



UiO : University of Oslo

IN5230 - Mandatory Task 2



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Deadline for delivery

- October 18 @ 08:00.
- The report is delivered in group.



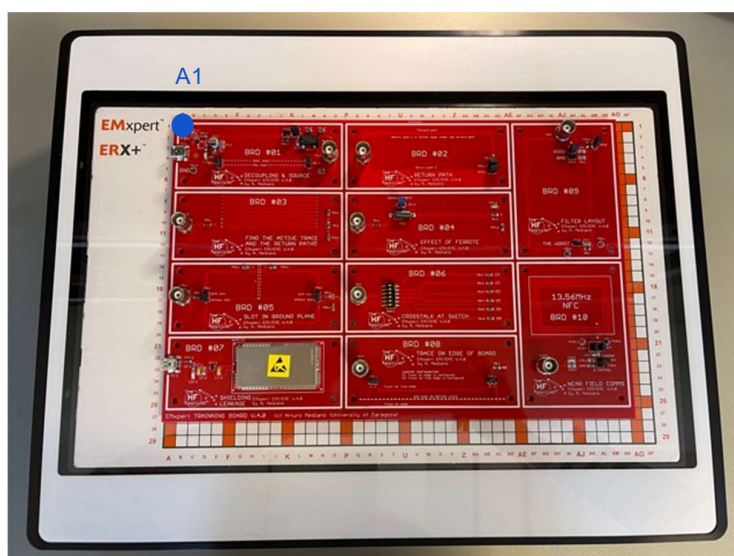
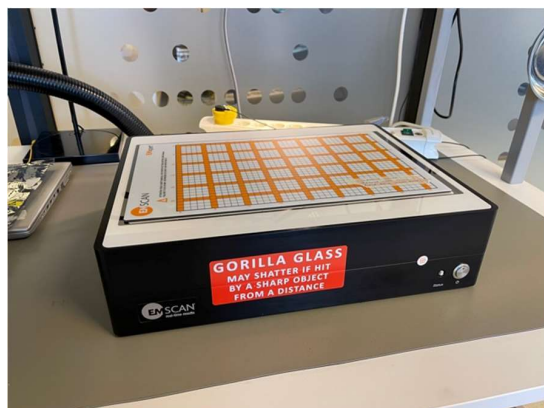
Image is borrowed from Internet!

Electro-Magnetic Interface (EMI)

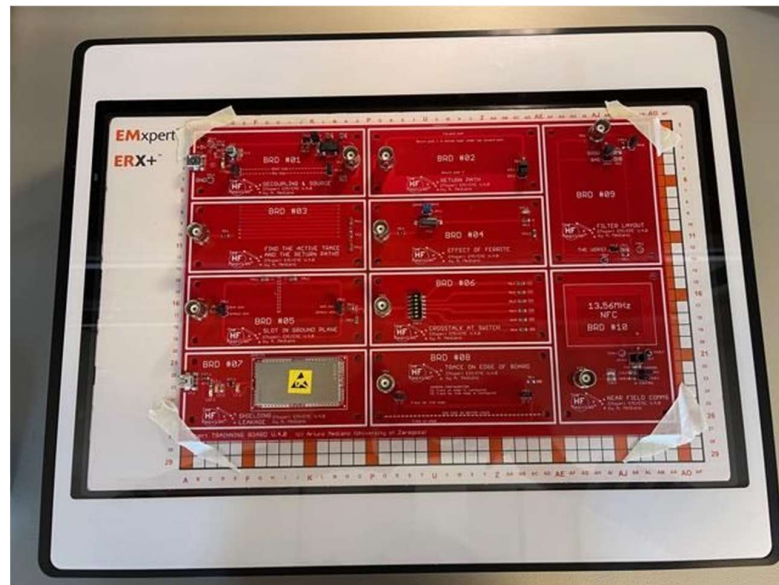
- Provided Materials
 - EMxpert Scanner
 - Demo Board
 - Laptop

5419
Lab

EMxpert Scanner



EMxpert Scanner



Paper tape for fixing the board on the scanner.

EMxpert Scanner



USB Charger for powering up the boards.

Laptop

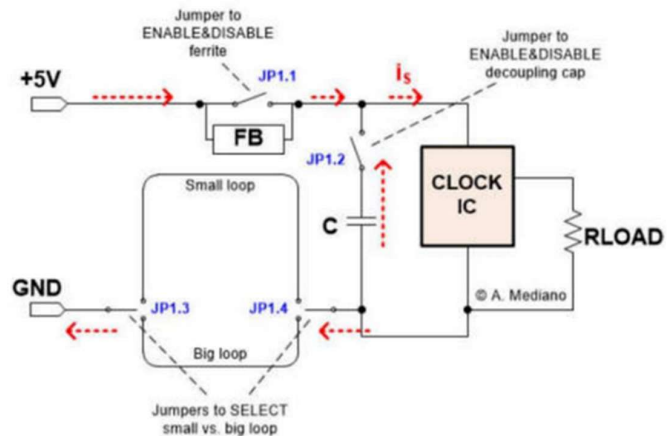
- username: stoy, password: stoystoy
- C:\IN5230stud\2024
 - GroupN_user1_user2
- EMxpert64 Program

Scanning Type

- Spectral Scan
 - Scanning the PCB at some locations in a wide frequency range.
- Spatial Scan
 - Scanning a selection of locations at a certain frequency.

BRD#01

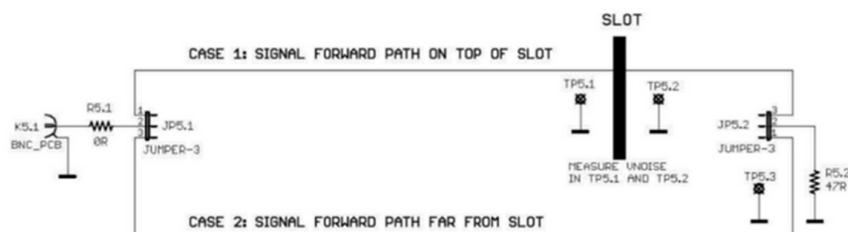
- Protecting the power supply from EM field generated by the IC clock by:
 - Decoupling capacitor
 - Small loop
 - Ferrite Bead*



* FB suppresses high-frequency electronic noise in electronic circuits.

BRD#05

- Routing the signal over the slot on the ground plane is dangerous!



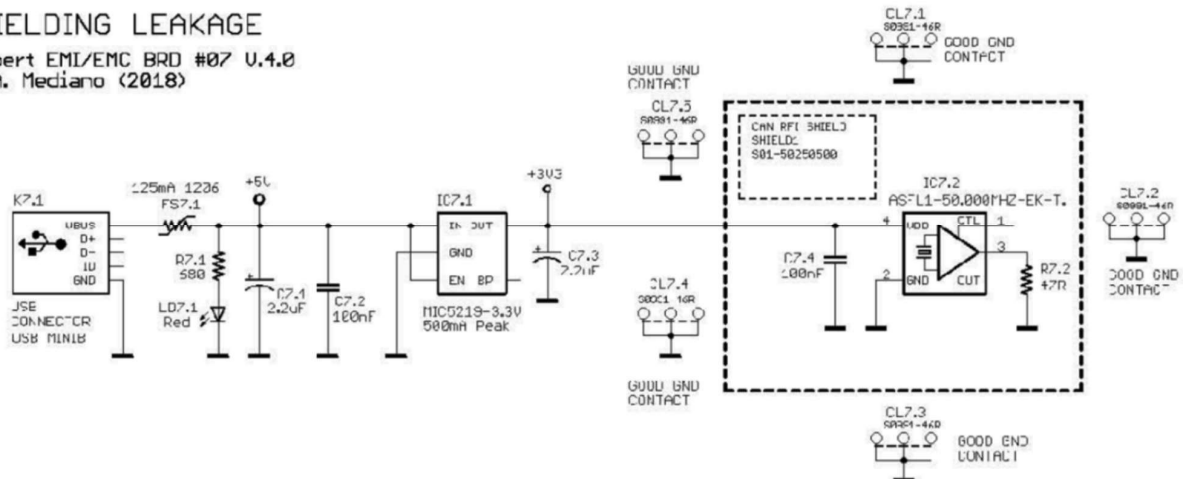
High frequency signal tries to return in the same direction as the forward path.

BRD#07

Shielding reduces the EMI!

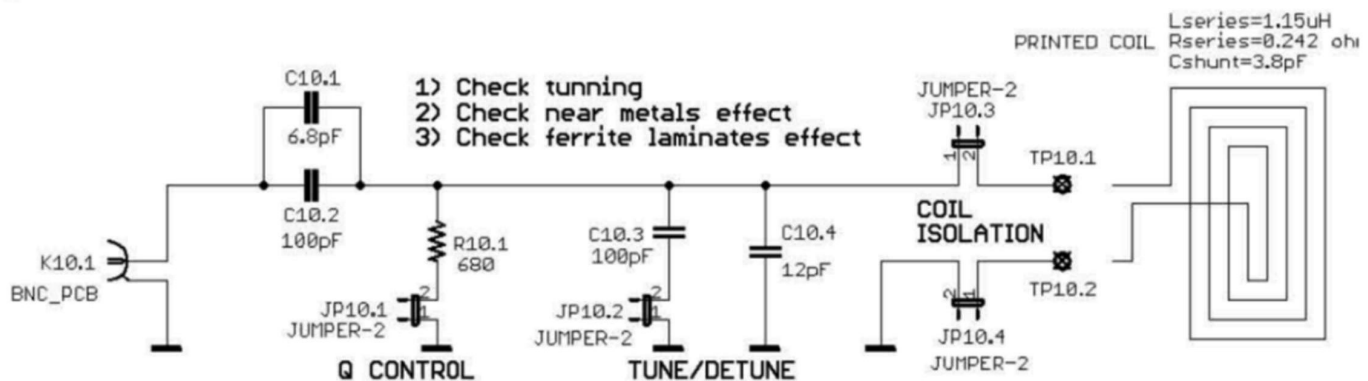
SHIELDING LEAKAGE

EMxpert EMI/EMC BRD #07 V.4.0
by A. Mediano (2018)



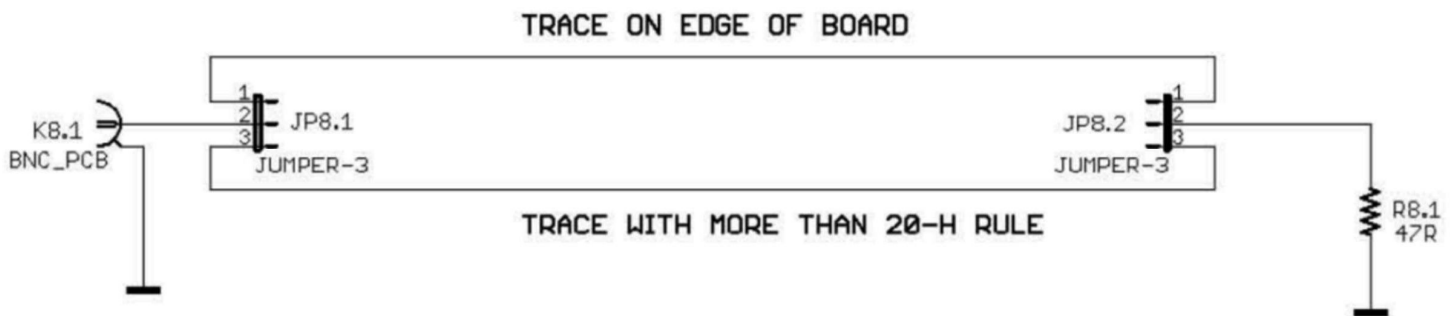
BRD#10

Testing the performance of the NFC antenna by EM scanner.

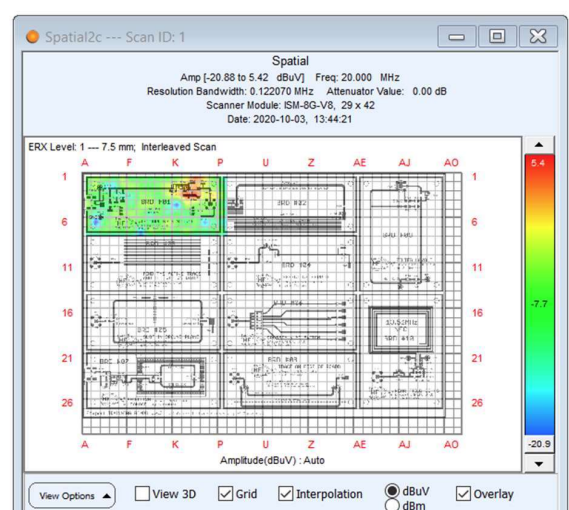
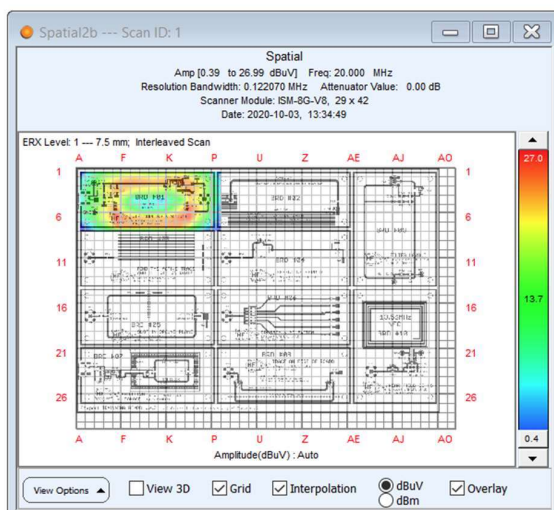


BRD#08, PhD

Critical signal near the edge of the board is not a good option causing fringing effect.



Scaling



Enjoy 😊

Project Setting

- Spectral Scan
 - Scanning the PCB at some locations in a wide frequency range.
 - *Start frequency* = 10MHz, *Stop frequency* = 200MHz, and *RBW*=122.070 kHz
 - Enable *Interleaved Scan*

Node Settings - Lab_2Test

Spectral Scan | Spectral Scan Probes | Spatial Scan | Spatial Scan Probes | Signal Conditioning | Description

Start Frequency: 10.000 MHz

Stop Frequency: 200.000 MHz

RBW: 122.070 kHz

☒ Interleaved Scan

ERX Control Level: Level 1 --- 7.50 mm

Sweeps Per Cell: 1

☒ Measure Peaks

Maximum Number Of Peaks: 2

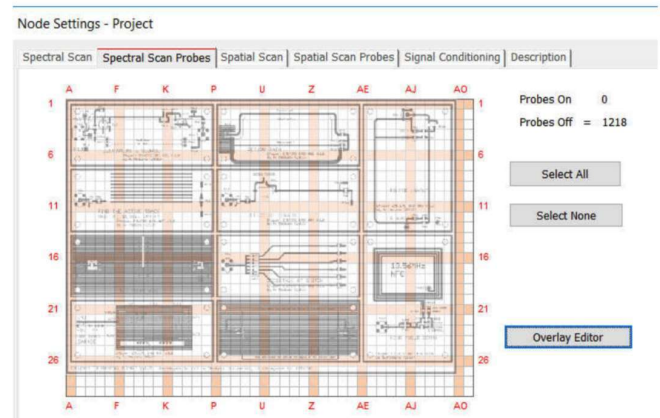
☐ Peak Hold

☐ Spectral Averaging

☒ Replace Data When Running Continuously

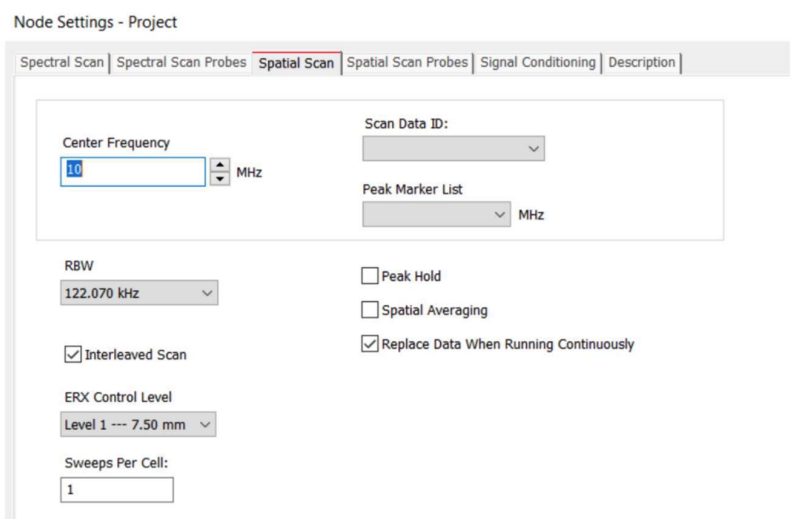
Project Setting

- Spectral Scan Probes
 - *Select None* and set *Overlay editor* and browse the image from 'C:\EMSCAN\IN5230 DemoCard\DemoBoardGerb'
 - Adjust the image



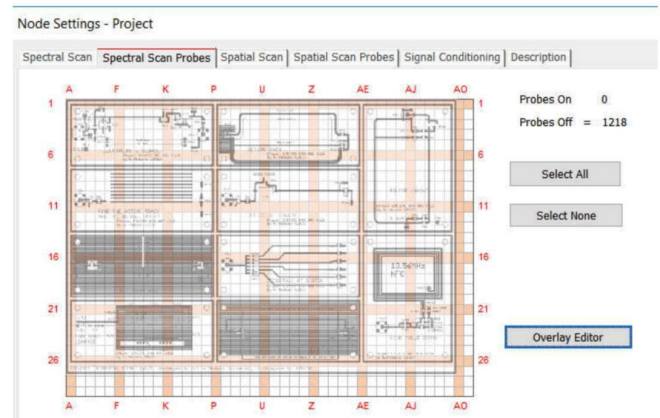
Project Setting

- Spatial Scan
 - Scanning a selection of locations at a certain frequency.
 - Set *Center frequency* = 20MHz.
 - Enable *Interleaved Scan*



Project Setting

- Spatial Scan Probes
 - The same as Spectral Scan Probes



Project Setting

- Leave the *Signal Conditioning* section as it is.
- Use the *Description* Tab to change the name of the project
- Create a new node for each exercise
 - project → right click → add node → module
 - change the module name to the exercise name
- Add a new simulation within each exercise module
 - exercise 1 → add node → Spectral/Special