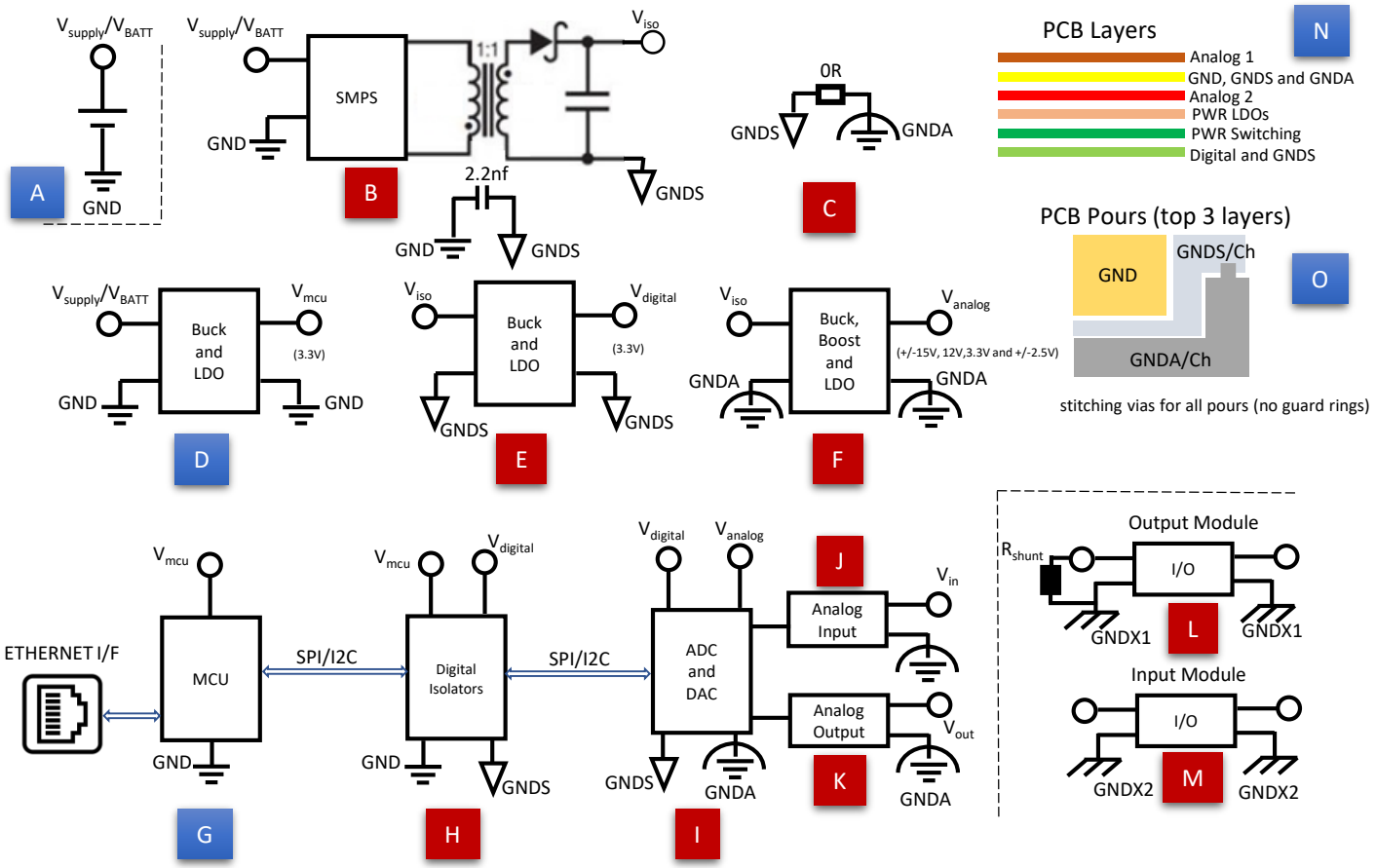


A Battery or DC Power Supply

B DC-DC Switching Power Supply

C Digital and Analog Grounds Connection

D Non-Isolated Buck and LDO for MCU

E Isolated Buck and LDO for Digital Supply

F Isolated Buck and LDO for Analog Supplies

G MCU

H Digital Signal Isolators

I ADC and/or DAC

J Analog Input Interface Circuit

K Analog Output Interface Circuit

L External Current Source

M External Voltage Measurement

N PCB Layers Assignments

O Ground Cu Pours Layout

Shared between Channels

One per Channel

Signal Types

DC signals (both V_{in} and V_{out})

Ranges

-50 uV < V_{out} < 70 mV

-50 uV < V_{in} < 400 mV

TI Products

ADS124S08IPBSR
DAC8771RGZ
ISO1540QDRQ1
ISO7740DBQ
ISO7741DBQ
LM27762
LM5180-Q1NGU
LMZM23600SIL
LP38798SD-ADJ_NOPB
MSP432E401YPDT_A
TMP117MAIDRVR
TPD4E1B06DCK
TPS26624DRCT
TPS7A9001DSK

Power Supply Reuse

1. VNEG and VPOS of the DAC8771's BBC be used as a VCC supply to ADA4522-4ARUZ and ADGS5414BCPZ in the Analog Output circuit.

Field Isolation Scenarios (Power and Signal)

1. GND, GNDX1 and GNDX2 are mutually isolated
2. GND, GNDX1 and GNDX2 are connected but isolated from GND
3. GND, GNDX1 and GNDX2 are connected

-- V_{out} (0.1 - 50 mV) at K is connected to external circuit M

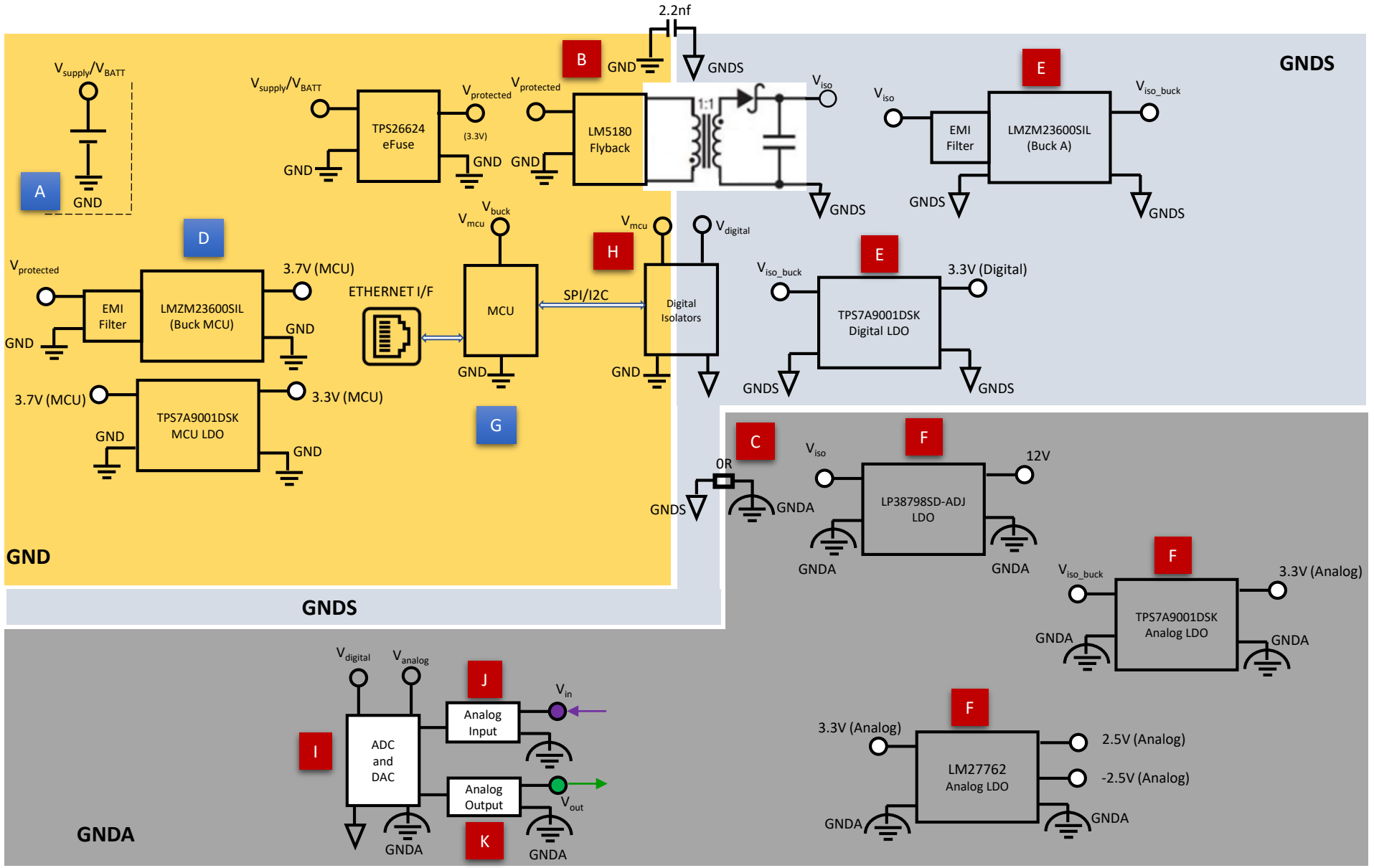
-- should V_{in} (0.1 - 50 mV) at J is connected to external circuit L

Noise, Ground-Loop and EMI Mitigation

-- PCB layers and Cu pours minimize noise at K

-- PCB layers and Cu pours minimize EMI at K

Followed most recommendations in component datasheets for EMC/EMI (SMPS current path, filters, etc.).

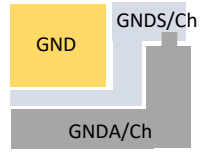


N

PCB Layers

- Analog 1
- GND, GNDS and GNDA
- Analog 2
- PWR LDOs
- PWR Switching
- Digital and GNDS

PCB Pours (top 3 layers)



O

stitching vias for all pours (no guard rings)