TPS65381A-Q1:

Flexibility for Core Voltage - DCDC instead of VDD1 LDO Controller

TPS65381A-Q1: uP Core Supply Flexibility

- The default configuration uses the VDD1 LDO controller with external FET as the primary uP/MCU core voltage supply (0.8V to 3.3V).
- The TPS65381A-Q1 architecture has flexibility to use an external DCDC for the core rail:
  - Applications may need more core current than feasible with VDD1 LDO controller
  - Some applications may need or want more efficiency
  - Some applications may need to address a thermal budget.

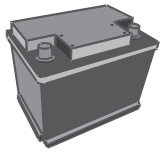
- **Solution 1:** use ***downstream external DCDC*** for the uP/MCU core voltage supply.
  - VDD6 as pre-regulator for the DCDC
    - Stay within the total current budget for VDD6.
    - Stay within the thermal budget of the system ant TPS65381A-Q1.
    - This rail may be monitored by the TPS65381A-Q1 by using the VDD1_SENSE pin and the OV/UV monitoring for VDD1.
    - Input range considerations: must the design consider faults with VDD6 that may allow input voltage from system to pass to input od downstream external DCDC?

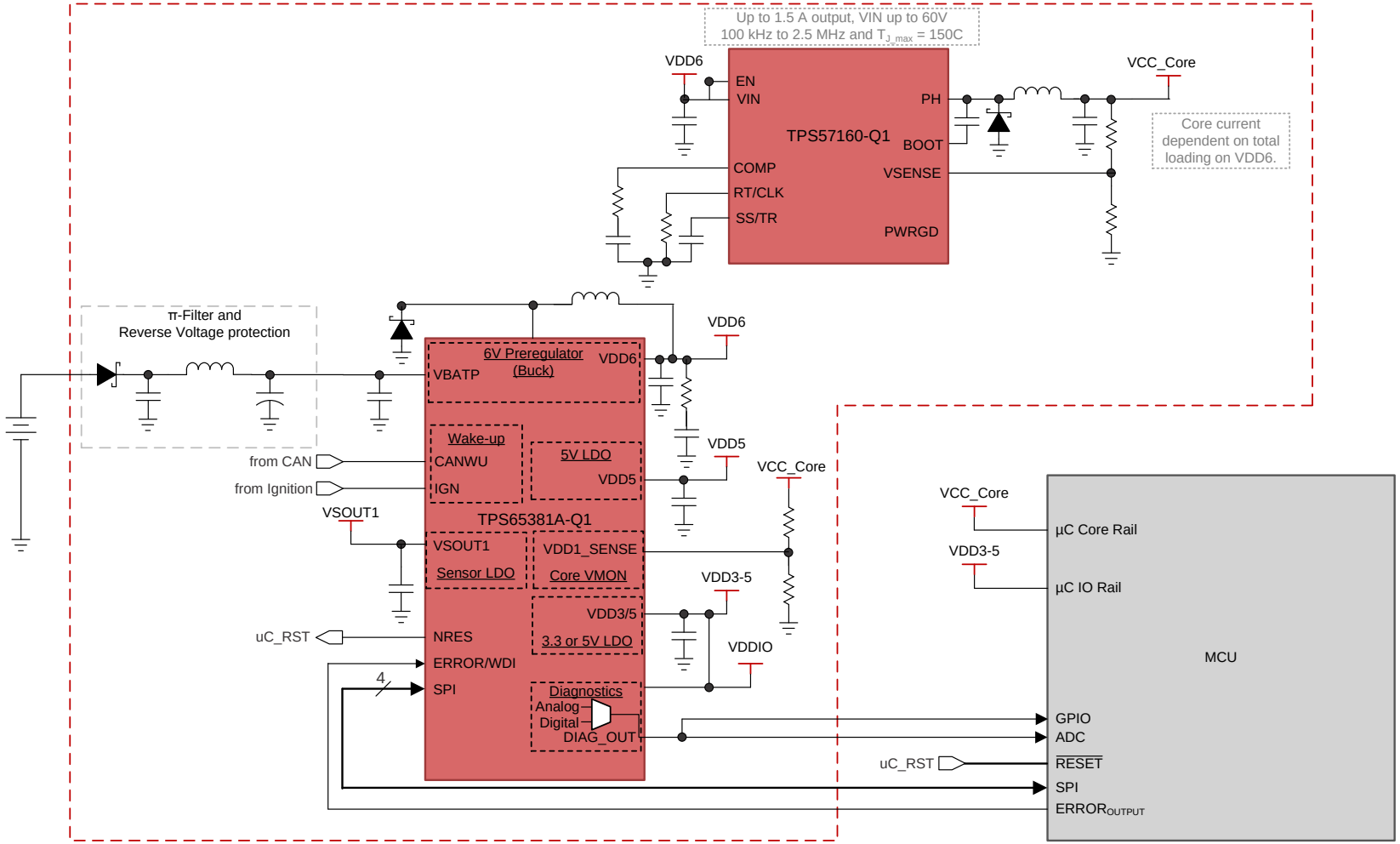
- **Solution 2:** for higher current cores use ***external DCDC from main supply (battery or industrial supply)*** for the uP/MCU core voltage supply.
  - This rail may be monitored by the TPS65381A-Q1 by using the VDD1_SENSE pin and the OV/UV monitoring for VDD1.

TPS65381A-Q1:

VDD6 Pre-regulator supplying DCDC

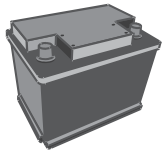
TPS57160-Q1 Cascaded for Core Rail

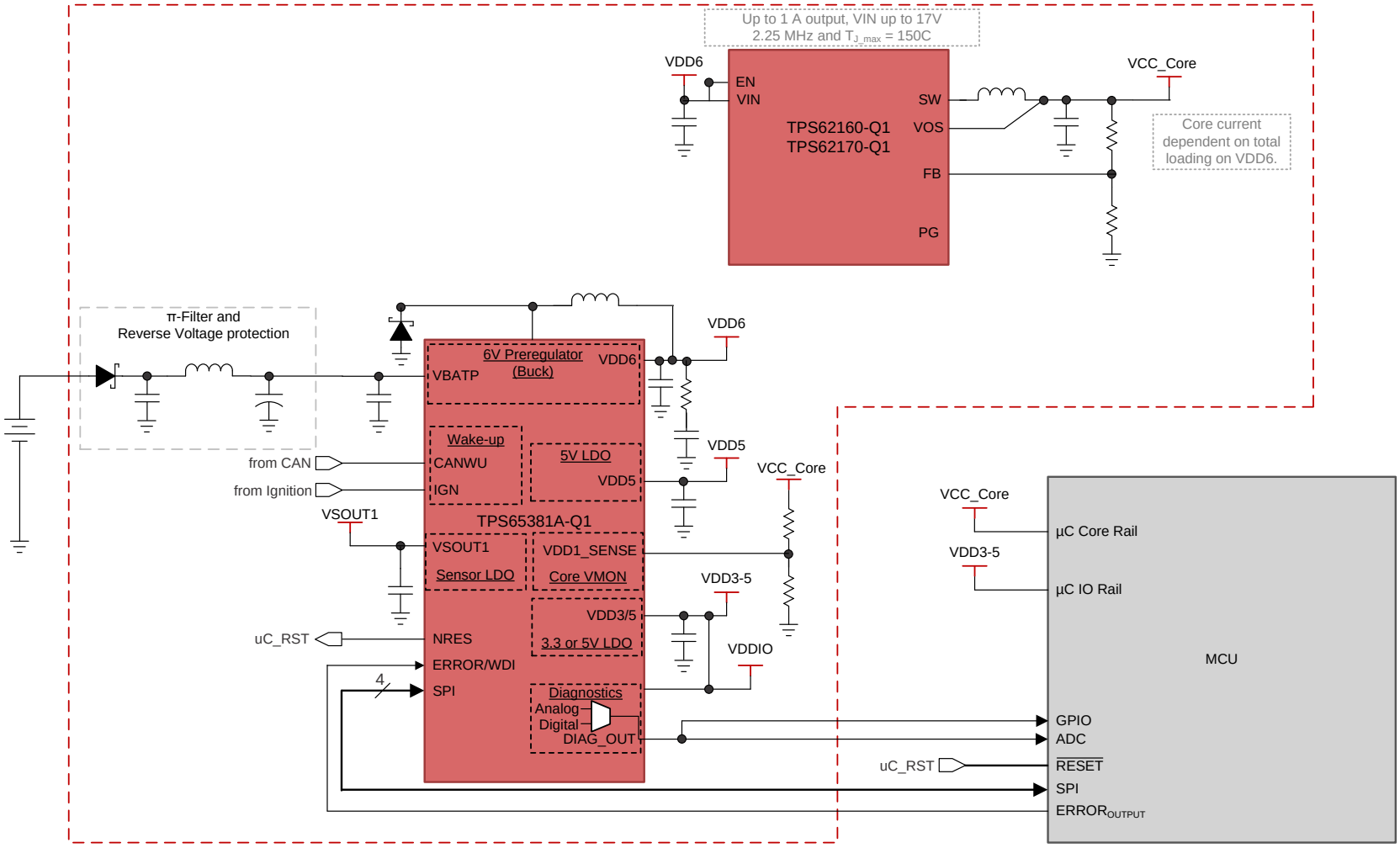




TPS57160-Q1 input range is up to 60V.

TPS621x0-Q1 Cascaded for Core Rail



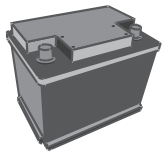


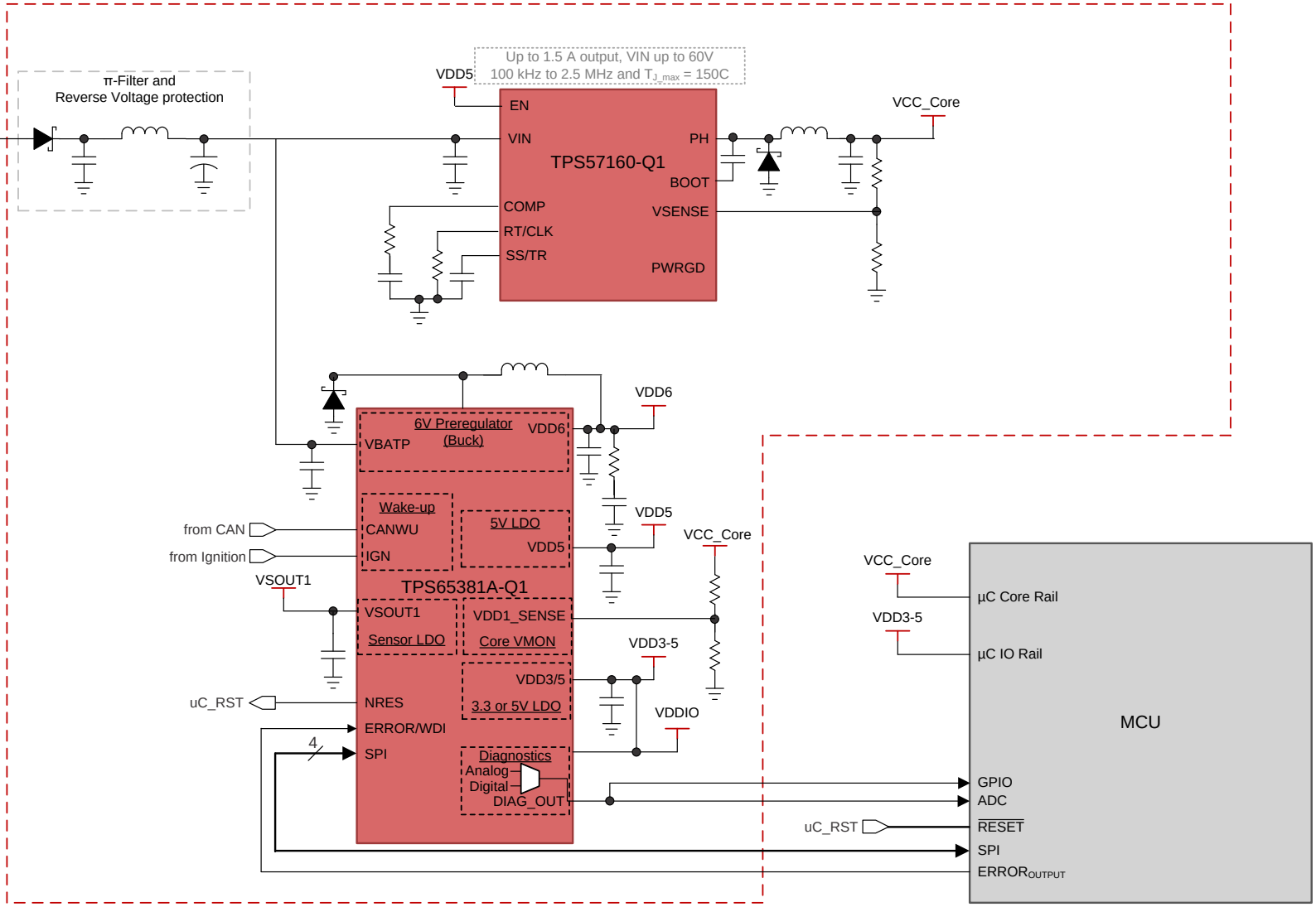
TPS621x0-Q1 input range is up to 17V. TPS62160-Q1 output current is up to 1 A, TPS62170-Q1 output current is up to 500 mA.

TPS65381A-Q1:

Main supply for both TPS65381A-Q1 and Supplying Core Rail DCDC

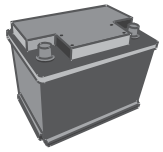
TPS57160-Q1 Parallel for Core Rail

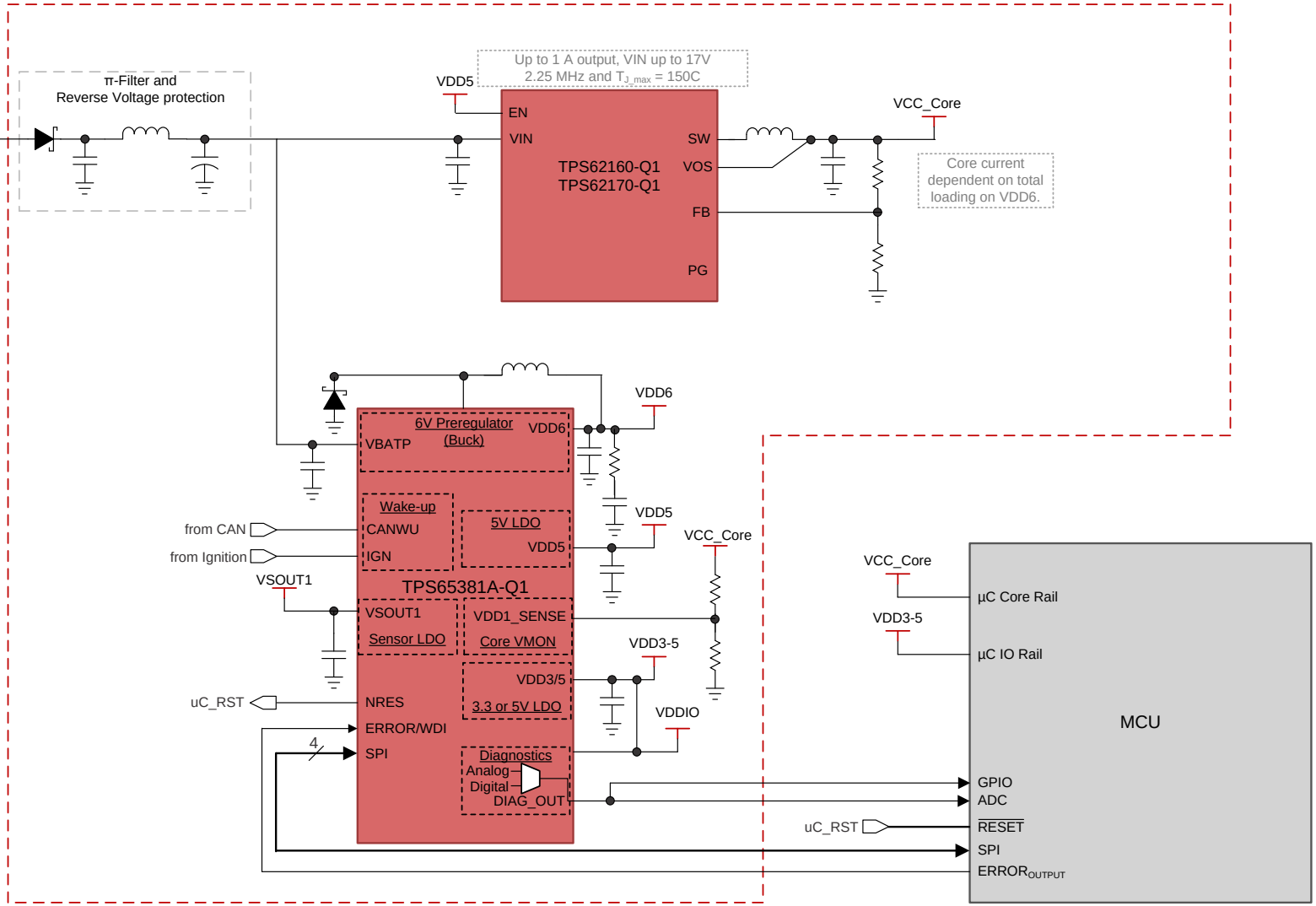




TPS57160-Q1 input range is up to 60V.

TPS621x0-Q1 Parallel for Core Rail





TPS621x0-Q1 input range is up to 17V. TPS62160-Q1 output current is up to 1 A, TPS62170-Q1 output current is up to 500 mA.

Thank You!