

EMS Problems, Ground Bounce

1. Objectives

Getting acquainted with advanced functions of a oscilloscope;
Understanding chosen EMS problems and electronic circuit design problems - Ground Bounce

2. Components and instrumentation.

Oscilloscope LeCroy 300MHz (o equivalent) is used.

3. Preparation.

Estimated preparation time for classes is 1 to 2 hours.

3.1. Reading

- [1] Understanding Electromagnetic Effects using PCB demos.pdf, chapters 13, 14, 15, 16
- [2] Minimizing Ground Bounce & VCC Sag.pdf

3.2. Problems

What is the mechanism of Bounce appearance ?

4. Contest of rapport

Observe all of possible voltages in PCB 14/16 (described in [1])

- Take screenshots of the voltages observed on scope and print them;
- Using measurement function of the scope read maximum, minimum, and peak-to-peak bounce voltages;
- Tabularize results in Tab. like below,
- Order them from the worst to the best rresult;
- Answer the question: how to design an electronic circuit to minimize ground bounces (and voltage sag) ?

Case (description)	Min bounce [mV]	Max bounce [mV]	Peak-peak bounce [mV]