes low and turns on D10 when VIN1 is not used
and USB is

Local 3V3 supply always on when 5V_IN or VBAT_IN
are supplied
Removal of R3 give option to feed in user supplied
VIO
IQ < 1uA



Cell balancing ensuring the voltage across each cell
remains constant
Review pre bent and bent parts

Supercap charger taken from 9704
Stat pin is low when 98% charged otherwise pulled up
CE pulled down internally so default is charger
enabled
 $VFB = 0.8, 750/174 = 4.25V$ output
 $300/649$ gives 462mA charging current
IQ is 600uA or 4uA when charge disabled

TPS3808
=====

Holds 9604 Module in reset when $V_{IRID} < 3.08V$,
open drain output pulled up by 100K to 1V8
nMR pin allows for manual reset pulled up by 90K
internally, active low 3V3 TTL
CT pulled to VDD gives <400mS reset time
low IQ <2uA

27k - 0.8-1.1A

TPS2553DRVR
=====

R54 pulls up nCHG_EN disabling U2 when LiPo is present and
stopping U2 charging the LiPo



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Ground Control

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Title: RockBlock_9604_ANT_&_SMA

Size: A4	Date: 2026-08-20	Ver: 1A	Itrn: 2	Fit Var:
KiCad E.D.A. 10.0.4		Id: 5/6		

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