Power Line EMI sensing

Date: 21st Jan, 2014

Goal

To study conducted EMI in power lines

Specific points to focus:

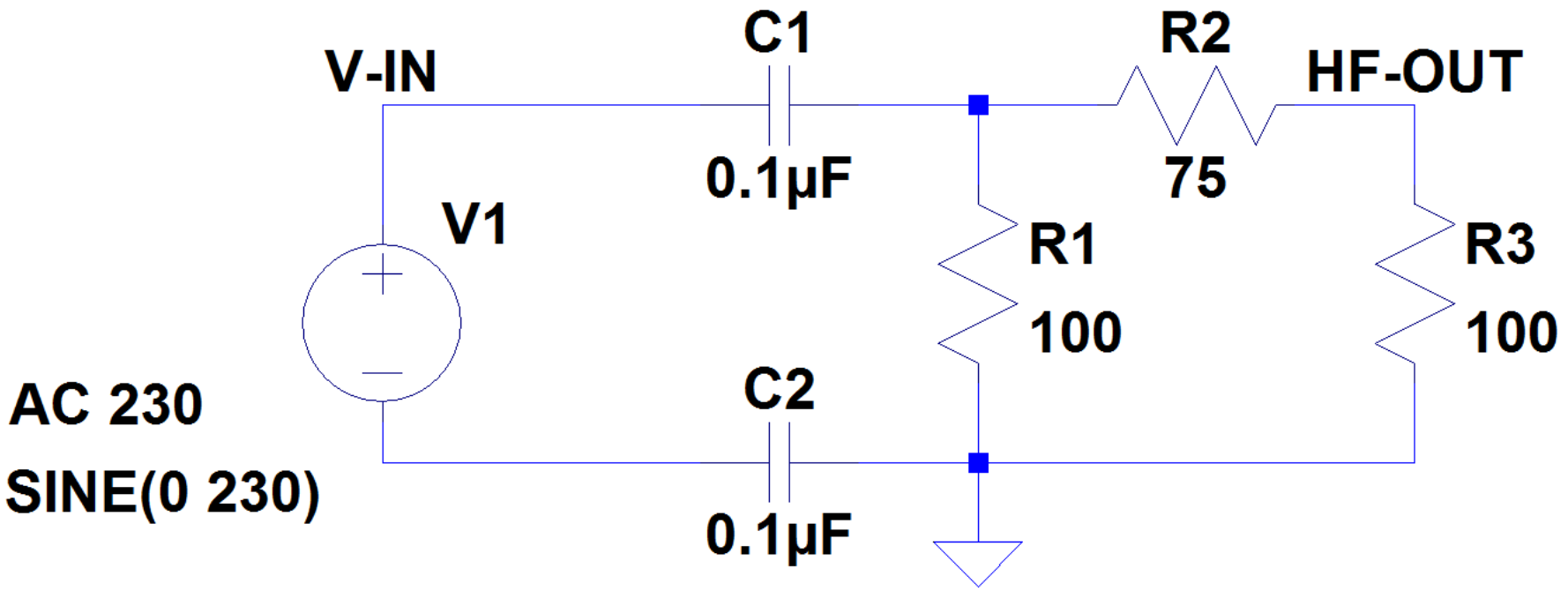
1. Effect of voltage fluctuation on CE.
2. Effect of building architecture on CE.
3. Analyze different CE signatures w/ and w/o load conditions.
4. CE signatures with different load settings on a single SMPS (EUT).
5. Difference in common mode CE and differential mode CE generated by appliances using CM and DM separation. [Added on 21/1/2014] [Imp.]

* CE: Conducted EMI

High Pass filter Circuit

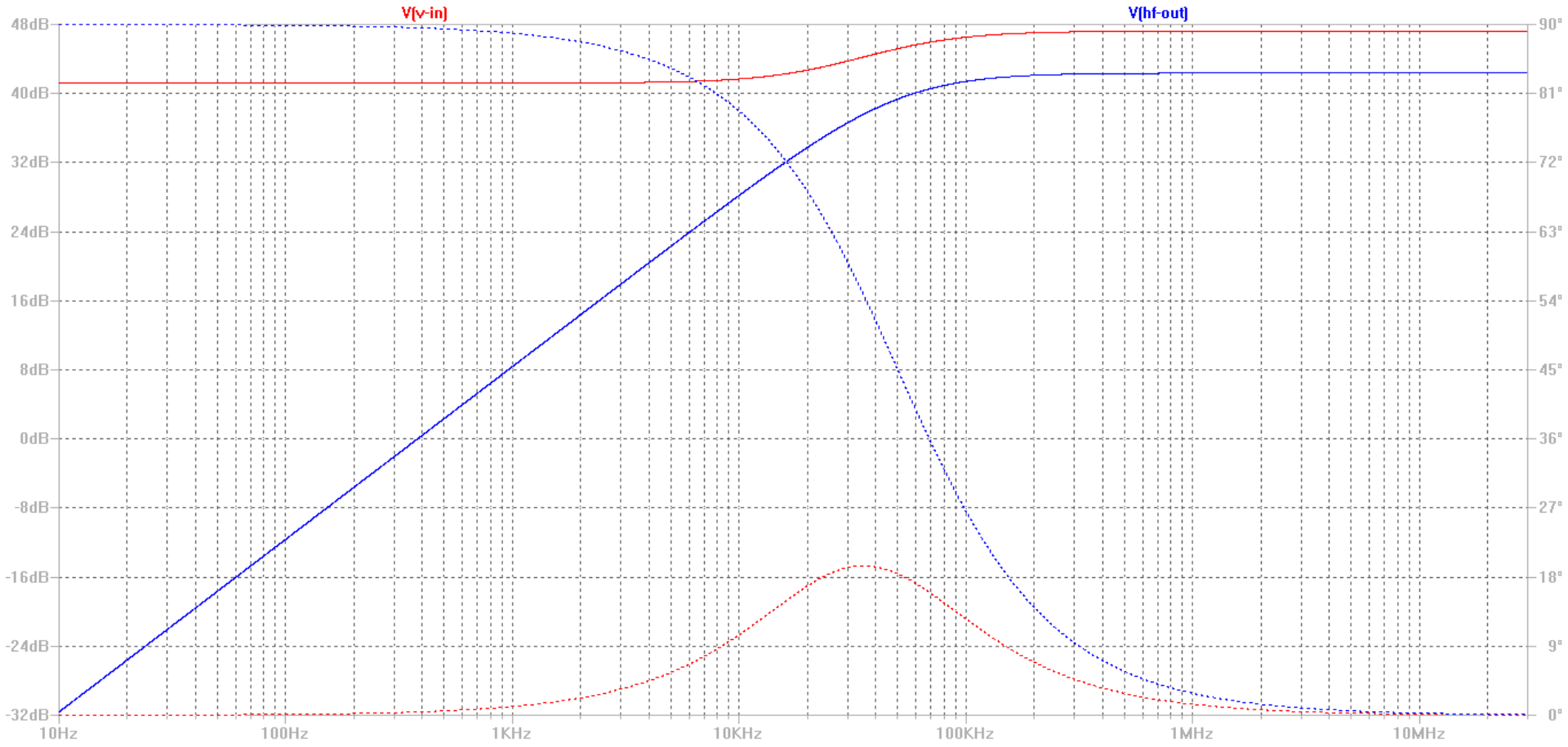
- Spec required :
  - 50Khz to 30Mhz flat range
  - Should be capable to withhold 250VAC
  - components should be selected to work in RF range
- Attenuator required at o/p to avoid high voltage signal from destroying analyzer front end.
- Output impedance should be 50 Ohm to match with Signal analyzer input port.

Simulated Circuit HPF



.ac oct 1000 10Hz 30000000Hz

Frequency response



HPF Filter from Solar EMC (US)

URL: http://solar-emc.com/TEMP/7415-3.html

HPF filter from COM-Power

URL: http://www.com-power.com/transient_limiters.html

EMI testing Facility in Delhi

- STQC lab {Standardisation Testing and Quality Certification}

http://www.stqc.gov.in/content/emiemc-testing

- Key Areas:

http://www.stqc.gov.in/testing-key-areas/160/333

- Lab in Okhla, Delhi

ERTL(North) Delhi			
Head of Laboratory	**M P Sharma (Sr. Director)**	ERTL(North) S- Block, Okhla Industrial Area, Phase - II, New Delhi - 110020	**Tel.:** 011 - 26386219 **Fax:** 011 - 26384583 **Email:** mpsharma AT stqc.nic.in

EMI Testing GB pant College

- GB pant engineering college, Okhla (Delhi) is having good microwave, EMI/EMC testing labs.

Link:
www.sltmicrowave.com/doc_pdf/**EMIEMC**%20**Test**%20Facility.pdf

References

- Power Line Filter Design for Conducted Electromagnetic Interference Using Time-Domain Measurements (Link to PDF).

Conclusions

- Setup a test bed for CE testing without wasting much time on designing HPFs.
- Look for off the shelf components and facilities available nearby.
- Simulate a generic SMPS model for modeling noise from different appliances.
- Study 2-3 research papers and prepare presentation for weekly meeting. Document each and every discussion.

*CE: Conducted EMI