Measuring Noise in Voltage Regulators

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Introduction

Following presentation will cover state of the art in current methods of measuring noise generated by regulators. In addition, current progress of my work will be shown.

Agenda:

1. What is voltage regulator?
2. What noise regulators have?
3. How to combat them?
4. My progress.

Voltage regulator

> is a device which converts unregulated supply to more or less stable output.

Simple regulator with opamp:

Theory of operation

- Voltage reference.
- Feedback network.
- Error amplifier.
- Output stage.

Sources of noise in regulator

- Intrinsic semiconductor's noises:
  - popcorn noise,
  - shot noise,
  - 1/f (pink)noise.
  - Thermal noise (Johnson, wideband, white)

    
- Effect of temperature dependency
- Seebeck (Thermoelectric effect)

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