RP2350 CPU

File: PICO6809-RP2350B_v23.kicad_sch

ESP32

File: PICO6809-ESP32_v23.kicad_sch

6809 Interface

File: PICO6809-6809_Interface_v23.kicad_sch

USB Hub

File: PICO6809-USBHUB_v23.kicad_sch

Power Supply

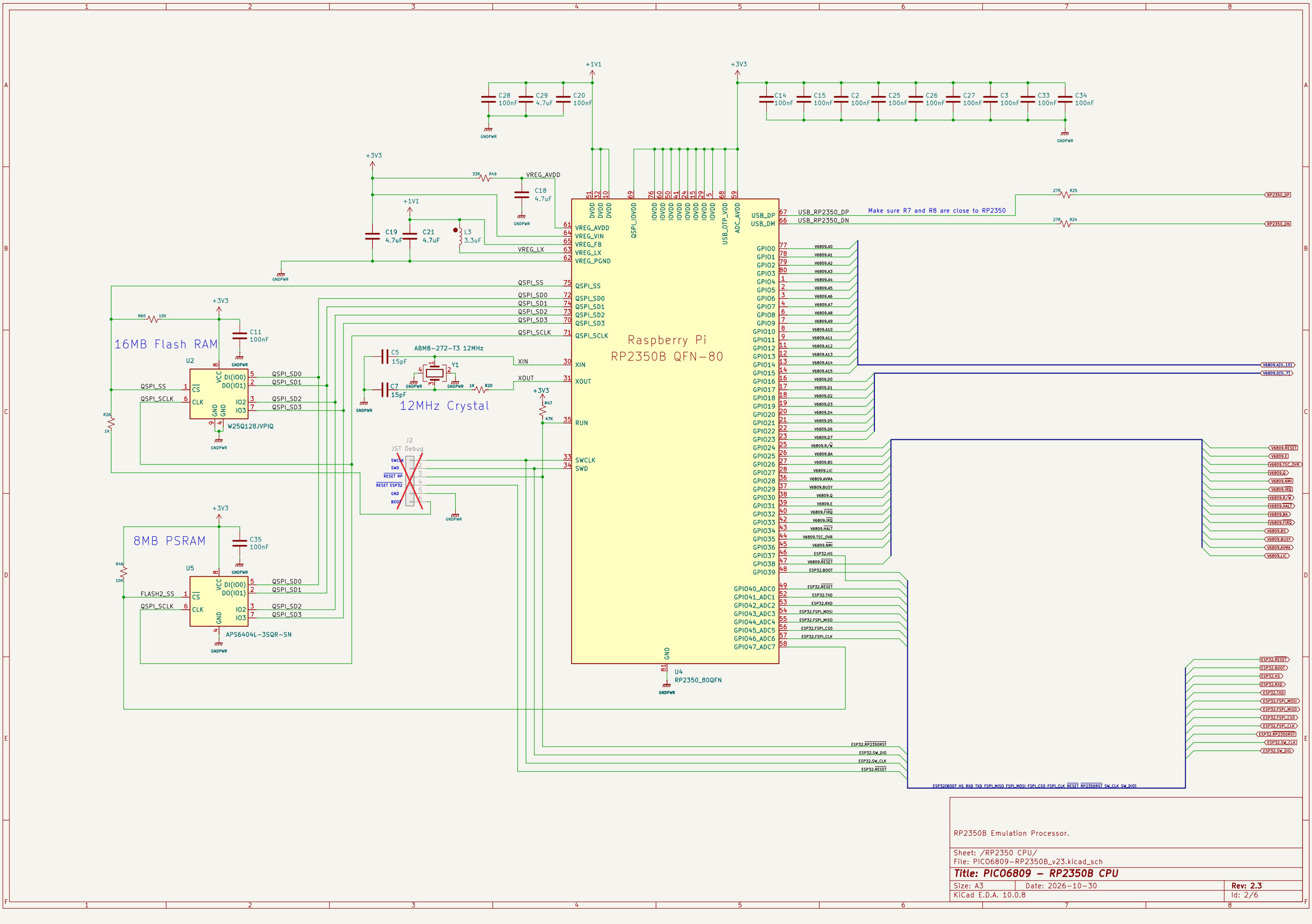
File: PICO6809-PowerSupply_v23.kicad_sch

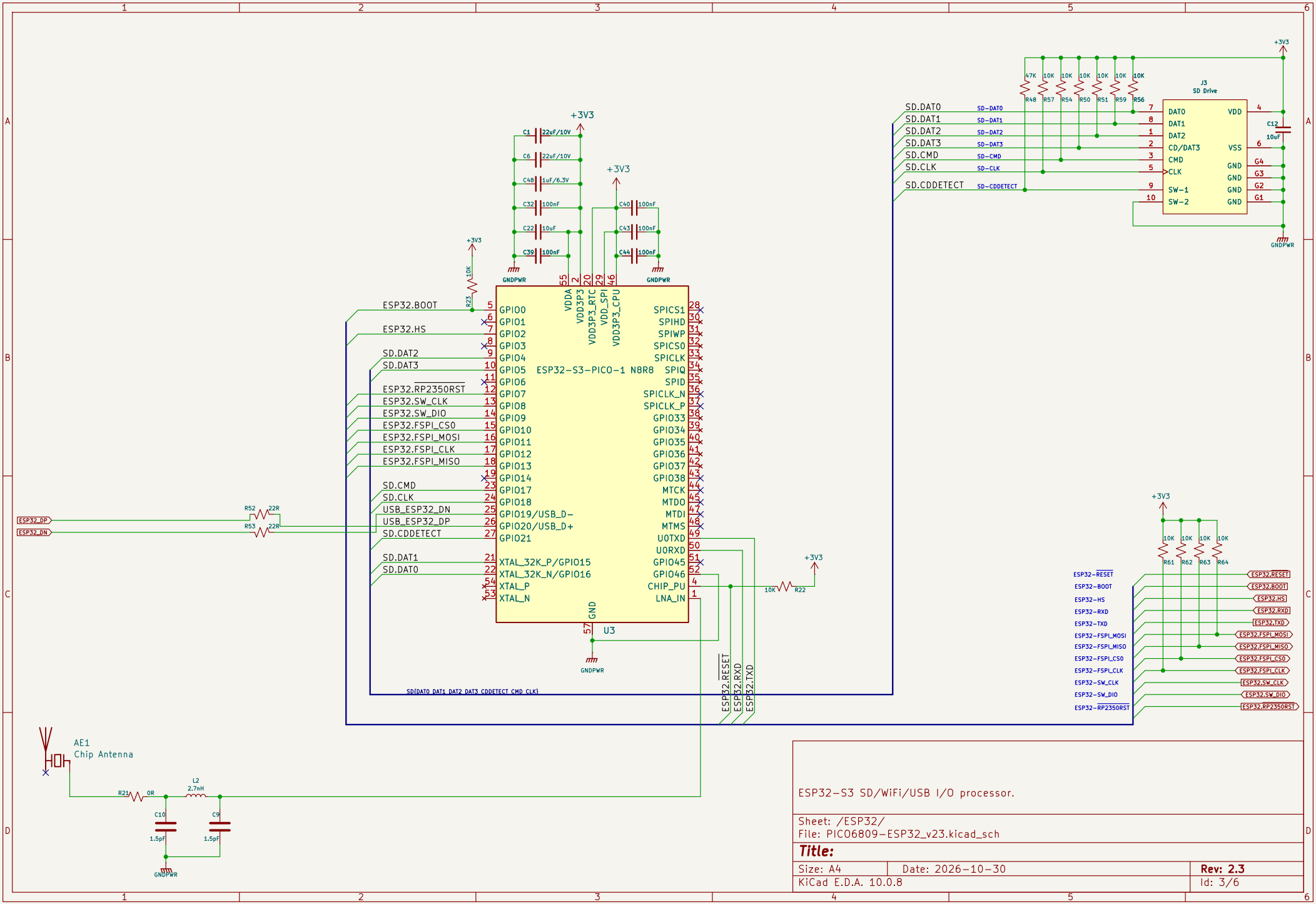
A 6809E replacement using a Raspberry Pi RP2350 MCU.

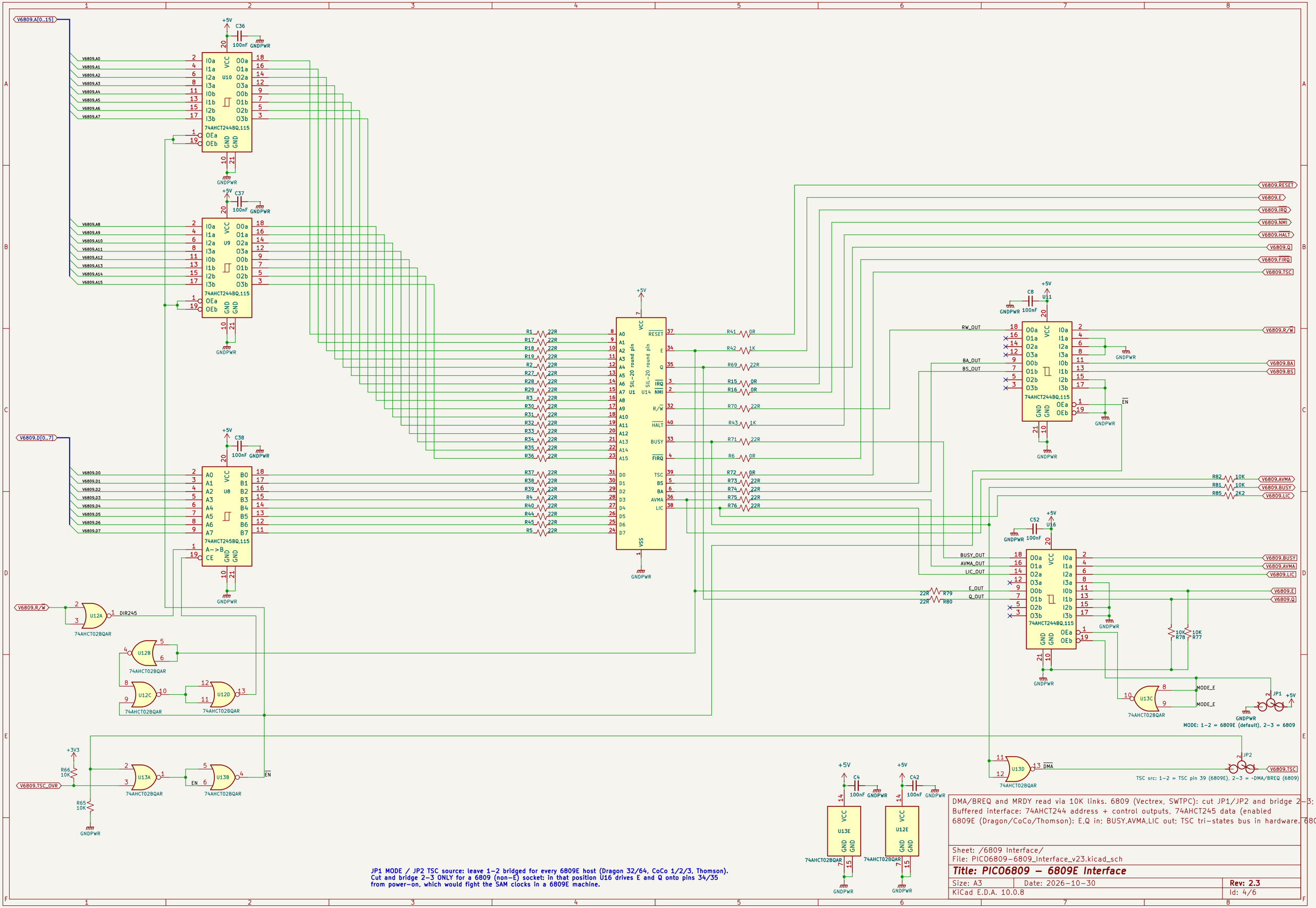
Sheet: /
File: PICO6809_v23.kicad_sch

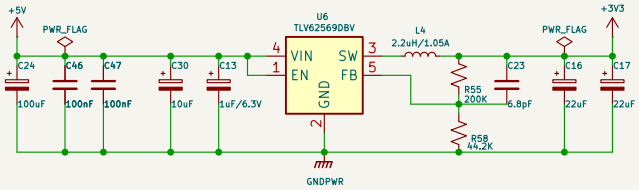
Title: PICO6809

Size: A4	Date: 2023-08-28	**Rev: 2.3**
KiCad E.D.A. 10.0.8		Id: 1/6


+1V1
+3V3
C28 100nF
C29 4.7uF
C20 100nF
C14 100nF
C15 100nF
C2 100nF
C25 100nF
C26 100nF
C27 100nF
C3 100nF
C33 100nF
C34 100nF
GNDPWR
R49 33Ω
VREG_AVDD
C18 4.7uF
C19 4.7uF
C21 4.7uF
L3 3.3uF
VREG_LX
DVDD
QSPI_IOVDD
IOVDD
USB_OTP_VDD
ADC_AVDD
VREG_AVDD
VREG_VIN
VREG_FB
VREG_LX
VREG_PGND
QSPI_SS
QSPI_SD0
QSPI_SD1
QSPI_SD2
QSPI_SD3
QSPI_SCLK
XIN
XOUT
RUN
SWCLK
SWD
USB_DP
USB_DM
USB_RP2350_DP
USB_RP2350_DN
Make sure R7 and R8 are close to RP2350
R25 27Ω
R24 27Ω
RP2350_DP
RP2350_DN
Raspberry Pi
RP2350B QFN-80
U4
RP2350_80QFN
GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
GPIO20
GPIO21
GPIO22
GPIO23
GPIO24
GPIO25
GPIO26
GPIO27
GPIO28
GPIO29
GPIO30
GPIO31
GPIO32
GPIO33
GPIO34
GPIO35
GPIO36
GPIO37
GPIO38
GPIO39
GPIO40_ADC0
GPIO41_ADC1
GPIO42_ADC2
GPIO43_ADC3
GPIO44_ADC4
GPIO45_ADC5
GPIO46_ADC6
GPIO47_ADC7
V6809.A0
V6809.A1
V6809.A2
V6809.A3
V6809.A4
V6809.A5
V6809.A6
V6809.A7
V6809.A8
V6809.A9
V6809.A10
V6809.A11
V6809.A12
V6809.A13
V6809.A14
V6809.A15
V6809.A[0..15]
V6809.D[0..7]
V6809.D0
V6809.D1
V6809.D2
V6809.D3
V6809.D4
V6809.D5
V6809.D6
V6809.D7
V6809.R/W
V6809.BA
V6809.BS
V6809.LIC
V6809.AVMA
V6809.BUSY
V6809.Q
V6809.E
V6809.FIRQ
V6809.IRQ
V6809.HALT
V6809.TSC_OVR
V6809.NMI
ESP32.HS
V6809.RESET
ESP32.BOOT
ESP32.RESET
ESP32.TXD
ESP32.RXD
ESP32.FSPI_MOSI
ESP32.FSPI_MISO
ESP32.FSPI_CS0
ESP32.FSPI_CLK
ESP32.RP2350RST
ESP32.SW_DIO
ESP32.SW_CLK
ESP32(BOOT HS RXD TXD FSPI_MISO FSPI_MOSI FSPI_CS0 FSPI_CLK RESET RP2350RST SW_CLK SW_DIO)
16MB Flash RAM
U2
W25Q128JVPIQ
R60 10K
C11 100nF
R26 1K
8MB PSRAM
U5
APS6404L-3SQR-SN
R46 10K
C35 100nF
ABM8-272-T3 12MHz
C5 15pF
C7 15pF
Y1
R20 1K
12MHz Crystal
R47 47K
J2
JST Debug
SWCLK
SWD
RESET RP
RESET ESP32
GND
BOOT
RP2350B Emulation Processor.
Sheet: /RP2350 CPU/
File: PICO6809-RP2350B_v23.kicad_sch
Title: PICO6809 - RP2350B CPU
Size: A3
Date: 2026-10-30
Rev: 2.3
KiCad E.D.A. 10.0.8
Id: 2/6


ESP32-S3-PICO-1 N8R8
U3
SD Drive
J3
ESP32.BOOT
ESP32.HS
SD.DAT2
SD.DAT3
ESP32.RP2350RST
ESP32.SW_CLK
ESP32.SW_DIO
ESP32.FSPI_CS0
ESP32.FSPI_MOSI
ESP32.FSPI_CLK
ESP32.FSPI_MISO
SD.CMD
SD.CLK
USB_ESP32_DN
USB_ESP32_DP
SD.CDDETECT
SD.DAT1
SD.DAT0
ESP32_DP
ESP32_DN
AE1
Chip Antenna
ESP32-S3 SD/WiFi/USB I/O processor.
Sheet: /ESP32/
File: PICO6809-ESP32_v23.kicad_sch
Title:
Size: A4
Date: 2026-10-30
Rev: 2.3
KiCad E.D.A. 10.0.8
Id: 3/6


V6809.A[0..15]
V6809.D[0..7]
74AHCT244BQ,115
74AHCT245BQ,115
74AHCT02BQAR
SIL-20 round pin
100nF
GNDPWR
+5V
+3V3
DIR245
RW_OUT
BA_OUT
BS_OUT
BUSY_OUT
AVMA_OUT
LIC_OUT
E_OUT
Q_OUT
MODE_E
MODE: 1-2 = 6809E (default), 2-3 = 6809
TSC src: 1-2 = TSC pin 39 (6809E), 2-3 = ~DMA/BREQ (6809)
JP1 MODE / JP2 TSC source: leave 1-2 bridged for every 6809E host (Dragon 32/64, CoCo 1/2/3, Thomson).
Cut and bridge 2-3 ONLY for a 6809 (non-E) socket: in that position U16 drives E and Q onto pins 34/35
from power-on, which would fight the SAM clocks in a 6809E machine.
DMA/BREQ and MRDY read via 10K links. 6809 (Vectrex, SWTPC): cut JP1/JP2 and bridge 2-3; E,Q ge
Buffered interface: 74AHCT244 address + control outputs, 74AHCT245 data (enabled
6809E (Dragon/CoCo/Thomson): E,Q in; BUSY,AVMA,LIC out; TSC tri-states bus in hardware. 6809 (Ve
Sheet: /6809 Interface/
File: PICO6809-6809_Interface_v23.kicad_sch
Title: PICO6809 - 6809E Interface
Size: A3
Date: 2026-10-30
Rev: 2.3
KiCad E.D.A. 10.0.8
Id: 4/6

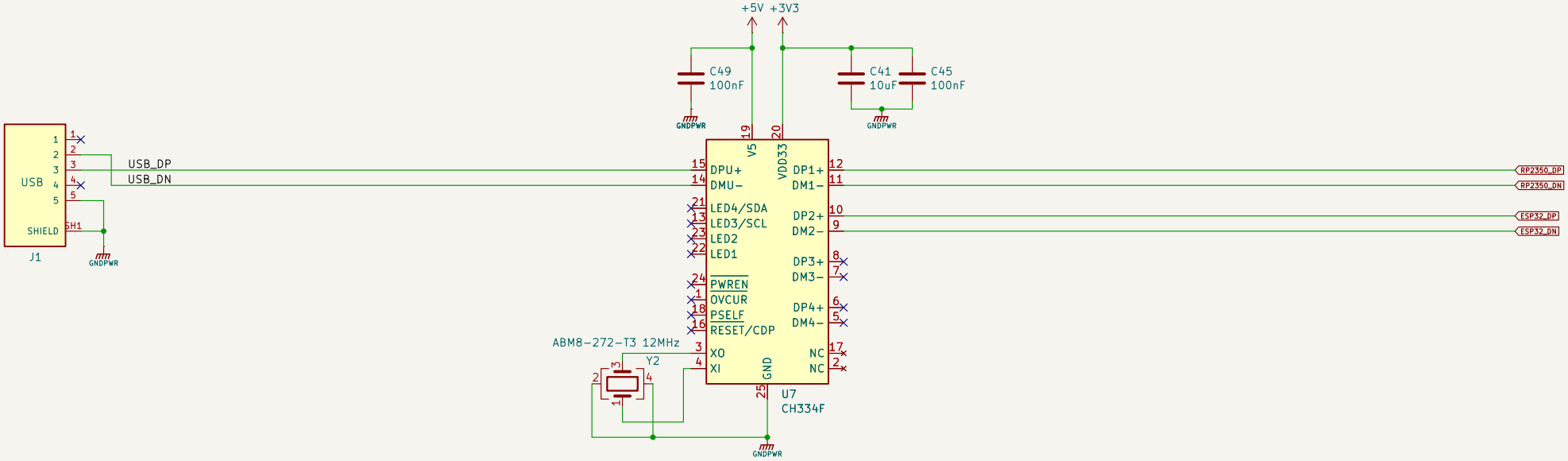


3v3 Buck Converter.

Sheet: /Power Supply/
File: PICO6809-PowerSupply_v23.kicad_sch

Title:

Size: A4	Date: 2026-10-30	**Rev: 2.3**
KiCad E.D.A. 10.0.8		Id: 5/6



USB Hub – present RP2350 & ESP32 USB to host.

Sheet: /USB Hub/
File: PICO6809-USBHUB_v23.kicad_sch

Title: USB Hub Controller

Size: A4	Date: 2026-04-01	**Rev: 2.3**
KiCad E.D.A. 10.0.8		Id: 6/6