EECS192 Lecture 5
Feb. 16, 2016

Notes:

1. Check off-
- 2/19: Motor drive/stall, steering servo from battery, schematics due (+ part location rats nest- no copper)
- PCB design due (Gerbers) Tues 2/23 midnight

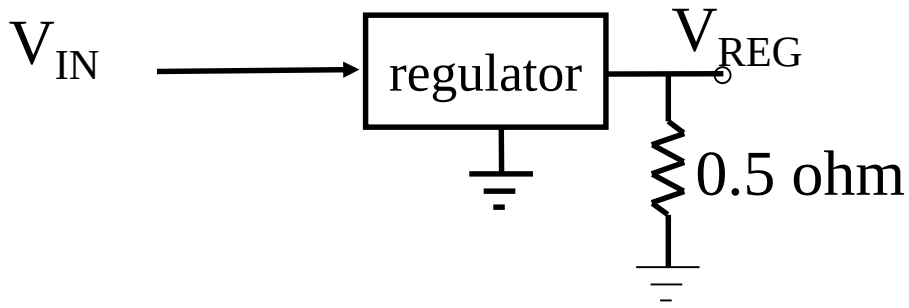
2. 2/22 Quiz 3: switch mode power supply and regulator
3. CalDay Sat. April 16 @ UCB, Freescale Cup at UC Davis

Topics

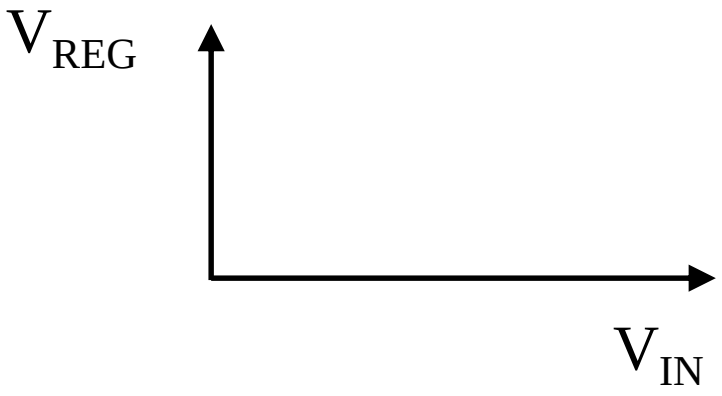
- Power supplies
- Linear regulator
- Boost converter- switch mode power supply

``7.2V'' supply waveforms with motor PWM

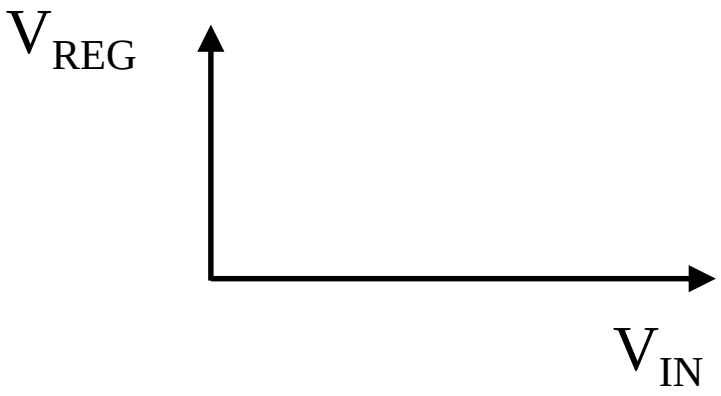
- Battery model
- Waveforms on board
- Wiring to reduce voltage resistance effects of wiring



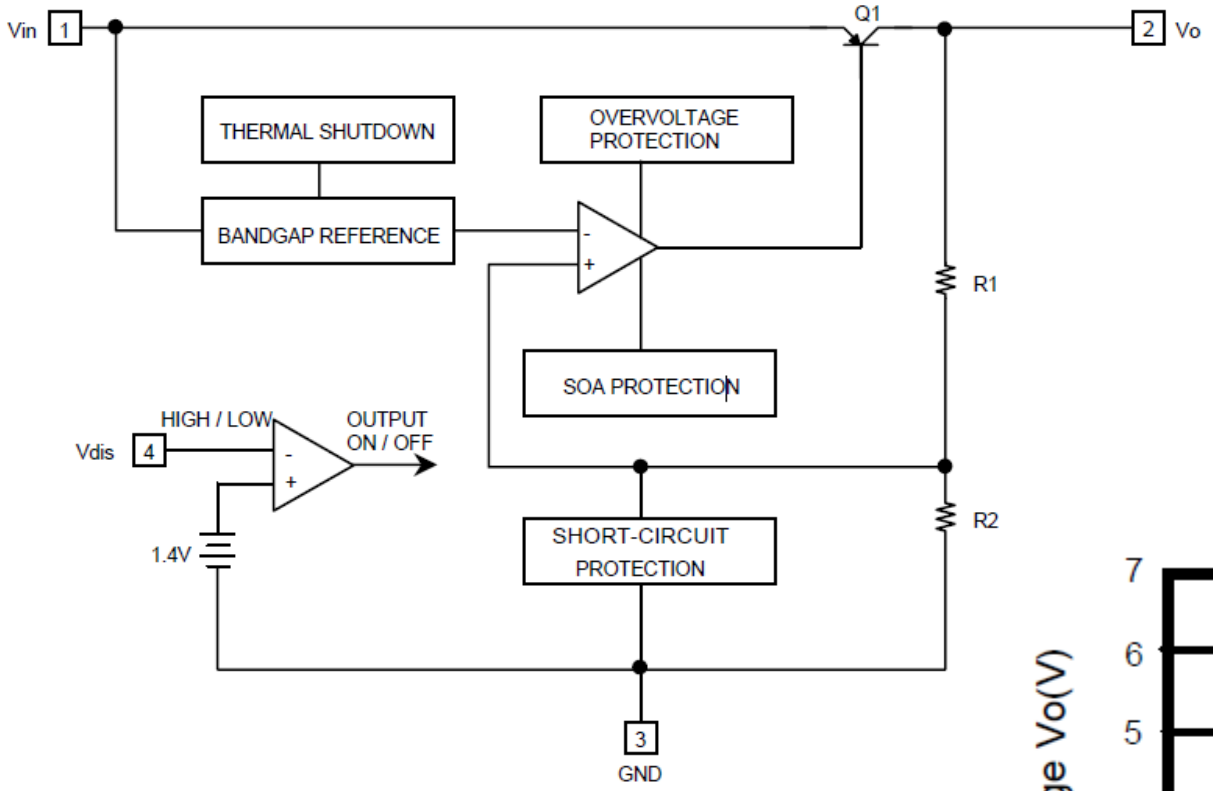
Linear Regulator $V_{IN} > V_{REG}$

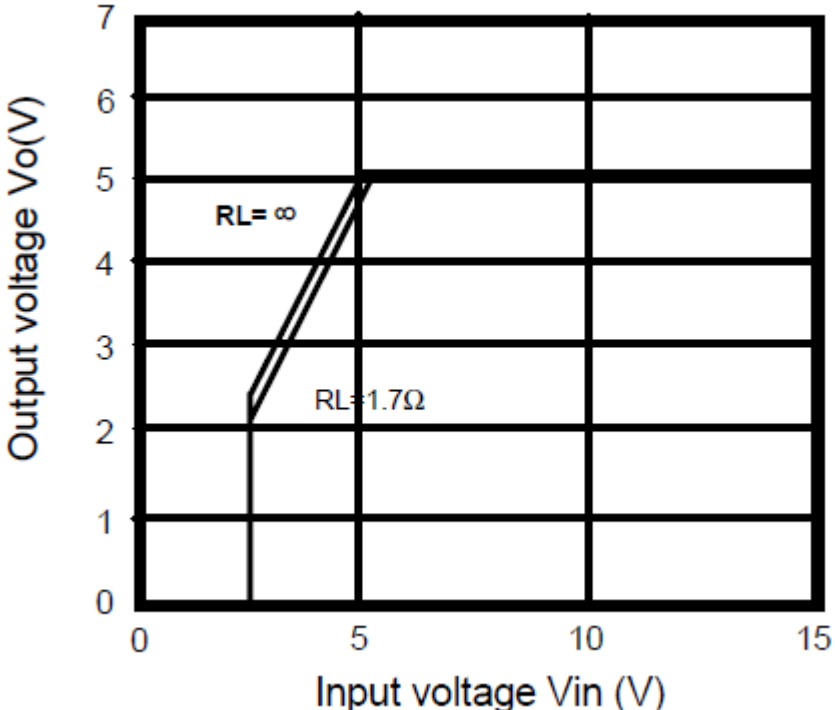


Boost Converter $V_{IN} < V_{REG}$



Linear Regulator, e.g. KA378R05

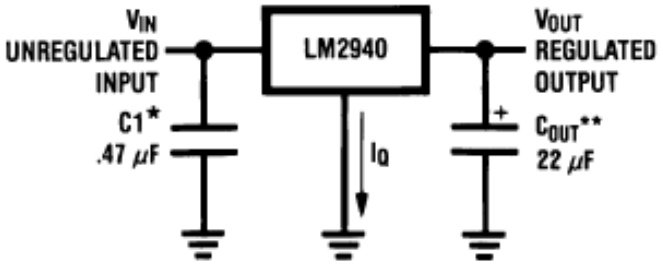




LDO = low drop out
Caution: not all are low drop out

LM2940

Typical Application



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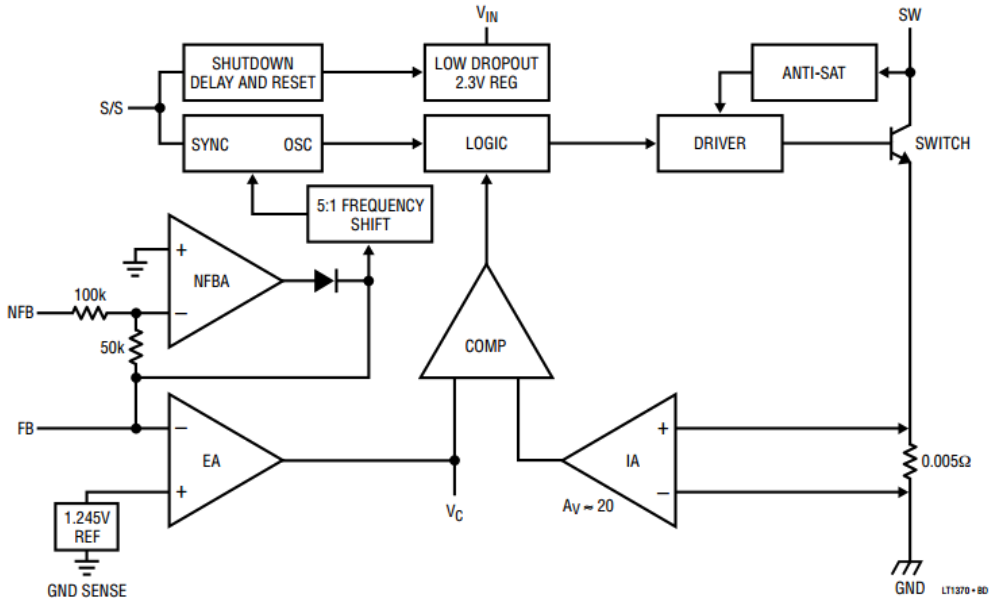
*Required if regulator is located far from power supply filter.

**C_{OUT} must be at least 22 µF to maintain stability. May be increased without bound to maintain regulation during transients. Locate as close as possible to the regulator. This capacitor must be rated over the same operating temperature range as the regulator and the ESR is critical; see curve.

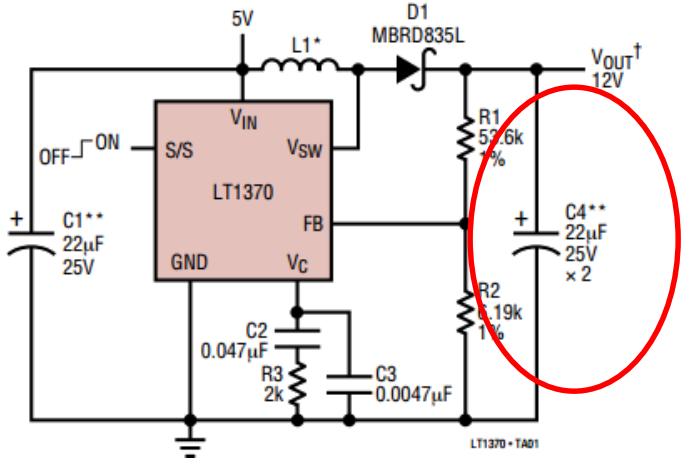
Boost Converter- LT1370

LT1370

BLOCK DIAGRAM

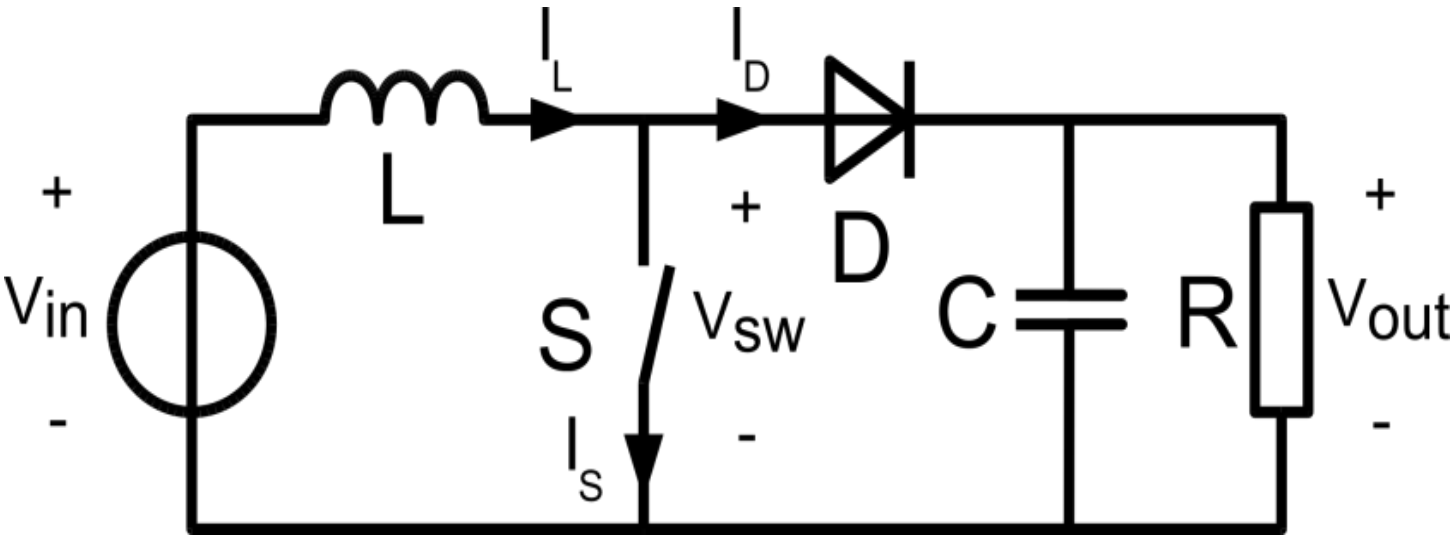


5V to 12V Boost Converter



Caution: ESR!
Need special cap

Boost Converter



Waveforms on board
(also see boost
converter notes)