Specifications

1. **Verification of PINOUT**

A diagram of a circuit

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**Design parameters**

|  |  |
| --- | --- |
| Parameter | Value |
|  | 4.5-16V - Not sure why (8.8V - 15.2V) is on schematic |
|  | 7V – must be above 6.5V |
|  | 250mA – (assuming MOSFET is not switched at 1KHz) |
| Output overshoot, undershoot |  |
| Output voltage ripple |  |
| Operating frequency | 400KHz |

1. **How do you set the output voltage? (PRIORITY HIGH)**

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**Defining variables**

Choose (Ensure is above 6.5V for stable operation of LDO)

Plugging that into eq we get

77.5K ~= 76.8K

1. **How to choose output inductor (PRIORITY MEDIUM)**

Overall, I chose parameters that limited EMI, at the cost of being less energy efficient.

is a coefficient that represents the amount of inductor ripple current relative to the maximum output current of the device. must be 0.2-0.6 of maximum IOUT supported by converter.

**= 0.2 –** lowest EMI, least energy efficient

- lower switching frequency variant chosen for less EMI

- not sure why 15.2V was chosen

Plugging the **old** parameters in we get

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Figure 1 Formula used for inductance

**We chose giving us K = 0.26**

Now we can calculate the ripple across the input of the inductor using

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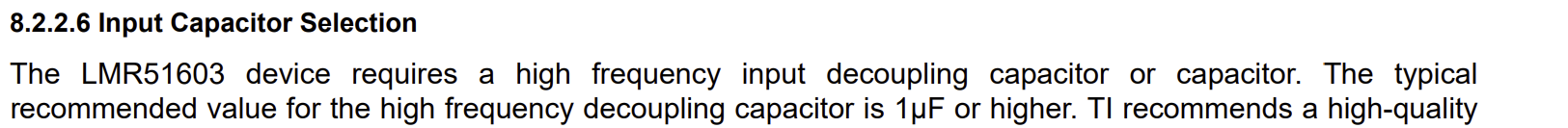
Figure 2 ripple current(PG 19 datasheet)

A screenshot of a math problem

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**Note\*** This inductor has been routed away from analog signals to reduce EMI.

1. **Choosing Input capacitors (PRIORITY: LOW)**



**Followed recommendation using 1uF**

1. **Choosing output capacitor( PRIORITY: LOWish)**

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**A black and white image of a mathematical equation

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Target ripple is

ESR ~= 10m @300KHz

0.93mV

A screenshot of a math test

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I will have 10uF + 1uF

This one may be better as all wiring has already been created.

Export TPS54202DDCR ‑ 8.5V-16V to 7.00V @ 0.3A

<https://webench.ti.com/power-designer/switching-regulator/select>