ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

ROXTAG
SENSOR READOUT WITH PASSIVE NFC
README

Originator:

Function	Name
Project manager	Leo Torchia

Version:

Person	Date	NOTE
Leo Torchia	2021-01-10	Contains the project structure. Missing some images to showcase how it works.
Leo Torchia	2022-08-26	Changed name from ROXTAG to more general name. And updated doc a bit.

Introduction

The ROXTAG PROJECT uses an NFC based RFID chip (NHS3152) to detect a resistance of a device under test (DUT). An RFID is a tag that harvests EM energy to power a microchip and communicate with a device (in our case, an Android Phone). The project was born to Measure the resistance of a radiation sensor (relating changes in R to radiation absorbed), however it generalized to any DUT that needs a DC resistance measurement.

The project is divided into three parts:

NHS3152-App

App written in **Java** (programmer Alessandro Rossi), the app handles the phone-Chip NFC communication, captures the resistance data, and dose some basic plotting.

NHS3152-Firmware

The on-chip firmware, this code written in **c** allows the chip to measure the resistance of the DUT, save the data to memory, and communicate the data to the phone.

NHS3152-Hardware

This PCB design integrates the chip with an antenna (for energy harvesting and communication), and provides pads to connect to the DUT.

Commented [LDT1]: Issue with pad connection not resolved yet.

Project tree structure.

Below is the tree structure of this Project, with the main 3 parts: (NHS3152)-App, Firmware, Hardware. There is also folder **release_mra2_12_4_nhs3152**, an NXP provided folder with drivers, documentation and code examples related to NHS3152. The side comments highlight the most important files for each section.

```
├──NHS3152-App
│   ├──app
│   │   ├──build
│   │   │   ├──outputs
│   │   │   │   ├──apk
│   │   │   │   │   └──debug
│   │   └──src
│   │       ├──androidTest
│   │       │   └──java
│   │       │       └──com
│   │       │           └──example
│   │       │               └──readernhs
│   │       ├──main
│   │       │   ├──java
│   │       │   │   └──com
│   │       │   │       └──example
│   │       │   │           └──readernhs
│   └──NHS3152APPdocs
│       ├── HowREADERNHSAPPworks.pdf
│       ├── ProjectReport.pdf
│       ├── READERNHS3152 APP Documentation.pdf
│       └──tutorialVideo.mp4
```

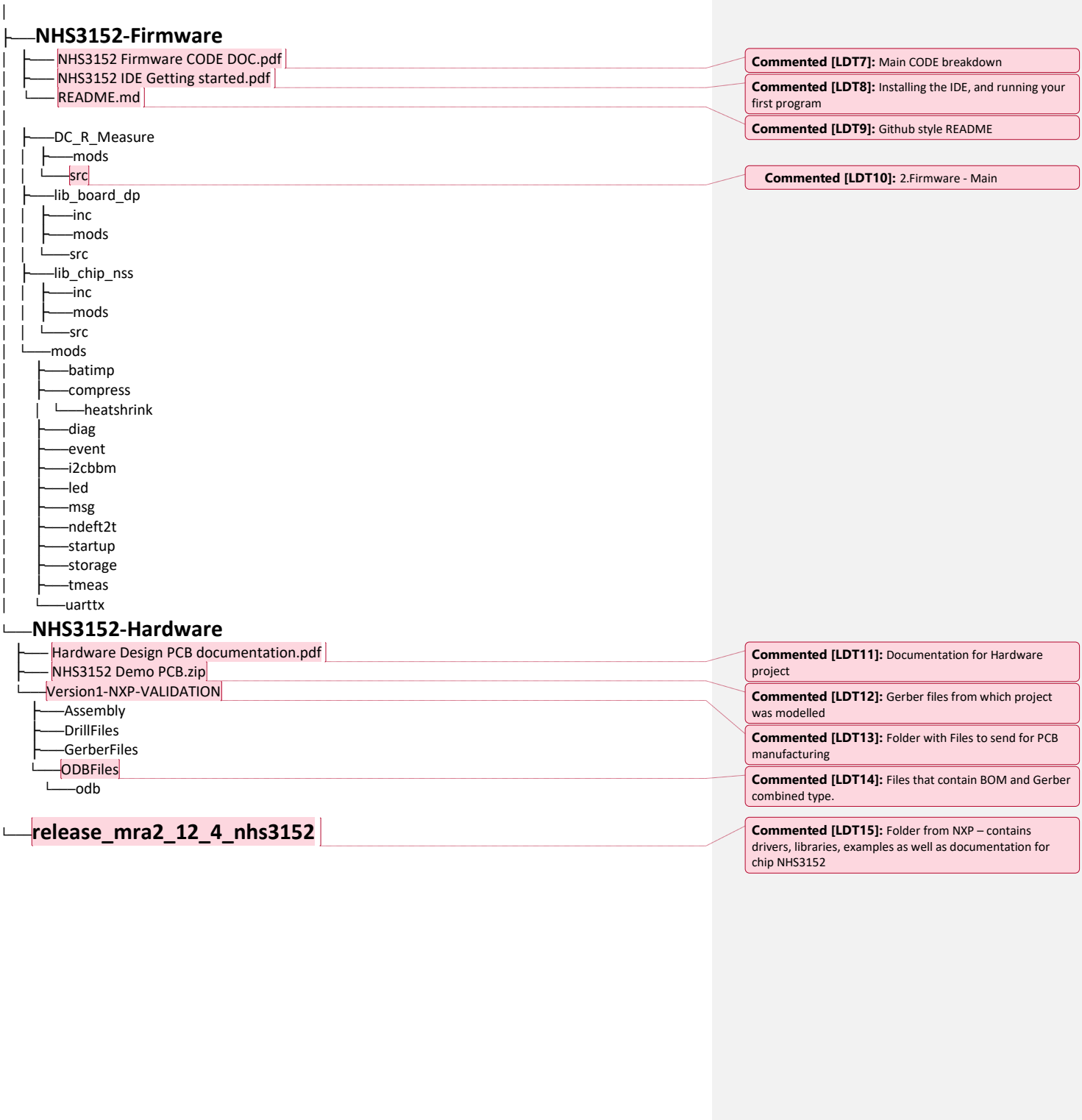
Commented [LDT2]: APK of APP

Commented [LDT3]: Main of APP

Commented [LDT4]: Doc: how app works

Commented [LDT5]: Doc relating code to APP functions

Commented [LDT6]: Video showing how APP works


NHS3152-Firmware
NHS3152 Firmware CODE DOC.pdf
NHS3152 IDE Getting started.pdf
README.md
DC_R_Measure
mods
src
lib_board_dp
inc
mods
src
lib_chip_nss
inc
mods
src
mods
batimp
compress
heatshrink
diag
event
i2cbbm
led
msg
ndeft2t
startup
storage
tmeas
uarttx
NHS3152-Hardware
Hardware Design PCB documentation.pdf
NHS3152 Demo PCB.zip
Version1-NXP-VALIDATION
Assembly
DrillFiles
GerberFiles
ODBFiles
odb
release_mra2_12_4_nhs3152
Commented [LDT7]: Main CODE breakdown
Commented [LDT8]: Installing the IDE, and running your first program
Commented [LDT9]: Github style README
Commented [LDT10]: 2.Firmware - Main
Commented [LDT11]: Documentation for Hardware project
Commented [LDT12]: Gerber files from which project was modelled
Commented [LDT13]: Folder with Files to send for PCB manufacturing
Commented [LDT14]: Files that contain BOM and Gerber combined type.
Commented [LDT15]: Folder from NXP – contains drivers, libraries, examples as well as documentation for chip NHS3152