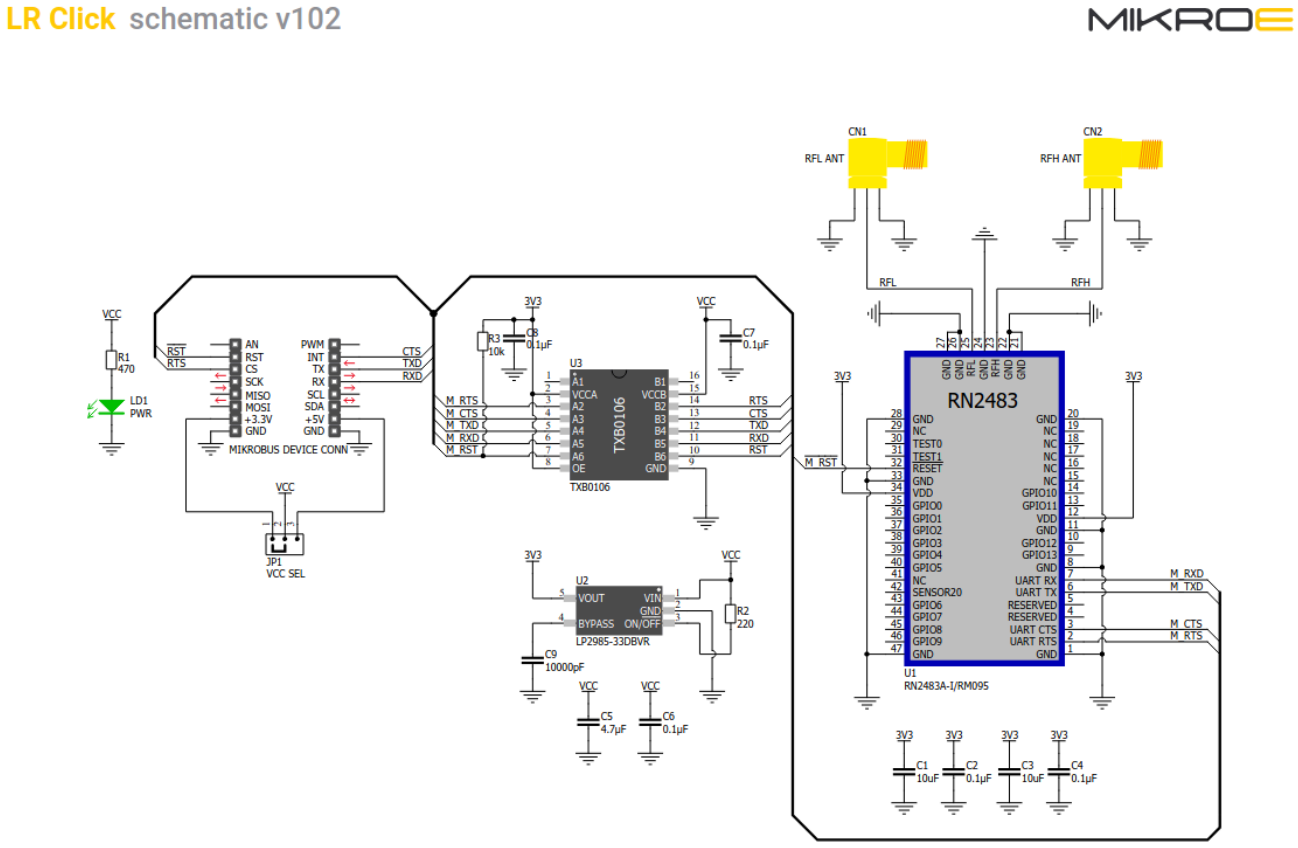
RN2483 power consumption

Motivation

To able to investigate how much the parameters for power consumption changes between individual chips. The only bare SOM LoRa trancievers in relevant numbers was the "LR click", Featuring RN2483A.

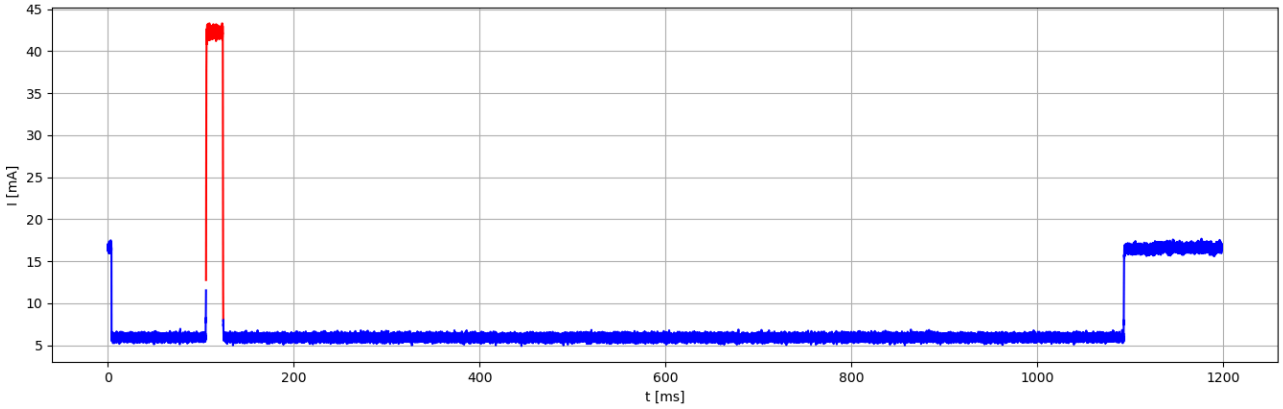
Devboard considerations.

The following schematic was supplied, by the manufacturer.
The devboard features a always enabled level shifter and LDO with quetscent current at 0.039mA & 0.065 mA respectively, these does not dictate the measured quescent current.



Results

The following characteristics were observed.



Red denotes the TX state transmission. The other states are UART communication yielding a significant consumption. A 50ohm termination was utilized for antenna.

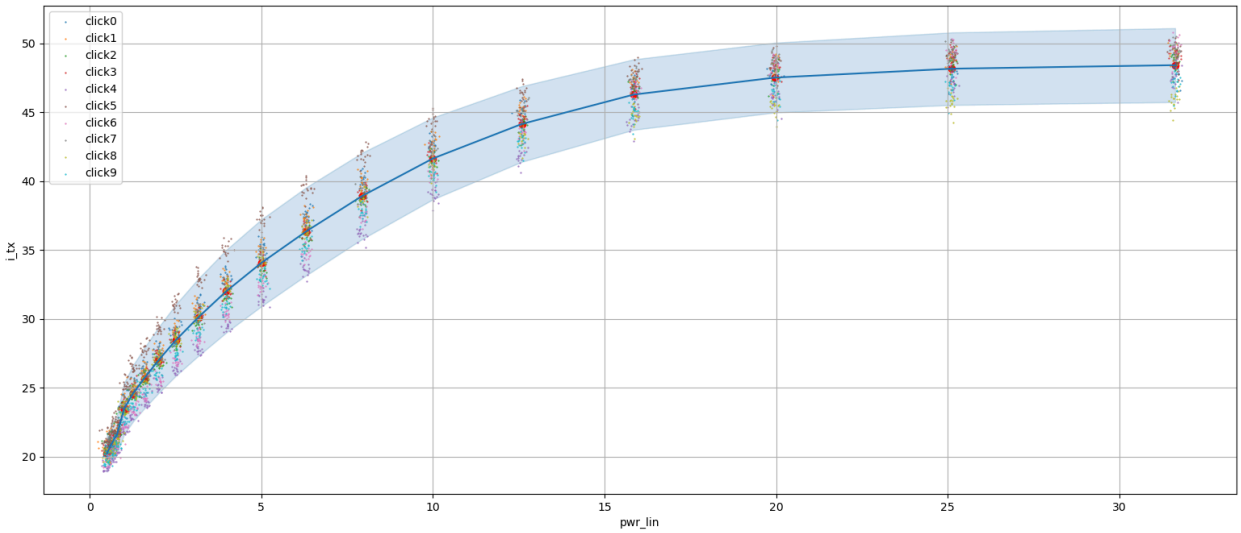
10x clickboards have been characterized with the following transmission settings:

```
spreading_factor = [7, 8, 9, 10, 11, 12]
bandwidth = [125, 250, 500]
tx_power = [-3, -2, -1, 0, 1, 2, 3,4,5,6,7,8,9,10,11,12,13,14,15]
code_rate = [5]
```

With the following message:

```
char message[] = {0,0,0,0,0,0,0,0,0,0};
```

The following variances were observed.

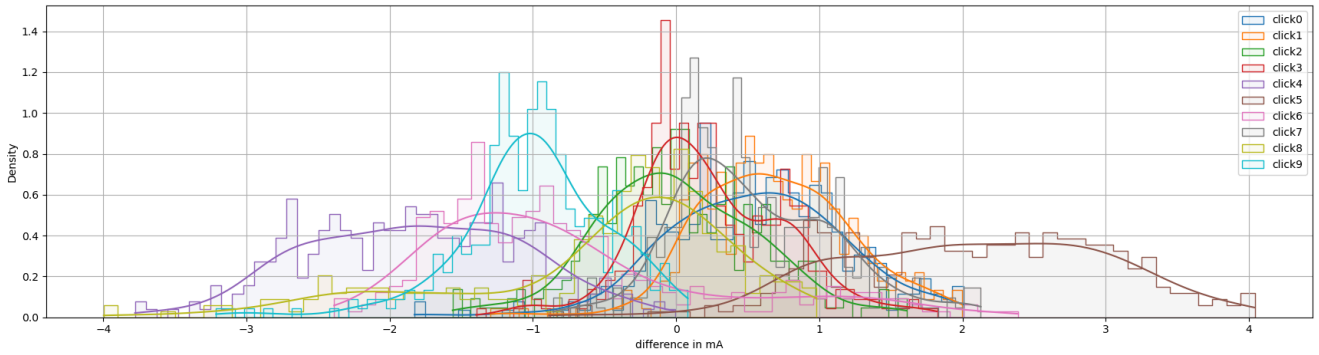


A slight noise have been added on the x axis to emphesise the distributions.

All 10 clickboards have been used to construct a population estimate for the mean for any power setting. Afterwards the residuals for each clickboard have been compared to this estimator.

120 Lines of statistical malpractice later...

The following tendency could be observed.



All raw measurements can be found in the github repo:

Discussion

Most importantly is the tendency to be above or below the population mean seems to be consistant for any setting of tx power, all raw data can be obtained from the github repo: https://github.com/Maltheren/CNT_antenna_meas_pt2/tree/main/Temperature_measurements

compiled on Feb 26, 2026, more to come.
-Malthe Sennels, CNT-AAU